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Well Fitness Evaluation for the Idaho National Engineering Laboratory

Volume 3

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DOE/ID-10392

Well Fitness Evaluation for the Idaho National Engineering Laboratory

Volume 3

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Published June 1993

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FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-020

A. WELL USE

1) Year well was drilled: 1951

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >8 inches Casing size 8 inches I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	8 I.D.	0 - 404	N.F.	20	N.F.	N.F.
Carbon Steel	6.25 I.D.	397 - 676	N.F.	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Sediment	658 - 676 (inside casing)	N.F.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No spreading areas, influent streams or percolation ponds are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no surface water exists in the area and no evidence was found of perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Methods _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Personal Communication - Rodger Jensen, USGS (May 1993).

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-020

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located over 1 mile southeast of the ICPP facility and monitors the Snake River Plain aquifer. The well does not have an annular surface seal as required by state regulations. However, it is not in proximity to any facilities or other potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration in the annulus is extremely low, a variance should be requested for the lack of this seal. Also, the following minor deficiencies were noted: the casing thicknesses and joint types were not documented and the borehole was not the required 2 inches larger than the casing in the alluvium but was about the same size.

Remediation: None

 GEOLOGIC LOG Well Name USGS-020

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	15	Sandy Gravel
15	21	Silt
21	114	Basalt
114	127	Siltstone and Claystone
127	150	Basalt
150	155	No Sample
155	215	Basalt
215	220	Cinders
220	248	Basalt
248	250	Siltstone
250	313	Basalt and Cinders
313	315	Siltstone
315	355	Basalt
355	362	Sandstone
362	367	Gravel
367	373	Sandy Clay
373	377	Clay / Gravel / Sand

COMPILED BY/ORGANIZATION: J.V. Wozniewicz / GAI Date October 8, 1992

 GEOLOGIC LOG Well Name USGS-020

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
377	450	Basalt
450	465	Basalt and Cinders
465	565	Basalt
565	570	No Sample
570	608	Basalt
608	641	Gravel and Cinders
641	643	Silt
643	650	Sand and Gravel
650	675	Clay
675	676	Basalt

COMPILED BY/ORGANIZATION: J.V. Wozniewicz / GAI Date October 8, 1992

WellName: USGS–020

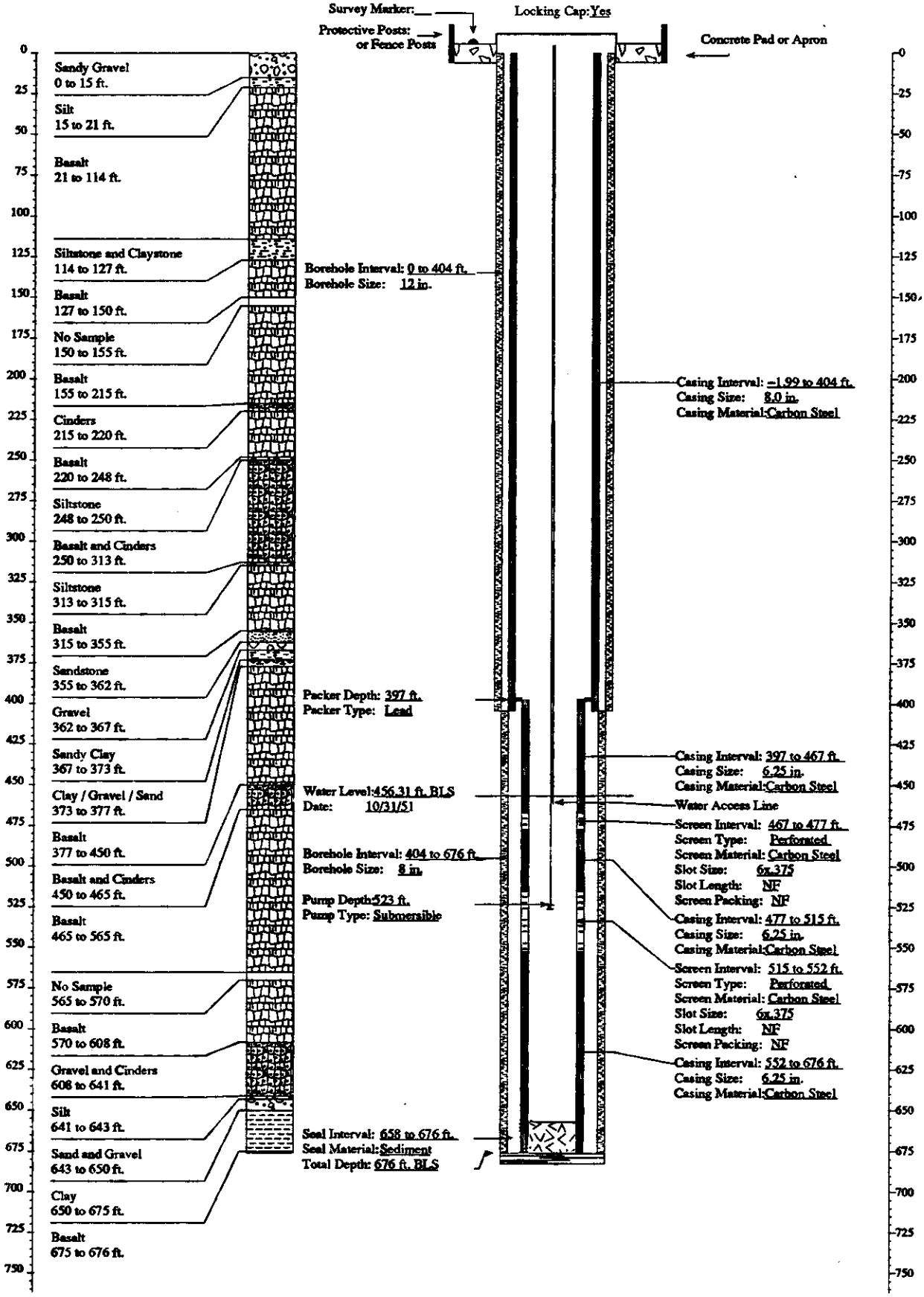
09/12/1993

Facility: ICPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1951
Total Depth: 676

Easting: 301228.86
Northing: 686526.62
Longitude: 1125459.00
Latitude: 433253.00
Completion Depth: 676

Driller: Strasser
Geologist: P.T.Voegeli,J.Jones
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4915.85

Water Level: 456.31
Water Level Date: 10/31/51
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No. USGS-034**

A. WELL USE

1) Year well was drilled: 1954

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, No_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS/Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16 inch Casing size 10 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	10 I.D.	0 - 500	N.F.	12	N.F.	N.F.
Carbon Steel	8 I.D. or O.D.	578 - 700	N.F.	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Puddling Clay	0 - 460	N.F.	N.F.
Canvas Packer	460	N/A	N/A
Neat Cement	494 - 499	1 sack of cement / 2 parts sand	Yes
Sediment (Inside Casing)	698 - 700	N.F.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _ Explanation_)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is outside the lateral extent of perched water created by the ICPP percolation ponds based on USGS Report 91-4166. The well also is over 4700 feet south of the Big Lost River channel.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched water above the sampling interval from the CWS files or the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Uncertain - the integrity of the puddling clay seal at 0-460 feet bls could not be evaluated since no information was found regarding its composition or method of emplacement. However, no evidence was found for perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-034

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The integrity of the puddling clay seal at 0-460 feet bls could not be evaluated since its composition and method of emplacement were not documented. However, the well is located over 3000 feet southwest of the ICPP percolation ponds and over 4700 feet south of the Big Lost River channel. Since the well is beyond the extent of perched water created by these sources, a variance should be obtained for the surface seal. Also, no information was found for the 8-inch casing or the 10-inch casing thickness, which are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-034

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	34	Gravel and Sand
34	63	Basalt
63	65	Clay
65	128	Basalt
128	135	Clay
135	169	Basalt
169	172	Clay
172	343	Basalt
343	347	Clay
347	402	Basalt
402	405	Clay
405	587	Basalt
587	598	Clay
598	625	Basalt
625	633	Sand and Clay
633	700	Basalt
		Total Depth 700 feet

COMPILED BY/ORGANIZATION: F.S. Mocker/ GAI Date August 12, 1992

WellName: USGS–034

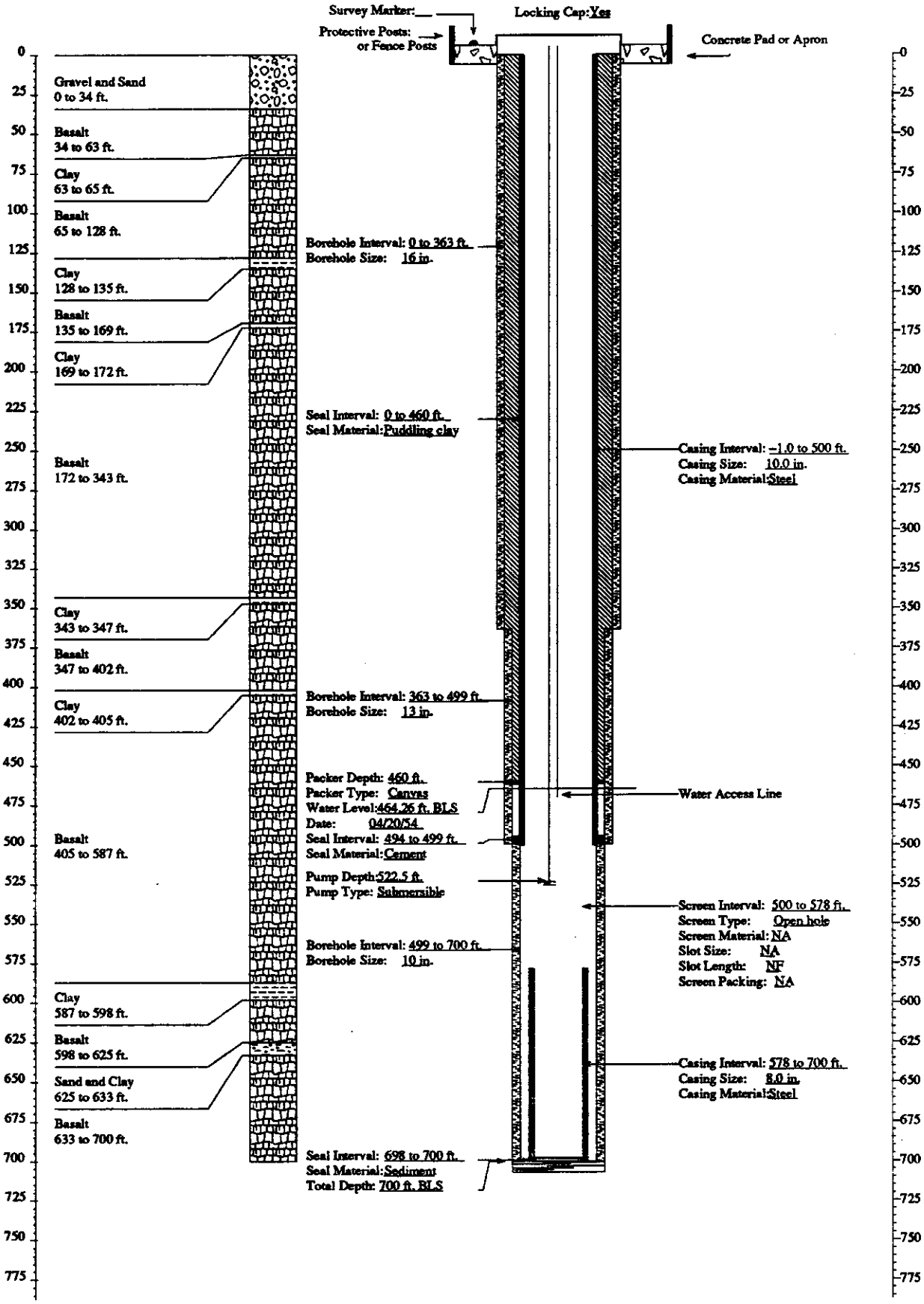
07/06/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1954
Total Depth: 700

Easting: 292739.00
Northing: 690799.00
Longitude: 1125654.81
Latitude: 433334.42
Completion Depth: 699.86

Driller: Cope
Geologist: Rex O. Smith
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4929.65

Water Level: 464.26
Water Level Date: 04/20/54
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No.** USGS-035

A. WELL USE

1) Year well was drilled: 1955

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS/ Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock:(Yes _ No X Borehole size >12 inches Casing size 12 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12 I.D.	0 - 39	N.F.	18	N.F.	N.F.
Carbon Steel	8 I.D.	0 - 142.5	N.F.	24	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is beyond the lateral extent of perched water created by the ICPP percolation ponds based on the USGS Report 91-4166. The well also is over 4200 feet south of the Big Lost River channel.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Based on information from the CWS files and geophysical logs, no indication was found of perched or saturated conditions near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no evidence was found of perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _)

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-035

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface casing seal as required by state regulations. However, the well is located over 3000 feet southwest of the ICPP percolation ponds and over 4200 feet south of the Big Lost River channel. Since the well is beyond the extent of perched water created by these sources, a variance should be requested for the lack of this seal. In addition, the following minor deficiencies were noted: the borehole was not the required 2 inches larger that the surface casing but was about the same size and the casing thicknesses and joint types were not documented.

Remediation: None

GEOLOGIC LOG

Well Name USGS-035

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	35	Gravel
35	50	Basalt
50	57	Clay / Sand / Gravel
57	170	Basalt
170	175	Siltstone
175	202	Basalt
202	210	Sandstone
210	218	Basalt
218	225	Siltstone
225	268	Basalt
268	540	Basalt and Cinders
540	578.5	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker/GAI Date 12 Aug 92

WellName: USGS–035

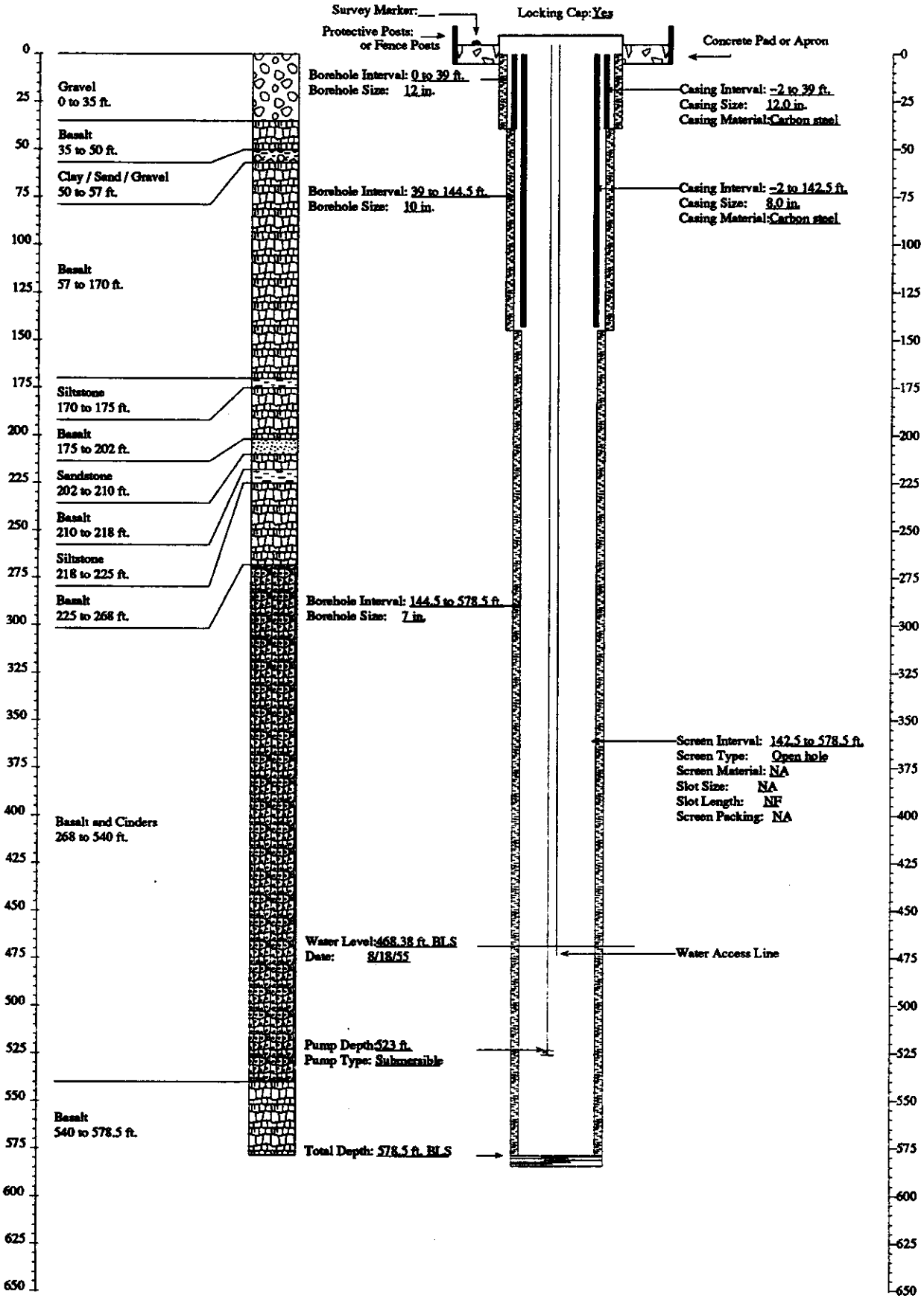
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1955
Total Depth: 578.5

Easting: 292495.00
Northing: 691251.00
Longitude: 1125658.19
Latitude: 433338.86
Completion Depth: 578.5

Driller: Cope
Geologist: Alan E. Peckhain
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4930.07

Water Level: 468.38
Water Level Date: 8/18/55
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-036

A. WELL USES

1) Year well was drilled: 1955

2) Current use for well:
( )DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3; RCRA - pH, specific conductances, TOC, TOX, Ba, Cd, Cr, Ag, As, Pb, Se, Hg, F, NO_3, Endrin, Lindane, Methoxychlor, Toxaphene, Herbicides, Gross Alpha, Gross Beta, Fe, Mn, Na, phenols, Cl, SO_4

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: Draft Final Groundwater Monitoring Plan for the Idaho Chemical Processing Plant

7) Responsible organization/Contact person: RCRA - WINCO/Ken Taylor; USGS Observation - USGS/Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)

5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock:(Yes _ No X Borehole size >12 inches Casing size 12 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel (surface casing)	12 I.D.	0 - 37	N.F.	15	N.F.	N.F.
Steel	6.25 I.D.	0 - 430	N.F.	15	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Bridge (Rock) (1)	541	N/A	N/A
(1) From video log run in well 4-21-93 (pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation Based on USGS Report 91-4166, the well is beyond the lateral extent of perched waters created by the ICPP percolation ponds. Also, the well is almost a mile south of the Big Lost River channel.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No indication was found of perched water above the sampling interval from the CWS files or the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no evidence was found of perched groundwater above the monitoring interval.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes X No _) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Open Hole Completion
Screen	Open Hole Completion
Pump	Grundfos submersible 5 HP Model
Discharge Pipe	1.5-inch Stainless Steel
Water Level Measuring Pipe	Stainless Steel

Explanation Stainless steel is acceptable for compliance/detection monitoring.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitoring interval, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval 468.3 feet bls (water table) - 567.1 feet bls. The monitoring interval of about 100 feet is excessive and may include more than one type of lithology.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth 523 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Grundfos Submersible 5 HP Explanation EGG-WM-9787 documents that submersible pumps, gas piston pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166; EGG-WM-9787; Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation and RCRA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface casing seal as required by state regulations. However, the well is located over 3000 feet southwest of the ICPP percolation ponds and almost a mile south of the Big Lost River channel. Since the well is located beyond the extent of perched water created by these sources and is not in proximity to any other potential sources of surface contamination, a variance should be requested for the lack of this seal. In addition, the following minor deficiencies were noted: the casing thicknesses and joint types were not documented and the borehole is not the required 2 inches larger than the surface casing, but is about the same size.

Remediation: None

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-036

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
( ) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not comply with state regulations to the extent stated above. The well does not comply with RCRA guidelines for the following reasons: (1) the monitoring interval of about 100 feet is considered excessive for compliance/detection use and may result in the dilution of contaminant concentrations, (2) the completion zone includes a 10-foot section of basalt with interbedded sand, and the monitoring of more than one lithology type is usually not acceptable for RCRA, and (3) the casing is not sealed, which may affect the validity of the water samples. Although no documentation was found for decontamination procedures, well development or the use of drilling fluids, these are minor deficiencies. A 1993 video log run in the well indicated that a rock had bridged in the hole at 541 feet bls. This is 18 feet below the pump intake and should not affect water chemistry.

Remediation: None

GEOLOGIC LOG

Well Name USGS-036

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	35	Gravel and Sand
35	60	Basalt
60	65	Sand
65	73	Gravel and Sand
73	84	Basalt
84	86	No Sample
86	140	Basalt
140	148	Basalt and Clayey Cinders
148	300	Basalt
300	320	Basalt / Clay / Cinders
320	355	Basalt
355	375	Sand and Gravel
375	385	Sandy Clay
385	395	Clay
395	470	Basalt
470	480	Interbedded Basalt and Sand
480	567.1	Basalt
		Total Depth 567.1 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 14, 1992

WellName: USGS–036

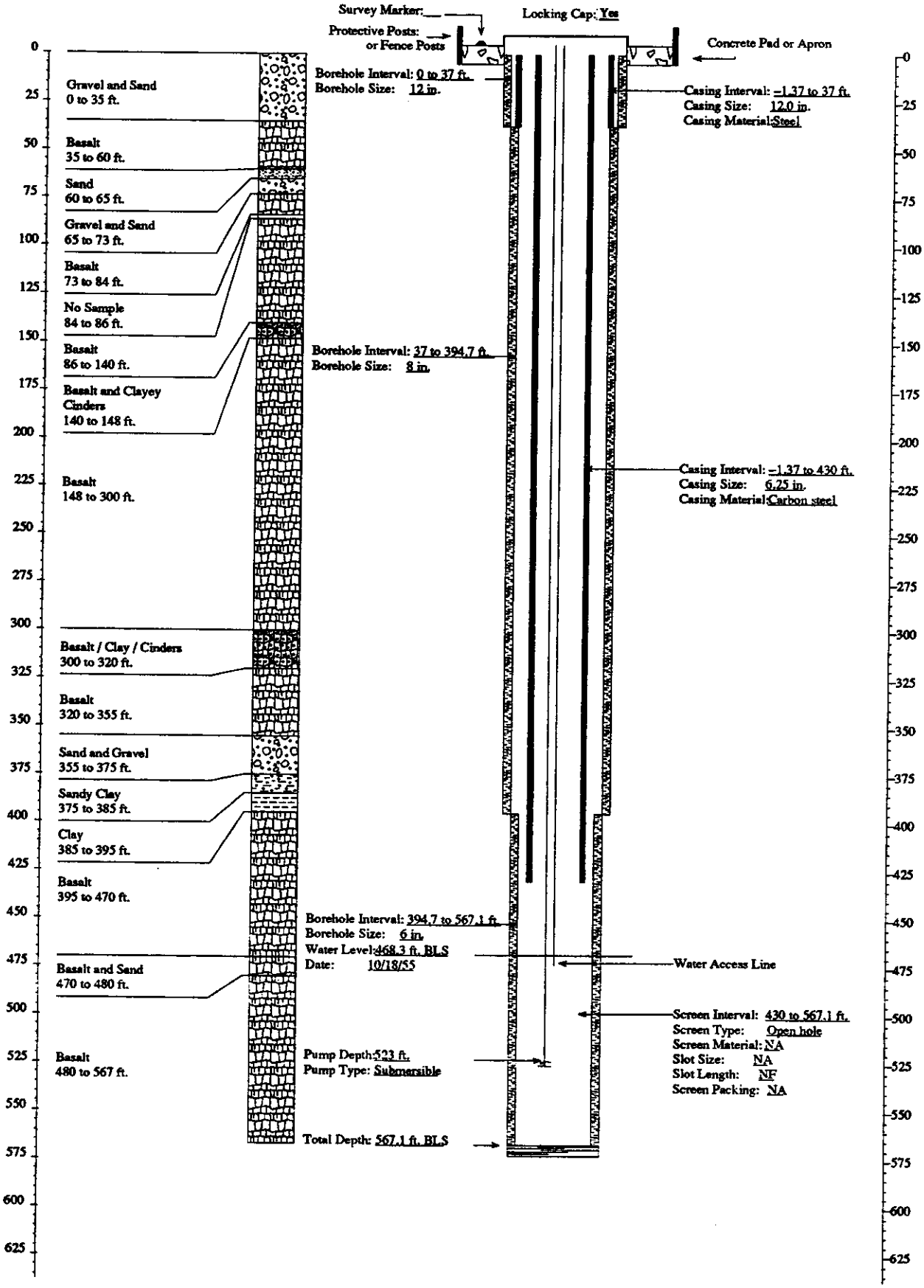
Facility: CPP
Well Type: Monitoring Well
Well Status: Active
Year Drilled: 1955
Total Depth: 567.1

Easting: 292977.00
Northing: 690358.00
Longitude: 1125651.53
Latitude: 433330.09
Completion Depth: 567.1

Driller: Cope
Geologist: Alan E. Peckhain
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4929.85

06/23/1993

Water Level: 468.3
Water Level Date: 10/18/55
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-037

A. WELL USE

1) Year well was drilled: 1955

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}, Pu^{238}, $Pu^{239-240}$, Gamma Spec

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >12 inches Casing size 12 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel (surface casing)	12 inch I.D.	0 to 41.5	Welded	16	N.F.	N.F.
Steel	6.25 inch I.D.	0 to 507	N.F.	16	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Sediment	567 - 571.5	N.F.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation Based on information in USGS publication 91-4166, the well is not within the lateral extent of perched waters created by the ICPP percolation ponds. The well also is located over a mile south of the Big Lost River channel.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Geophysical logs do not indicate any occurrence of perched waters above the sampling interval. However, the driller's log mentioned mud in the borehole at approximately 403 feet.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, a casing seal was not documented. However, the well is over 3100 feet from the ICPP percolation ponds and the likelihood of perched waters occurring near the well is low.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

	Material
Casing	
Screen	
Pump	
Discharge Pipe	
Explanation	

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _)

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface casing seal as required by state regulations. However, the well is located over 3100 feet southwest of the ICPP percolation ponds and over a mile south of the Big Lost River channel. Since the well is located beyond the extent of perched water created by these sources and is not in proximity to any other potential sources of surface contamination, a variance should be requested for the lack of this seal. In addition, the following minor deficiencies were noted: the casing thicknesses and the 6-inch casing joint type were not documented and the borehole is not the required 2 inches larger than the surface casing, but is about the same size.

Remediation: None

 GEOLOGIC LOG Well Name USGS-037

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	42	Gravel and Sand
42	55	Basalt
55	72	Sand and Gravel
72	120	Basalt
120	125	Basalt / Silt / Clay
125	182	Basalt
182	192	Basalt / Sand / Clay
192	197	Sandy Clay
197	218	Basalt
218	228	Basalt and Volcanic Ash
228	293	Basalt
293	314	Basalt and Clayey Sand
314	348	Basalt
348	359	Gravel / Sand / Clay
359	375	Gravel and Sand
375	413	Basalt
413	450	Basalt and Sand
450	496	Basalt
496	505	Basalt and Clay

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 6, 1992

GEOLOGIC LOG

Well Name USGS-037

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
505	555	Gravel and Clayey Sand
555	571.5	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 6, 1992

WellName: USGS-037

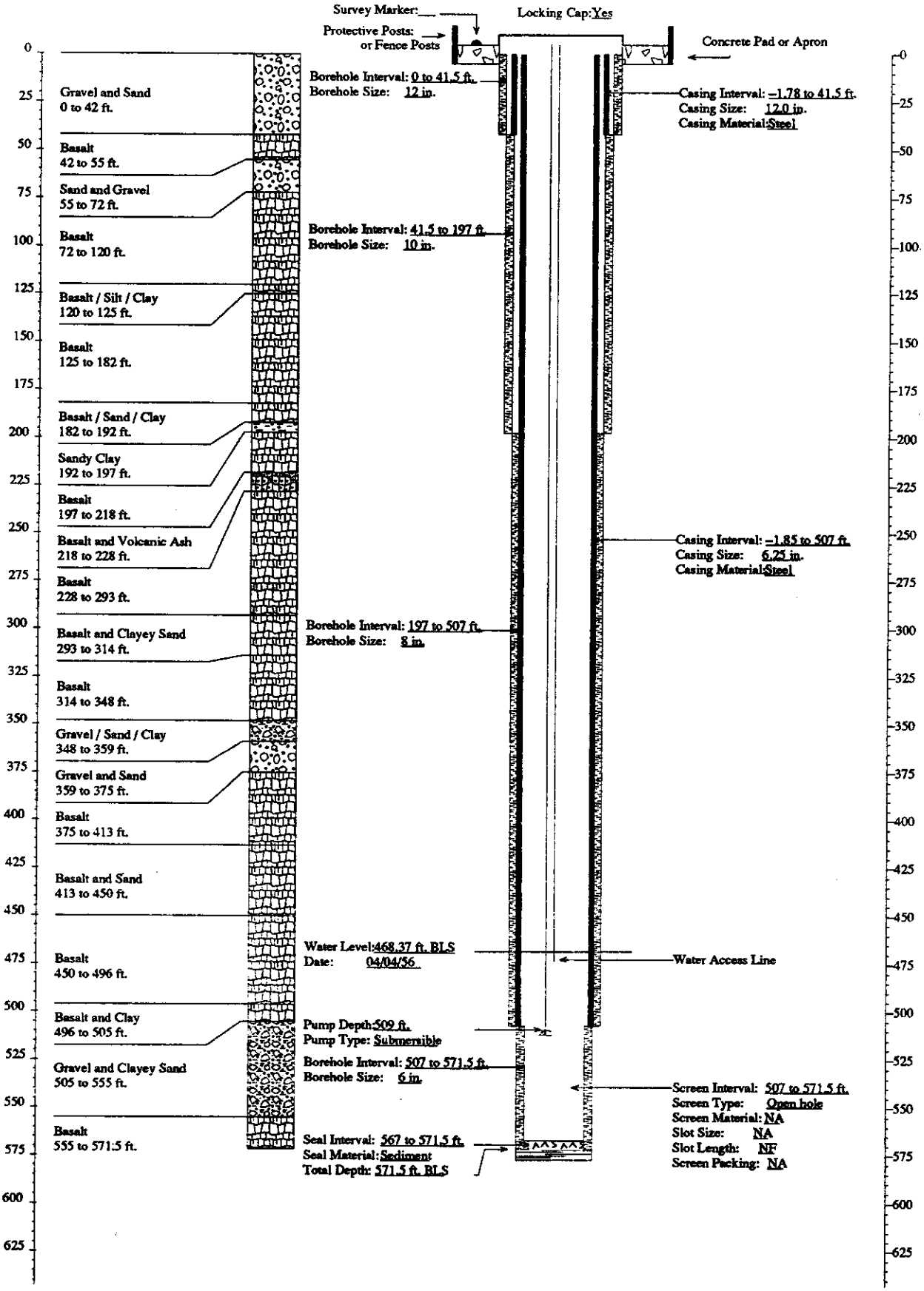
07/30/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1955
Total Depth: 571.5

Easting: 293222.00
Northing: 689920.00
Longitude: 1125648.14
Latitude: 433325.79
Completion Depth: 571.5

Driller: Cope
Geologist: Alan E. Peckhain
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4929.63

Water Level: 468.37
Water Level Date: 04/04/56
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No. USGS-038**

A. WELL USE

1) Year well was drilled: 1955

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >12.25 inches Casing size 12.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12.25 I.D.	0 - 25.6	Welded	17	N.F.	N.F.
Steel	6.25 I.D.	0 - 505	Screw Coupled	17	0.25	Yes
Steel	4.0 I.D.	427 - 678	Screw Coupled	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Sediment [1]	607 - 729	N.F.	N/A
[1] Sediment extends into 4-in. casing from 607 to 678 feet bls. (from video log run in well 4-16-93, pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation Based on information available in USGS publication 91-4166, the well is outside the lateral extent of perched waters created by the ICPP percolation ponds. The well also is located over a mile south of the Big Lost River channel.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched water above the sampling interval from the CWS files or the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no evidence was found for perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _)

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface casing seal as required by state regulations. However, the well is located over 3000 feet southwest of the ICPP percolation ponds and over a mile south of the Big Lost River channel. Since the well is beyond the extent of perched water created by these sources and is not in proximity to any other potential sources of surface contamination, a variance should be requested for the lack of this seal. In addition, the following minor deficiencies were noted: the thickness of the 4-inch and 12-inch casings were not documented and the borehole was not the required 2 inches larger than the casing but was about the same size.

Remediation: None

 GEOLOGIC LOG Well Name USGS-038

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	26	Sand and Gravel
26	30	Basalt / Sand / Gravel
30	53	Basalt
53	60	Basalt / Sand / Silt
60	67	Gravel / Silt / Sand
67	107	Basalt
107	145	Cinders and Clay (No Sample)
145	157	Basalt and Silt
157	175	Basalt
175	195	Basalt and Cinders
195	215	Basalt
215	225	Basalt and Cinders
225	235	Basalt
235	245	Basalt and Cinders
245	313	Basalt
313	322	Basalt and Silt
322	347	Basalt
347	354	Silt
354	361	Gravel and Sand

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 6, 1992

 GEOLOGIC LOG Well Name USGS-038

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
361	370	Gravel
370	375	Silt and Sand
375	460	Basalt
460	536	Basalt and Cinders
536	578	Basalt
578	610	Basalt / Clay / Gravel
610	625	Basalt / Sand / Gravel
625	640	Gravel and Sand
640	652	Silt and Sand
652	670	Basalt / Sand / Gravel
670	685	Silt / Sand / Gravel
685	700	Basalt
700	729	Sand and Basalt
		Total Depth 729 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 6, 1992

WellName: USGS–038

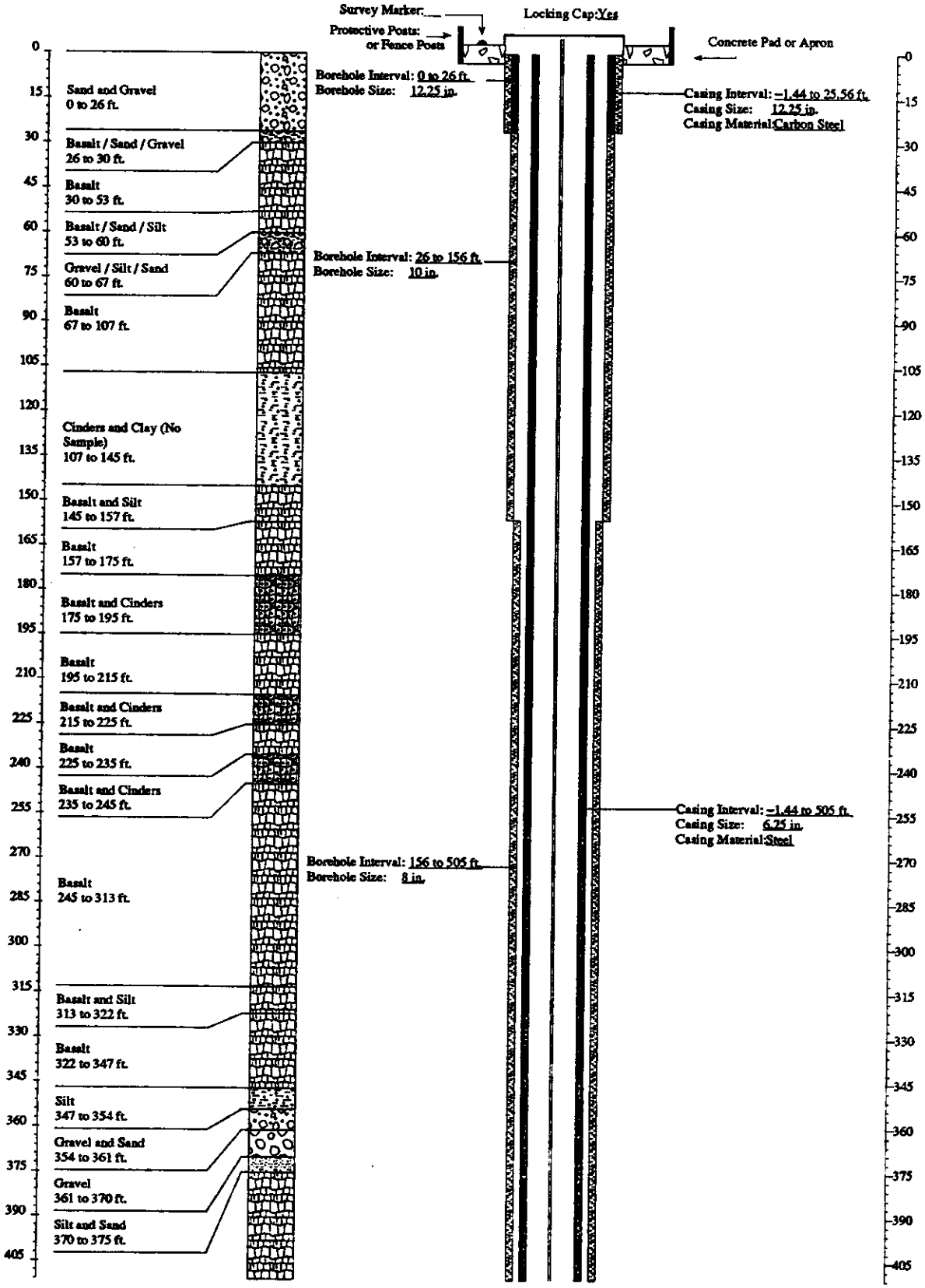
12/21/1993

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1955
Total Depth: 729

Easting: 449530.193
Northing: 689544.976
Longitude: 1125646.2526
Latitude: 433322.00865
Completion Depth: 729

Driller: Cope
Geologist: R. H. Carson
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4933.14

Water Level: 468.96
Water Level Date: 11/11/55
Water Level Access: Line



WellName: USGS-038

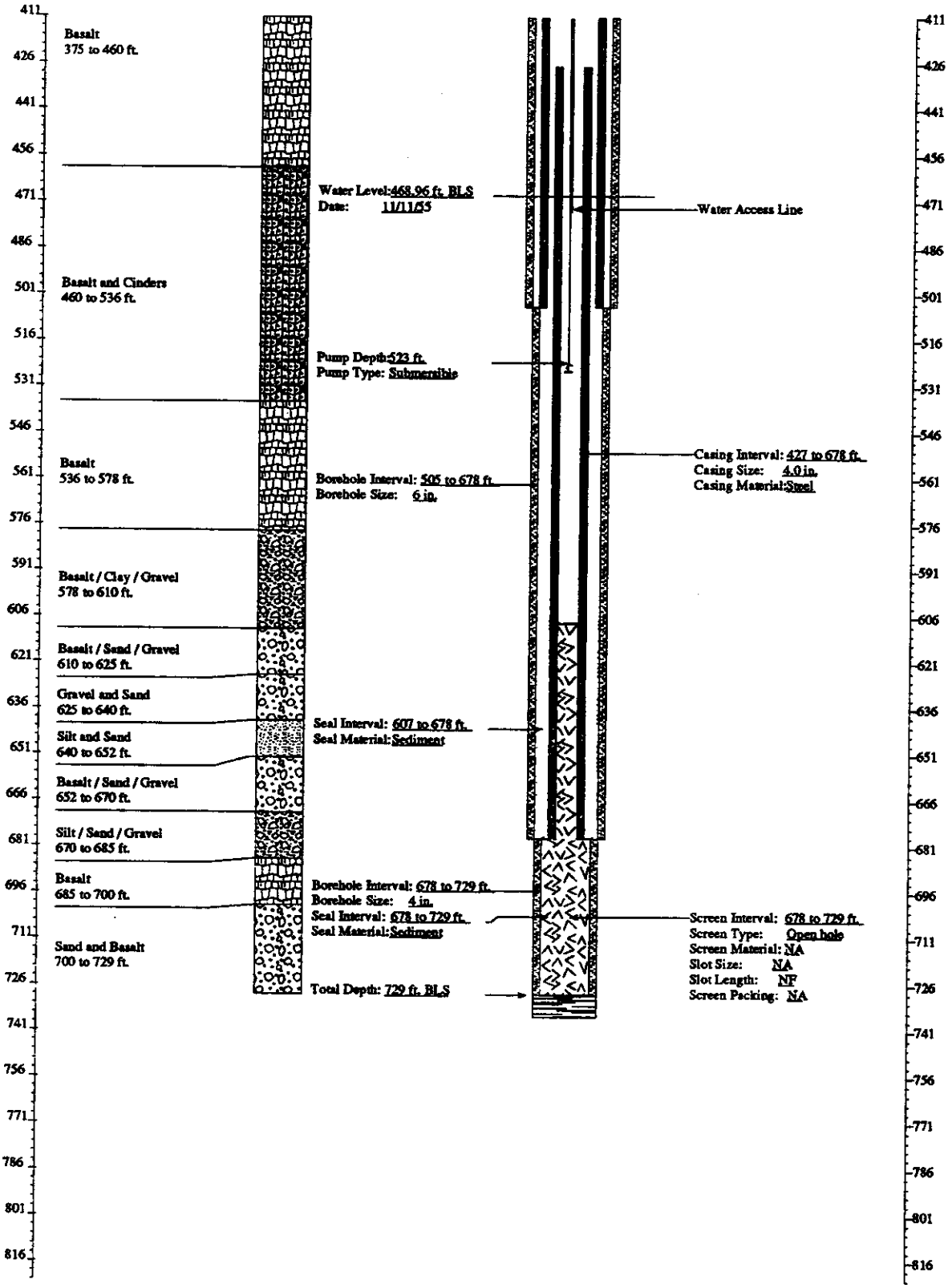
12/21/1993

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1955
Total Depth: 729

Easting: 449530.193
Northing: 689544.976
Longitude: 1125646.2526
Latitude: 433322.00865
Completion Depth: 729

Driller: Cope
Geologist: R. H. Carson
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4933.14

Water Level: 468.96
Water Level Date: 11/11/55
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-039

A. WELL USES

1) Year well was drilled: 1955

2) Current use for well:
( )DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3; RCRA - pH, specific conductance, TOC, TOX, Ba, Cd, Cr, Ag, As, Pb, Se, Hg, F, NO_3, Endrine, Lindane, Methoxychlor, Toxaphene, Herbicides, Gross Alpha, Gross Beta, Fe, Mn, Na, phenols, Cl, SO_4

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: Draft Final Groundwater Monitoring Plan for the Idaho Chemical Processing Plant

7) Responsible organization/Contact person: RCRA - WINCO/Ken Taylor; USGS Observation - USGS/Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)

5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3.3.2.1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >12 inches Casing size 12 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12 inch I.D.	0 - 48	N.F.	17	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Caved Material (1)	493 - 571.9	N.F.	N.F.
(1) From video log run in well 4-21-93 (pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation Based on USGS report 91-4166, the well is beyond the lateral extent of perched waters created by the ICPP percolation ponds. The well also is over 3700 feet south of the Big Lost River channel.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _)Explanation (Qualify data/specify perched intervals if applicable) No indication was found of perched waters above the sampling interval from the CWS files or the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no evidence was found of perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes X No _) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity N.F.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Open Hole Completion
Screen	Open Hole Completion
Pump	Grundfos Submersible Model
Discharge Pipe	1.5-inch stainless steel
Water Level Measuring Pipe	1-inch steel

Explanation Stainless steel is acceptable for compliance/detection monitoring. Although steel may corrode in acidic environments, the groundwater at the INEL is not acidic.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Open hole completion

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitoring interval, the well monitors both dissolved constituents and "floaters".

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes X No _) Monitoring interval(s) 470 feet bls (water table) to 572 feet bls. The monitoring interval of about 100 feet is excessive. It includes cindery zones and the lithology in the bottom 44 feet of the well was not defined.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth 490 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Grundfos Submersible 5HP Explanation EGG-WM-9787 documents that submersible pumps, gas piston pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-WM-9787, USGS Report 91-4166, Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-039

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located over 3000 feet west of the ICPP percolation ponds and over 3700 feet south of the Big Lost River channel. Since the well is beyond the extent of perched water created by these sources and is not in proximity to any other sources of surface contamination, a variance should be requested for the lack of this seal. In addition, the following minor deficiencies were noted: the casing thickness and joint type were not documented and the borehole was not the required 2 inches larger than the surface casing but was about the same size.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
( ) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not comply with state regulations to the extent stated above. The well does not comply with RCRA guidelines for the following reasons: (1) the monitoring interval of about 100 feet is considered excessive for compliance/detection use and (2) the borehole is uncased and unsealed for about 420 feet above the monitored zone, which may affect the integrity of the groundwater samples. Although no documentation was found for the decontamination procedures, well development or the use of drilling fluids, these are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-039

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	38	Gravel and Sand
38	67	Gravel/Sand/Basalt
67	125	Sandy Basalt and Clay
125	160	Cinders
160	230	Basalt and Cinders
230	238	Silt/Sand/Basalt
238	267	Basalt
267	278	Silt and Basalt
278	350	Basalt
350	357	Basalt and Cindery Silt
357	400	Basalt
400	414	Basalt/Gravel/Sand
414	435	Basalt
435	444	Cindery Basalt
444	453	Basalt and Clay
453	477	Basalt
477	487	Cinders and Basalt
487	505	Basalt
505	519	Basalt/Cinders/Gravel
519	528	Cindery Basalt
528	571.9	No Sample (Fractured Basalt and Cinders?)

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 18, 1992

WellName: USGS–039

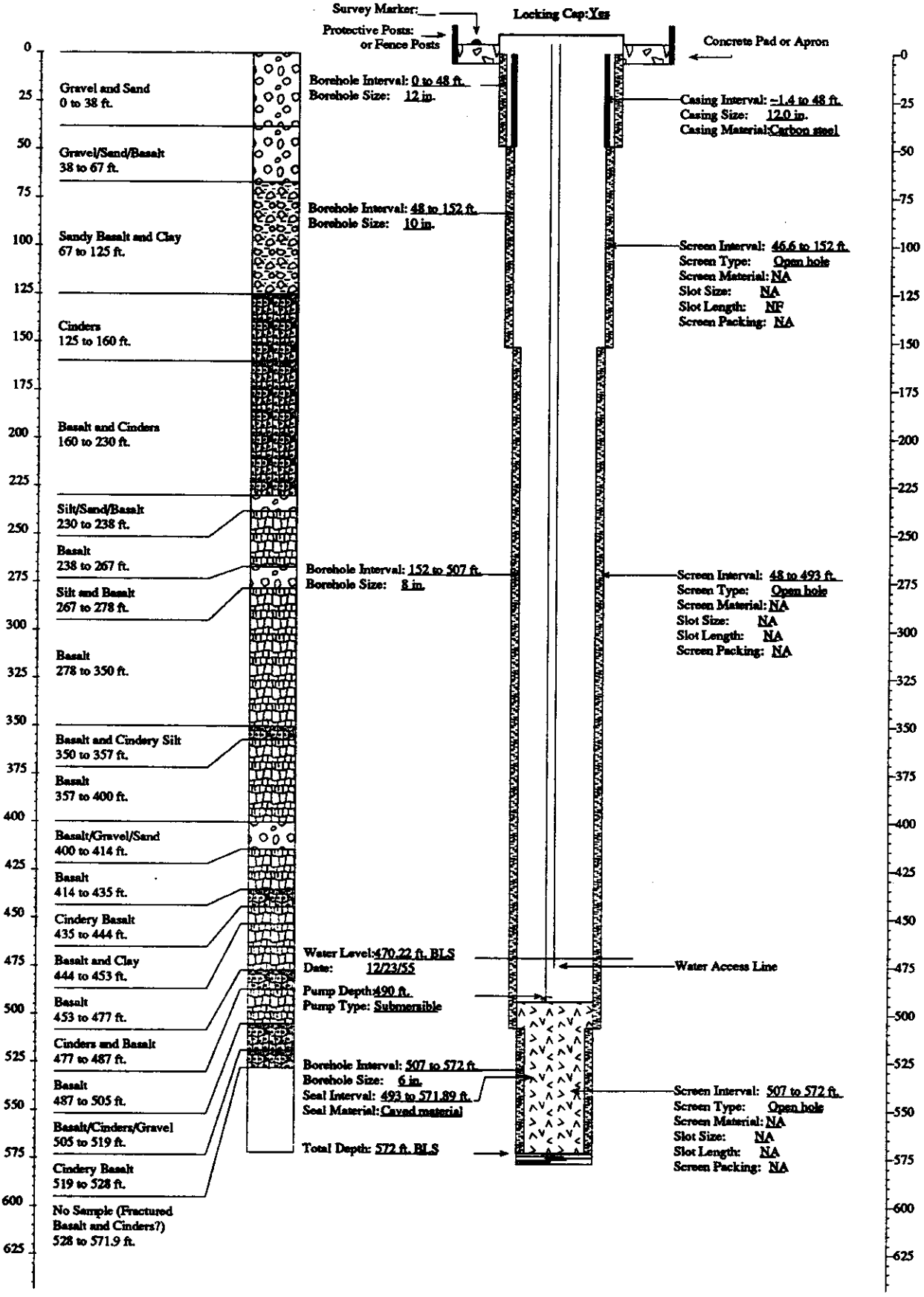
06/17/1993

Facility: CPP
Well Type: Monitoring Well
Well Status: Active
Year Drilled: 1955
Total Depth: 572

Easting: 292258.00
Northing: 691691.00
Longitude: 1125701.46
Latitude: 433343.19
Completion Depth: 571.89

Driller: Cope
Geologist: Alan E. Peckhain
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4932.88

Water Level: 470.22
Water Level Date: 12/23/55
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No. USGS-040**

A. WELL USE

1) Year well was drilled: 1956

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Gamma Spec., ^{241}Am, ^{238}Pu, $^{239,240}Pu$, Na, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 11.5 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	6.25 I.D.	0 - 446.9	Screw-Coupled	15	N.F.	N.F.
Steel (1)	4 I.D.	432 - 678.8	N.F.	N/A	N.F.	N.F.

(1) A video log made in 1992 showed that the casing is perforated from 452 to 483 feet bls (above the backfill in the casing) and is badly deteriorated in this interval (pers. comm. Rodger Jensen, USGS).

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Drill Cuttings	0 - 220	N.F.	No
Cement Grout	About 440 - 447 (bottom of casing set in cement)	N.F.	Yes
Backfill	483 - 677 (in 4-inch casing)	N.F.	No
Cement Grout	677 - 678.8 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located on the west side of the ICPP facility about 2000 feet southeast of the Big Lost River, which may create transitory perched water in the area when it flows. It is also situated near several small depressions which may concentrate surface runoff.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _) Explanation (Qualify data/specify perched intervals if applicable) The well is located about 370 feet south of an area which contains contaminated perched water at about 110 feet bls (ICPP Groundwater Monitoring Plan, 1991). The source of the perched water has not been determined. Also, the 1970 neutron log shows deflections at 105-225 feet bls and at 375 feet bls which may result from clay in the formation or saturated conditions.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains drill cuttings from 0 to 220 feet bls and is unsealed from 220 to 440 feet bls.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

	Material
Casing	
Screen	
Pump	
Discharge Pipe	
Explanation	

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _)

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** ICPP Groundwater Monitoring Plan (Nov. 1991); "Report of the Idaho Chemical Processing Plant Drilling and Sampling Program at HLLW Tank Farm and LDU CPP-33" (Golder Associates, Dec. 1991); USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (Feb. 1993); Personal Communication - Gerald Sehlke, EG&G (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well was backfilled from the surface to 220 feet bls with drill cuttings, a material not approved as a seal by state regulations. Except for the bottom of the casings, the remainder of the annular spaces are unsealed. The 6-inch casing should be grouted because of the well's location: (1) It is near the west-central boundary of the ICPP facility about 370 feet south of an area which contains contaminated perched water at 110 feet bls. (2) It is also about 2000 feet southeast of the Big Lost River channel, which may cause transitory perched conditions in the area when it flows. The potential also exists for this perched water to wash residual subsurface contamination into USGS 040. The contamination was caused by the CPP-03 injection well when it plugged and breached the 200 to 300-foot interval (pers. comm. Jerry Sehlke, EG&G). In addition, the 4-inch casing was backfilled from 483 to 679 feet bls and the perforated interval above the backfill is badly deteriorated according to a video log made in 1992 (pers. comm. Rodger Jensen, USGS). Although the casing thicknesses and the 4-inch casing joint type were not documented, these are minor deficiencies.

Remediation: The 6-inch casing should be grouted in the borehole, the perforated section of the 4-inch casing should be replaced, and the bottom of the well should be sealed with grout, not backfilled.

GEOLOGIC LOG

Well Name USGS-040

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	50	Sand and Gravel
50	60	Clay
60	110	Basalt and Cinders
110	120	Basalt and Clay
120	150	Basalt
150	160	Basalt / Clay / Sand
160	250	Basalt
250	270	Basalt and Clay
270	280	Basalt
280	290	Basalt with Cinders
290	370	Basalt
370	380	Basalt and Clay
380	400	Clay and Sand
400	420	Basalt
420	430	Basalt and Clay
430	440	Basalt
440	465	Clay
465	520	Basalt and Cinders
520	530	Basalt and Sand
530	678.8	Basalt and Cinders
		Total Depth 678.8 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 9 1992

WellName: USGS–040

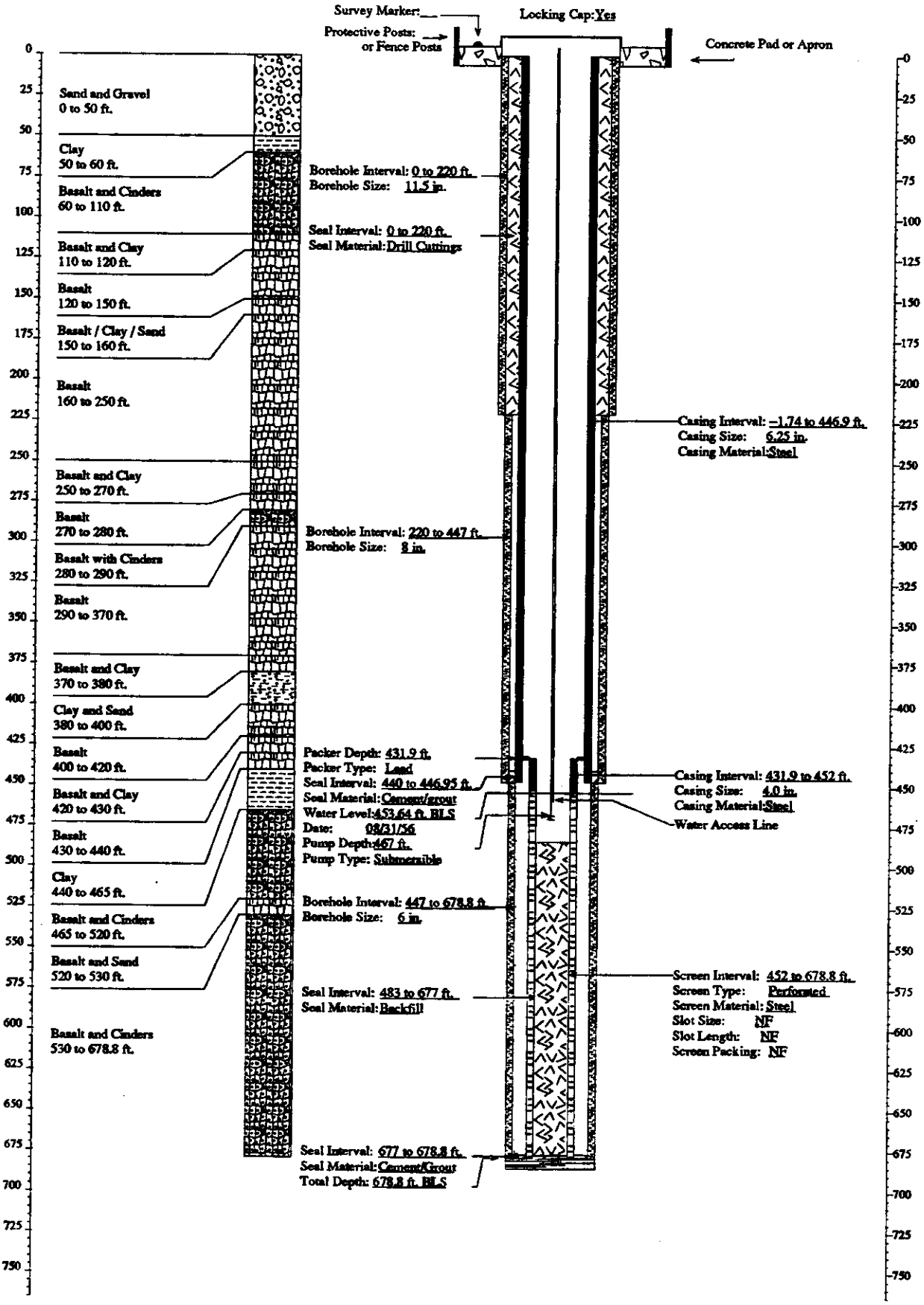
09/12/1993

Facility: ICPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1956
Total Depth: 678.8

Easting: 295936.00
Northing: 694539.00
Longitude: 1125611.87
Latitude: 433411.65
Completion Depth: –483

Driller: Cope
Geologist: Alan E. Peckham
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4916.04

Water Level: 453.64
Water Level Date: 08/31/56
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No. USGS-041**

A. WELL USE

1) Year well was drilled: 1956

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3.3.2.1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 8 inch Casing size 6.5 inch O.D.)
Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D./6.5 O.D.	0 - 428.1	Threaded	20	0.25	Yes

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Clay Backfill	0 - 410	N.F.	Insufficient Data
Concrete	410 - 428 (bottom of casing set in cement)	N.F.	No

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)The integrity of the clay seal from 0 to 410 feet bls could not be determined because no documentation was found for the type and volume of clay used and its method of installation.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located about 2300 feet from the Big Lost River channel and is beyond the extent of perched water created by the ICPP percolation ponds, according to USGS Report 91-4166.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched conditions in the well from the geologic or geophysical logs. The well is also over 750 feet south of an area with known perched water at 110 feet bls (ICPP Groundwater Monitoring Plan) and is over 1500 feet from the tank farm area where perched conditions also have been encountered (Golder Associates Report, 1991).

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Uncertain, the well contains clay backfill from 0 to 410 feet bls. and its composition and method of emplacement was not documented. However, no evidence of perched groundwater was found near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _)

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** ICPP Groundwater Monitoring Plan (Nov. 1991); "Report of the Idaho Chemical Processing Plant Drilling and Sampling at HLLW Tank Farm and LDU CPP-33 " (Golder Associates, Dec. 1991); USGS Report 91-4166; USGS Report 90-4067

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The integrity of the clay seal could not be evaluated because no documentation was found for its type, volume and method of emplacement. Although the well is located within the ICPP, it is situated in the west-central area of the facility between the animal and security fences and is not in proximity to any operations that would make the well susceptible to surface releases and contamination. Since no evidence was found for perched conditions near the well, a variance should be requested for the seal material.

Remediation: None

 GEOLOGIC LOG Well Name USGS-041

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	45	Sand and Gravel
45	51	Basalt and Clay
51	100	Basalt and Cinders
100	113	Basalt and Clay
113	118	Basalt
118	128	Basalt and Clay
128	164	Basalt
164	180	Basalt and Clay
180	240	Basalt
240	258	Basalt and Clay
258	264	Basalt / Clay / Sand
264	270	Basalt and Clay
270	322	Basalt
322	330	Basalt and Clay
330	375	Basalt
375	390	Basalt and Clay
390	396	Basalt
396	417	Basalt and Clay
417	600	Basalt and Cinders
600	620	Basalt and Sand
620	675	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 10, 1992

WellName: USGS-041

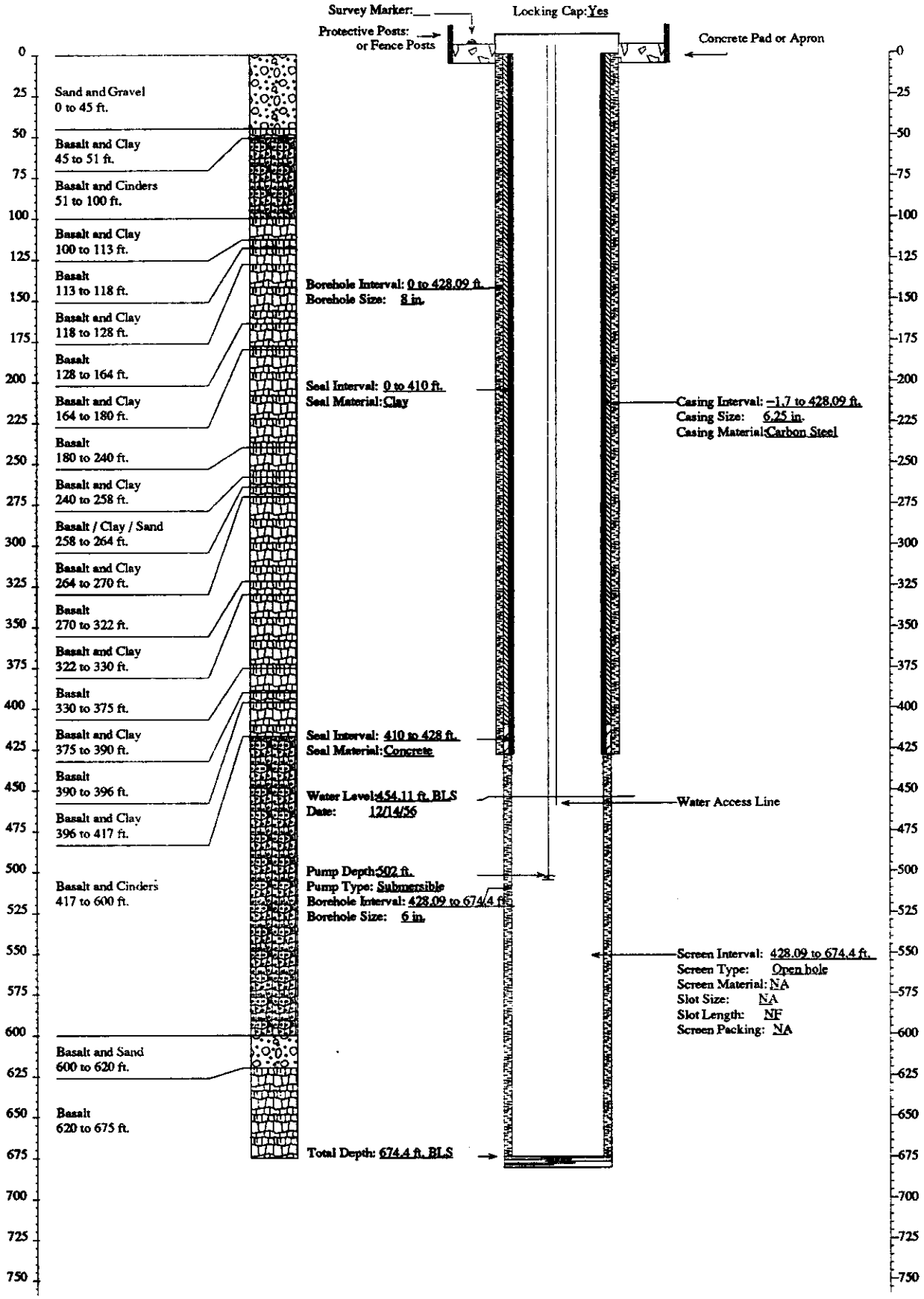
07/30/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1956
Total Depth: 674.4

Easting: 295936.00
Northing: 694138.00
Longitude: 1125611.82
Latitude: 433407.69
Completion Depth: 674.4

Driller: Cope
Geologist: R.H.C.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4917.13

Water Level: 454.11
Water Level Date: 12/14/56
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No. USGS-042**

A. WELL USE

1) Year well was drilled: 1973

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade:(Yes _ No _ N/A X
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 452.5	Screw-Couple	11	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Drill Cuttings	0 - 430	N.F.	No
Cement Grout	430 - 452.5 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located about 2770 feet southeast of the Big Lost River channel. It is north of the ICPP percolation ponds and is beyond the lateral extent of perched water created by them based on USGS Report 91-4166.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Based on the geologic log and geophysical logs, no evidence was found for perched water near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no annular casing seal. However, no evidence was found for perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _)

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** ICPP Groundwater Monitoring Plan (Nov. 1991); "Report of the Idaho Chemical Processing Plant Drilling and Sampling Program at HLLW Tank Farm and LDU CPP-33" (Golder Associates, Dec. 1991); USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The casing annulus was backfilled with drill cuttings from 0 to 430 feet bls, a material not approved by state regulations for a surface seal. Although the well is located within the the ICPP, it is in the southwestern part of the facility between the animal and security fences and is not in proximity to any operations which would make the well susceptible to surface releases or contamination. Since no evidence was found of perched conditions near the well, a variance should be requested for the lack of a surface seal. Also, no information was found for the casing thickness, which is a minor deficiency.

Remediation: None

GEOLOGIC LOG

Well Name USGS-042

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	34	Sand and Gravel
34	102	Hard Basalt
102	110	Clay and Basalt
110	125	Basalt and Cinders
125	165	Basalt
165	177	Clay
177	195	Cinders / Basalt / Clay
195	255	Basalt
255	300	Basalt / Clay / Cinders
300	370	Basalt
370	388	Clay and Basalt
388	435	Basalt
435	467	Basalt and Cinders
467	487	Cinders
487	492	No Sample
492	528	Basalt
528	540	Cinders
540	560	Basalt
560	578	Basalt and Cinders
578	585	Broken Basalt
585	678.5	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 10, 1992

WellName: USGS-042

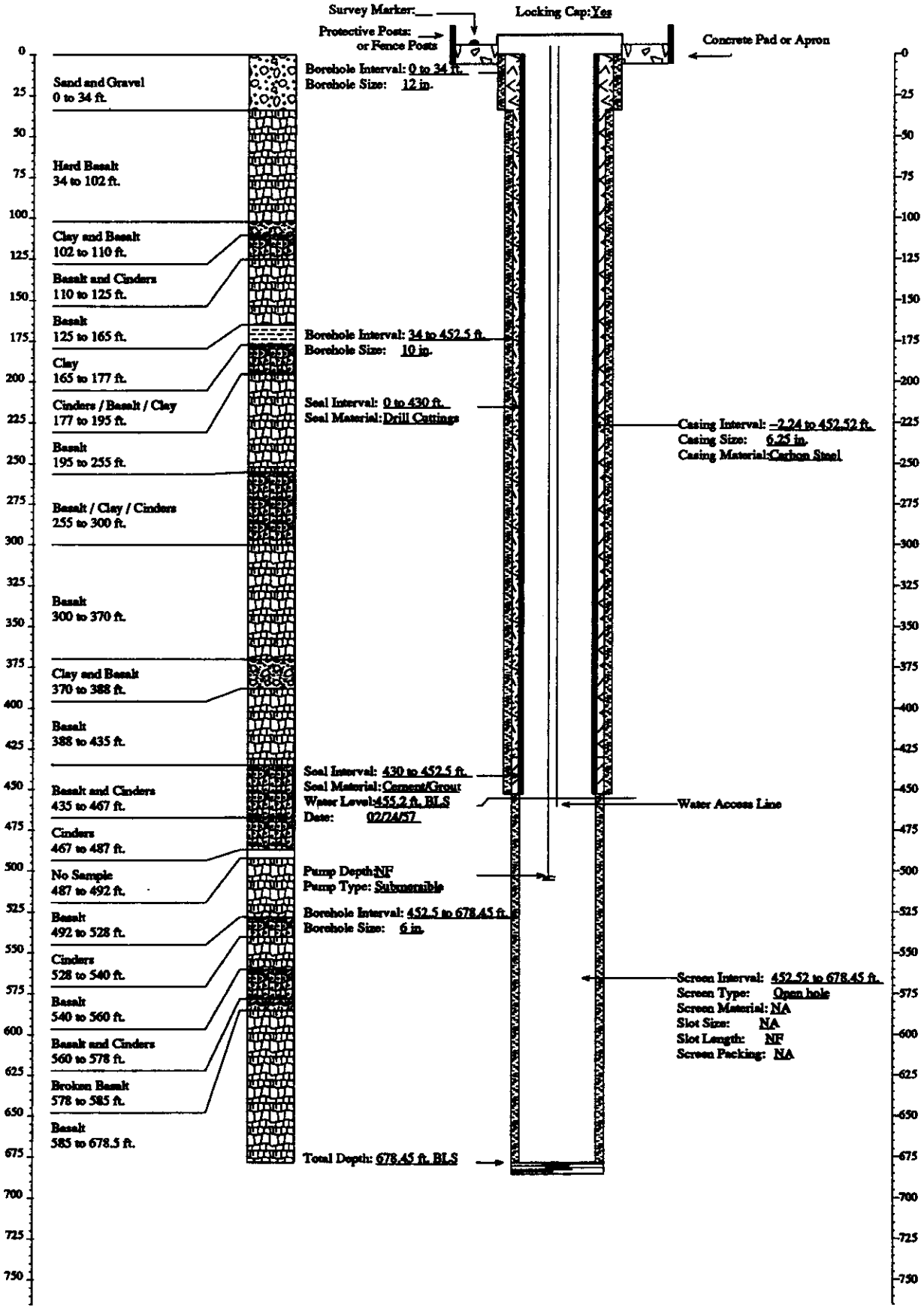
08/11/1993

Facility: ICPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1957
Total Depth: 678.45

Easting: 295936.00
Northing: 693637.00
Longitude: 1125611.76
Latitude: 433402.74
Completion Depth: 678.45

Driller: Cope
Geologist: R.H.C.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4917.85

Water Level: 455.2
Water Level Date: 02/24/57
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No.** USGS-043

A. WELL USE

1) Year well was drilled: 1957

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Gamma Spec., Na^{+}, NO_3^{-}

4) Water lever monitored: (Yes _ No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 450.5	Screw-coupled	6	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Drill Cuttings	0 - 450	N.F.	No
Cement Grout	450 - 450.4 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located on the western boundary of the ICPP facility about 1600 feet from the Big Lost River.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) The well is just south of an area containing contaminated perched water at about 110 feet bls. The source of this water has not been determined. Also, the lithology log indicated that water was encountered at 205-225 feet bls and 350-420 feet bls during drilling in 1957, and the 1970 neutron log indicates an increase in moisture from about 165 to 230 feet bls. However, this may have partly resulted from clay in the interval.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the casing annulus was backfilled with drill cuttings from 0 to 450 feet bls.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** ICPP Groundwater Monitoring Plan (Nov. 1991); Report of the Idaho Chemical Processing Plant Drilling and Sampling Program at HLLW Tank Farm and LDU CPP-33" (Golder Associates, Dec. 1991); USGS report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The annular space around the 6-inch casing was backfilled with drill cuttings from 0 to 450 feet bls, a material not approved as a seal by the state regulations. The casing should be grouted in the borehole for the following reasons: (1) the well is located near the west-central boundary of the ICPP facility immediately south of an area containing contaminated perched water at 110 feet bls; (2) the well is about 1600 feet from the Big Lost River, which may cause transitory perched conditions in the area when it flows; and (3) saturated conditions were observed during drilling in 1957 at 205-225 feet bls and 305-420 feet bls. However, this may have partly been caused by the CPP-03 injection well, which has not been used since 1989 and is abandoned. Also, the following minor deficiencies were noted: the casing thickness was not documented and the casing extends 6 inches above ground instead of the required 12 inches.

Remediation: The casing should be grouted in the borehole to prevent the migration of potentially contaminated water in the annular space and to comply with state regulations.

 GEOLOGIC LOG Well Name USGS-043

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	18	Clay/Gravel/Sand
18	30	Gravel and Sand
30	54	Clay/Gravel/Sand
54	110	Basalt (Hard from 96 to 110 feet)
110	137	Basalt/Cinders/Clay
137	150	Basalt and Cinders
150	170	Sandy Clay and Cinders
170	205	Basalt and Clay
205	225	Basalt (Wet)
225	233	Basalt and Clay
233	289	Broken Basalt and Dry Cinders
289	350	Hard and Dry Basalt
350	420	Basalt and Cinders with Sand/Gravel/Clay (Contains Perched Water)
420	445	Basalt
445	458	Basalt and Cinders
458	470	Basalt
470	484	Hard Basalt
484	504	Broken Basalt
504	516	No Sample
516	535	Cinders and Sand
535	555	Sand

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 12, 1992

GEOLOGIC LOG

Well Name USGS-043

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
555	570	Sand and Cinders
570	585	Sand
585	625	Sand and Basalt
625	640	Basalt
640	675.8	Sand
		Total Depth 675.8 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 12, 1992

WellName: USGS-043

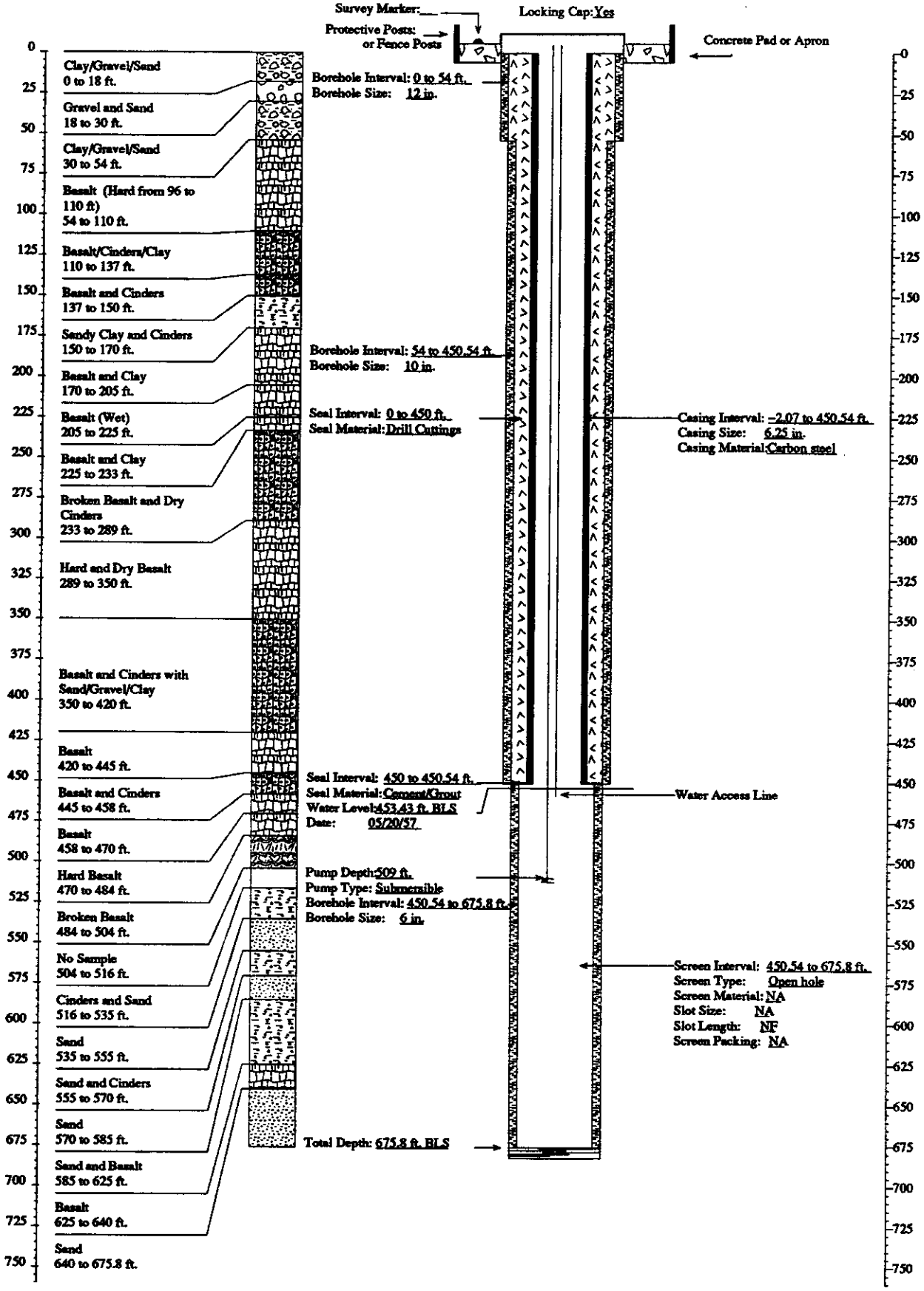
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1957
Total Depth: 675.8

Easting: 295720.00
Northing: 694857.00
Longitude: 1125614.84
Latitude: 433414.77
Completion Depth: 675.8

Driller: Cope
Geologist: Alan Peckham
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4916.30

Water Level: 453.43
Water Level Date: 05/20/57
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-044

A. WELL USE

1) Year well was drilled: 1957

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Gamma Spec., Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann.

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 461	Screw coupled	18	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Drill Cuttings	0 - 454	N.F.	No
Sand / Cement Grout	454 - 461	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located about 1920 feet southeast of the Big Lost River which may cause transitory perched water in the area when it flows. Although the well is located beyond the lateral extent of perched waters created by the ICPP percolation ponds based on USGS Report 91-4166, it is located about 265 feet southwest of a large depression which may cause surface runoff to pond.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _)
Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well based on a 1970 neutron log. The well is located over 800 feet from the northwestern area of the facility which has contaminated perched water at 110 feet bls (ICPP Groundwater Monitoring Plan) and is over 1900 feet from the tank farm where perched conditions also have been encountered (Golder Associates Report, 1991).

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well was backfilled with drill cuttings from 0 to 454 feet bls. Although no evidence was found for perched groundwater near the well, transitory perched conditions could develop in the area when the Big Lost River is flowing.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** ICPP Groundwater Monitoring Plan (Nov. 1991); "Report of the Idaho Chemical Processing Plant Drilling and Sampling Program at HLLW Tank Farm and LDU CPP-33" (Golder Associates, Dec. 1991); USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-044

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well was backfilled with drill cuttings from 0 to 454 feet bls, a material not approved by state regulations for a seal. The well is located about 625 feet west of the facility and about 1920 feet southeast of the Big Lost River channel. The well is not in proximity to any known source of surface contamination, and no evidence was found for perched groundwater near the well based on a neutron log from 1970, which was a relatively "wet period". Therefore, a variance should be requested for the lack of an approved surface seal. Also, no documentation was found for the casing thickness, which is a minor deficiency.

Remediation: None

 GEOLOGIC LOG Well Name USGS-044

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	35	Gravel
35	98	Basalt
98	100	Clay
100	110	Clay / Boulders / Cinders
110	120	Broken Basalt
120	140	Hard Basalt
140	150	Clay and Cinders
150	155	Pumice
155	180	Hard Basalt
180	200	Broken Basalt
200	250	Hard Basalt
250	260	Broken Basalt and Sand
260	265	Hard Basalt
265	270	Clay and Cinders
270	290	Porous Basalt
290	362	Hard Basalt
362	370	Pumice
370	387	Clay / Sand / Fine Gravel
387	420	Hard Basalt
420	430	Porous Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 11, 1992

 GEOLOGIC LOG Well Name USGS-044

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
430	470	Hard Basalt (Water at 460 feet)
470	500	Basalt and Sand
500	570	Porous Basalt
570	650	Hard Basalt
		Total Depth 650 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 11, 1992

WellName: USGS-044

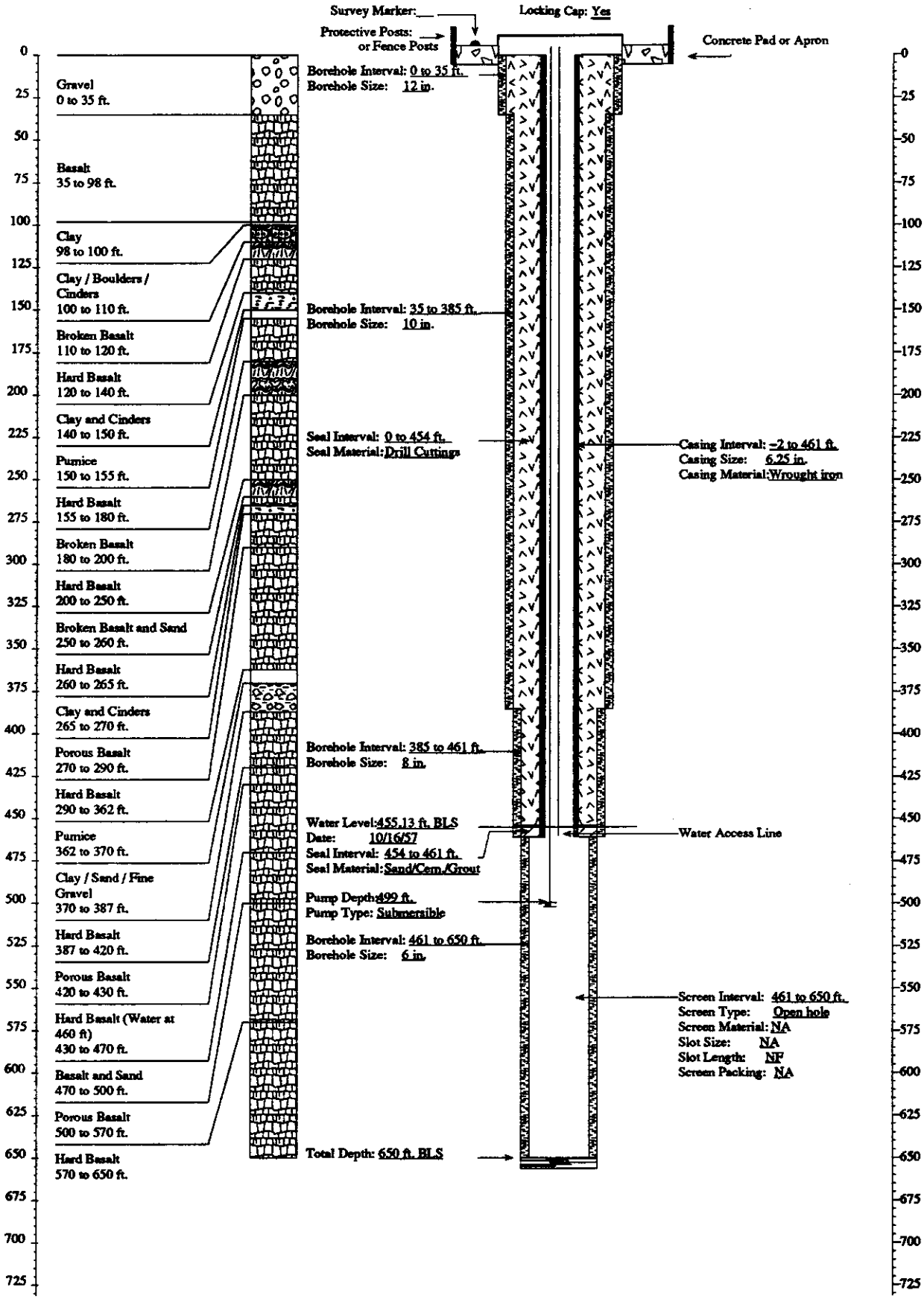
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1957
Total Depth: 650

Easting: 295248.00
Northing: 694242.00
Longitude: 1125621.18
Latitude: 433408.66
Completion Depth: 650

Driller: Denton
Geologist: Alan Peckham
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 4918.62

Water Level: 455.13
Water Level Date: 10/16/57
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No.** USGS-045

A. WELL USE

1) Year well was drilled: 1957

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann.

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 461	Screw coupled	21	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-045

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Sand / Gravel	0 - 456 feet	N.F.	No
Sand / Cement Grout	456 - 461.5 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located about 375 west of the ICPP facility. Based on the USGS report 91-4166, the well is outside the lateral extent of perched groundwater created by the ICPP percolation ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No indication of perched groundwater was found from neutron logs taken in 1984, 1985, 1986, 1990 and 1991.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the annular space contains sand and gravel from 0 to 456 feet bls. Although, no evidence of perched groundwater exists near the well based on 5 neutron logs taken between 1984 and 1991, the well is located near the ICPP facility and

should be sealed from the ground to the top of the basalt at 50 feet bls to protect the well from surface contamination.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____
Screen _____
Pump _____
Discharge Pipe _____
Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The annular space in the well contains sand and gravel from the ground to 456 feet bls, which does not comply with state well construction regulations. However, no evidence of perched water was found on 5 neutron logs taken from 1984 to 1991. Also, the well is located about 375 feet west of the ICPP facility and is not in proximity to any known source of surface contamination. Therefore, a variance should be requested for the lack of a surface seal. Also, the casing thickness was not documented, which is a minor deficiency.

Remediation: None. However, geophysical logs should continue to be run periodically in the well to confirm the absence of perched water near the well.

 GEOLOGIC LOG Well Name USGS-045

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	10	Topsoil and Gravel
10	30	Gravel
30	50	Sandy Clay
50	103	Basalt
103	115	Basalt and Clay
115	145	Basalt
145	155	Sandy Clay and Broken Basalt
155	165	Broken Basalt
165	175	Basalt and Clay
175	210	Hard Basalt
210	260	Basalt
260	275	Clay
275	290	Broken Basalt and Clay
290	365	Hard Basalt
365	368	Sandy Clay and Boulders
368	400	Hard Basalt
400	445	Basalt and Clay
445	635	Basalt
635	651.2	Hard Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 10, 1992

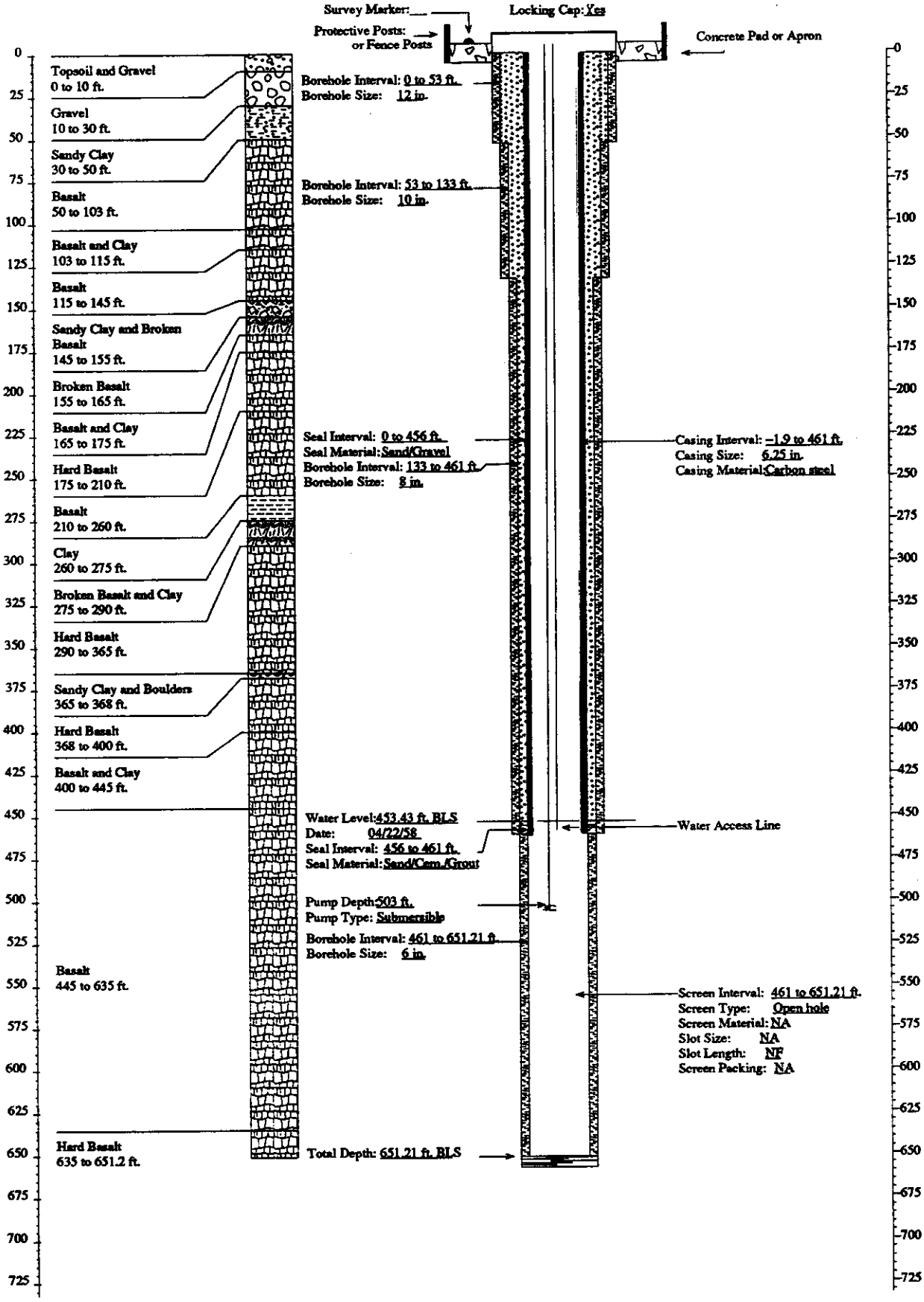
WellName: USGS–045

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1957
Total Depth: 651.21

Easting: 295490.00
Northing: 693598.00
Longitude: 1125617.81
Latitude: 433402.32
Completion Depth: 651.21

Driller: Denton
Geologist: J.R.H.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4919.63

07/06/1993
Water Level: 453.43
Water Level Date: 04/22/58
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-046

A. WELL USE

1) Year well was drilled: 1958

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Gamma Spec., Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 461.3	Screw Coupled	18	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-046

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X Intervals _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well:Yes_ NoX Explanation The well is located about 140 feet west of the ICPP facility and about 2340 feet southeast of the Big Lost River channel. Based on USGS 91-4166, the well is outside the lateral extent of perched waters created by the ICPP the percolation ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent ground water movement within the annular space: No, the well contains no documented casing seal. However, no evidence was found for perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

	Material
Casing	
Screen	
Pump	
Discharge Pipe	
Explanation	

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-046

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have an annular surface seal from the ground to the top of bedrock at about 45 feet bls as required by state well construction regulations. The well is located about 140 feet west of the ICPP facility and no evidence was found of perched groundwater near the well. Although the well is not in proximity to any plant operations that would make it susceptible to surface releases and contamination, it is situated close to the main access road for the east side of the ICPP facility. Also, the casing thickness was not documented, which is a minor deficiency.

Remediation: An annular surface seal should be installed from the ground to the top of basalt at about 45 feet bls to protect the well from potential surface contamination.

 GEOLOGIC LOG Well Name USGS-046

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	45	Clay and Gravel
45	50	Broken Basalt and Clay
50	100	Hard Basalt
100	110	Basalt and Clay
110	245	Basalt
245	250	Basalt and Clay
250	365	Hard Basalt
365	375	Basalt/Gravel/Coarse Sand
375	381	Sandy Clay
381	385	Coarse Sand
385	390	Sandy Clay
390	400	Basalt and Clay
400	408	Basalt
408	414	Sandy Clay
414	535	Basalt
535	540	Ash
540	650.9	Basalt
		Total Depth 650.9 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 10, 1992

WellName: USGS-046

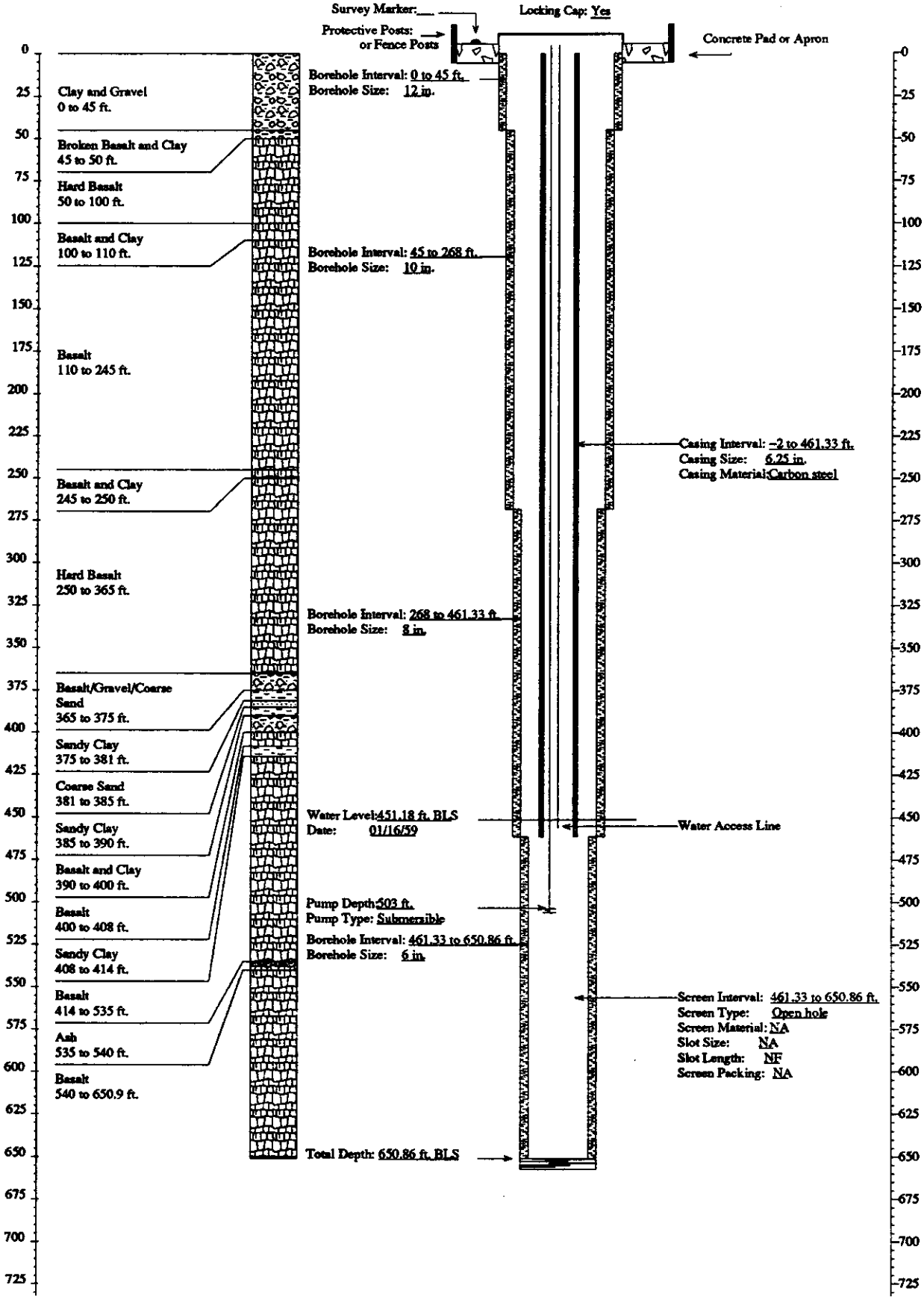
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1958
Total Depth: 650.86

Easting: 295722.00
Northing: 694023.00
Longitude: 1125614.71
Latitude: 433406.54
Completion Depth: 650.86

Driller: Denton
Geologist: F.J.F.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4917.33

Water Level: 451.18
Water Level Date: 01/16/59
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No.** USGS-047

A. WELL USE

1) Year well was drilled: 1958

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No X N/A _)
Explanation The well is flush to the ground surface and therefore does not require guard posts.
6) Based on location of well, is existing or planned surface completion adequate: (Yes _ No X) Explanation The well is located in a manhole which drains a

large area of a parking lot (pers. comm. Rodger Jensen, USGS). The manhole should be sealed with a water tight cover, and the area around the well built up to prevent the migration of potential surface contaminants into the well and to direct surface runoff to a proper drain.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 458.1	Screw-Coupled	0	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Sand and Gravel	0 - 450	N.F.	No
Sand / Cement Grout	450 - 458.1 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented _ Explanation for seal emplacement The sand and gravel were poured from the surface. No information was found on the placement of the sand/cement grout.

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located in the south-central area of the ICPP facility. It is beyond the lateral extent of perched water created by the ICPP percolation ponds based on USGS report 91-4166.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No _ Insufficient data X) Explanation

(Qualify data/specify perched intervals if applicable) Use of the CPP-03 injection well until 1989 may have contributed to deep perched conditions in the area during the time of its operation. USGS 047 is located about 700 feet south of CPP-03, which has been abandoned.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the annular space in the well is filled with sand and gravel from the surface to 450 feet bls.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166, Personal Communication - Rodger Jensen, USGS (Feb. 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The annulus of the well contains sand and gravel from the surface to 450 feet bls, which does not comply with state regulations. The well is located in the south-central part of the ICPP facility about 700 feet south of the now abandoned injection well CPP-03. The casing is flush-mounted in a manhole which drains a large area of a parking lot. This makes the well susceptible to such contaminants as oils and salts in the surface runoff. Because of the well's location in the facility and the potential for residual subsurface contamination caused by CPP-03 when it plugged and breached in the 200 to 300-foot interval, a seal should be installed. Although the casing thickness was not documented, this is a minor deficiency.

Remediation: An annular casing seal should be installed from the ground to 450 feet bls to protect the well from potential surface and subsurface contamination. The manhole in which the well is located should be sealed with a water-tight cover and the area around the well built up so that surface runoff is directed to a proper drain.

 GEOLOGIC LOG Well Name USGS-047

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	40	Gravel
40	110	Basalt
110	120	Basalt and Clay
120	140	Basalt
140	147	Baked Clay and Broken Basalt
147	200	Basalt
200	205	Clay and Basalt
205	245	Basalt
245	255	Clay
255	270	Basalt
270	282	Basalt and Clay
282	365	Hard Basalt
365	370	Basalt and Ash
370	375	Basalt and Sandy Clay
375	385	Sandy Clay
385	395	Broken Basalt
395	505	Basalt
505	515	Cinders
515	560	Basalt
560	570	Broken Basalt
570	651.3	Hard Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 12, 1992

WellName: USGS-047

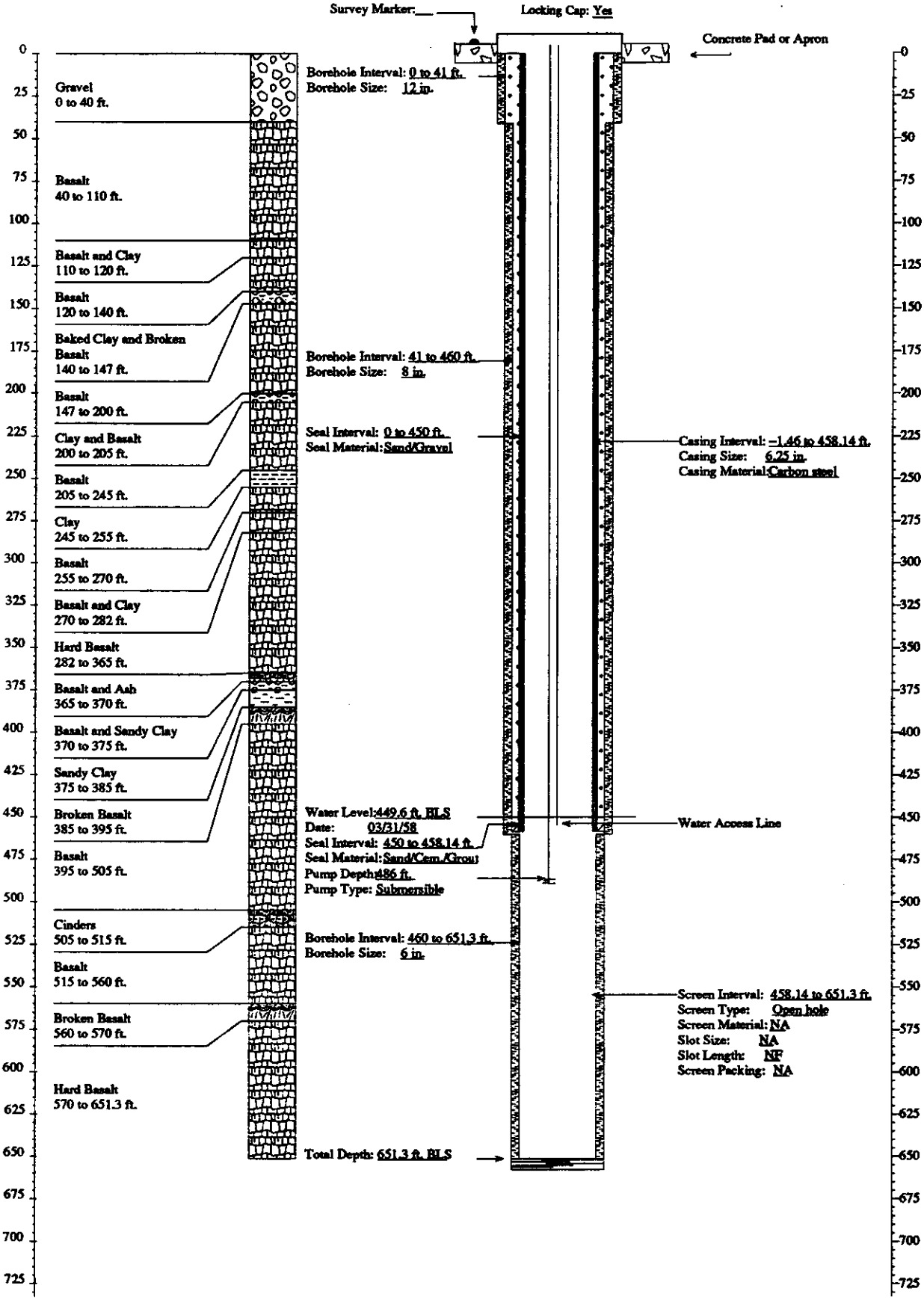
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1958
Total Depth: 651.3

Easting: 296572.00
Northing: 694110.00
Longitude: 1125603.18
Latitude: 433407.47
Completion Depth: 651.3

Driller: Denton
Geologist: F. J. Frank
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4915.61

Water Level: 449.6
Water Level Date: 03/31/58
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-048

A. WELL USE

1) Year well was drilled: 1973

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS/Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 462.1	Screw couple	16	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Drill Cuttings	0 - 456	N.F.	No
Sand/Cement Grout	456 - 462 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located in the southern area of the ICPP facility about 850 feet north of perched water created by the percolation ponds, based on USGS Report 91-4166.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No documentation of perched water was found in the CWS files or on the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains drill cuttings from 0 to 456 feet bls. Although no evidence was found of perched groundwater near the well, the well is located within the ICPP and susceptible to surface contamination.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

	Material
Casing	
Screen	
Pump	
Discharge Pipe	

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The annulus of the well was backfilled with drill cuttings, a material not approved by state well construction regulations as a seal. The well is located in the southern area of the ICPP facility about 850 feet north of perched water from the percolation ponds. However, no evidence of perched water was found near the well based on the 1986 geophysical logs. Also, the casing thickness was not documented, which is a minor deficiency.

Remediation: The casing should be sealed in the borehole from the surface to the top of the bedrock at about 34 feet bls to protect the well from potential surface contamination. Because of its proximity to perched water from the percolation ponds, a neutron log should be run periodically to confirm the absence of perched water in the well.

 GEOLOGIC LOG Well Name USGS-048

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	32	Gravel and Clay
32	102	Basalt
102	110	Baked Clay
110	118	Baked Clay and Broken Basalt
118	145	Hard Basalt
145	155	Broken Basalt and Clay
155	160	Basalt
160	166	Clay and Broken Basalt
166	197	Hard Basalt
197	210	Broken Basalt
210	220	Basalt and Clay
220	245	Basalt
245	250	Clay
250	261	Basalt
261	280	Basalt and Clay
280	295	Broken Basalt
295	315	Broken Basalt and Clay
315	372	Hard Basalt
372	385	Broken Basalt and Clay

COMPILED BY/ORGANIZATION: F.S. Mocker/GAI Date 10 Aug 92

GEOLOGIC LOG

Well Name USGS-048

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
385	396	Basalt and Clay
396	450	Basalt
450	470	Broken Basalt
470	496	Basalt
496	506	Cinders and Broken Basalt
506	548	Basalt
548	552	Ash
552	580	Basalt and Ash
580	729	Basalt
729	740	Broken Basalt
740	750	Clay and Gravel

COMPILED BY/ORGANIZATION: F.S. Mocker/GAI Date 10 Aug 92

WellName: USGS-048

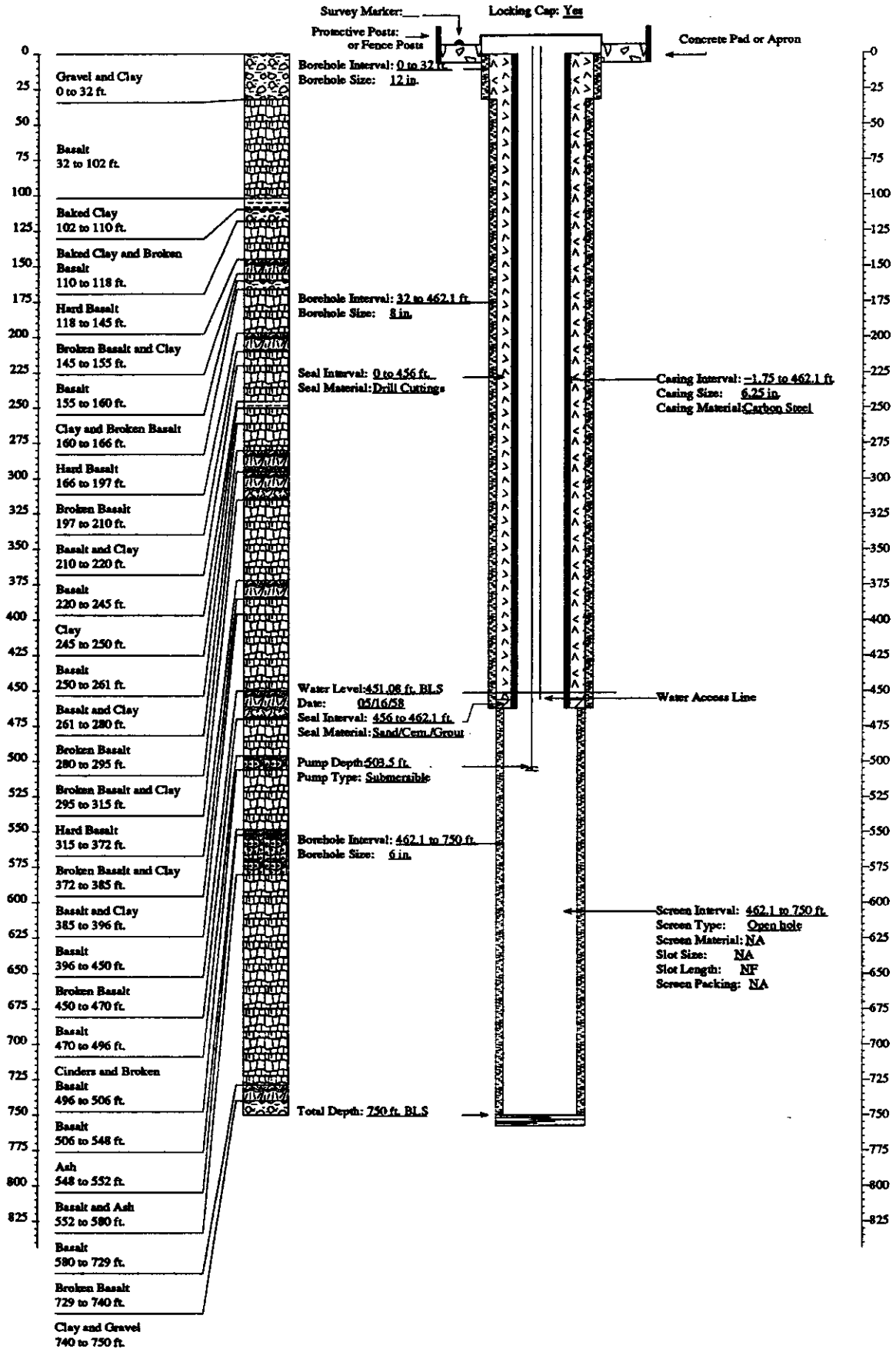
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1958
Total Depth: 750

Easting: 296612.00
Northing: 693414.00
Longitude: 1125602.55
Latitude: 433400.60
Completion Depth: 750

Driller: Denton
Geologist: F.J.F.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4917.11

Water Level: 451.08
Water Level Date: 05/16/58
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-049

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: None (The well is obstructed by debris.)

4) Water level monitored: (Yes X No _ Insufficient data _) The water level was monitored until April 1992. Measurements will resume if the water level rises (pers. comm. Rodger Jensen, USGS)

5) Is the well used for USGS observation: (Yes _ No X)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16-inch Casing size 6-inch (I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
N.F.	6-inch (I.D. or O.D.?)	0 - 458.8	N.F.	22.8	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Drill Cuttings	0 - 458.8	N.F.	No
Cement Grout	458.8 (bottom of casing set in cement)	N.F.	Yes
Open Hole	458.8 - 656	The well is obstructed by debris at about 460 feet bls, which is currently above the water table. This occurred when the well casing was broken off by heavy equipment.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located in the south-central area of the ICPP facility. Based on USGS Report 91-4166, the well is located outside the lateral extent of perched waters created by the ICPP percolation ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of saturated conditions above the sampling interval from the CWS files or the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well is backfilled with drill cuttings from 0 to 459 feet bls.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166, Personal Communication-Rodger Jensen, USGS (Feb. 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located in the south-central part of the ICPP facility. The well was backfilled with drill cuttings from 0 to 459 feet bls, a material not approved as an annular seal by state regulations. Since the well is located in the facility and susceptible to potential surface contamination, a surface seal should be installed. The well also is obstructed by debris at 460 feet bls, which is currently above the water table. One attempt has been made to clean it out. Although the casing thickness and joint type were not documented, these are minor deficiencies.

Remediation: A surface seal should be installed from the ground to the top of basalt at 28 feet bls to protect the well from potential surface contamination. A second attempt should be made to clean out the well.

 GEOLOGIC LOG Well Name USGS-049

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	28	Gravel
28	40	Basalt
40	80	Basalt and Ash
80	100	Basalt
100	120	Clay
120	127	Basalt
127	138	No Sample
138	143	Obsidian
143	150	Clay and Gravel
150	170	Basalt
170	188	Broken Basalt
188	260	Basalt (Broken 200-201 ft)
260	305	Cinders and Clay
305	364	Basalt
364	367	Basalt and Clay
367	380	Basalt
380	386	Basalt and Clay
386	410	Basalt
410	419	Clay and Gravel

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date September 1, 1992

GEOLOGIC LOG

Well Name USGS-049

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
419	432	Clay / Sand / Basalt
432	437	No Sample
437	453	Broken Basalt
453	480	Basalt (Water)
480	507	No Sample
507	517	Basalt
517	540	No Sample
540	550	Cinders
550	565	No Sample
565	590	Broken Basalt
590	600	Hard Basalt
600	615	No Sample
615	640	Cinders
640	650	Basalt
650	656	No Sample

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date September 1, 1992

WellName: USGS–049

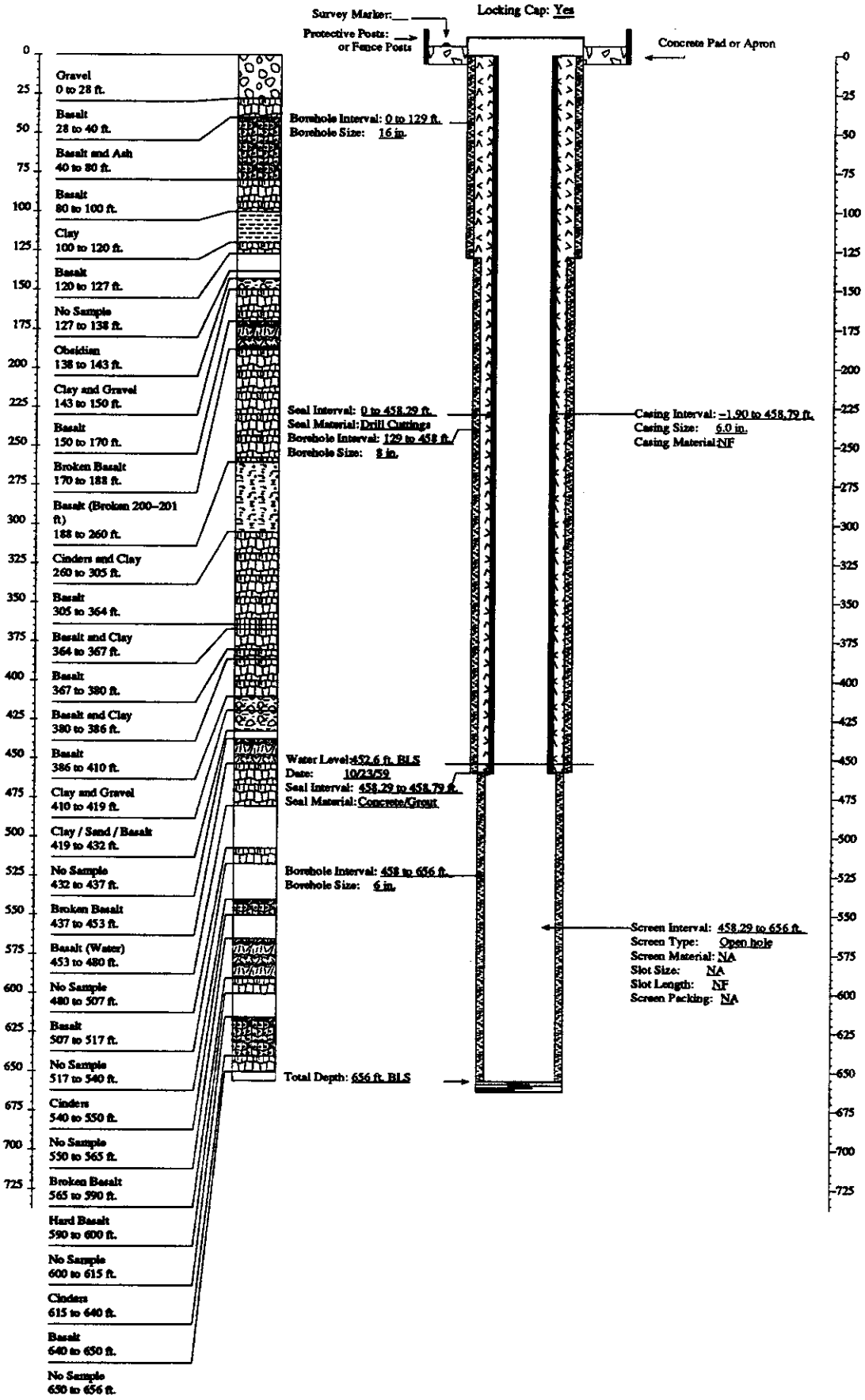
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Inactive
Year Drilled: 1960
Total Depth: 656

Easting: 297232.00
Northing: 693640.00
Longitude: 1125554.16
Latitude: 433402.89
Completion Depth: 656

Driller: Andrew
Geologist: F. J. Frank
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4912.9

Water Level: 452.6
Water Level Date: 10/23/59
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-050

A. WELL USE

1) Year well was drilled: 1959

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Gamma Spec., Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock:(Yes _ No X Borehole size 10 inch Casing size 8.63 inch O.D.
Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	8.63 O.D.	0 - 257	N.F.	17	N.F.	N.F.
Carbon Steel	6.63 O.D.	230 - 357	N.F.	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located 280 feet south of the ICPP Tank Farm and about 1800 feet southeast of the Big Lost River channel. The well was designed to monitor perched water at about 400 feet bls.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) The well was drilled to about 280 feet bls in 1959 and deepened to 405 feet bls in 1962. Perched water was encountered at 85 and 272 feet bls during drilling in 1959. A video log run in the well in September 1992 showed water entering the well at about 1 gpm from the bottom of the 6-inch casing at 357 feet bls (pers. comm. Rodger Jensen, USGS).

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the casing does not have an annular seal.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (Feb. 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have an annular casing seal as required by state regulations. A casing seal should be installed for the following reasons: (1) the well is located in the north-central area of the ICPP, which contains numerous potential sources of contamination, (2) perched groundwater was documented during the drilling of the well at depths of 85 feet and 272 feet bls and, (3) the well is 200 feet from well CPP33-02 which monitors perched groundwater at approximately 93 feet bls. Also, the casing thicknesses and joint types were not documented, which are minor deficiencies.

Remediation: A casing seal should be installed around the 6 and 8-inch casings to prevent the migration of potentially contaminated perched water in the borehole. If the well is not sealed, it should be properly plugged and abandoned.

 GEOLOGIC LOG Well Name USGS-050

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	46	Sand and Gravel
46	85	Gray Basalt
85	90	Brown Basalt
90	110	Gray Basalt
110	140	Clay / Gravel / Broken Basalt
140	188	Gray Basalt
188	197	Clay
197	258	Gray Basalt
258	272	Broken Basalt
272	286	Red Cinders
286	299	Brown Basalt
299	304	Red Cinders
304	314	Brown Basalt
314	364	Gray Basalt
364	372	Clay
372	394	Basalt
394	398	Clay
398	405	Basalt
		Total Depth 405 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 18,1992

WellName: USGS–050

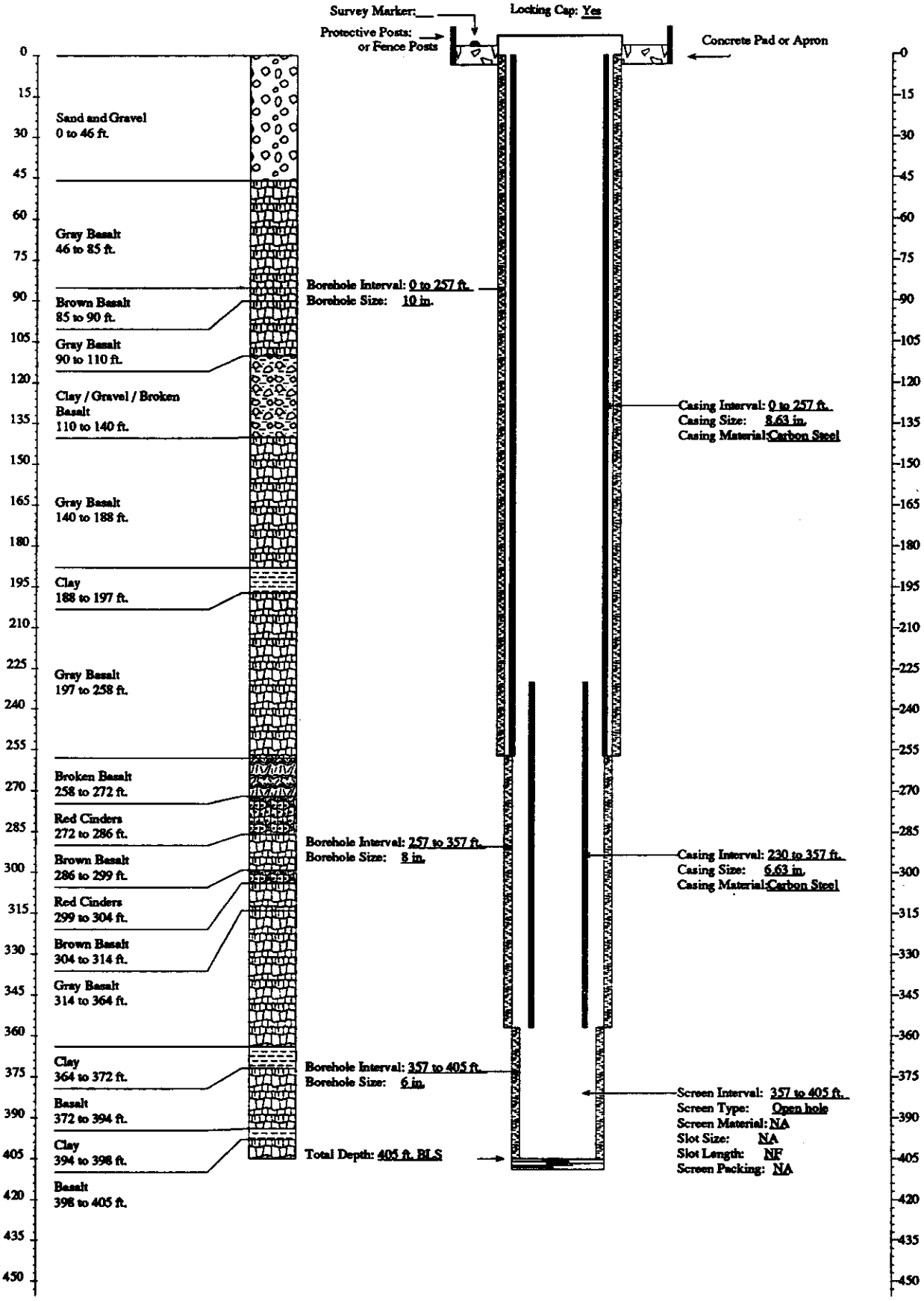
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1959
Total Depth: 405

Easting: 296633.00
Northing: 695247.00
Longitude: 1125602.49
Latitude: 433418.71
Completion Depth: 405

Driller: Hopkins
Geologist: F. J. Frank
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 4912.85

Water Level: DRY
Water Level Date: 03/10/60
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-051

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock:(Yes X No _ Borehole size 12 inch Casing size 6.63 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.63 O.D.	0 - 475.2	N.F.	24	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	N.F.	Portland Type II Cement with an Expansion Initiator	Yes
Drill Cuttings	N.F.	N.F.	No

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented _ Explanation for seal emplacement In 1960, drill cuttings were dropped in the annulus as a seal. The fill depth was not known but probably didn't extend much below the bottom of the 12-inch borehole at 68 feet bls. In 1986, remediation work was performed on the well. A packer was installed at 300 feet bls inside the 6-inch casing. The casing was perforated from about 250 feet bls to the top of the packer with an air-powered star wheel. The casing was filled to the land surface with cement and then drilled out.

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located adjacent to the northwest corner of ICPP Percolation Pond 2 and within the lateral extent of perched water (USGS Report 91-4166).

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Based on the USGS document 91-4166, four perched water zones occur near the well: above alluvium/basalt contact, 30-104 feet bls, 134-178 feet bls, and 266-332 feet bls. A TV log run in the well at the completion of

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock to

remediation in 1986 found no evidence of cascading water inside the casing.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the interval sealed in 1986 is not documented. However, no evidence was found of cascading water inside the casing after the remediation.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____
Screen _____
Pump _____
Discharge Pipe _____
Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Method of seal installation described in letter report "Comparison of Groundwater Sample Analyses Results for Wells 57, 59, 121, 122 and 123" (Golder Associates Inc, 1991); USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-051

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
(X) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located within 20 feet of the ICPP percolation ponds and therefore should be sealed from the surface to just above the monitoring interval. USGS report 91-4166 indicates that four perched water zones occur near the well: above the alluvium/basalt contact, 30-104 feet bls, 134-178 feet bls and 266-332 feet bls. The casing was perforated between 250 and 300 feet bls and pressure grouted in 1986; however the extent of the grouted interval is not known. Also, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: A neutron log and/or cement bond log should be performed to determine the seal interval. If necessary, the casing annulus should be pressure grouted so that it is sealed from the surface to just above the monitoring interval.

GEOLOGIC LOG

Well Name USGS-051

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	32	Sand and Gravel
32	100	Basalt
100	110	Cinders
110	119	Clay and Ash
119	150	Basalt
150	158	Cinders
158	254	Basalt
254	270	Basalt / Ash / Clay
270	378	Basalt
378	400	Sandstone and Gravel
400	417	Cinders
417	430	Basalt
430	457	Cinders
457	659	Basalt
		Total Depth 659 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 10, 1992

WellName: USGS-051

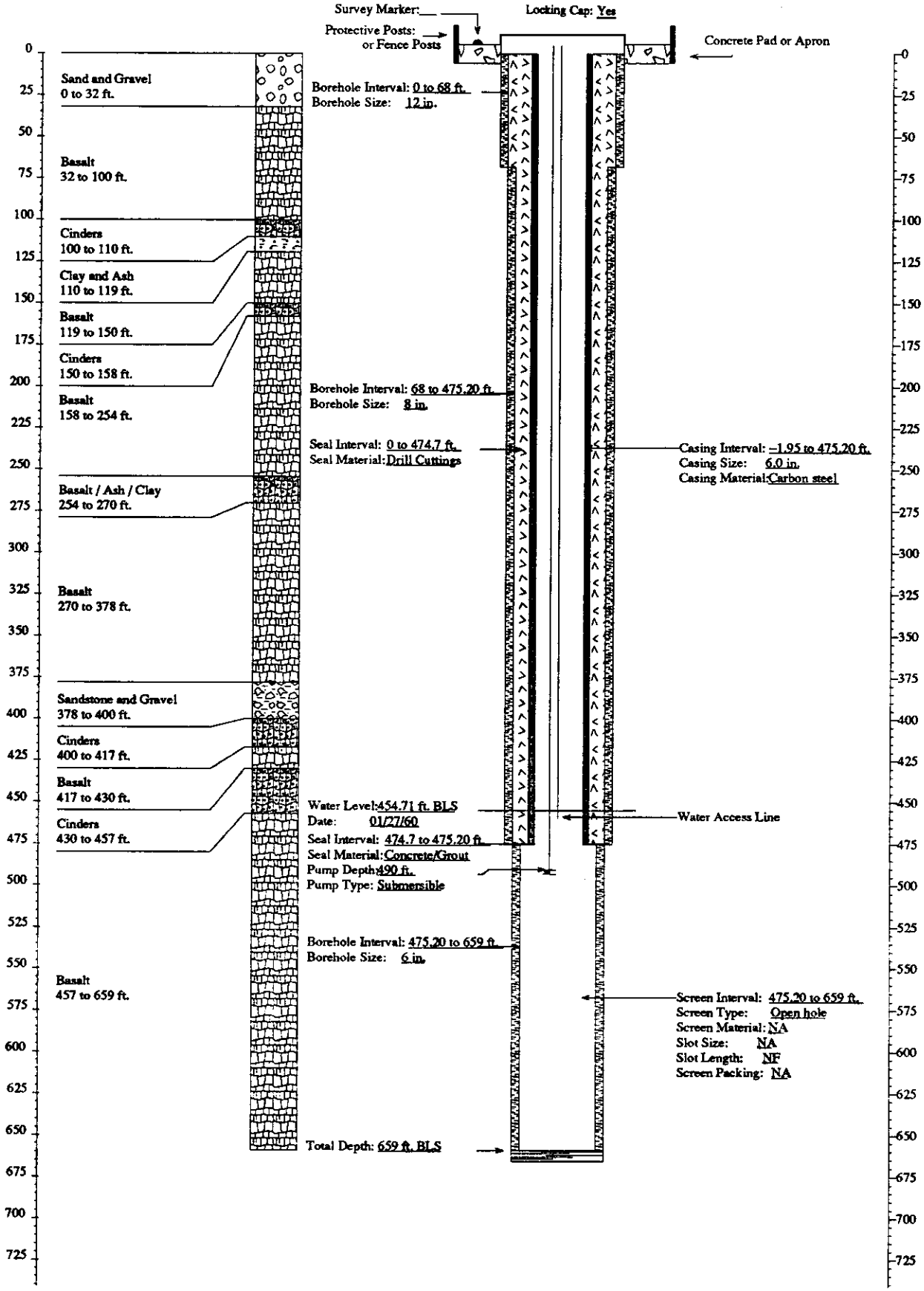
06/17/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1960
Total Depth: 659

Easting: 296347.88
Northing: 692342.77
Longitude: 1125606.00
Latitude: 433350.00
Completion Depth: 659

Driller: Hopkins
Geologist: F. J. Frank
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 4918.1

Water Level: 454.71
Water Level Date: 01/27/60
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-052

A. WELL USE

1) Year well was drilled: 1959

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann.

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size 16 inch Casing size 16 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	16 O.D.	0 - 50	N.F.	20	N.F.	N.F.
Carbon Steel	12 O.D.	0 - 250	Welded	0	N.F.	N.F.
Carbon Steel	6.63 O.D.	0 - 450	N.F.	3.5	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	430 - 450	100 Bags Cement, 36 Bags Bentonite and 2 Bags of Setting Agent	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented _ Explanation for seal emplacement The 6-inch casing was pressure grouted.

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located about 1600 feet south of the sewage lagoon ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) The 1961 USGS well schedule indicated that perched water was encountered at 162 feet bls. The well also is located 400 feet east of well CPP-55-06 which monitors contaminated perched groundwater at about 103 feet bls.

e) Is the casing sealed adequately to prevent ground water movement within the annular space: No, the 6-inch casing was pressure grouted in 1960 by Halliburton but the interval sealed was not well documented. However, the USGS well construction log indicates that it is installed from 430 to 450 feet bls. The remainder of the casing annular spaces are unsealed.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** "Report of the Idaho Chemical Processing Plant Drilling and Sampling Program at HLLW Tank Farm and LDU CPP-33" (Golder Associates Inc, 1991); USGS Report 91-4166; ICPP Groundwater Monitoring Plan, 1991

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well was pressure grouted in 1960 by Haliburton but the interval sealed was not well documented. However, the USGS well construction diagram indicates that the casing is sealed from 430 to 450 feet bls. Perched water was encountered in the well at 162 feet bls when it was drilled in 1960. The well also is located 400 feet east of well CPP-55-06 which monitors perched water at 103 feet bls. No evidence was found of perched groundwater between 200 and 430 feet bls. In addition, the following minor deficiencies were noted: the borehole was not the required 2 inches larger than the surface casing but was about the same size, and the casing thicknesses and the 6 and 16-inch casing joint types were not documented. Although the 6 and 12-inch casings extend less than the required 12 inches above ground, they are protected inside the 16-inch casing.

Remediation: The 12 and 16-inch casings should be grouted from the surface to their total depths or 200 feet bls to prevent the migration of contaminated perched water in the borehole and to seal the well from potential surface contamination.

 GEOLOGIC LOG Well Name USGS-052

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	44	Sand / Gravel / Clay
44	97	Gray and Brown Basalt
97	122	Clay
122	150	Gray Basalt
150	167	Red and Brown Cinders
167	195	Brown Basalt
195	203	Clay
203	218	Basalt
218	224	Clay
224	232	Brown Basalt
232	240	Sand
240	247	Broken Basalt
247	274	Gray and Brown Basalt
274	288	Cinders
288	305	Basalt
305	312	Broken Gray Basalt
312	327	Cinders and Brown Silt
327	337	Basalt
337	362	Silt and Cinders
362	408	Gray Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 12, 1992

 GEOLOGIC LOG Well Name USGS-052

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
408	427	Brown Clay and Silt
427	436	Gray Basalt
436	440	Broken Basalt
440	450	Gray Basalt and Cinders
450	482	Gray Basalt
482	490	Broken Basalt
490	506	Gray Basalt
506	509	Cinders
509	521	Gray Basalt
521	538	Cinders / Sand / Silt
538	547	Gray Basalt
547	560	Broken Gray Basalt
560	568	Basalt
568	575	Black Cinders
575	583	Gray Basalt
583	600	Cinders and Basalt
600	648	Gray Basalt
648	650	Cinders

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 12, 1992

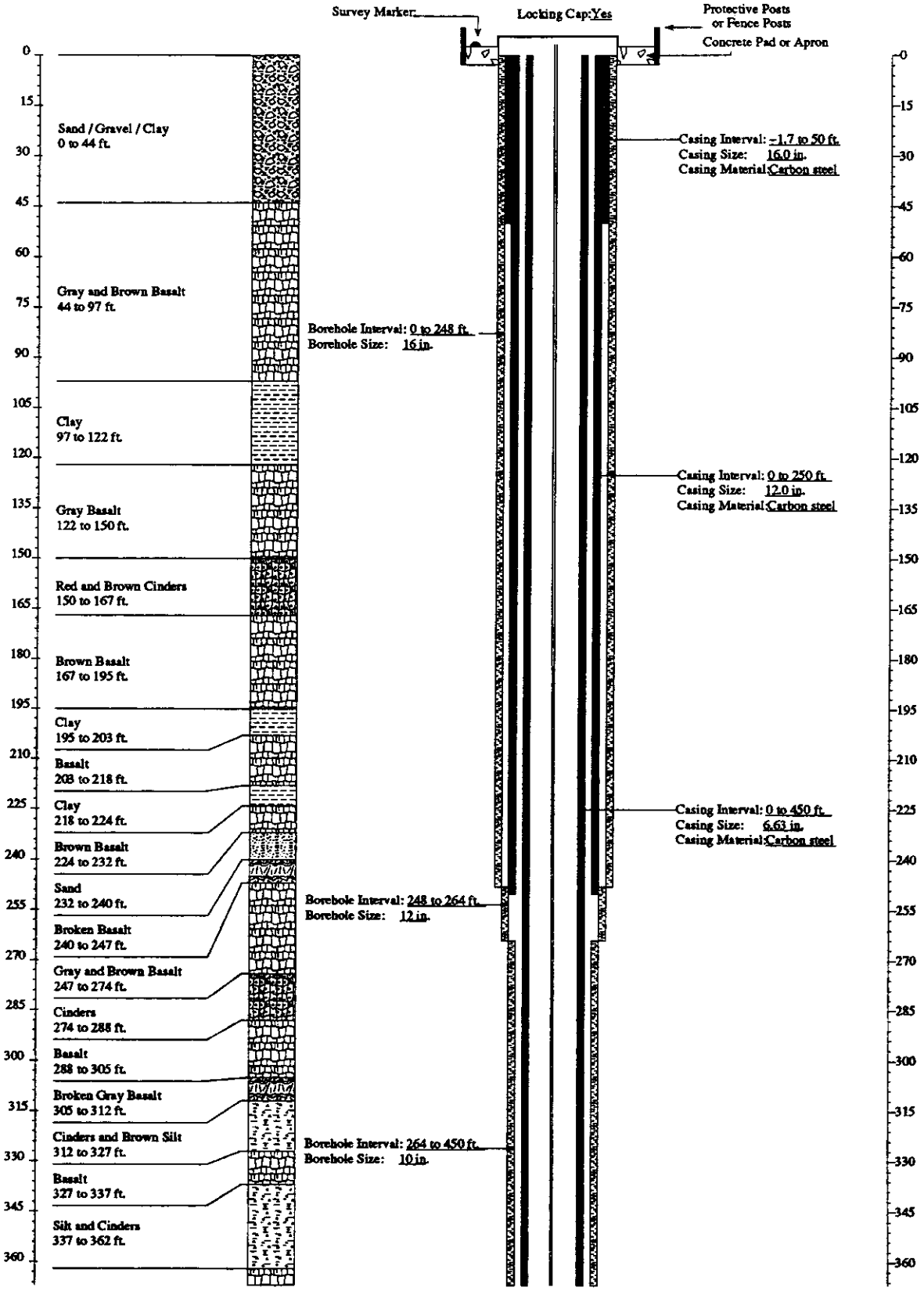
WellName: USGS–052 Corrections:Perched water at 162 ft. & 12 in. casing cemented – extent unknown 04/22/1994

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1959
Total Depth: 650

Easting: 297971.180
Northing: 694832.510
Longitude: 1125544.26437
Latitude: 433414.73616
Completion Depth: 650

Driller: Hopkins/Andrew
Geologist: E. Shuter
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4909.557

Water Level: 456
Water Level Date: NF
Water Level Access: Line



WellName: USGS–052 Corrections:Perched water at 162 ft. & 12 in. casing cemented – extent unknown

04/22/1994

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1959
Total Depth: 650

Easting: 297971.180
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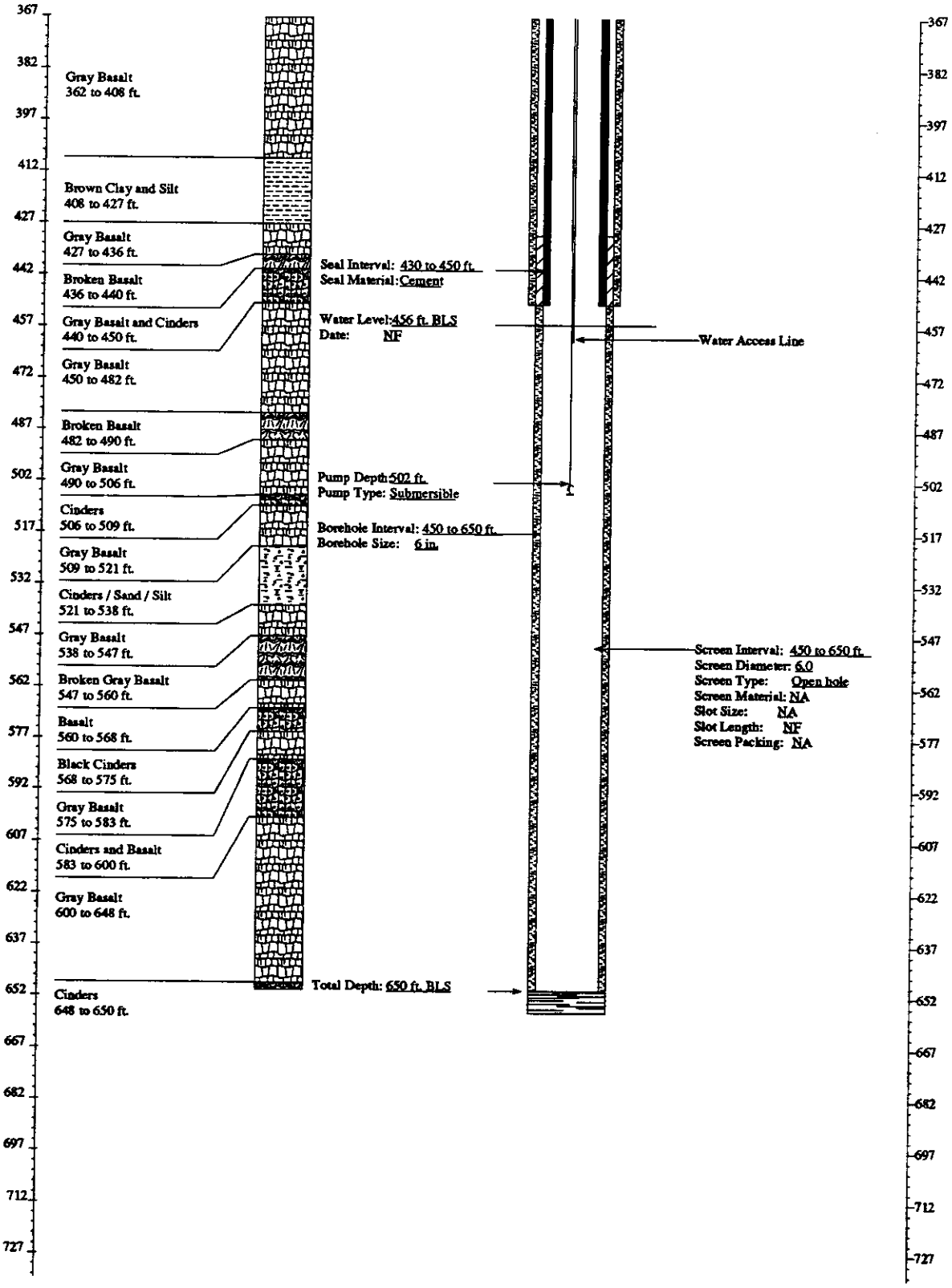

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP_ Well Name/No. USGS-057

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.63 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	6.63 O.D.	0 - 474	N.F.	25	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Grout	385 - 415	312 gallons of AM-9 Grout	Yes
Bridge (1)	544	N.F.	N/A
(1) Determined from video log on 4/17/93 (Pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located about 1530 feet west of the ICPP percolation ponds. Based on USGS publication 91-4166, it is within the lateral extent of perched waters created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) The well was grouted from 385 to 415 feet bls to seal off perched groundwater. No other evidence of perched water was found.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented annular casing seal from 0 to 385 feet bls.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____
Screen _____
Pump _____
Discharge Pipe _____
Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166, Personal Communication - Rodger Jensen, USGS (Feb. and May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal from the ground to the top of the bedrock at about 54 feet bls as required by state regulations. The well is located about 1530 feet west of the ICPP percolation ponds and is within the extent of perched groundwater created by them. The casing annulus has been grouted from 385 to 415 feet bls to seal out perched water. Geophysical logs run in 1990 indicated that the borehole had bridged or caved at 580 feet bls. Since no evidence was found of perched water above the sealed interval and the well is not in proximity to any known sources of surface contamination, a variance should be requested for the lack of a surface seal. In addition, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None. However, geophysical logs should continue to be run in the well periodically to confirm the absence of perched water above the sealed interval.

 GEOLOGIC LOG Well Name USGS-057

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	12	Gravel
12	39	Sand and Gravel
39	50	Silty Clay
50	54	Silty Clay and Gravel
54	58	Red Broken Basalt
58	105	Gray Basalt
105	117	Red Cinders and Silt
117	130	Brown Basalt
130	158	Gray Basalt
158	166	Red and Brown Cinders
166	175	Brown Basalt
175	220	Gray Basalt
220	240	Brown Basalt
240	300	Gray Basalt
300	307	Reddish Basalt
307	318	Brown Cinders and Clay
318	320	Cinders and Basalt
320	388	Gray Basalt
388	390	Clay and Cinders
390	395	Red Sand and Gravel
395	410	Gravel

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 7, 1992

 GEOLOGIC LOG Well Name USGS-057

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
410	415	Clay and Gravel
415	450	Basalt
450	454	Cinders
454	465	Broken Brown Basalt
465	468	Basalt
468	477	Cinders
477	537	Gray Basalt
537	545	Cinders
545	555	Broken Basalt and Cinders
555	563	Gray Basalt
563	568	Cinders
568	571	Basalt
571	575	Clay and Cinders
575	667	Gray Basalt
667	672	Cinders
672	732	Basalt
		Total Depth 732 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 7, 1992

WellName: USGS-057

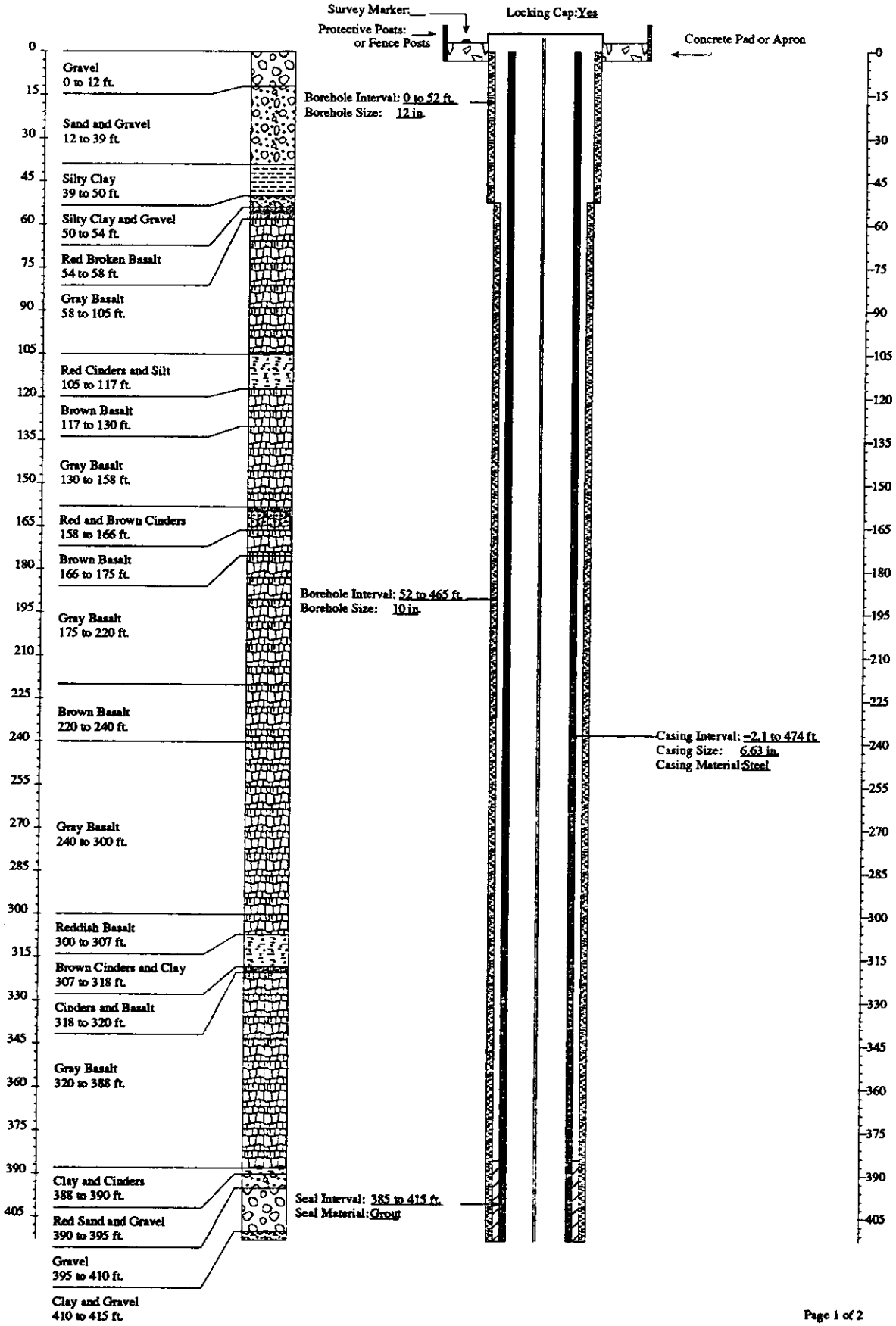
12/21/1993

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1960
Total Depth: 732

Easting: 450822.156
Northing: 691729.699
Longitude: 1125628.9849
Latitude: 433343.70384
Completion Depth: 732

Driller: Andrew
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4925.99

Water Level: 463
Water Level Date: NF
Water Level Access: Line



WellName: USGS–057

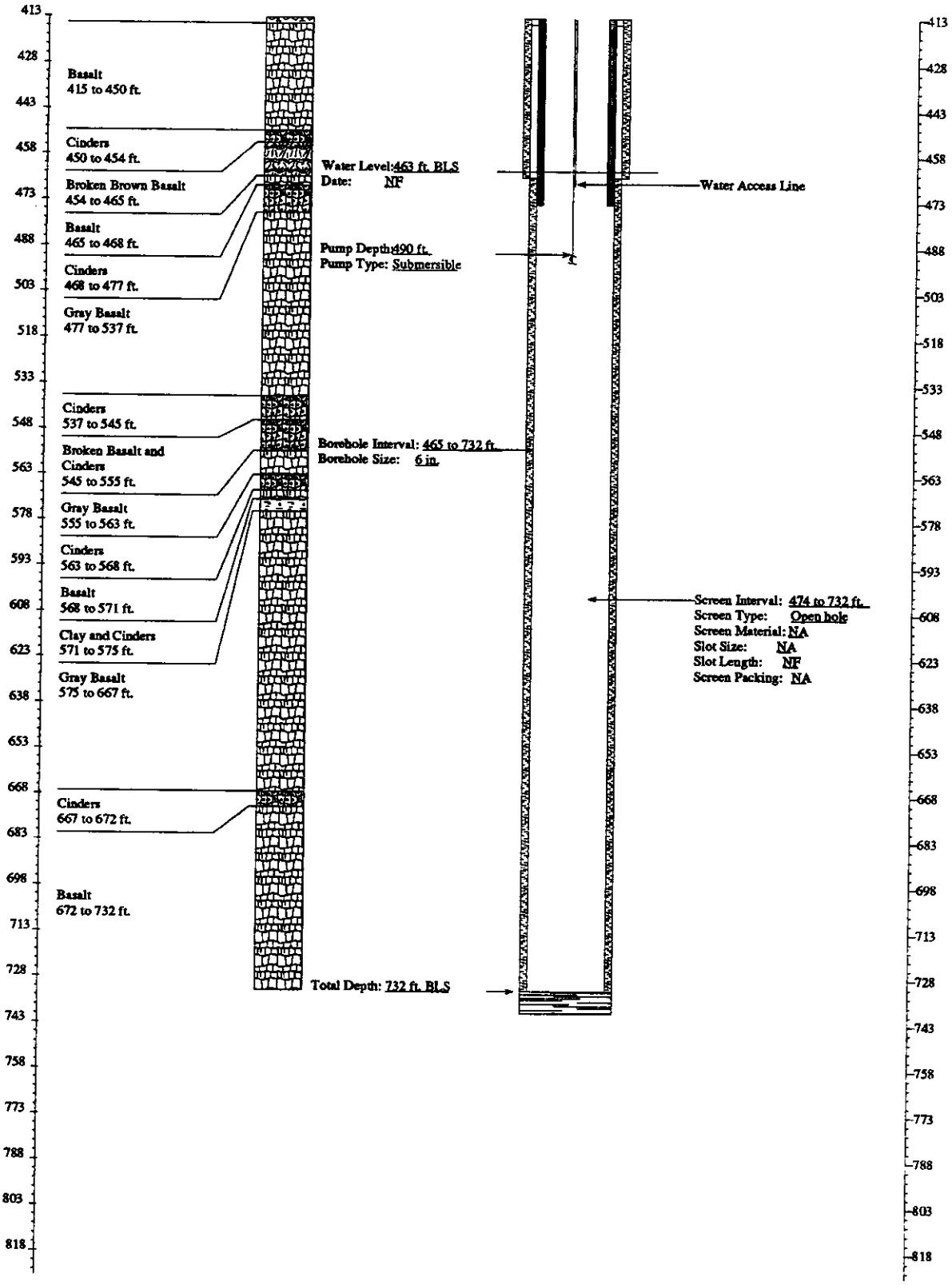
Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1960
Total Depth: 732

Easting: 450822.156
Northing: 691729.699
Longitude: 1125628.9849
Latitude: 433343.70384
Completion Depth: 732

Driller: Andrew
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4925.99

12/21/1993

Water Level: 463
Water Level Date: NF
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-059

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock:(Yes X No _ Borehole size 12 inch Casing size 6.63 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	6.63 O.D.	0 - 464	N.F.	20	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Expanding Cement (1)	370 - 464	12 Yards	Yes
(1) To seal a perched water zone in 1986, a drillable packer was set at 465 feet bls and the 6-inch casing was perforated at 314 - 464 feet bls.			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located about 440 feet northeast of the ICPP percolation ponds. Based on information in USGS publication 91-4166, the well is located near the lateral extent of perched water created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) In 1990, perched groundwater was encountered during drilling at well USGS 122, about 300 feet southwest of USGS 059. The water was encountered at the following depths: 43 to 47 feet, 56 to 62.5 feet, 83 feet, 135 to 170 feet and 392 feet.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, although the well contains a seal from 370 feet to 464 feet bls, perched groundwater zones were encountered above the seal during drilling in 1990 at well USGS 122, approximately 300 feet to the southwest.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

	Material
Casing	
Screen	
Pump	
Discharge Pipe	

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** "Well Completion Report for Wells 121, 122, and 123 at the Idaho Chemical Processing Plant" (Golder Associates, 1990), USGS Report 91-4166, Personal Communication - Rodger Jensen, USGS (Feb. 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located about 440 feet northeast of the ICPP percolation ponds. The well does not comply with state regulations because it is unsealed except for the interval from 370 to 464 feet bls. Although the 6-inch casing was perforated at 314 - 464 feet bls in 1986 to seal off a perched water zone, perched groundwater was encountered above this interval during the drilling of USGS 122 in 1990. USGS 122 is located about 300 feet southwest of USGS 059 and perched water was encountered at the following depths: 43-47 feet, 56-62.5 feet, 83 feet, 135-170 feet and 392 feet. Also, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: Based on the well's proximity to the percolation ponds and the evidence for perched groundwater nearby, a seal should be installed from the surface to the top of the existing seal at 370 feet bls.

GEOLOGIC LOG

Well USGS-059

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	20	Sand and Gravel
20	25	Gravel / Basalt / Cinders
25	42	Broken Basalt
42	49	Clay and Basalt
49	60	Gray Basalt
60	65	Basalt and Cinders
65	73	Red Cinders
73	105	Gray Basalt
105	120	Orange Clay
120	140	Brown and Green Clay
140	150	Gray Basalt and Clay
150	180	Gray Broken Basalt
180	210	Gray Basalt and Cinders
210	218	Clay and Cinders
218	253	Cinders and Basalt
253	272	Clay / Cinders / Gravel
272	280	Basalt
280	291	Clay / Cinders / Gravel
291	383	Gray Basalt
383	403	Basalt / Cinders / Sand / Gravel

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 7, 1992

 GEOLOGIC LOG Well Name USGS-059

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
403	445	Basalt / Silt / Cinders
445	455	Gray Basalt and Cinders
455	458	Red Cinders
458	490	Gray Basalt and Cinders
490	510	Gray Basalt
510	517	Basalt and Cinders
517	524	Gray / Red / Brown Basalt
524	530	Cinders
530	538	Red Basalt
538	550	Gray and Brown Basalt
550	558	Basalt and Cinders
558	561	Red Cinders and Clay
561	588	Basalt
588	593	Cinders
593	650	Basalt
650	657	Basalt and Cinders
		Total Depth 657 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 7, 1992

WellName: USGS-059

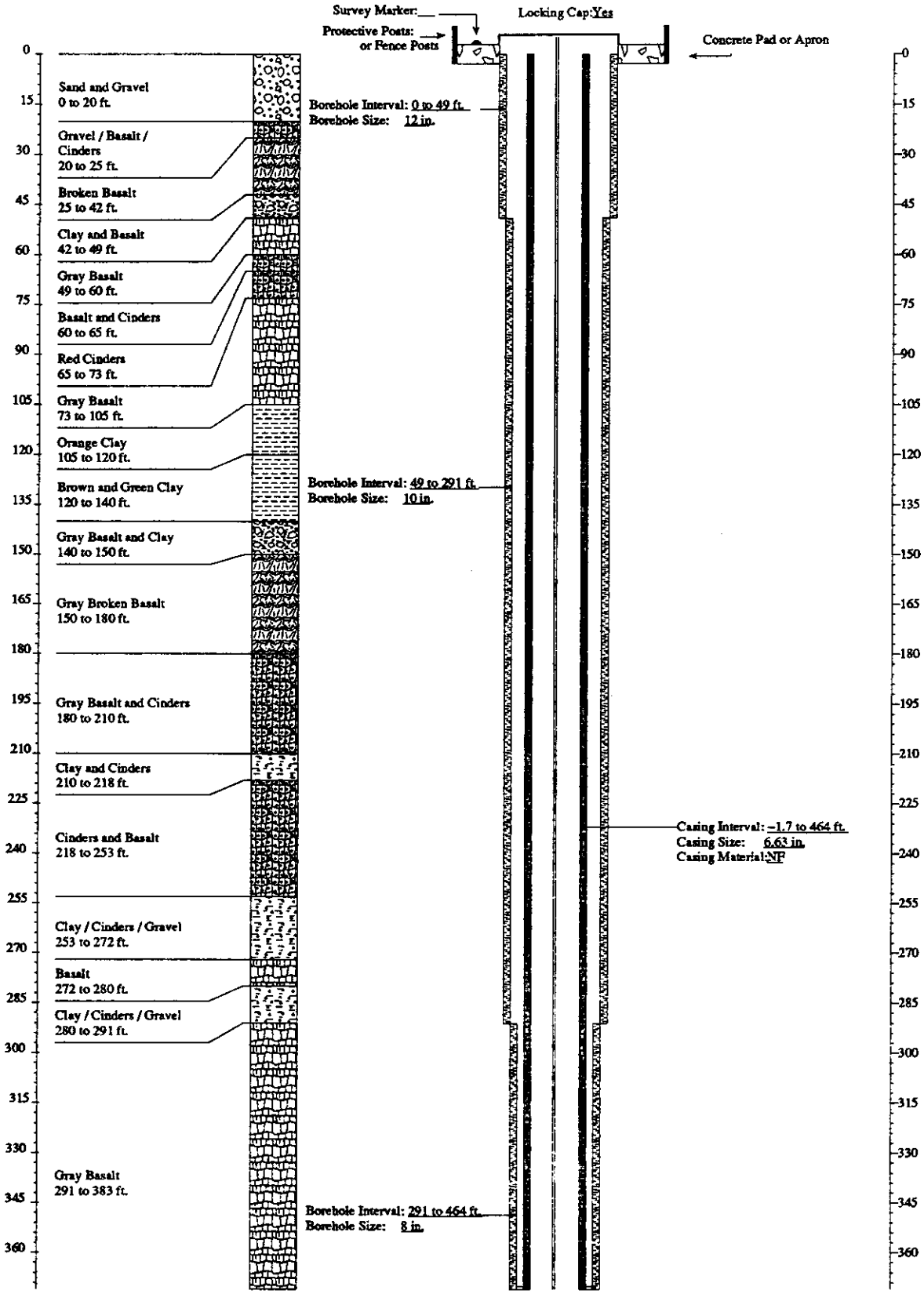
12/21/1993

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1960
Total Depth: 657

Easting: 453627.564
Northing: 692744.704
Longitude: 1125551.0120
Latitude: 433353.98429
Completion Depth: 657

Driller: Andrew
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4916.92

Water Level: 455
Water Level Date: NF
Water Level Access: Line



WellName: USGS-059

12/21/1993

Facility: ICPP
Well Type: Observation
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Year Drilled: 1960
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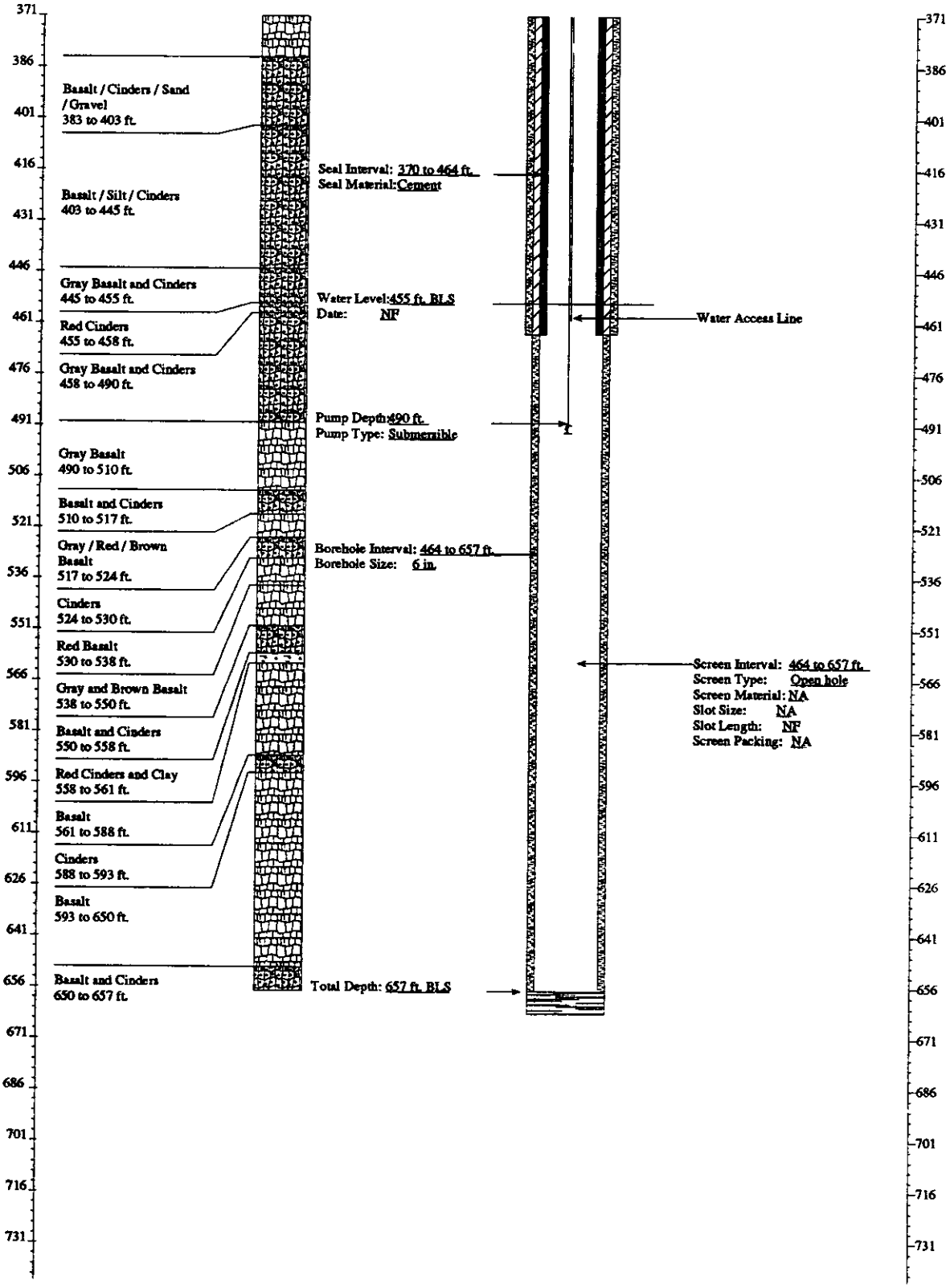
Water Level: 455
Water Level Date: NF
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No.** USGS-067

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: None (Water table too low to pump)
Constituents previously monitored: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock:(Yes X No _ Borehole size 12 inch Casing size 6.63 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.63 O.D.	0 - 465	N.F.	21	N.F.	N.F.
Carbon Steel	4 I.D. or O.D.?	0 - 450	N.F.	27	N.F.	N.F.
Carbon Steel	4.5 O.D.	552 - 635	N.F.	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Expanding Cement (1)	0 - 465 (4-inch casing seal) and 315 - 465 (6-inch casing seal)	13.9 yd^3	Yes
(1) The 6-inch casing was perforated from 315 to 465 feet bls and pressure grouted when the 4-inch casing was installed and grouted.			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement In 1986, the 6-inch casing was perforated from 315 to 465 feet. A packer was set at approximately 465 feet, and the casing was pressure grouted with expanding cement.

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located about 765 feet southeast of the ICPP percolation ponds near the lateral extent of perched waters created by the ponds according to USGS Report 91-4166.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Neutron logs prior to 1986 showed evidence of perched groundwater at about 310 feet bls. After the 6-inch casing was grouted, a TV log was run in the well and no evidence was found of cascading water.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the casing is unsealed except for an interval between about 315 and 465 feet bls.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Perched groundwater and seal information (Personal communication, Rodger Jensen, USGS, 1992 and 1993), USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located about 765 feet southeast of the ICPP percolation ponds. It does not have an annular surface seal as required by state regulations. Although most of the casing is unsealed, the perched water zone at about 310 feet bls was sealed out of the well in 1986 when the 6-inch casing was perforated and grouted between 315 and 465 feet bls. After the casing was grouted, a video log was run in the well and no evidence was found of cascading water. Therefore, a variance should be requested for the lack of a surface seal. However, the 6-inch casing was damaged when it was perforated and the packer set at 465 feet bls could not be drilled out. The water table currently is below the depth of the pump and discharge pipe, and the well can not be used.

Remediation: The well should be checked periodically to the confirm the integrity of the grout seal and the absence of perched water above the grouted interval. Since the well can not be used when the water table is low, another attempt should be made to remediate the well.

 GEOLOGIC LOG Well Name USGS-067

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	22	Gravel
22	37	Basalt
37	40	Broken Basalt
40	62	Basalt
62	80	Red Cinders
80	93	Broken Basalt
93	103	Brown Basalt
103	107	Cinders and Silt
107	113	Red Silt
113	122	Basalt
122	144	Brown Clay and Silt
144	150	Basalt
150	155	Broken Basalt
155	165	Basalt
165	177	Red Silt and Cinders
177	197	Basalt
197	218	Broken Basalt
218	225	Cinders and Silt
225	238	Cinders / Silt / Broken Basalt
238	313	Gray Basalt
313	320	Red Cinders and Sand

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 7, 1992

 GEOLOGIC LOG Well Name USGS-067

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
320	328	Cinders and Brown Silt
328	340	Gray Basalt
340	360	Broken Basalt
360	422	Gray Basalt
422	427	Cinders and Red Silt
427	497	Gray Basalt
497	513	Cinders and Broken Basalt
513	535	Broken Basalt
535	573	Basalt
573	591	Red Clay and Silt
591	604	Red Sand
604	677	Basalt
677	680	Broken Basalt
680	690	Basalt
690	694	Cinders
		Total Depth 694 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 7, 1992

WellName: USGS–067

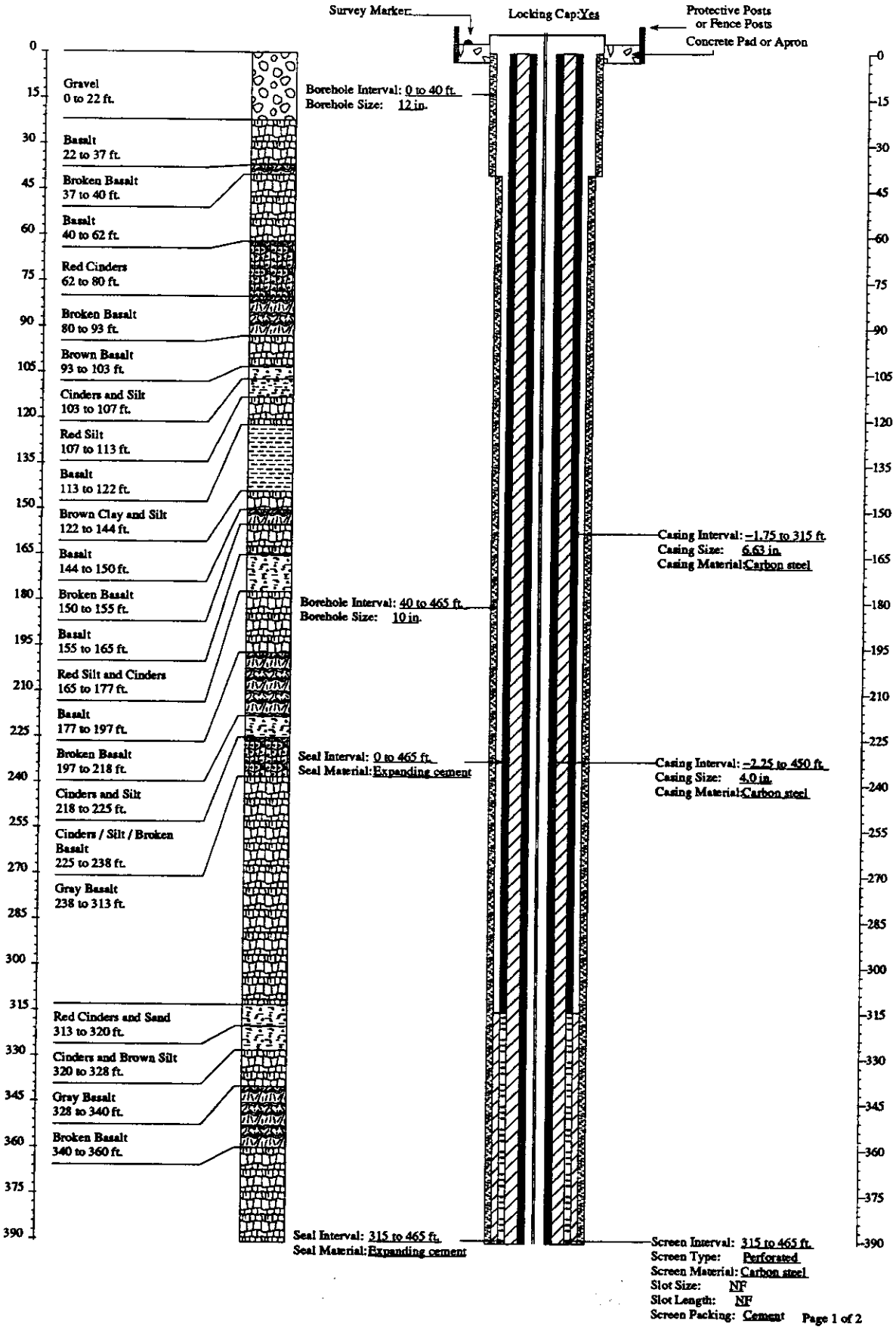
04/08/1994

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1960
Total Depth: 694

Easting: 454155.686
Northing: 691704.322
Longitude: 1125543.7098
Latitude: 433343.75753
Completion Depth: 694

Driller: Andrew
Geologist: D.R.R. and E.S.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4917.42

Water Level: 455
Water Level Date: NF
Water Level Access: Line



WellName: USGS--067

04/08/1994

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1960
Total Depth: 694

Easting: 454155.686
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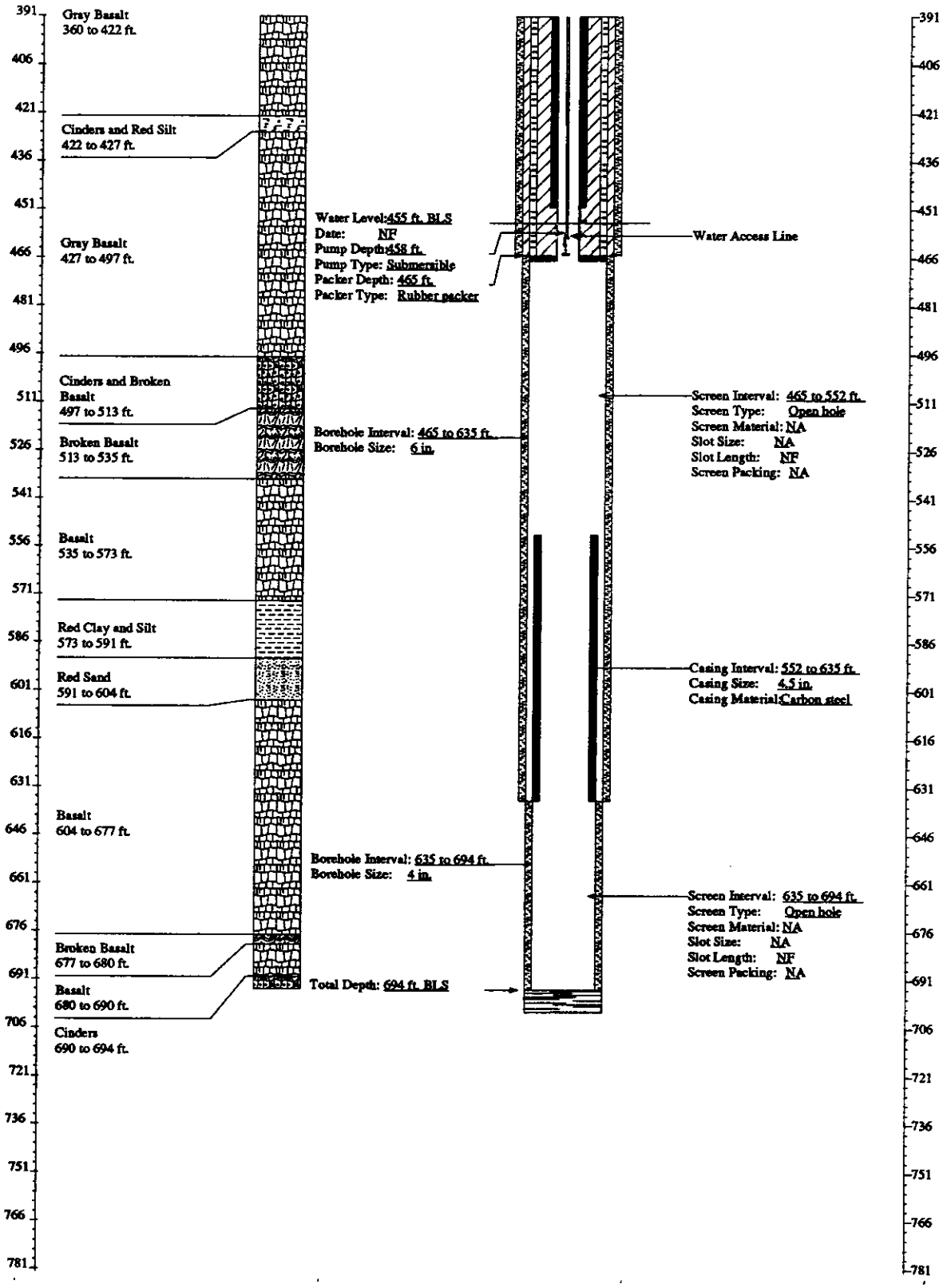

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-077

A. WELL USE

1) Year well was drilled: 1962

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: Yes X No _ Borehole size 12 inch Casing size 6.63 inch O.D.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	6.63 O.D.	0 - 470	N.F.	27	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Sediment (1)	586 - 610	N.F.	N/A
(1) From video log run in well 4-17-93 (pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located south of the ICPP percolation ponds. Based on USGS report 91-4166, the well is located beyond the lateral extent of perched waters created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No indication was found of perched water near the well from the CWS files or the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented annular seal. However, no evidence was found of perched groundwater above the monitoring interval.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (May 1993).

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-077

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located south of the ICPP percolation ponds and beyond the extent of perched water created by the ponds. Since the well is not in proximity to any potential sources of surface or subsurface contamination and no evidence was found of perched groundwater near the well, a variance should be requested for the lack of this seal. In addition, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well USGS-077

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	17	Gravel
17	35	Gray Basalt
35	48	Orange Clay and Basalt
48	130	Gray Basalt
130	136	Sand and Clay
136	153	Broken Basalt
153	156	Clay and Cinders
156	240	Basalt
240	255	Red Broken Basalt
255	260	Brown Broken Basalt
260	320	Gray Basalt
320	330	Broken Basalt
330	343	Red Clay and Gravel
343	372	Basalt
372	390	Broken Basalt
390	400	Clay and Basalt
400	418	Firm Basalt
418	428	Clay / Sand / Gravel
428	465	Gray Basalt
465	540	Brown Basalt
540	583	Gray Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 12, 1992

GEOLOGIC LOG

Well Name USGS-077

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
583	598	Sand and Clay
598	610	Cinders
		Total Depth 610 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 12, 1992

WellName: USGS–077

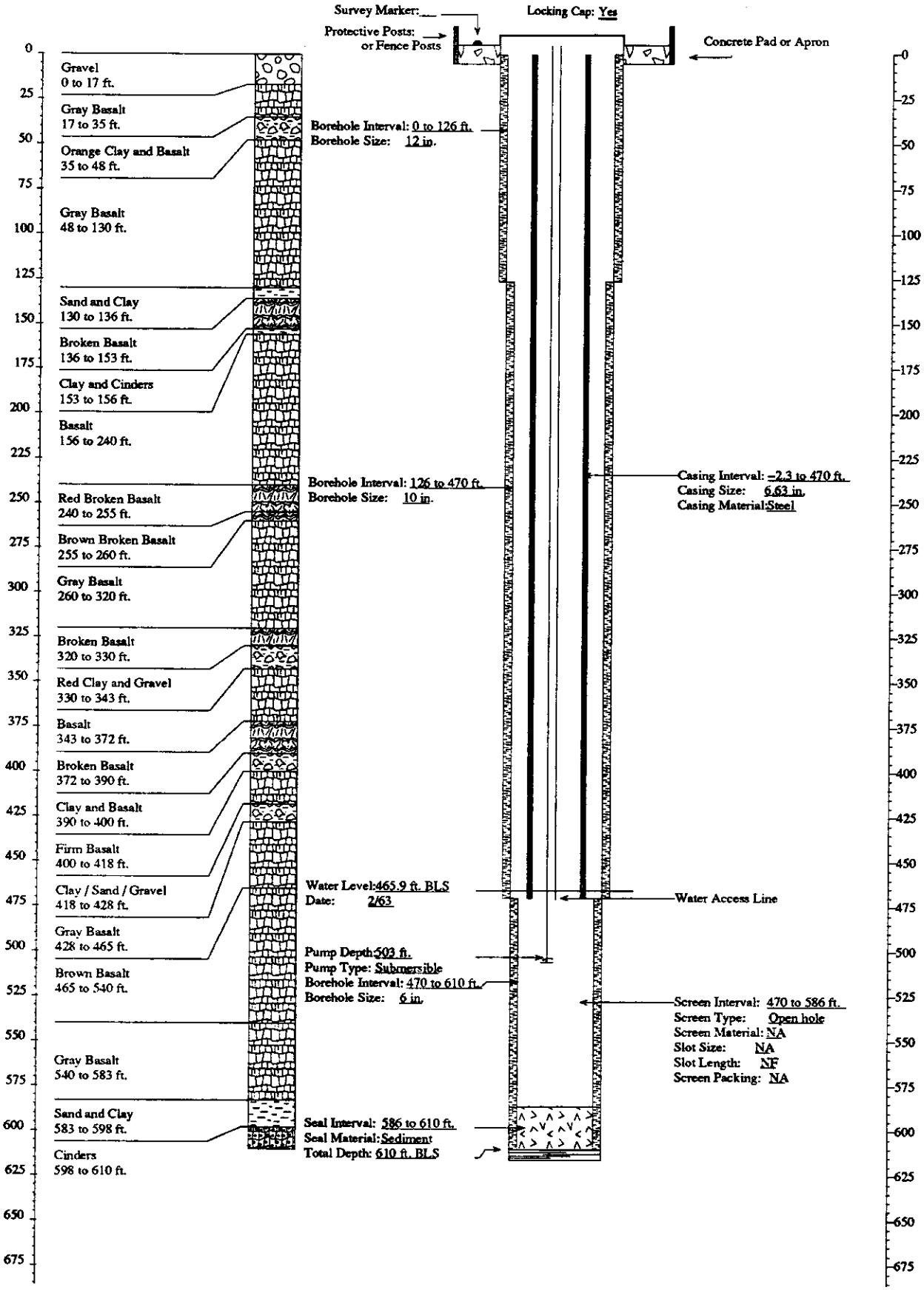
06/18/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1962
Total Depth: 610

Easting: 296489.92
Northing: 688820.41
Longitude: 1125603.63
Latitude: 433315.23
Completion Depth: 610

Driller: Andrew
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4922.69

Water Level: 465.9
Water Level Date: 2/63
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-081

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring ( )USGS Observation
( )CERCLA Characterization (X)No Documented Use
(X)Other: Open Borehole

3) Constituents monitored currently: None - the well is currently dry.

4) Water level monitored: (Yes _ No X Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes _ No X)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No X N/A _)
Explanation According to Nielson Birch of WINCO, the borehole is no longer being used.
6) Based on location of well, is existing or planned surface completion adequate:
(Yes _ No X) Explanation The borehole should be upgraded or abandoned.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes _ No X Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size 4-inch Casing size 4-inch (I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel (surface casing)	4 (I.D. or O.D.?)	0 to 26	N.F.	4	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The borehole is located over 1000 feet east of the ICPP facility. Based on USGS report 91-4166, it is beyond the lateral extent of perched water created by the ICPP percolation ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No indication was found of perched water near the borehole from information available in the CWS files or from the geophysical logs. The borehole is reportedly dry and not in use.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the borehole contains no annular seal. However, no evidence was found for perched groundwater near it.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: No Documented Use/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
(X) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The borehole is located over 1000 feet east of the ICPP facility. It was drilled to a depth of about 104 feet to collect a continuous core sample. Because it is dry and no longer being used, it was not scheduled for a surface upgrade.

Remediation: The borehole should completed for another use and upgraded or abandoned in accordance with state regulations.

GEOLOGIC LOG

Well Name USGS-081

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	8	No Sample
8	27	Vesicular Basalt
27	32	Fine-grained Sandstone
32	95	Basalt (Fractured 32-33 and at 95 ft)
95	97	No Sample
97	104.3	Sandstone / Sand / Clay

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 14, 1992

WellName: USGS-081

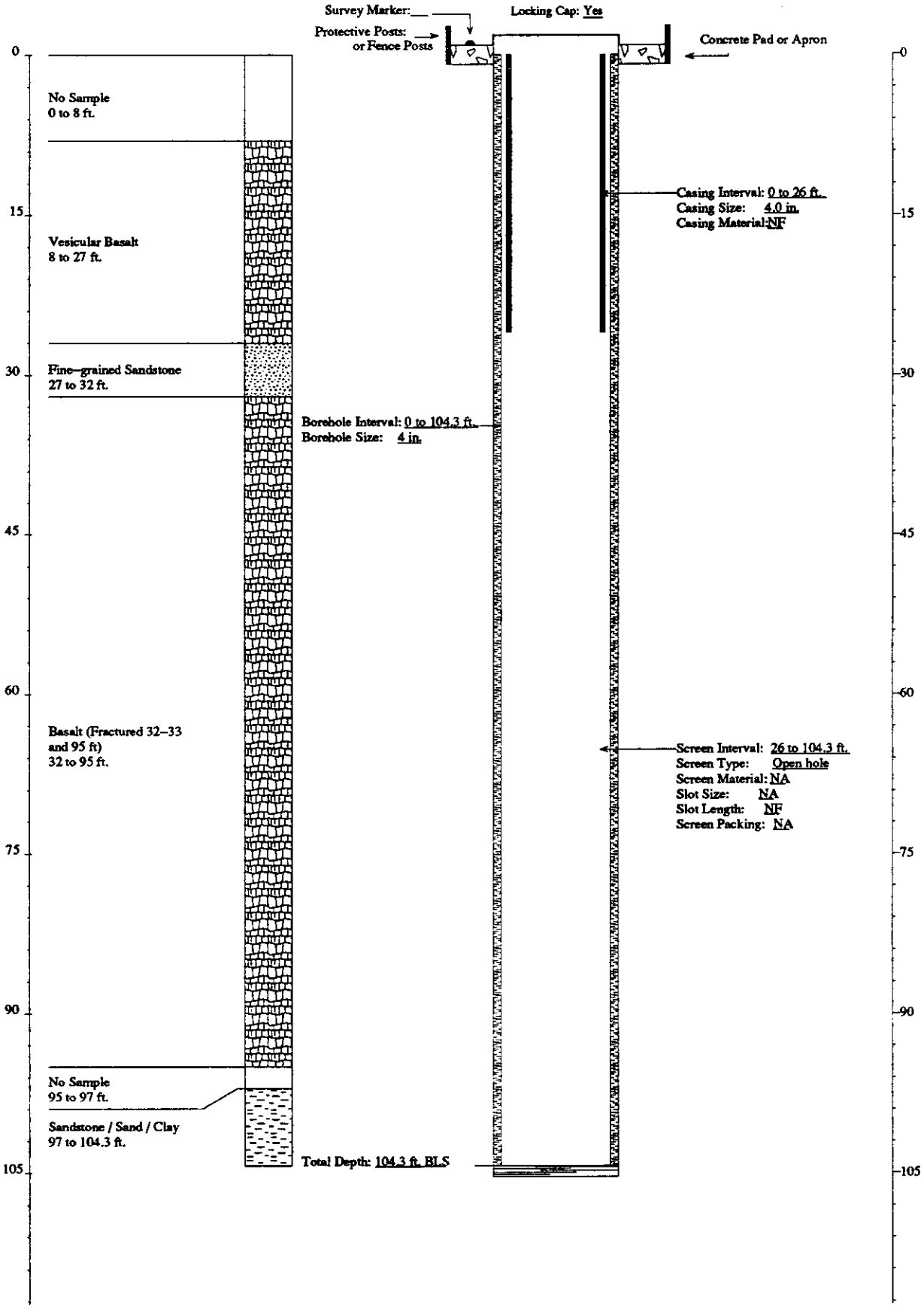
06/18/1993

Facility: CPP
Well Type: Observation Well
Well Status: Inactive
Year Drilled: 1960
Total Depth: 104.3

Easting: 300480.17
Northing: 693317.52
Longitude: 1125510.00
Latitude: 433400.00
Completion Depth: 104.3

Driller: Andrew
Geologist: NF
Drilling Method: Rotary cored
Drilling Fluid: NF
Land Surface: 4909

Water Level: DRY
Water Level Date: NF
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-082

A. WELL USES

1) Year well was drilled: 1962

2) Current use for well:
( )DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3; RCRA - pH, specific conductance, TOC, TOX, Ba, Cd, Cr, Ag, As, Pb, Se, Hg, F, NO_3, Endrin, Lindane, Methoxychlor, Toxaphene, Herbicides, Gross Alpha, Gross Beta, Fe, Mn, Na, phenols, Cl, SO_4

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: Draft Final Groundwater Monitoring Plan for the Idaho Chemical Processing Plant

7) Responsible organization/Contact person: RCRA - WINCO / Ken Taylor; USGS Observation - USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)

5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)Explanation _

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 8.625 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	8.625 O.D.	0 - 460	N.F.	18	N.F.	N.F.
Steel (1)	6.625 O.D.	445 - 593	N.F.	N/A	N.F.	N.F.
(1) Casing perforated 470-570 feet bls; Open hole 593-693 feet bls.						

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Sediment (1)	693 - 700	N.F.	N/A
(1) From video log run in well 4-22-93 (pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located over 1000 feet east of the ICPP facility. Based on USGS report 91-4166, the well is located outside the lateral extent of perched waters created by the ICPP percolation ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of saturated formations near the well from information available in the CWS files or from the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented annular seal. However, no evidence was found of perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes X No _) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity N.F.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

Material

Casing Carbon Steel

Screen Perforated Carbon Steel Casing (469 - 561 feet bls) and Open Hole (593 - 700 feet bls)

Pump 1.5 HP Submersible pump

Discharge Pipe 1-inch Galvanized Steel

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between metal concentrations in the groundwater from wells constructed of stainless steel and carbon steel at the RWMC. Although galvanized steel may corrode in acidic environments, the groundwater is not acidic at the INEL. The water level measuring pipe is constructed of PVC which is not preferred in compliance/detection monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Perforated casing and open hole

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs above the monitoring interval, the well monitors only dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes X No _) Monitoring interval(s) 469 - 561 feet bls and 593 - 700 feet bls. The well monitors two intervals, one 92 feet long and the other 107 feet long. These intervals are excessive in length and include zones of broken basalt, massive basalt and cinders. Although the casing is unsealed, the perforated casing and the open hole may be isolated from each other by a 7-foot thick clay layer.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth 510 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type 1.5 hp submersible Explanation EGG-WM-9787 documents that submersible pumps, gas piston pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166; EGG-ER-8496; EGG-WM-9787; Personal Communication - Rodger Jensen, USGS (May, 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The casing does not have a surface seal as required by state regulations. However, the well is located over 1000 feet east of the ICPP facility and beyond the extent of perched water created by the ICPP percolation ponds. Since the well is not in proximity to any potential sources of surface or subsurface contamination and no evidence was found of perched groundwater near the well, a variance should be requested for the lack of this seal. In addition, the casing joint types and casing thicknesses were not documented, which are minor deficiencies.

Remediation: None

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-082

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
( ) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not comply with state regulations to the extent stated above. The well does not comply with RCRA guidelines for the following reasons: (1) the casing is not sealed in the borehole above the monitored zone, which may affect the integrity of water samples and (2) the well monitors two intervals with a combined length of about 200 feet. This is excessive for compliance/detection use and may result in the dilution of contaminant concentrations. Also, the mixing of water from two intervals usually is not acceptable for RCRA purposes. Although the casing is not grouted in the borehole, a 7-foot thick clay bed may seal the casing between the perforated zone and the open hole. In addition the following minor deficiencies were noted: (1) the well development, decontamination procedures and the use of drilling fluids were not documented and (2) the bottom 7 feet of the borehole (which is 183 feet below the pump) is filled with sediment.

Remediation: None

 GEOLOGIC LOG Well Name USGS-082

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	4	Sand and Silt
4	22	Massive Basalt
22	32	Red Sandstone and Clay
32	40	Vesicular Basalt
40	93	Massive Basalt
93	110	Red-Brown Sand and Clay
110	157	Basalt
157	170	Clay
170	210	Basalt
210	214	Clay
214	248	Basalt
248	265	Clay and Sand
265	315	Basalt
315	330	Broken Basalt and Cinders
330	365	Basalt
365	372	Cinders
372	377	Basalt
377	385	Clay
385	420	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 18, 1992

GEOLOGIC LOG

Well Name USGS-082

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
420	449	Clay and Sand
449	498	Broken Basalt
498	535	Massive Basalt
535	537	Cinders
537	558	Basalt
558	565	Clay
565	618	Basalt
618	639	Broken Basalt and Cinders
639	700	Basalt
		Total Depth 700 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 18, 1992

WellName: USGS-082

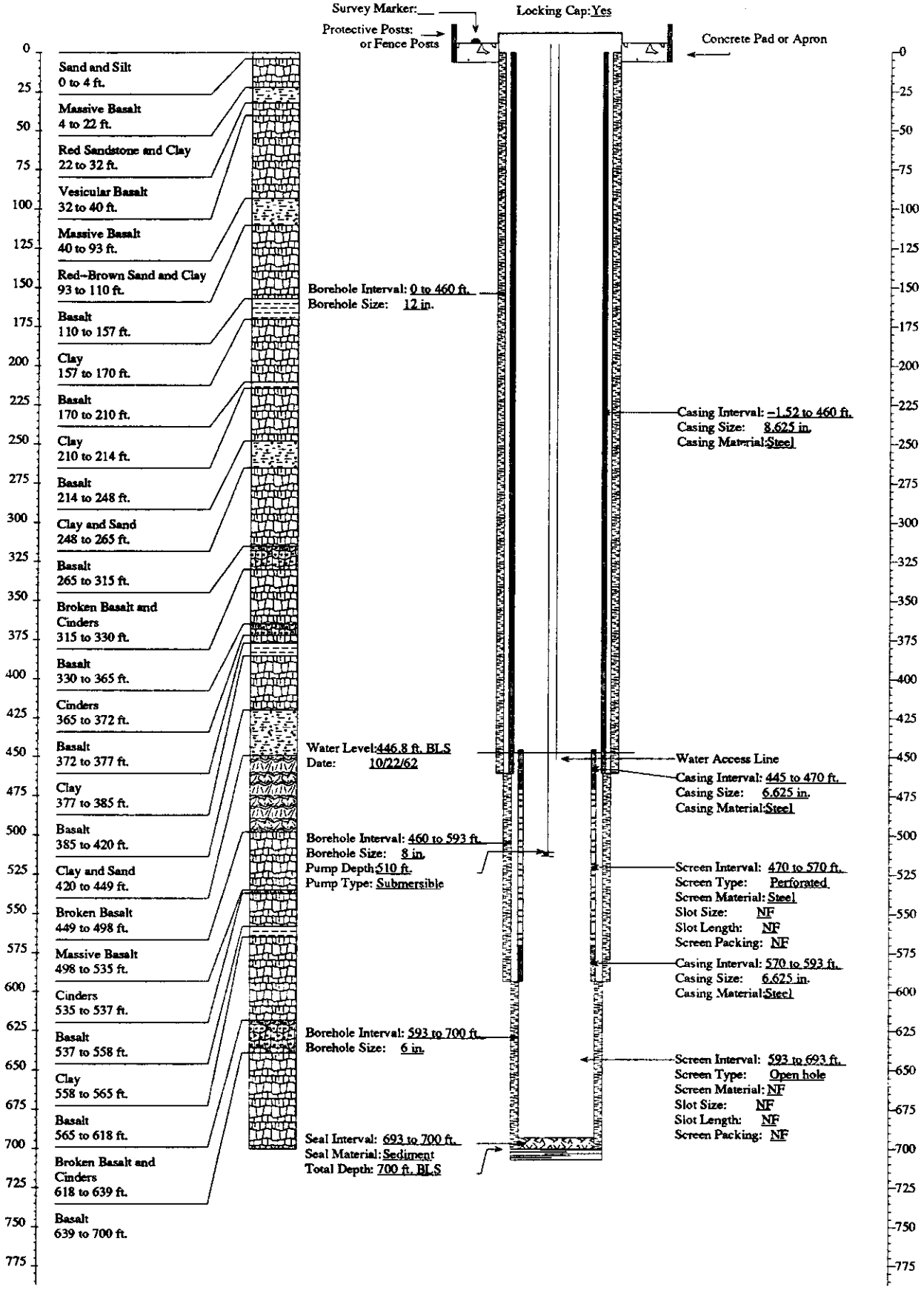
07/27/1993

Facility: CPP
Well Type: Monitoring Well
Well Status: Active
Year Drilled: 1962
Total Depth: 700

Easting: 300452.85
Northing: 693409.73
Longitude: 1125510.38
Latitude: 433400.91
Completion Depth: 700

Driller: Hopkins
Geologist: E. Shuter
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4908.23

Water Level: 446.8
Water Level Date: 10/22/62
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-085

A. WELL USE

1) Year well was drilled: 1962

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO,

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.63 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.63 O.D.	0 - 522	N.F.	29	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Sediment (1)	614 - 637	N.F.	N/A
(1) From video log run in well 4-22-93 (pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located south of the ICPP percolation ponds. Based on USGS report 91-4166, the well is located outside the lateral extent of perched waters created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of saturated zones from the CWS files or the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented annular seal. However, no evidence was found of perched groundwater above the monitoring interval.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have an annular surface seal as required by state regulations. However, it is located south of the ICPP percolation ponds and beyond the extent of perched water created by the ponds. Since the well is not in proximity to any other sources of surface or subsurface contamination and no evidence was found of perched groundwater near the well, a variance should be requested for the lack of this seal. In addition, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well Name USGS-085

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	27	Gravel
27	55	Gray Basalt
55	65	Clay
65	80	Brown Basalt
80	97	Gray Basalt
97	107	Red Clay and Basalt
107	147	Brown Basalt
147	165	Brown Basalt and Clay
165	203	Gray Basalt
203	220	Brown Basalt
220	235	Gray Basalt
235	298	Brown Basalt
298	302	Clay
302	320	Brown Basalt
320	345	Gray Basalt
345	355	Brown Clay
355	375	Gray Broken Basalt
375	400	Brown Broken Basalt
400	423	Brown Basalt
423	462	Gray Basalt
462	494	Brown Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 13, 1992

 GEOLOGIC LOG Well Name USGS-085

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
494	515	Gray Basalt
515	522	Broken Basalt and Clay
522	612	Brown Basalt
612	622	Clay
622	637	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 13, 1992

WellName: USGS-085

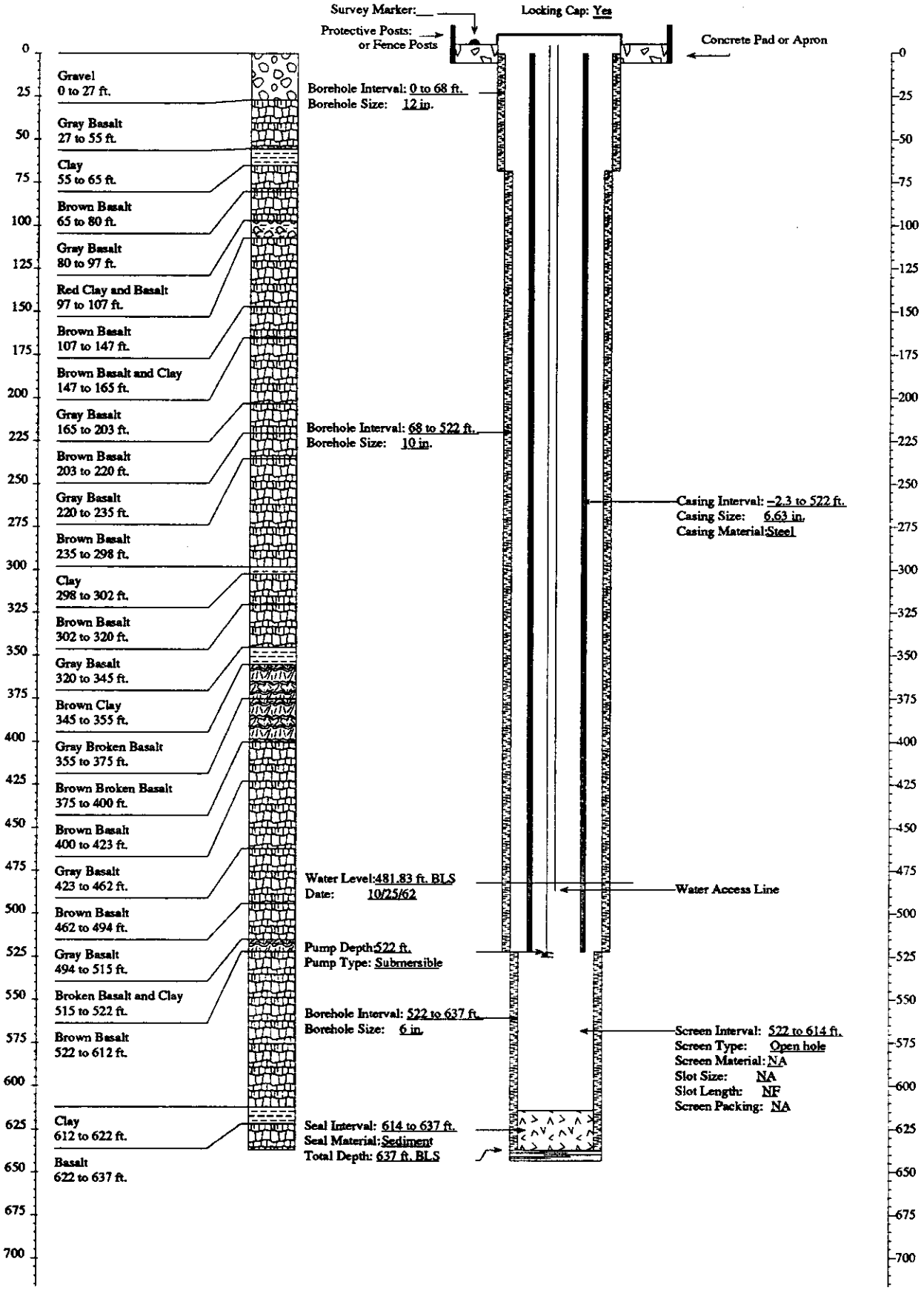
06/18/1993

Facility: CPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1962
Total Depth: 637

Easting: 291433.91
Northing: 685921.96
Longitude: 1125711.91
Latitude: 433246.14
Completion Depth: 637

Driller: Hopkins
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4940.15

Water Level: 481.83
Water Level Date: 10/25/62
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-111

A. WELL USE

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation ^{3}H, ^{90}Sr, Cl, Na, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size ~12 inch Casing size 8 inch (I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	8 (I.D. or O.D.)	0 - 442	N.F.	24.5	N.F.	N.F.
Carbon Steel	10 (I.D. or O.D.)	0 - 10	N.F.	0	N.F.	N.F.

Three segments of PVC were encountered with video log run down hole on 4/17/93. The top of one is at 536 ft. and the tops of two others are at 573 ft. (Pers. comm. Rodger Jensen, USGS)

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Bentonite	0 - 10 (surface seal)	N.F.	Yes
Grout	0 - 10 (between casings)	N.F.	Yes
Grout	~311 - 440	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located over 1400 feet south of the ICPP percolation ponds. Based on information available in the USGS Report 91-4166, the well is outside the lateral extent of perched water created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the well contains an annular casing seal from 0 to 12 feet bls and from 311 to 440 feet bls, and no evidence was found of perched groundwater between the seals.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-111

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well contains an annular casing seal from 0 to 12 feet bls, which is one foot into the basalt, and from 311 to 440 feet bls. The well does not comply with state regulations which require a surface seal to a depth of at least 18 feet. Since the well is located over 1400 feet south of the ICPP percolation ponds and no evidence was found of perched groundwater near the well, a variance should be requested for the length of the seal. Also, the casing thicknesses and joint type were not documented, which are minor deficiencies. Although the surface casing has no stick-up, the well is adequately sealed from surface contamination.

Remediation: None

GEOLOGIC LOG

Well Name USGS-111

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	11	Alluvium
11	34	Basalt
34	44	Clay
44	58	Basalt
58	112	Broken Basalt
112	261	Hard Basalt
261	270	Soft Broken Basalt
270	388	Basalt
388	397	Sediment
397	595	Hard Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 6, 1992

WellName: USGS-111

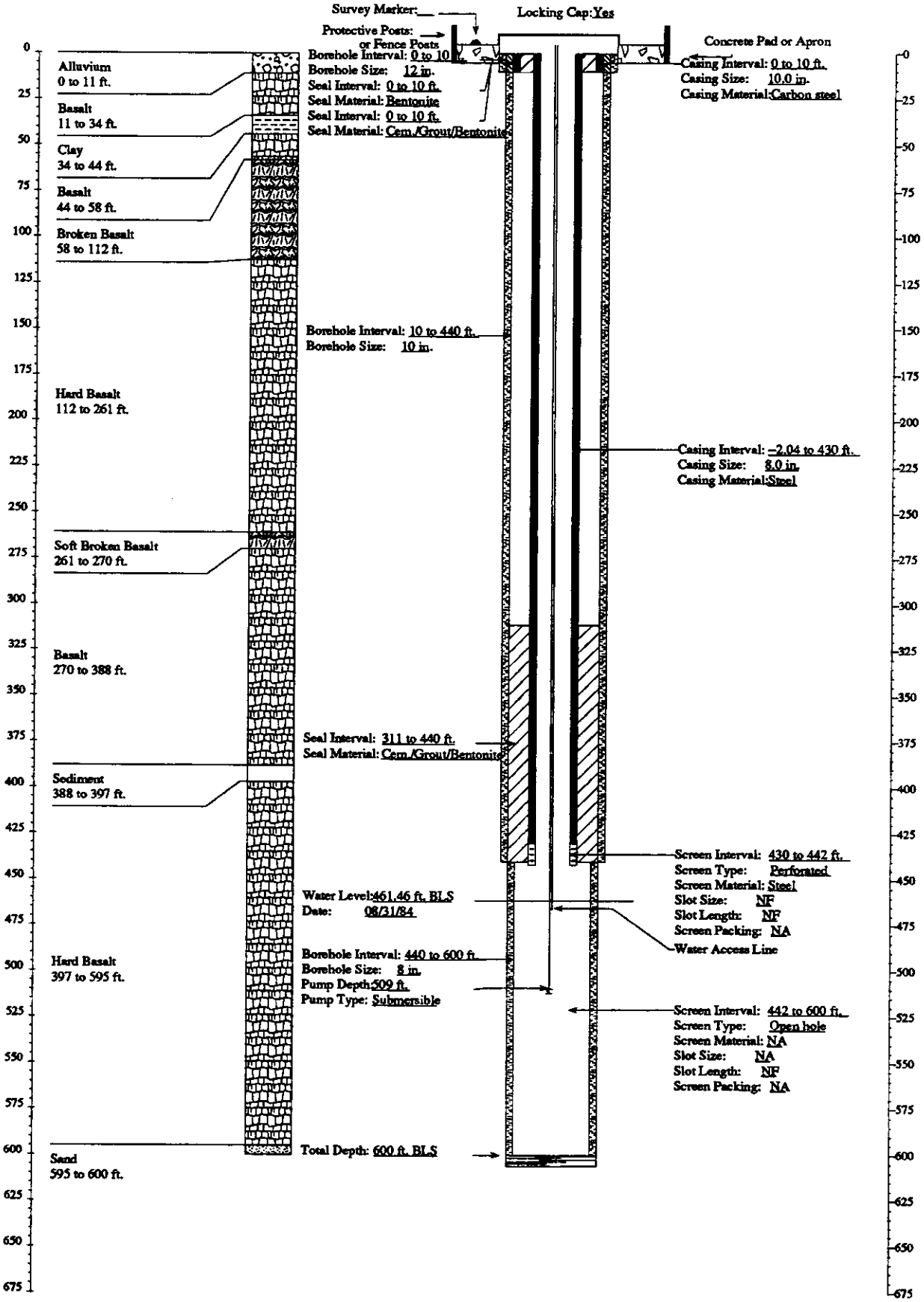
09/12/1993

Facility: ICPP
Well Type: Observation Well
Well Status: Active
Year Drilled: 1984
Total Depth: 600

Easting: 296386.02
Northing: 690432.40
Longitude: 1125605.24
Latitude: 433331.13
Completion Depth: 600

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4920.26

Water Level: 461.46
Water Level Date: 08/31/84
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-112

A. WELL USES

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3; RCRA - pH, specific conductance, TOC, TOX, Ba, Cd, Cr, Ag, As, Pb, Hg, F, NO_3, Endrine, Lindane, Methoxychlor, Toxaphene, Herbicides, Gross Alpha, Gross Beta, Fe, Mn, Na, phenols, Cl, SO_4.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: Draft Final Groundwater Monitoring Plan for the Idaho Chemical Processing Plant

7) Responsible organization/Contact person: RCRA - WINCO / Ken Taylor; USGS Observation - USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)

4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size 12 inch

Casing size 10 inch (I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	10 (I.D. or O.D.)	0 - 29	N.F.	0	N.F.	N.F.
Steel	8 (I.D. or O.D.)	0 - 430	N.F.	25	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Bentonite Grout	0 - 30	N.F.	Yes
Cement Bentonite Grout	320 - 430	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located south of the ICPP percolation ponds. Based on USGS 91-4166, the well is outside the lateral extent of perched waters created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the well contains a seal from 0 to 30 feet bls and from 320 to 430 feet bls, and no evidence was found of perched groundwater between the seals.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes X No _) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity N.F.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No X)

Material

Casing Open Hole Completion

Screen N/A

Pump 5 HP Grundfos Submersible Pump

Discharge Pipe 1.5-inch Galvanized Steel

Explanation Although galvanized steel may corrode in an acidic environment, the groundwater is not acidic at the INEL. The measuring pipe for water levels is constructed of PVC, which is not preferred in compliance monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Open hole completion

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitoring interval, the well monitors both dissolved constituents and "floaters".

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval Water Table (approximately 465 feet bls) to 563 feet bls. The monitoring interval of about 100 feet is excessive.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A X)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth 509 feet

10) Does the pump type collect representative groundwater samples: (Yes _ No X Not Documented _) Type Grundfos Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166; EGG-WM-9787; Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations except that no documentation was found for casing thicknesses and joint types, which are minor deficiencies. The annulus between the 8-inch casing and borehole is unsealed from 30 feet to 320 feet bls, but the well is located south of the extent of perched water created by the ICPP percolation ponds and no evidence was found for saturated conditions in the unsealed interval. Although the surface casing does not extend above ground, the well is adequately sealed from surface contamination.

Remediation: None

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-112

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
( ) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated above. The well does not comply with RCRA guidelines for the following reasons: (1) the annulus between the 8-inch casing and borehole does not have a continuous seal above the monitored zone and (2) the monitoring interval of about 100 feet is considered excessive for compliance/detection use and may result in the dilution of contaminant concentrations. Also, the following minor deficiencies were noted: the water level measuring pipe is constructed of PVC, a material not preferred for compliance monitoring due to its absorbing/leaching characteristics; and the well development, the use of drilling fluids, and the decontamination procedures were not documented.

Remediation: None

GEOLOGIC LOG

Well Name USGS-112

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	30	Alluvium
30	42	Basalt
42	48	Broken Basalt
48	130	Basalt
130	140	Broken Basalt
140	149	Basalt
149	155	Broken Basalt
155	162	Basalt
162	172	Broken Basalt
172	186	Sediment
186	295	Basalt
295	300	Broken Basalt
300	346	Basalt
346	378	Sediment
378	397	Basalt
397	402	Broken Basalt
402	415	Basalt
415	419	Sediment
419	430	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 18, 1992

 GEOLOGIC LOG Well Name USGS-112

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
430	440	Broken Basalt
440	550	Basalt
550	555	Broken Basalt
555	563	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 18, 1992

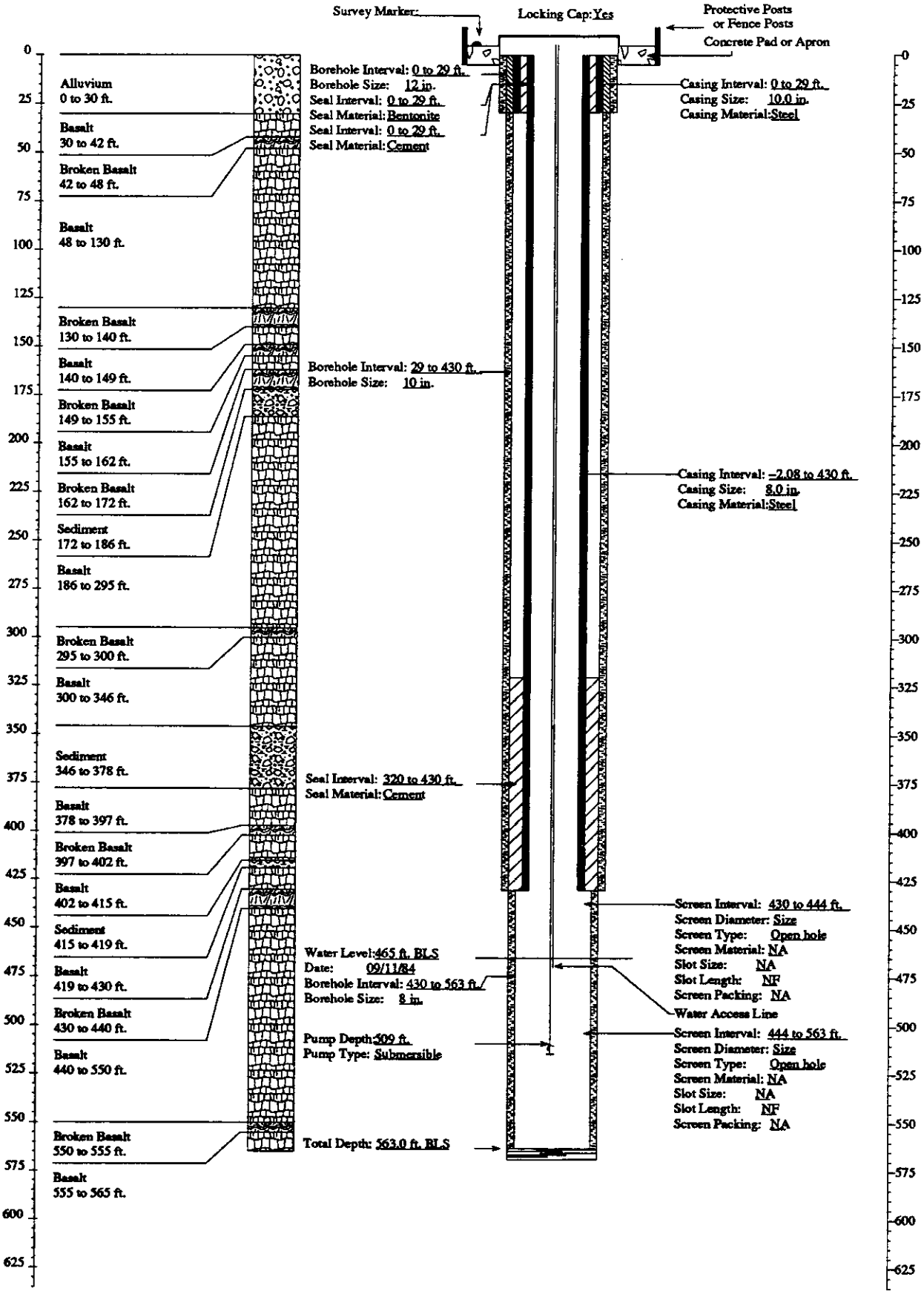
WellName: USGS-112 Corrections:Set bottom of bentonite seal = 29 ft. (original NF) 04/19/1994

Facility: ICPP
Well Type: Monitoring
Well Status: Active
Year Drilled: 1984
Total Depth: 563.0

Easting: 450445.110
Northing: 688742.077
Longitude: 1125633.7268
Latitude: 433314.16391
Completion Depth: 563.0

Driller: Denning
Geologist: NF
Drilling Method: Hydraulic rotary
Drilling Fluid: NF
Land Surface: 4931.34

Water Level: 465
Water Level Date: 09/11/84
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP PAGE 1 of 7 Well Name/No. USGS-113

A. WELL USE

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation ^{3}H, ^{90}Sr, Cl, Na, NO, _

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size 12 inch Casing size 10 inch (I.D. or O.D.) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	6 (I.D. or O.D.)	0 - 443	N.F.	25	N.F.	N.F.
Carbon Steel	10 (I.D. or O.D.)	0 - 15	N.F.	0	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Bentonite Grout	0 - 15	N.F.	Yes
Cement Bentonite Grout	282 - 445	N.F.	Yes
Sediment (1)	561 - 564	N.F.	N/A
(1) From a video log run in well 4-21-93 (pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located south of the ICPP percolation ponds. Based on USGS report 91-4166, the well is outside the lateral extent of perched water created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the well contains an annular casing seal from 0 to 15 feet bls (1 foot below the top of basalt) and from 282 to 445 feet bls. No evidence was found of perched groundwater between the seals.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well contains annular casing seals from 0 to 15 feet bls (1 foot below the top of basalt) and from 282 to 445 feet bls. The well does not comply with state regulations which require a surface seal to a depth of at least 18 feet. Since the well is located south of the extent of perched water created by the ICPP percolation ponds and no evidence was found for saturated conditions in this interval, a variance should be requested for the length of the seal. In addition, the casing thicknesses and joint type were not documented, which are minor deficiencies. Although the surface casing has no stick-up, the well is adequately sealed from surface contamination.

Remediation: None

 GEOLOGIC LOG Well Name USGS-113

Source: USGS Generalized Lithology Log

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Interval (feet below surface)

Begin	End	Description
0	14	Alluvium
14	38	Basalt
38	41	Clay
41	45	Basalt
45	57	Broken Basalt
57	117	Basalt
117	121	Clay
121	140	Basalt
140	150	Broken Basalt
150	171	Basalt
171	183	Clay
183	303	Basalt
303	310	Broken Basalt
310	330	Basalt
330	335	Broken Basalt
335	343	Basalt
343	357	Clay
357	390	Basalt
390	395	Broken Basalt

COMPILED BY/ORGANIZATION: J.V. Wozniewicz / GAI Date September 21, 1992

GEOLOGIC LOG

Well Name USGS-113

Source: USGS Generalized Lithology Log

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Interval (feet below surface)

Begin	End	Description
395	500	Basalt
500	510	Broken Basalt
510	521	Basalt
521	530	Broken Basalt
530	564	Basalt

COMPILED BY/ORGANIZATION: J.V. Wozniewicz / GAI Date September 21, 1992

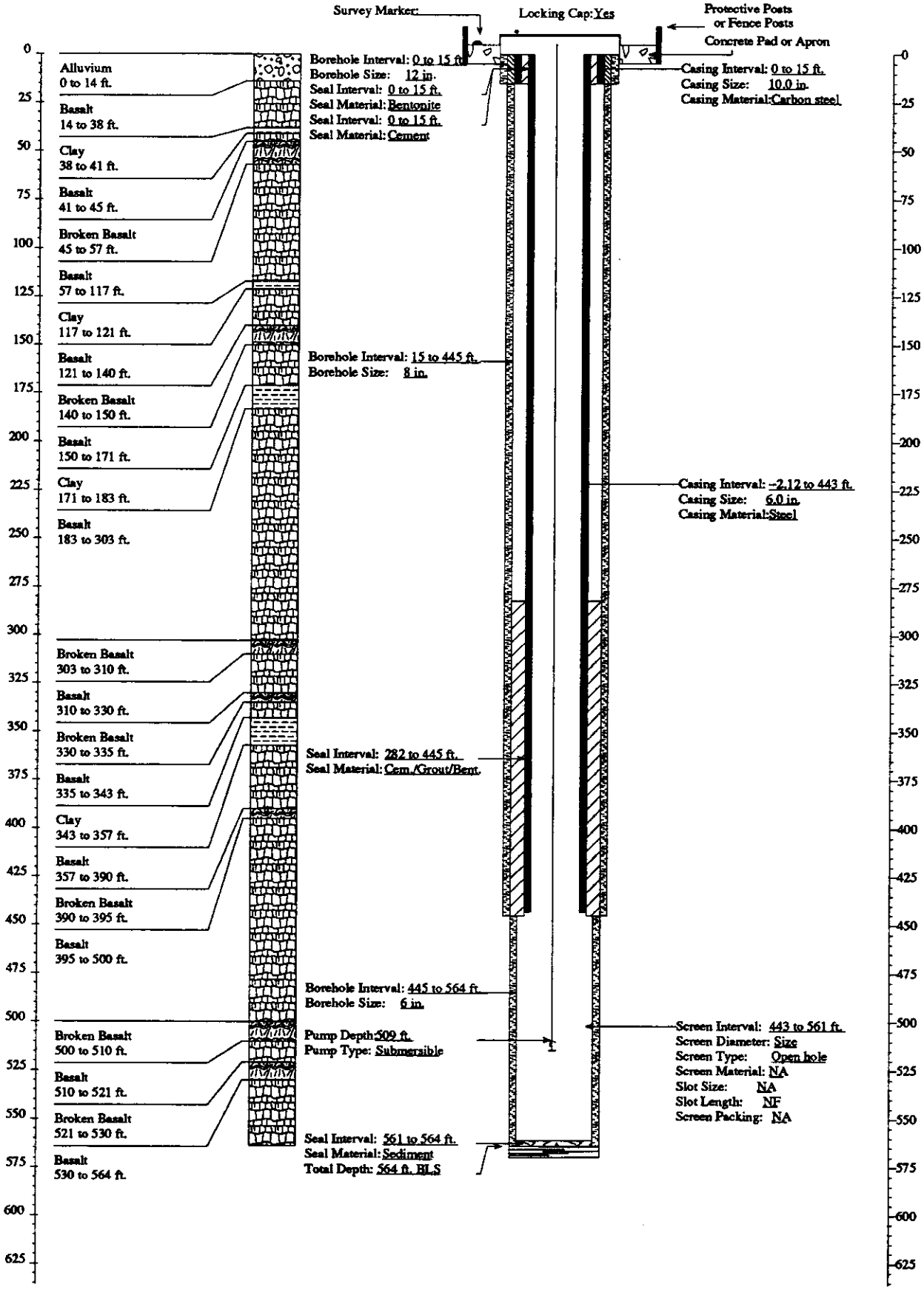
WellName: USGS–113 Corrections:Set bottom of bentonite seal = 15 (original NF) 04/22/1994

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1984
Total Depth: 564

Easting: 451361.893
Northing: 688737.140
Longitude: 1125621.2772
Latitude: 433314.19945
Completion Depth: 564

Driller: Denning
Geologist: NF
Drilling Method: Hydraulic rotary
Drilling Fluid: NF
Land Surface: 4928.78

Water Level: NF
Water Level Date: NF
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-114

A. WELL USES

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation ^{3}H, ^{90}Sr, Cl, Na, NO_3; RCRA - pH, specific conductance, TOC, TOX, Ba, Cd, Cr, Ag, As, Pb, Se, Hg, F, NO_3, Endrin, Lindane, Methoxychlor, Toxaphene, Herbicides, Gross Alpha, Gross Beta, Fe, Mn, Na, phenols, Cl, SO_4

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: Draft Final Groundwater Monitoring Plan for the Idaho Chemical Processing Plant

7) Responsible organization/Contact person: RCRA - WINCO / Ken Taylor; USGS Observation - USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)

4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size ~12 inch

Casing size 10-inch (I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	6 (I.D. or O.D.)	0 - 440	N.F.	25	N.F.	N.F.
Steel	10 (I.D. or O.D.)	0 - 19	N.F.	0	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP PAGE 4 of 8 Well Name/No. USGS-114

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Bentonite Grout	0 - 20	N.F.	Yes
Cement Bentonite Grout	280 - 440	N.F.	Yes
Sediment (1)	560 - 562.5	N.F.	N/A
(1) From video log run in well 4-22-93 (pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located south of the ICPP percolation ponds. Based on USGS Report 91-4166, it is located outside the lateral extent of perched water created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the well contains annular casing seals from 0 to 20 feet bls and 280 to 440 feet bls, and no evidence was found for perched groundwater between the seals.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes X No _) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity N.F.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No X)

	Material
Casing	Open Hole Completion
Screen	Open Hole Completion
Pump	5 HP Grundfos Submersible Pump
Discharge Pipe	1.5-inch Galvanized Steel

Explanation Although galvanized steel may corrode in acidic environments, the groundwater at the INEL is not acidic. The measuring pipe is constructed of PVC which is not preferred in compliance monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Open hole completion

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitoring interval, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithologyy: (Yes _ No X) Monitoring interval Water table (about 460 feet bls) to 562 feet bls. The monitoring interval of about 100 feet is excessive.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth 509 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Grundfos Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166, EGG-WM-9787, Personal Communication - Rodger Jensen, USGS (Feb. and May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations except that no documentation was found for casing thicknesses and joint types, which are minor deficiencies. The annular space between the 6-inch casing and borehole is unsealed from 20 to 280 feet bls, but the well is located south of the extent of perched water created by the ICPP percolation ponds and no evidence was found for saturated conditions in this interval. Although the surface casing does not extend above ground, the well is adequately sealed from surface contamination.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
( ) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated above. The well does not comply with RCRA guidelines for the following reasons: (1) the annulus between the 6-inch casing and borehole does not have a continuous seal and (2) the monitoring interval of about 100 feet is considered excessive for compliance/detection use and may result in the dilution of contaminant concentrations. Also, the following minor deficiencies were noted: the water level measuring pipe is constructed of PVC, a material not preferred due to its absorbing/leaching characteristics; and the use of drilling fluids, the decontamination procedures and the well development were not documented.

Remediation: None

 GEOLOGIC LOG Well Name USGS-114

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	19	Alluvium
19	25	Basalt
25	34	Broken Basalt
34	120	Basalt
120	130	Interbed
130	178	Basalt
178	186	Interbed
186	201	Basalt
201	206	Interbed
206	395	Basalt
395	405	Interbed
405	415	Broken Basalt
415	424	Interbed
424	440	Broken Basalt
440	475	Basalt
475	485	Broken Basalt
485	494	Basalt
494	510	Broken Basalt
510	540	Basalt
540	562.5	Broken Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 18, 1992

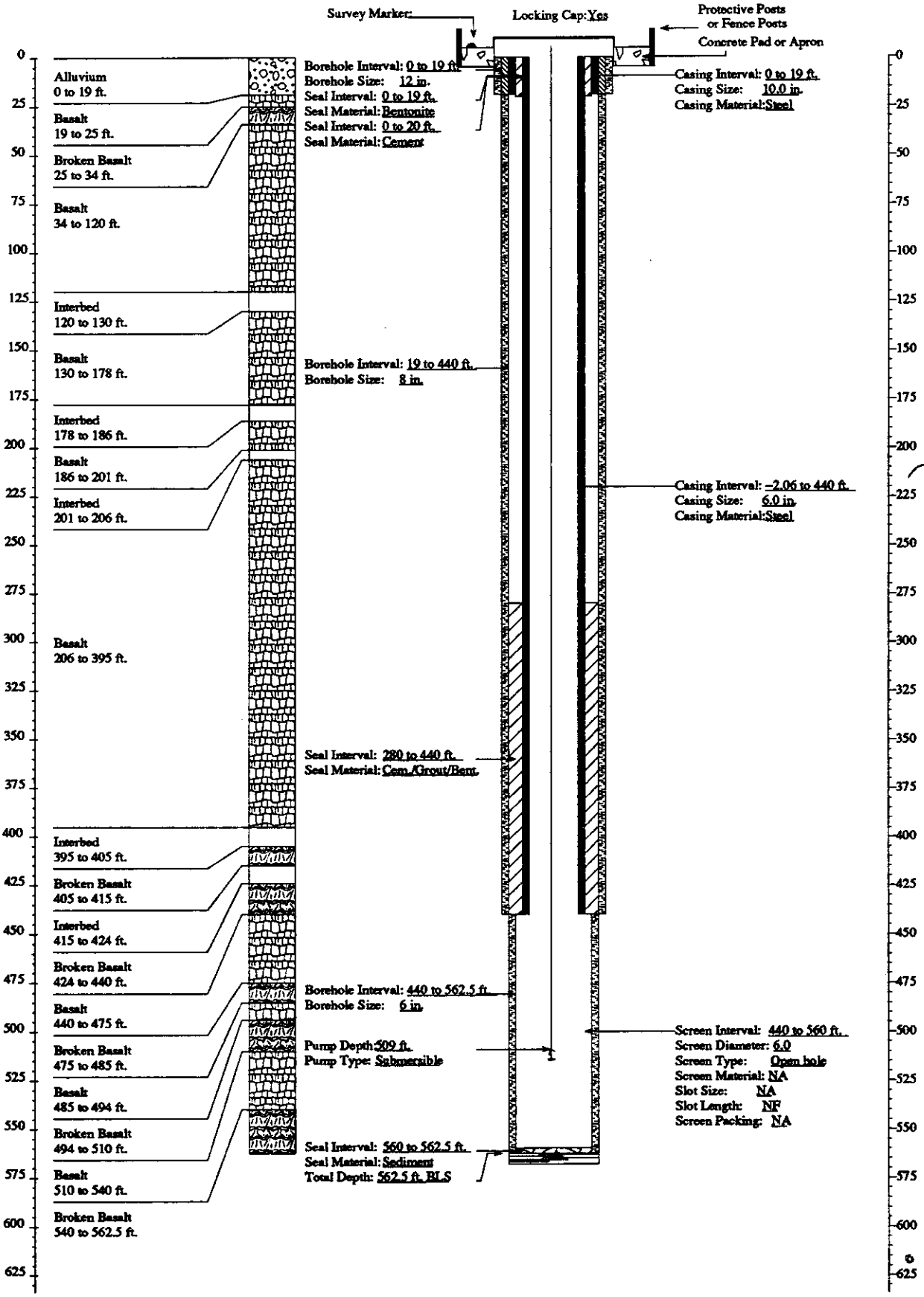
WellName: USGS-114 Corrections: Set bottom of bentonite seal = 19 (original NF) 04/22/1994

Facility: ICPP
Well Type: Monitoring
Well Status: Active
Year Drilled: 1984
Total Depth: 562.5

Easting: 297441.720
Northing: 689180.424
Longitude: 1125550.75010
Latitude: 433318.86845
Completion Depth: 562.5

Driller: Denning
Geologist: NF
Drilling Method: Hydraulic rotary
Drilling Fluid: NF
Land Surface: 4920.085

Water Level: NF
Water Level Date: NF
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP **Well Name/No. USGS-115**

A. WELL USE

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation ^{3}H, ^{90}Sr, Cl, Na, No,
4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size 12 inch Casing size 10 inch (I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	6 I.D. or O.D.	0 - 437	N.F.	25	N.F.	N.F.
Steel	10 I.D. or O.D.	0 - 23	N.F.	0	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-115

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Bentonite Grout	0 to 23	N.F.	Yes
Cement Bentonite Grout	280 to 440	N.F.	Yes
Sediment	580 - 581	N.F.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _) The seal extends to the top of the basalt at 23 feet bls. The depth of basalt is based on geophysical logs.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located south of the ICPP percolation ponds. Based on USGS Report 91-4166, the well is outside the lateral extent of perched water created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of saturated zones above the monitoring interval in the CWS files or on the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the well is sealed from the ground to the top of basalt at 23 feet bls and from 280 to 440 feet bls. No evidence was found of perched groundwater between the seals.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166; Personal Communication - Rodger Jensen, USGS (May 1993).

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-115

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations except that no documentation was found for the casing thicknesses and joint type, which are minor deficiencies. Although the casing is unsealed from 23 to 280 feet bls, the well is located south of the extent of perched water created by the ICPP percolation ponds and no evidence was found of saturated conditions in the unsealed interval. The surface casing has no stick-up as required, but the well is adequately sealed from surface contamination.

Remediation: None

GEOLOGIC LOG

Well Name USGS-115

Source: Gamma Log

****

Interval (feet below surface)

Begin	End	Description
0	23	Surficial Sediments
23	130	Basalt
130	165	Interbeds and Basalt
165	335	Basalt
335	340	Interbed
340	455	Basalt
455	460	Interbed
460	581	Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date 8/18/92

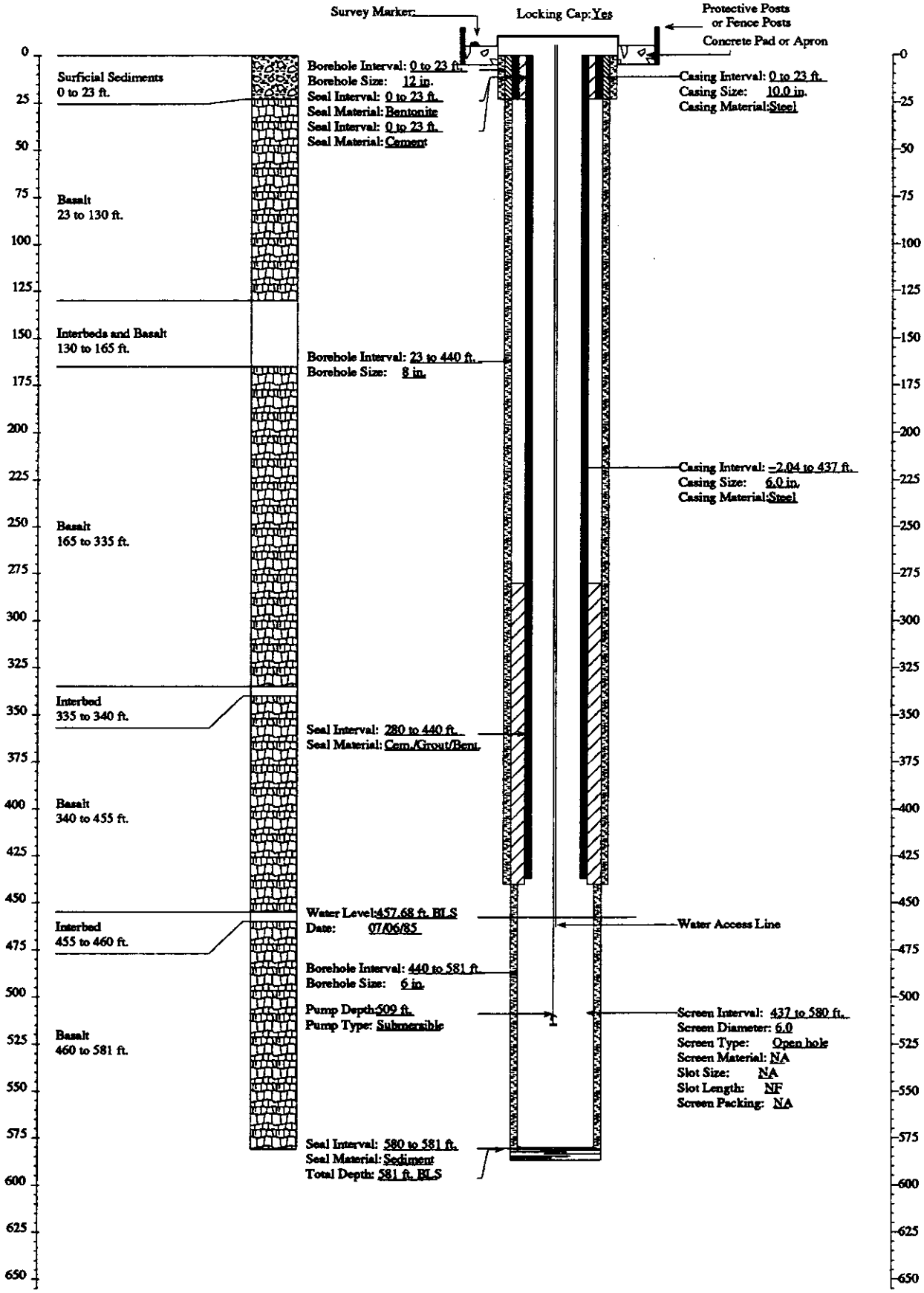
WellName: USGS-115 Corrections:Set bottom of bentonite seal = 23 (original NF) 04/22/1994

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1984
Total Depth: 581

Easting: 298132.387
Northing: 689310.474
Longitude: 1125541.38780
Latitude: 433320.21540
Completion Depth: 581

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4918.835

Water Level: 457.68
Water Level Date: 07/06/85
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-116

A. WELL USES

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation ^{3}H, ^{90}Sr, Cl, Na, NO_3; RCRA - pH, specific conductance, TOC, TOX, Ba, Cd, Cr, Ag, As, Pb, Se, Hg, F, NO_3, Endrin, Lindane, Methoxychlor, Toxaphene, Herbicides, Gross Alpha, Gross Beta, Fe, Mn, Na, phenols, Cl, SO_4

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: Draft Final Groundwater Monitoring Plan for the Idaho Chemical Processing Plant

7) Responsible organization/Contact person: RCRA - WINCO/Ken Taylor; USGS Observation - USGS/Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)

5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size ~12 inch
Casing size 8-inch (I.D. or O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	6 (I.D. or O.D.?)	0 - 401	N.F.	28	N.F.	N.F.
Steel	8 (I.D. or O.D.?)	0 - 38	N.F.	0	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Bentonite Grout	0 - 38	N.F.	Yes
Cement Bentonite Grout	265 - 400	N.F.	Yes
Sediment (1)	572 - 580	N.F.	N/A
(1) From video log run in well 4-22-93 (pers. comm. Rodger Jensen, USGS)			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located over 2000 feet southeast of the ICPP percolation ponds. Based on USGS Report 91-4166, the well is outside the lateral extent of perched waters created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Although the neutron log shows an increase in moisture content in several intervals above the water table, the gamma-gamma log shows no deflection. This suggests that these zones are not associated with perched water.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the well contains annular seals from 0 to 38 feet bls and from 265 to 400 feet bls. Although the 6-inch casing is unsealed from 38 to 265 feet bls, no surface or perched water was found near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes X No _) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Drilling Method Air Rotary Drilling

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No X)

	Material
Casing	Open Hole Completion
Screen	Open Hole Completion
Pump	5 HP Grundfos Submersible Pump
Discharge Pipe	1.5-inch Galvanized Steel

Explanation Although galvanized steel may corrode in acidic environments, the groundwater is not acidic at the INEL. The measuring pipe is constructed of PVC which is not preferred in compliance/detection monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Open hole completion

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitoring interval, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No _ Uncertain X) Monitoring interval(s) Water table (about 450 feet bls) to 580 feet bls. The monitoring interval of about 130 feet is excessive and the lithology in the interval was not documented.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A X)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth 505 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type 5 hp Grundfos Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** USGS Report 91-4166, EGG-WM-9787, Personal Communication-Rodger Jensen, USGS (Feb. and May 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations except that no documentation was found for casing thicknesses or joint types, which are minor deficiencies. The annular space between the 6-inch casing and borehole is unsealed from 38 to 265 feet bls, but the well is located southeast of the extent of perched water created by the ICPP percolation ponds and no evidence was found of perched water in the interval. Although the surface casing does not extend above ground, the well is adequately sealed from surface contamination.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
( ) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated above. The well does not comply with RCRA guidelines for the following reasons: (1) the monitoring interval of about 130 feet is considered excessive for compliance/detection use and may result in the dilution of contaminant concentrations, (2) the lithology of the monitored zone is not specified, and (3) the annulus between the 6-inch casing and borehole is not continuously sealed. In addition, the following minor deficiencies were noted: (1) the water level measuring pipe is constructed of PVC, a material not preferred due to its absorbing and leaching characteristics, (2) the well development and decontamination procedures were not documented, and (3) the bottom 8 feet of the borehole (which is 67 feet below the pump) is filled with sediment.

Remediation: None

 GEOLOGIC LOG Well Name USGS-116

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	38	Alluvium
38	104	Basalt
104	110	Sediment
110	125	Basalt
125	135	Sediment
135	214	Basalt
214	235	Broken Basalt
235	263	Basalt
263	273	Sediment
273	278	Broken Basalt
278	320	Basalt
320	580	No Data

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 19, 1992

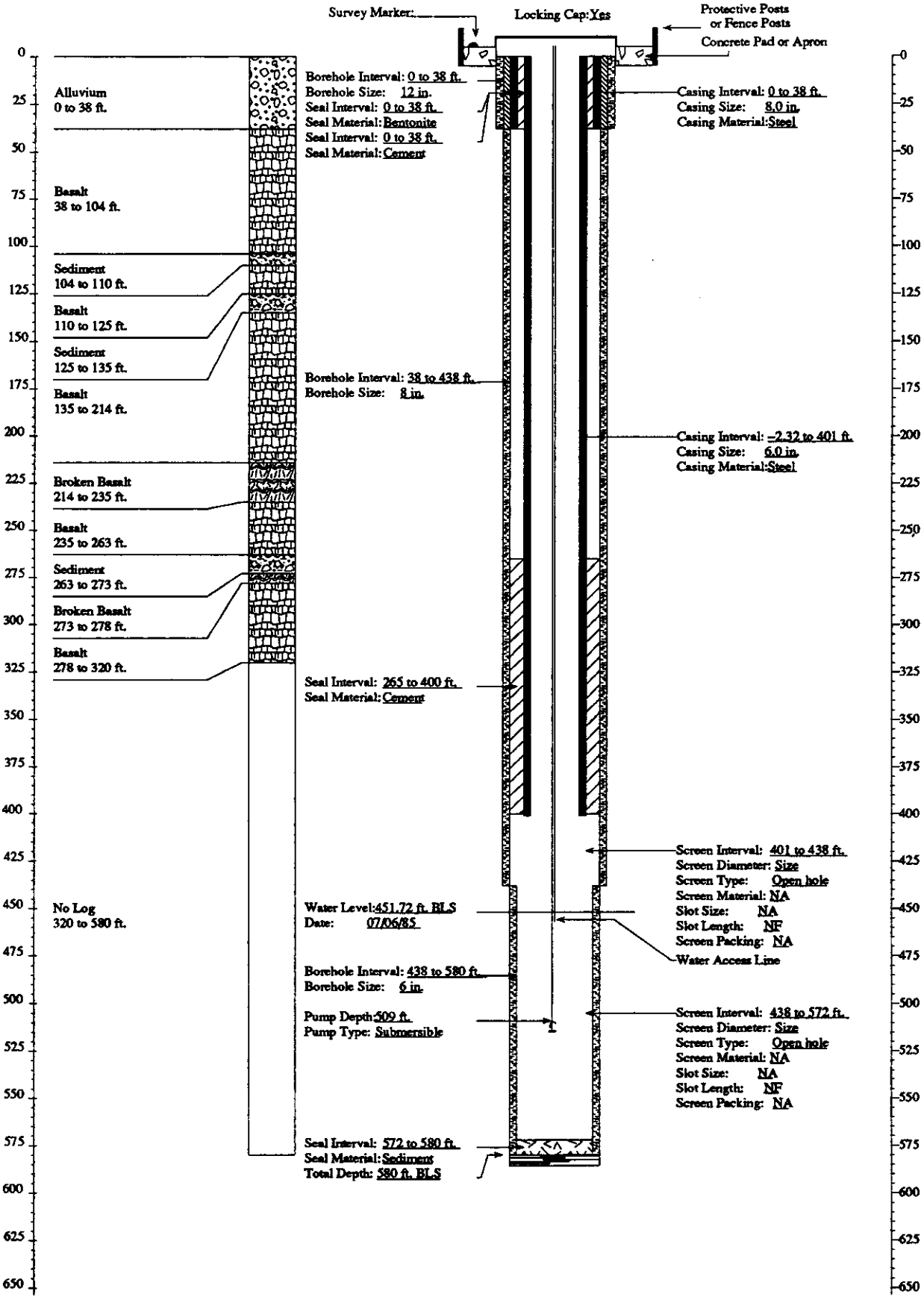
WellName: USGS-116 Corrections:Set bottom of bentonite seal = 38 ft. (original NF) 04/19/1994

Facility: ICPP
Well Type: Monitoring
Well Status: Active
Year Drilled: 1984
Total Depth: 580

Easting: 454737.358
Northing: 690429.128
Longitude: 1125535.6519
Latitude: 433331.21648
Completion Depth: 580

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4919.51

Water Level: 451.72
Water Level Date: 07/06/85
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-121

A. WELL USES

1) Year well was drilled: 1990

2) Current use for well
( )DOE 5400.1 Monitoring
(X)RCRA Monitoring
( )CERCLA Characterization
( )Other: _
(X)USGS Observation
( )No Documented Use

3) Constituents monitored currently: USGS Observation - ^{3}H, ^{90}Sr, Cl, Na, NO_3; RCRA - pH, specific conductance, TOC, TOX, Ba, Cd, Cr, Ag, As, Pb, Se, Hg, F, NO_3, Lindane, Endrin, Methoxychlor, Toxaphene, Herbicides, Gross Alpha, Gross Beta, Fe, Mn, Na, phenols, Cl, SO_4

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes X No _) If yes, specify regulating program plan: Draft Final Groundwater Monitoring Plan for the Idaho Chemical Processing Plant

7) Responsible organization/Contact person: RCRA - WINCO/Ken Taylor; USGS Observation - USGS/Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG- WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes _ No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)

5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16 inch Casing size 12 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Schedule 40 Carbon Steel	12 I.D.	0 - 39.2	Welded	24	0.406	Yes
Schedule 40 Carbon Steel	8 I.D.	0 - 432	Welded	24	0.322	Yes
Stainless Steel (1)	6 I.D.	412.6 - 480.1	Reverse Threaded	N/A	N.F.	N.F.

(1) Includes screen at 449 - 474.8 feet bls. and stainless steel packers at 412.6 and 423.3 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-121

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Powdered Bentonite	0 - 19	N.F.	Yes
Bentonite Pellets	19 - 21	N.F.	Yes
Cement Grout	21 - 39.2	Type III Portland cement with 0-5% Sodium Bentonite	Yes
Cement Bentonite Grout	0-444	Type I-II Portland Cement with 3-5% Sodium Bentonite, (2100 gallons Total Volume)	Yes
Silica Sand (below screen)	480.1 - 484.9	N.F.	N/A
Bentonite Pellets	484.9-495.2	15 gallons of Enviroplug 3/8 inch pellets and approximately 3 gallons of Minex 1/2 inch pellets	Yes
Cement Bentonite Grout	495.2-530	Type I-II Portland Cement with 0-5% Sodium Bentonite	Yes
Drill cuttings	530-745.8	N.F.	N/A
Cement Grout	above 495	16,640 gallons of grout used for borehole stabilization during drilling	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented _ Explanation for seal emplacement The 12-inch casing was pressure grouted. The cement grout and bentonite pellets were placed with a tremie pipe.

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the samplinginterval near the well: (Yes X No _) Explanation The well is located about 900 feet northwest of the Big Lost River channel.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Based on the Golder Associates report of October 1990 (referenced in section E), no perched water was encountered above the aquifer during drilling.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the casing is adequately sealed.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes X No _) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes X No _ No documentation _) Explanation No documentation was found for the drill rig and equipment pre-cleaning. However, the casing and screen were steam cleaned before their installation.

2) Were drilling additives used: (Yes X No _ Uncertain/No documentation _) Additive(s)/Quantity Air and bentonite mud - 0 to 39.2 feet bls; air and water - 39.2 to 538.0 feet bls; bentonite mud with bromide tracer - 538 to 745.8 feet bls. The tracer was no longer present after the well development.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

Material

Casing N/A
Screen Stainless Steel
Pump Stainless Steel
Discharge Pipe Stainless Steel
Water Level Measuring Pipe Stainless Steel
Explanation Stainless steel is acceptable for compliance/detection monitoring.

4) Is the screen factory fabricated: (Yes X No _ No screen _) Type 25.8 feet of stainless steel, wire-wrapped screen with 0.020-inch slots

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water level occurs within the screen, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval Water table (about 451 feet bls) to 484.9 feet bls. The well monitors a slightly excesssive interval of about 34 feet.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes X No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes X No _ Uncertain/Not Documented _) Well development type and duration About 12,000 gallons of water were pumped during four episodes with submersible and HydroStar pumps. The laboratory turbidity was measured at 3.18 and 3.29 NTU's after development.

9) Is the pump intake location documented: (Yes X No _) Depth 460 feet

10) Does the pump type collect representative groundwater samples: (Yes _ No X Not Documented _) Type HydroStar piston pump
Explanation EGG-WM-9787 documents that submersible pumps, bailers and piston pumps produced nearly equal results for selected volatile organics at TAN. However, the State of Idaho Report OPTR 91-01 documents that HydroStar pumps may contribute chromium to groundwater samples.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-121

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: "Well Completion Report for Wells 121, 122, and 123 at the Idaho Chemical Processing Plant" (Golder Associates Inc., October, 1990), USGS Report 91-4166, EGG-WM-9787, State Report OPTR 91-01 (December, 1991)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION:

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

(X) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: None. The well is located about 900 feet northwest of the Big Lost River channel and monitors the Snake River Plain aquifer. The well is adequately sealed and complies with the state regulations.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
( ) Well complies with applicable regulations and intended use except for minor details.
(X) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated in Section F. The well may not comply with RCRA guidelines because the monitoring interval of 34 feet may be considered slightly excessive for compliance/detection use. Since the well monitors a discrete zone consisting of one type of lithology, a variance should be requested before the well is used for RCRA purposes. Also, the use of the Hydrostar pump may contribute chromium to the groundwater samples.

Remediation: None

 GEOLOGIC LOG Well Name USGS-121

Source: Generalized Geology Log

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Interval (feet below surface)

Begin	End	Description
0	6	Silt and Sand
6	34	Sand and Gravel (little Silt)
34	87	Vesicular Basalt
87	95	Sand
95	129	Vesicular Basalt
129	133	Sand and Gravel
133	183	Vesicular Basalt
183	187	Rubble Zone
187	312	Vesicular Basalt
312	326	Cinders and Basalt
326	390	Vesicular Basalt
390	393	Silty Sand
393	397	Basalt
397	400.2	Silty Sand
400.2	400.7	Basalt
400.7	410	Sand and Clay
410	411	Sand and Gravel
411	419	Basalt
419	427	Silty Sand

COMPILED BY/ORGANIZATION: F.S. Mocker/GAI Date 8/19/92

GEOLOGIC LOG

Well Name USGS-121

Source: Generalized Geology Log

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Interval (feet below surface)

Begin	End	Description
427	522	Basalt
522	525	Silty Sand
525	599.2	Vesicular Basalt
599.2	599.4	Silty Clay
599.4	643.0	Basalt
643.0	643.1	Clayey Silt and Sand
643.1	743	Basalt
743	745.8	Silt and Clay
		Total Depth 745.8 feet

COMPILED BY/ORGANIZATION: F.S. Mocker/GAI Date 8/19/92

WellName: USGS-121

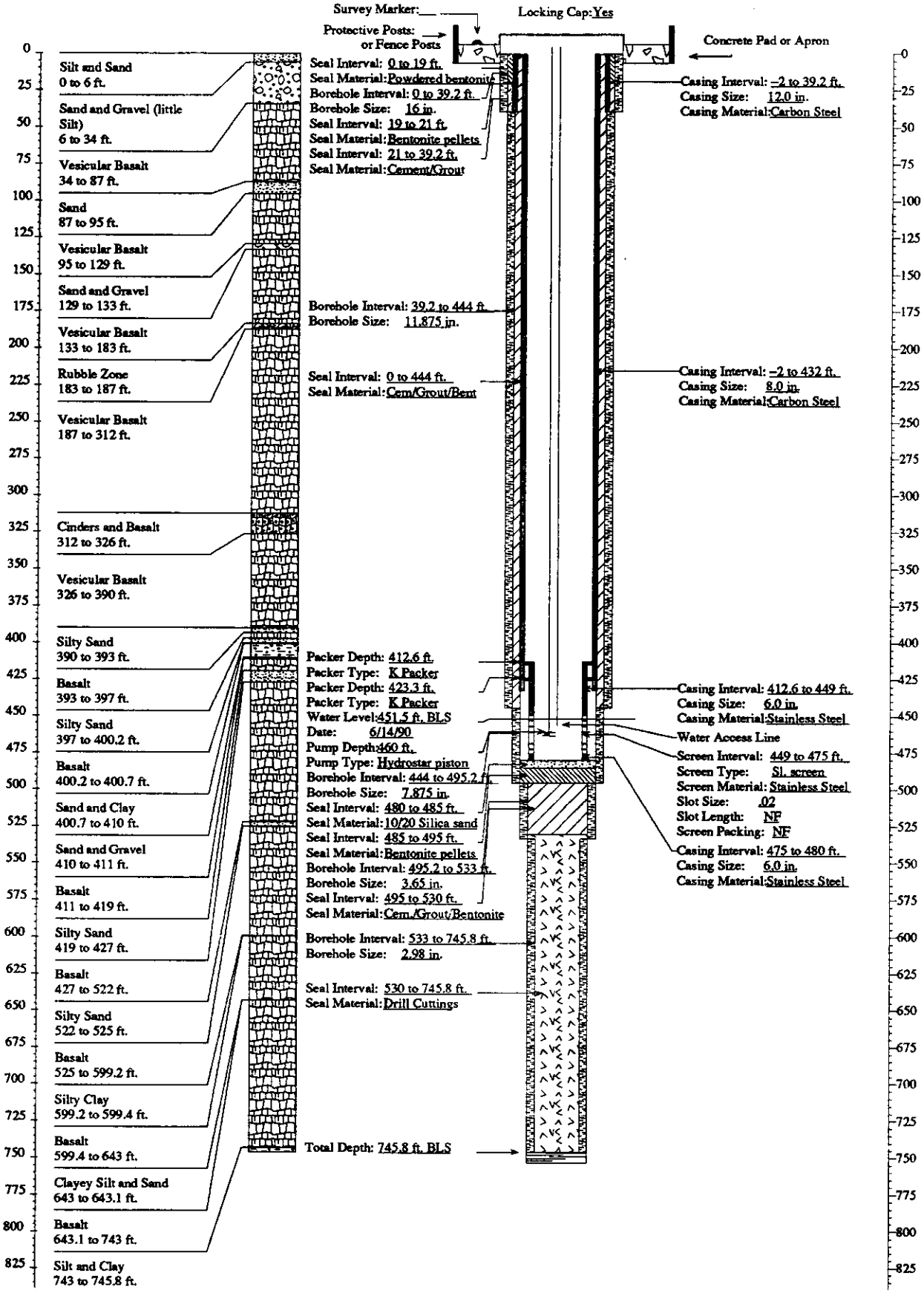
06/29/1993

Facility: CPP
Well Type: Monitoring Well
Well Status: Active
Year Drilled: 1990
Total Depth: 745.8

Easting: 296598.60
Northing: 698362.05
Longitude: 1125603.35
Latitude: 433449.47
Completion Depth: 485.0

Driller: P. C. Exploration
Geologist: NF
Drilling Method: Rotary-coring
Drilling Fluid: NF
Land Surface: 4910.48

Water Level: 451.5
Water Level Date: 6/14/90
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-122

A. WELL USE

1) Year well was drilled: 1990

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Evaluated to RCRA as a Best Management Practice since this criterion was used to construct the well.

3) Constituents monitored currently: USGS Observation Na, Cl, ^{3}H, ^{90}Sr, NO_3

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16 inch Casing size 12 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Schedule 40 Carbon Steel (surface casing)	12 I.D.	0 - 29.5	Welded	24	0.406	Yes
Schedule 40 Carbon Steel	8 I.D.	0 - 275.7	Welded	12	0.322	Yes
Schedule 40 Carbon Steel	4 (I.D.or O.D.)	0 - 440	Flush-threaded	24	0.237	Yes
Stainless Steel (1)	3 (I.D. or O.D.)	421.9 - 479.9	Flush-threaded	N/A	N.F.	N.F.

(1) Includes screen at 448.7-474.9 bls and 2 stainless steel packers at 421.9 and 432.2 feet bls

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	0 - 29.5 (Surface Casing Seal)	Type III Portland Cement Grout with 0-5% Sodium Bentonite	Yes
Cement Bentonite Grout	-1 - 287 (8-inch Casing Seal)	Type I and II Portland Cement with 3-5% Sodium Bentonite (9,000 gallons grout)	Yes
Cement Bentonite Grout	0 - 440 (4-inch Casing Seal)	Type I and II Portland Cement with 3-5% Powered Sodium Bentonite (9,000 gallons grout)	Yes
Cement Grout		24,300 gallons of grout were used for borehole stabilization during drilling	

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _ Intervals _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented _ Explanation for seal emplacement The surface casing seal was pressure grouted inside the 12-inch casing until grout appeared at the surface in the annulus. Pressure grouting and a tremie pipe were used to install the 8-inch casing seal, while a tremie pipe was utilized for the 4-inch casing seal.

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located about 310 feet north of the ICPP percolation ponds. Based on USGS report 91-4166, the well is located within the lateral extent of perched waters created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Based on Golder Associates Inc. report of October 1990 (referenced in section E), significant amounts of perched water were encountered in the well

when it was drilled. Water was encountered near interbeds at 43, 135, and 170 feet bls and also in the basalt at 392 feet bls.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the casing is adequately sealed.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes X No _ No documentation _) Explanation No documentation was found concerning the steam cleaning of the drill rig. However, the casing and screen were steam cleaned prior to their installation.

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Drilling Method Air Rotary Additive(s)/Quantity Sodium bentonite mud was used above 29.5 feet bls and water was added to the borehole below 287 feet bls. The use of additives from 29.5 to 287 feet bls was not documented.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Carbon Steel (above water table)
Screen	Stainless Steel
Pump	Stainless Steel (448.7 - 474.9 feet bls)
Discharge Pipe	Stainless Steel
Water Level Measuring Pipe	Stainless Steel

Explanation Materials are acceptable for compliance/detection monitoring.

4) Is the screen factory fabricated: (Yes X No _ No screen _) Type 0.02-inch slotted, wire-wrapped screen

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the screen, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No X) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval Water table (about 457 feet bls) to 482.8 feet bls. The well monitors a discrete zone of about 26 feet.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A X)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes X No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes X No _ Uncertain/Not Documented _) Well development type and duration About 1500 gallons of water were pumped from the well until pH, specific conductance and temperature stabilized. The turbidity of the water was measured in the laboratory at 0.97 and 0.90 NTU's.

9) Is the pump intake location documented: (Yes X No _) Depth 472 feet

10) Does the pump type collect representative groundwater samples: (Yes _ No X Not Documented _) Type HydroStar Pump Explanation EGG-WM-9787 documents that submersible pumps, bailers and piston pumps (HydroStar) produced nearly equal results for selected volatile organics at TAN. State of Idaho report OPTR 91-01 documented that HydroStar pumps may contribute chromium to groundwater samples.

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** "Well Completion Report for Wells 121, 122 and 123 at the Idaho Chemical Processing Plant" (Golder Associates Inc., Oct. 1990), USGS Report 91-4166, EGG-WM-9787, State Report OPTR 91-01 (Dec. 1991)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

(X) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: None. The well is located about 310 feet north of the ICPP percolation ponds. The well is adequately sealed and complies with the state regulations.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
(X) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated in Section F. The well complies with RCRA guidelines except that the use of the HydroStar pump may contribute chromium to the groundwater samples.

Remediation: None

 GEOLOGIC LOG Well Name USGS-122

Source: Generalized Geology Log

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Interval (feet below surface)

Begin	End	Description
0	1.5	Silt and Sand
1.5	24	Gravel and Sand
24	43	Vesicular Basalt
43	47	Silty Sand
47	56	Vesicular Basalt
56	63	Sand and Silt
63	103	Vesicular Basalt
103	110	Sand with Gravel / Silt / Clay
110	136	Silty Clay with Sand and Gravel
136	168	Vesicular Basalt
168	177	Silty Clay to Clayey Silt with Sand
177	278	Basalt
278	284	Silty Clay to Clayey Silt
284	380	Basalt
380	387	Silty Clay to Clayey Silt
387	415	Vesicular Basalt
415	424	Silt and Clay
424	482.8	Vesicular Basalt

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date 19 August 1992

WellName: USGS-122

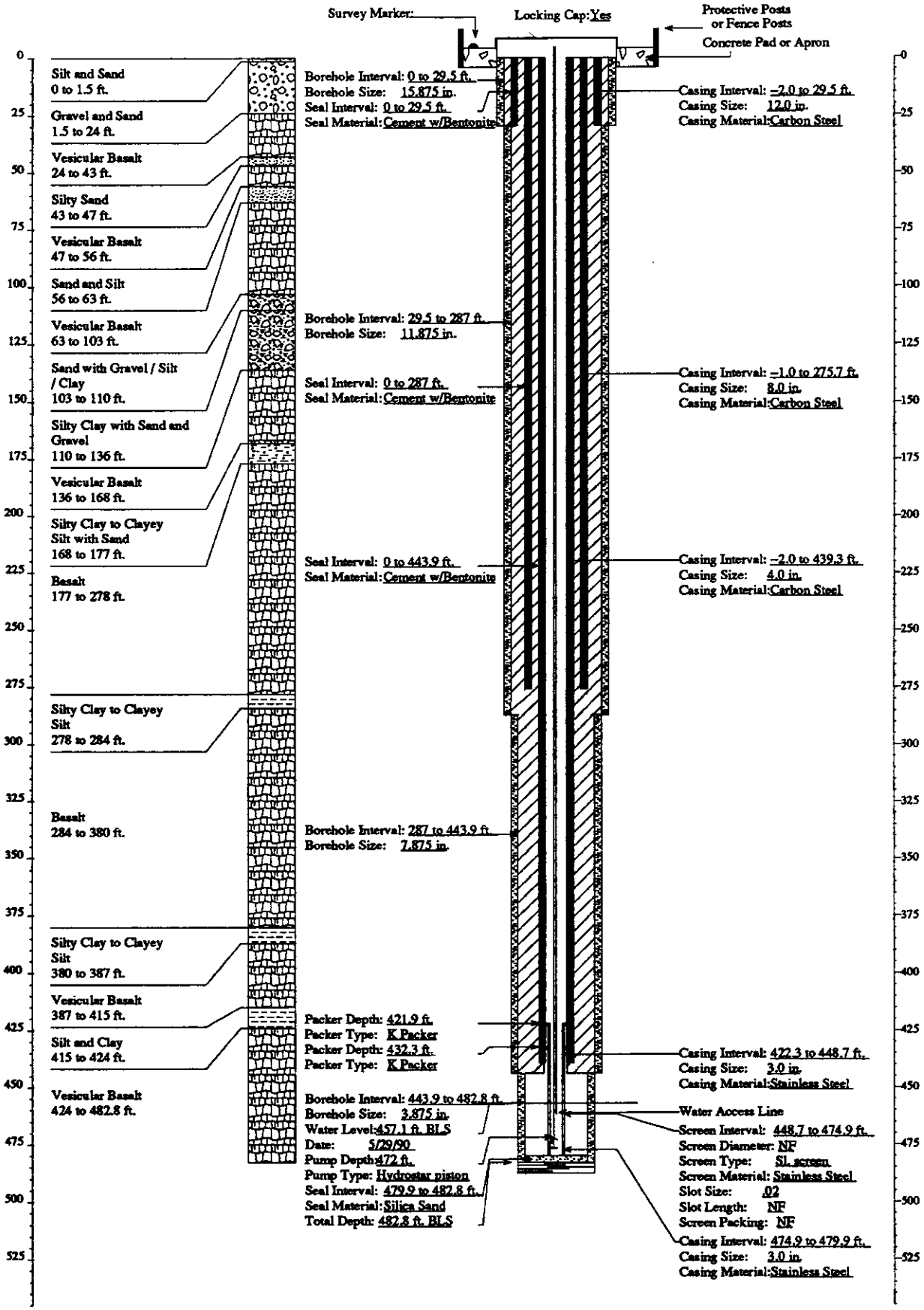
04/19/1994

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1990
Total Depth: 482.8

Easting: 453377.226
Northing: 692658.677
Longitude: 1125554.4012
Latitude: 433353.11197
Completion Depth: 482.8

Driller: P. C. Exploration
Geologist: NF
Drilling Method: Rotary-coring
Drilling Fluid: NF
Land Surface: 4917.25

Water Level: 457.1
Water Level Date: 5/29/90
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: ICPP Well Name/No. USGS-123

A. WELL USE

1) Year well was drilled: 1990

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Evaluated to RCRA as a Best Management Practice since this criterion was used to construct the well.

3) Constituents monitored currently: USGS Observation - Na, Cl, NO_3, ^3H, ^{90}Sr

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: Yes X No _ Borehole size 15.9 inch Casing size 12 inch I.D.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Schedule 40 Carbon Steel (surface casing)	12 I.D.	0 - 37.3 feet	Welded	26	0.406	Yes
Schedule 40 Carbon Steel	8 I.D.	0 - 440 feet	Flush-Threaded	24	0.322	Yes

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Bentonite Grout	0 - 39.7 (Surface Casing Seal)	Type III Portland Cement Grout with 0-5% Sodium Bentonite (465 gallons total volume)	Yes
Cement Bentonite Grout	-1 to 442.5 (8-inch Casing Seal)	Type I - II Portland Cement Grout with 0-5% Sodium Bentonite (4,400 gallons total volume)	Yes
Cement Bentonite Grout		3500 gallons of grout were used for borehole stabilization during drilling	

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented _ Explanation The surface casing seal was installed by pressure grouting. The 8-inch casing seal was installed by pressure grouting, grouting with a tremie pipe and pumping grout into the annulus from the surface.

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located about 625 feet northwest of the ICPP percolation ponds. Based on USGS Report 91-4166, the well is located within the lateral extent of perched waters created by the ponds.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Based on Golder Associates Inc. report of October 1990 (referenced in section E), perched groundwater was encountered at 260 feet bls and 396 feet bls in highly fractured zones. It was not possible to determine if perched water was present above the "110-foot interbed".

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Yes, the casing is adequately sealed.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes X No _ No documentation _) Explanation No documentation was found concerning the cleaning of the drill rig. However, the casing and screen were steam cleaned prior to their installation.

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Additive(s)/Quantity Air and bentonite mud were used from the surface to 440 feet bls (above the water table); water and air were used from 440 to 744 feet bls.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Carbon Steel (above water table)
Screen	Stainless Steel
Pump	Stainless Steel
Discharge Pipe	Stainless Steel
Water Level Measuring Pipe	Stainless Steel

Explanation The materials are acceptable for compliance/detection monitoring.

4) Is the screen factory fabricated: (Yes X No _ No screen _) Type Wire-wrapped screen with 0.02-inch slots

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the screen, the well monitors both dissolved constituents and "floaters".

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No X) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval Water table (about 460 feet bls) to 484 feet bls. The well monitors a discrete zone of about 25 feet.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A X)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes X No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes X No _ Uncertain/Not Documented _) Well development type and duration About 6,000 gallons of water were pumped from the well with a submersible pump and about 800 gallons were pumped with a HydroStar pump. Turbidity was measured at 0.19 NTU's after development.

9) Is the pump intake location documented: (Yes X No _) Depth 465.9 feet

10) Does the pump type collect representative groundwater samples: (Yes _ No X Not Documented _) Type HydroStar Pump Explanation EGG-WM-9787 documents that submersible pumps, bailers and piston pumps (HydroStar) produced nearly equal results for selected volatile organics at TAN. However, State of Idaho Report OPTR 91-01 documents that HydroStar pumps may contribute chromium to groundwater samples.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: "Well Completion Report for Wells 121, 122, and 123 at the Idaho Chemical Processing Plant" (Golder Associates Inc., Oct. 1990), EGG-WM-9787, USGS Report 91-4166, State Report OPTR 91-01 (Dec. 1991)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

(X) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: None. The well is located about 625 feet northwest of the ICPP percolation ponds. It is adequately sealed and complies with the state regulations.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: RCRA Monitoring/RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
(X) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated in Section F. The well complies with RCRA guidelines except that the use of the HydroStar pump may contribute chromium to the groundwater samples.

Remediation: None

 GEOLOGIC LOG Well Name USGS-123

Generalized Geology

****

Interval (feet below surface)

Begin	End	Description
0	32	Gravel / Sand / Silt
32	106	Vesicular Basalt
106	114	Sandstone to Claystone (Baked Horizon)
114	117	Vesicular Basalt
117	117.5	Stiff Clay
117.5	154	Vesicular Basalt
154	161	Stiff Clay
161	206	Vesicular Basalt
206	209	Stiff Clay
209	277	Vesicular Basalt
277	279	Very Stiff Silt and Clay
279	287	Silty Sand and Cinders or Basalt
287	501	Basalt
501	503	Very Stiff Silty Clay
503	561	Basalt
561	563	Sand and Basalt Rubble
563	687	Basalt
687	690	Soft Silt
690	740	Basalt
740	744.2	Soft Clay
		Total Depth 744.2 feet

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 19, 1992

WellName: USGS-123

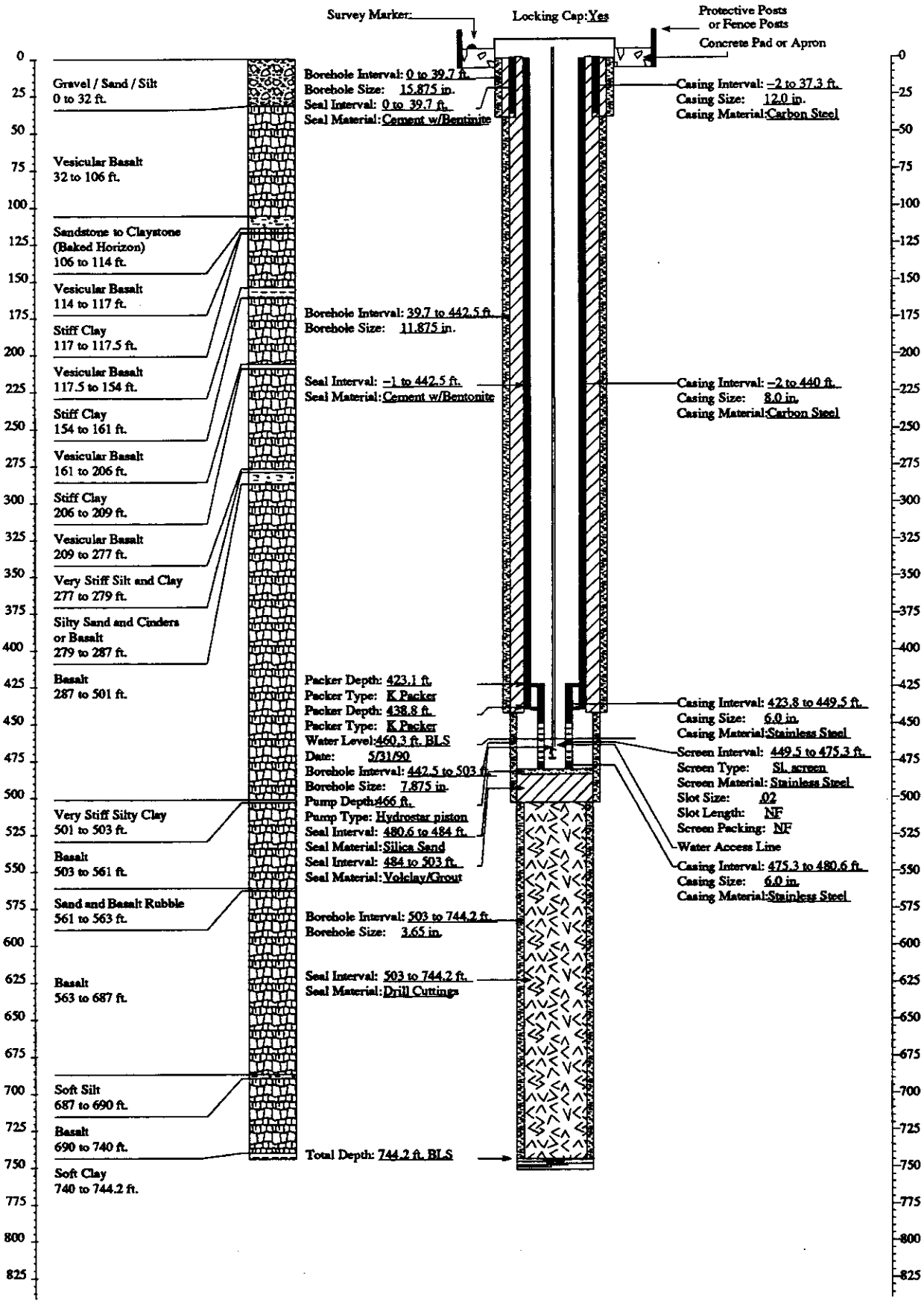
04/18/1994

Facility: ICPP
Well Type: Observation
Well Status: Active
Year Drilled: 1990
Total Depth: 744.2

Easting: 451732.646
Northing: 692497.168
Longitude: 1125616.7165
Latitude: 433351.36684
Completion Depth: 484

Driller: P. C. Exploration
Geologist: NF
Drilling Method: Rotary-coring
Drilling Fluid: NF
Land Surface: 4922.68

Water Level: 460.3
Water Level Date: 5/31/90
Water Level Access: Line



INEL–Middle

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. COREHOLE 2A

A. WELL USE

1) Year well was drilled: 1978

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other :_

3) Constituents monitored currently: None - well used exclusively for water level measurements.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No _ Borehole size >5 inch Casing size 5 inch (I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel	5 (I.D. or O.D.?)	0 - 260	N.F.	3	N.F.	N.F.
Steel	4 (I.D. or O.D.?)	0 - 400	N.F.	16	N.F.	N.F.
Steel	3 (I.D. or O.D.?)	0 - 1936	N.F.	10	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located more than 1 mile from the Big Lost River and sink area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented seal. However, no evidence was found of perched groundwater near the well and no surface water bodies are located in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located in the central region of the INEL site and is not in proximity to any facilities or other potential sources of surface or subsurface contamination. Since no evidence was found for perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of this seal. Also, the borehole size and the casing thicknesses and joint types were not documented, which are minor deficiencies. Although the stickups of the 3 and 5-inch casings are less than the required 12 inches, the casings are protected at the surface by a concrete pad.

Remediation: None

GEOLOGIC LOG

Well COREHOLE 2A

Source: No Lithologic Log Was Found

****

Interval (feet below surface)

Begin	End	Description

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 25, 1992

WellName: COREHOLE 2A

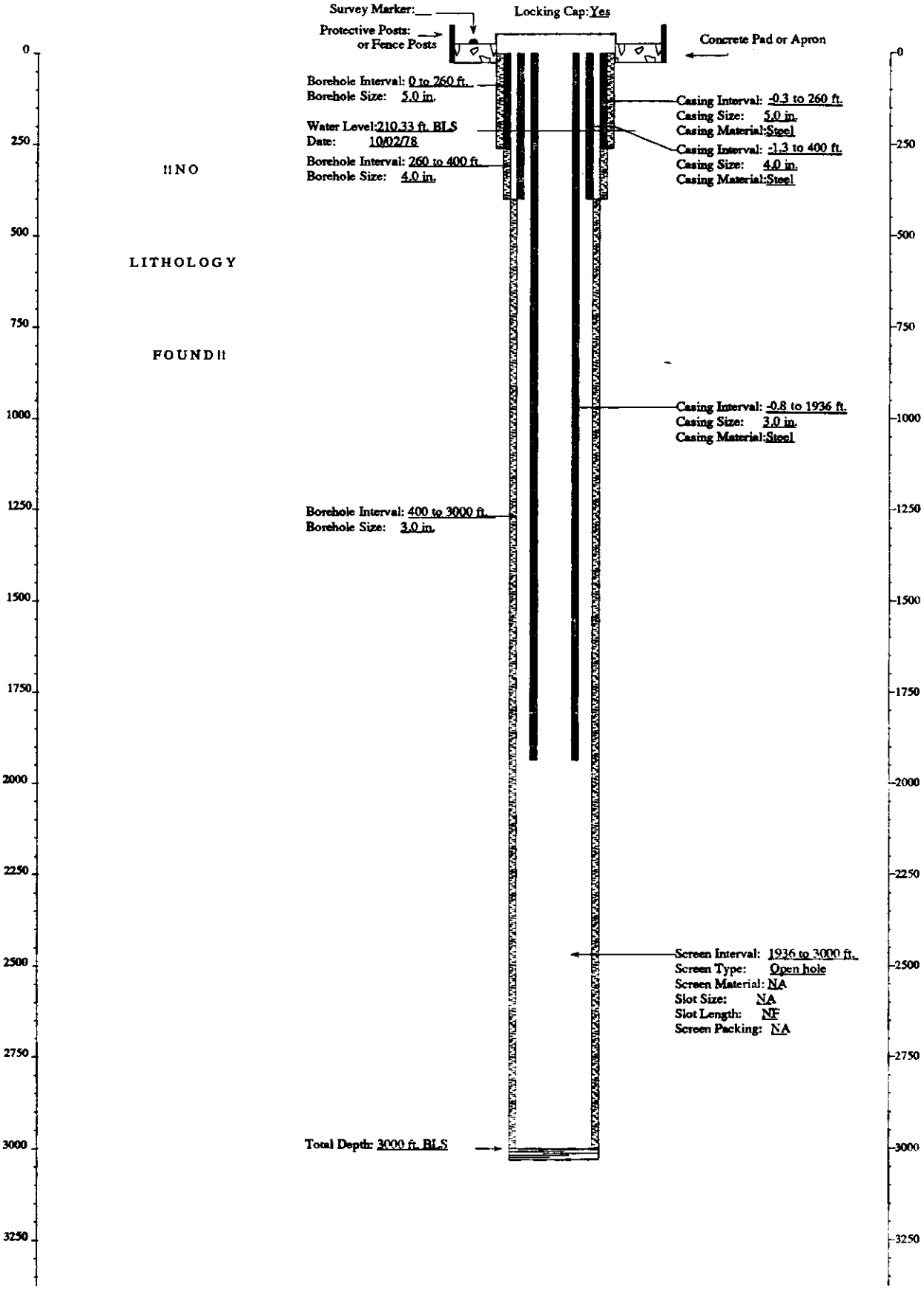
09/11/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1978
Total Depth: 3000

Easting: 346782.24
Northing: 765647.36
Longitude: 1124448.00
Latitude: 434558.00
Completion Depth: 3000

Driller: NF
Geologist: NF
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 4785

Water Level: 210.33
Water Level Date: 10/02/78
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. DH-1B

A. WELL USE

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring
( )CERCLA Characterization
( )Other: _
(X)USGS Observation
( )No Documented Use

3) Constituents monitored currently: None

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes _ No X) Explanation The annulus between the 6 and 8-inch casings may not be grouted at the surface. Since both casings may extend above the concrete pad, this should be remediated.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No _ Uncertain X Borehole size N.F. Casing size 8-inch (I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	8 I.D. or O.D.?	N.F.	N.F.	7	N.F.	N.F.
Carbon Steel	6 I.D. or O.D.?	0 - 380	N.F.	19	0.25	Yes

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located in the Big Lost River sinks, which may receive surface water runoff during periods of high precipitation or when the river flows.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of saturated conditions above the water table from the CWS file or the 1984 geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal and the potential exists for surface or perched water near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is completed in the Snake River Plain aquifer and does not have an annular surface seal as required by state regulations. Although the well is located in the west-central region of the INEL site and is not in proximity to any facilities, it is situated in the Big Lost River sinks, which may receive surface runoff during periods of high precipitation or when the river flows. The following minor deficiencies also were noted: the 8-inch casing extends 7 inches above ground instead of the required 12 inches, and the borehole size, the casing joint types, and the 8-inch casing length and thickness were not documented.

Remediation: A surface seal should be installed to prevent the migration of lower quality water along the casing. (This seal would be most effective if it were installed in the top of the basalt). The annulus between the 6 and 8-inch casings also should be sealed above ground if both casings extend above the concrete pad.

GEOLOGIC LOG

Well Name DH-1B

Source: No Lithologic Log Was Found

****

Interval (feet below surface)

Begin	End	Description

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 24, 1992

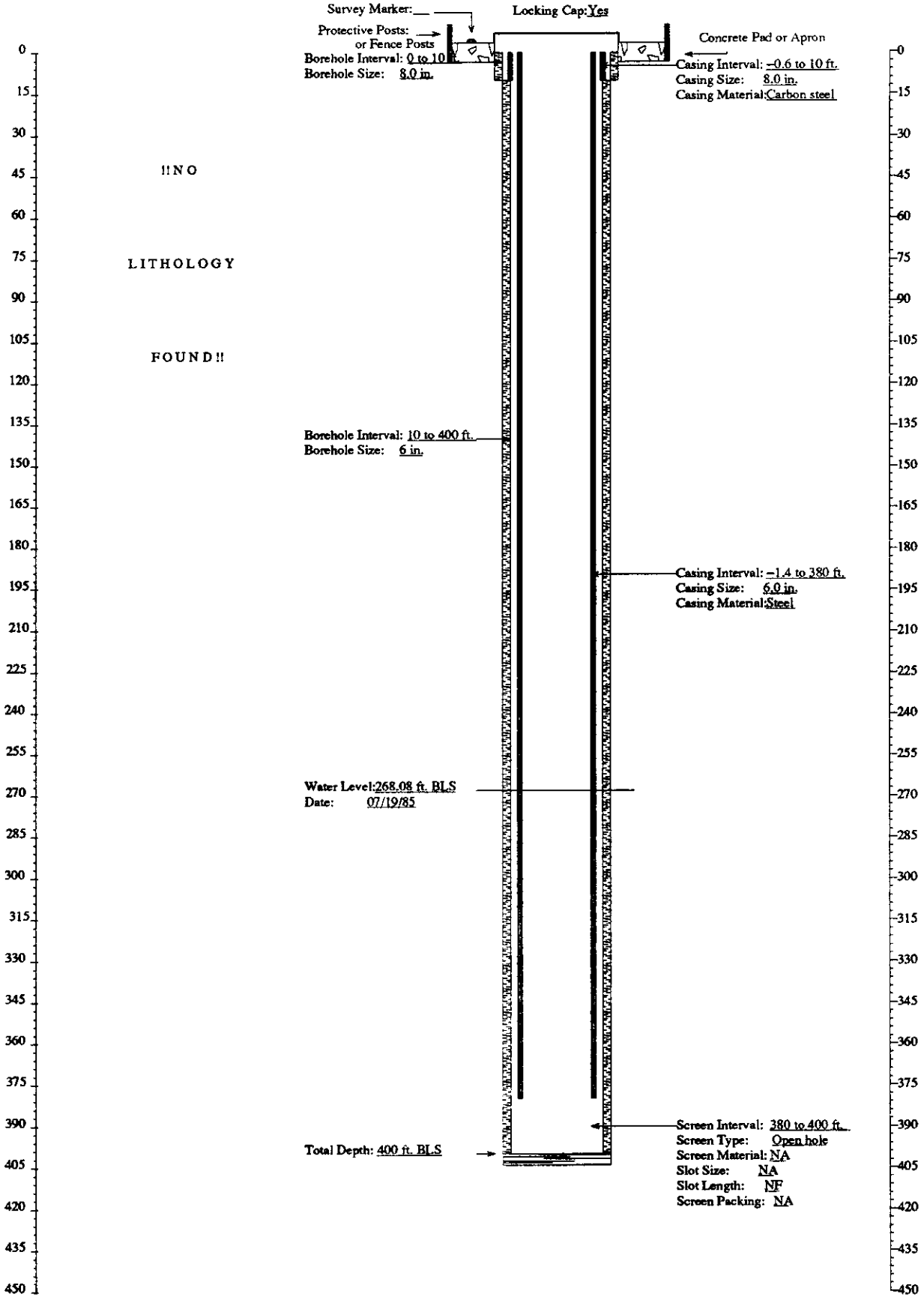
WellName: DH-1B Corrections:Set 8 in. casing bottom = 10ft, screen bottom = 400 ft(originals NF). 08/03/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1984
Total Depth: 400

Easting: 320743.02
Northing: 767161.55
Longitude: 1125043.00
Latitude: 434611.00
Completion Depth: NF

Driller: Andrew
Geologist: NF
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 4791.1

Water Level: 268.08
Water Level Date: 07/19/85
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. DH-2A

A. WELL USE

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: None

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes _ No X) Explanation The 6 and 8-inch casings extend less than 12 inches above ground, and the annulus between the casings may be unsealed. The

8-inch casing should be extended to at least 12 inches above ground and capped, or the annulus between the casings should be sealed at the surface.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No _ Uncertain X Borehole size N.F. Casing size 8-inch (I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	8 I.D. or O.D.?	N.F.	N.F.	3	N.F.	N.F.
Carbon Steel	6 I.D. or O.D.?	0 - 415	N.F.	8	0.25	Yes

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located in the Big Lost River sinks which may receive surface water runoff during periods of increased precipitation or when the river flows.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of saturated conditions above the water table from the CWS file or on the 1984 geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented annular seals, and the potential exists for surface or perched water near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____
Screen _____
Pump _____
Discharge Pipe _____
Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is completed in the Snake River Plain aquifer and does not have a an annular surface seal as required by state regulations. Although the well is located in the west-central region of the INEL site and is not in proximity to any facilities, it is situated in the Big Lost River sinks, which may receive surface runoff during periods of high precipitation or when the river flows. The following minor deficiencies also were noted: the casings extend less than the required 12 inches above ground and the borehole size, the casing joint types, and the 8-inch casing thickness and length were not documented.

Remediation: A surface seal should be installed to prevent the migration of lower quality water along the casing. (This seal would be most effective if it were installed in the top of the basalt). The annulus between the 6 and 8-inch casings also should be sealed above ground if both casings extend above the concrete pad.

GEOLOGIC LOG

Well Name DH-2A

Source: No Lithologic Log Was Found

****

Interval (feet below surface)

Begin	End	Description

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 25, 1992

WellName: DH-2A Corrections:Set 8 in. casing bottom = 10 ft. (original NF).

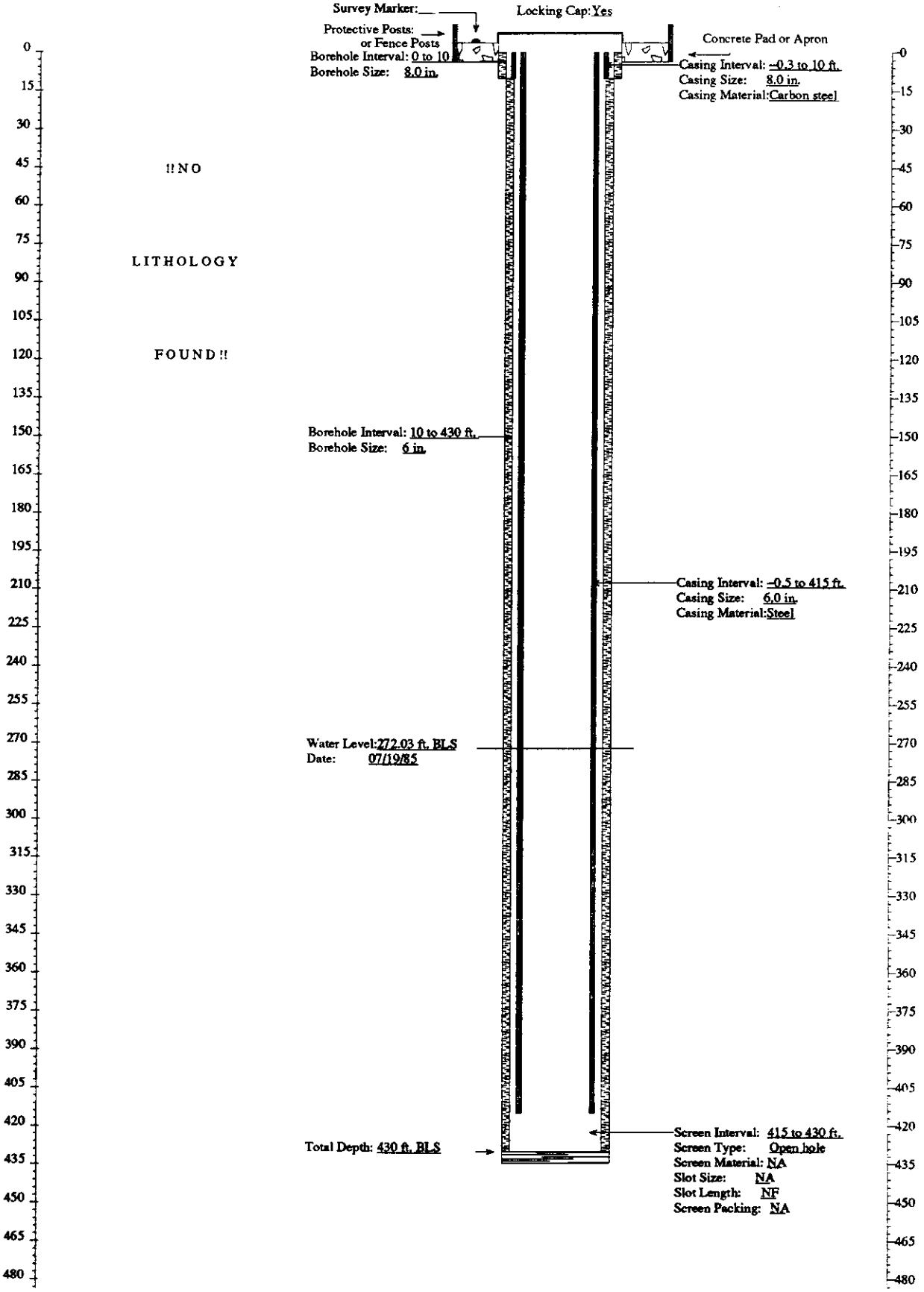
08/03/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1984
Total Depth: 430

Easting: 317420.83
Northing: 764758.83
Longitude: 1125128.00
Latitude: 434547.00
Completion Depth: 430

Driller: Andrew
Geologist: NF
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 4792.1

Water Level: 272.03
Water Level Date: 07/19/85
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. INEL-1

A. WELL USE

1) Year well was drilled: 1979

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: None

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No X N/A _)
6) Based on location of well, is existing or planned surface completion adequate: (Yes _ No X) Explanation The well has a plywood cover and is located in a 10-foot wide concrete pit. The pit is filled with water and covered with old

boards. The well and the pit should have steel covers and be protected with a lock, or the pit should be filled in and the well extended above grade.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes _ No X Insufficient Data _) The well currently has a plywood cover.

b) Access to measure water levels: (State of Idaho Reg. 3,11): (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >30 inches Casing size 30 inch I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
N.F. (surface casing)	30 I.D. or O.D.?	0 - 40	N.F.	0	N.F.	N.F.
Steel	20 I.D. or O.D.?	0 - 1511	N.F.	0	N.F.	N.F.
Steel	13 I.D. or O.D.?	0 - 3559	N.F.	0	0.375	Yes
Steel	9 I.D. or O.D.?	3282 - 6796	N.F.	N/A	N.F.	N.F

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located approximately 1 mile west of the Big Lost River. There are no spreading areas or percolation ponds near the well.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) There is no evidence of saturated formations above the sampling interval from the CWS files or the geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: It is uncertain. A casing seal is documented but its extent is not known. However, no evidence was found of perched water near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well's compliance with state regulations could not be determined because the extent of the casing seal was not documented. The well is located at least 2 miles from TAN and NRF, the nearest INEL facilities, and about 1 mile west of the Big Lost River. Since no evidence was found of surface or perched water near the well and the potential for contaminant migration within the annular spaces is extremely low, a variance should be requested if this information can not be ascertained. Also, the following minor deficiencies were noted: the casing thicknesses and joint types were not documented and the borehole was not two inches larger than the casing diameter as required but was about the same size.

Remediation: The well has a plywood cover and is located in a concrete pit, which is filled with water. The well and pit should have lockable steel covers or the pit should be filled in and the well extended above grade.

GEOLOGIC LOG

Well Name INEL-1

Source: EG&G Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	92	Basalt
92	113	Cinders
113	453	Basalt
453	480	Cinders
480	539	Basalt
539	567	Sand and Gravel
567	680	Basalt
680	718	Sand / Silt / Clay
718	813	Basalt
813	845	Cinders
845	966	Sand / Silt / Clay
966	1007	Basalt
1007	1040	Sand / Silt / Clay
1040	1100	Basalt
1100	1133	Sand / Silt / Clay
1133	1213	Basalt
1213	1533	Sand / Silt / Clay
1533	1633	Basalt
1633	1659	Sand / Silt / Clay
1659	2166	Basalt
2166	2446	Tuffaceous Interbed

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 25, 1992

 GEOLOGIC LOG Well Name INEL-1

Source: EG&G Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
2446	2800	Welded Tuff
2800	2846	Tuffaceous Interbed
2846	3039	Welded Tuff
3039	3080	Tuffaceous Interbed
3080	3312	Welded Tuff
3312	3353	Tuffaceous Interbed
3353	3426	Welded Tuff
3426	3454	Tuffaceous Interbed
3454	4233	Welded Tuff
4233	4289	Tuffaceous Interbed
4289	4487	Welded Tuff
4487	4512	Tuffaceous Interbed
4512	4774	Welded Tuff
4774	4800	Tuffaceous Interbed
4800	5080	Welded Tuff
5080	5106	Tuffaceous Interbed
5106	5987	Welded Tuff
5987	6006	Tuffaceous Interbed
6006	7053	Welded Tuff
7053	7087	Tuffaceous Interbed
7087	7146	Welded Tuff

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 25, 1992

GEOLOGIC LOG

Well Name INEL-1

Source: EG&G Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
7146	7174	Tuffaceous Interbed
7174	7226	Welded Tuff
7226	7259	Tuffaceous Interbed
7259	8074	Welded Tuff
8074	10365	Rhyodacite Ashflow

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 25, 1992

WellName: INEL-1

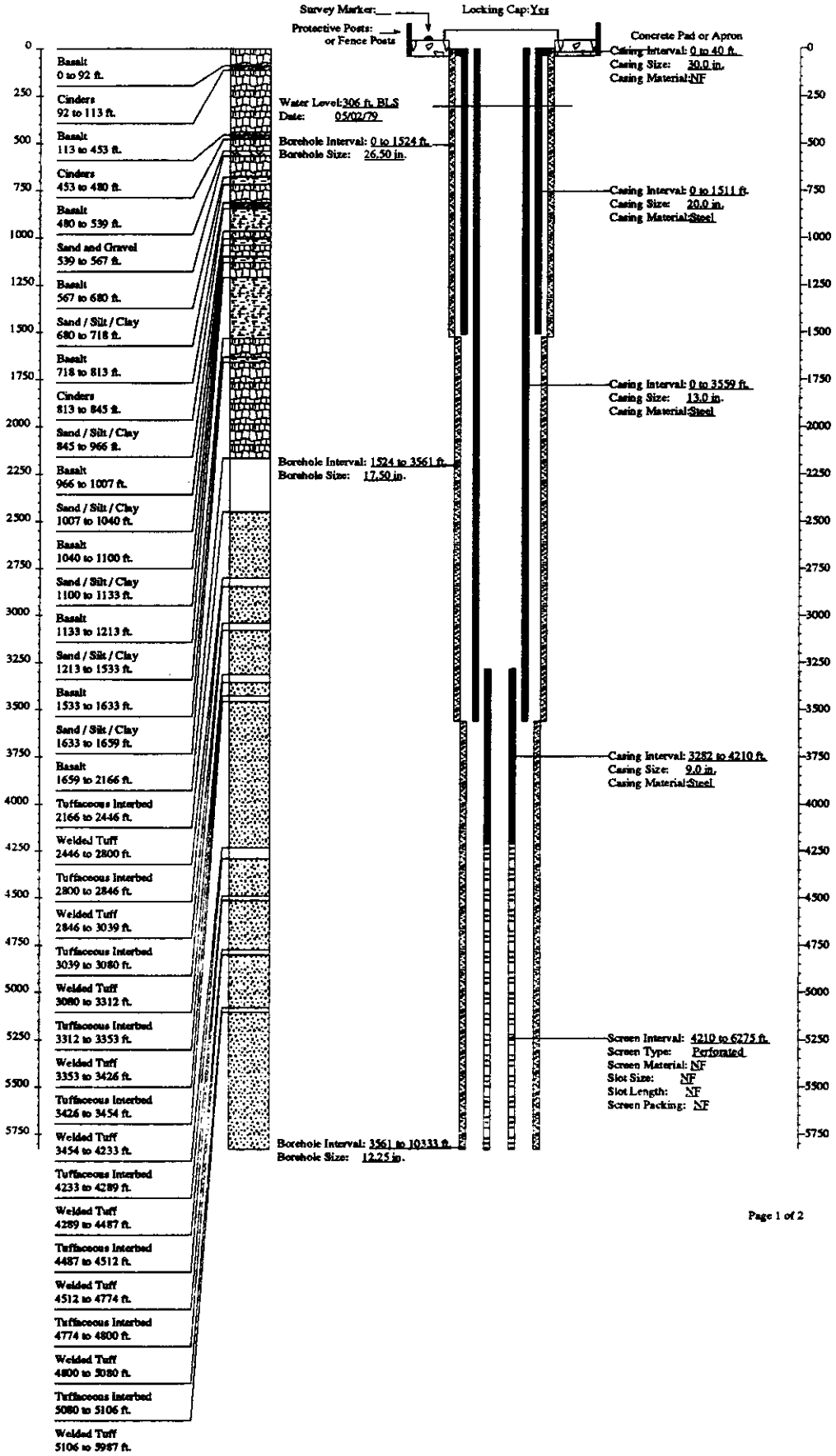
03/01/1994

Facility: MIDDLE
Well Type: Observation
Well Status: Active
Year Drilled: 1979
Total Depth: 10365

Easting: 450284.890
Northing: 713309.748
Longitude: 1125639.0238
Latitude: 433716.77365
Completion Depth: 10365

Driller: Brinkerhoff
Geologist: NF
Drilling Method: Rotary
Drilling Fluid: NF
Land Surface: 4876.23

Water Level: 306
Water Level Date: 05/02/79
Water Level Access: NF



WellName: INEL-1

03/01/1994

Facility: MIDDLE
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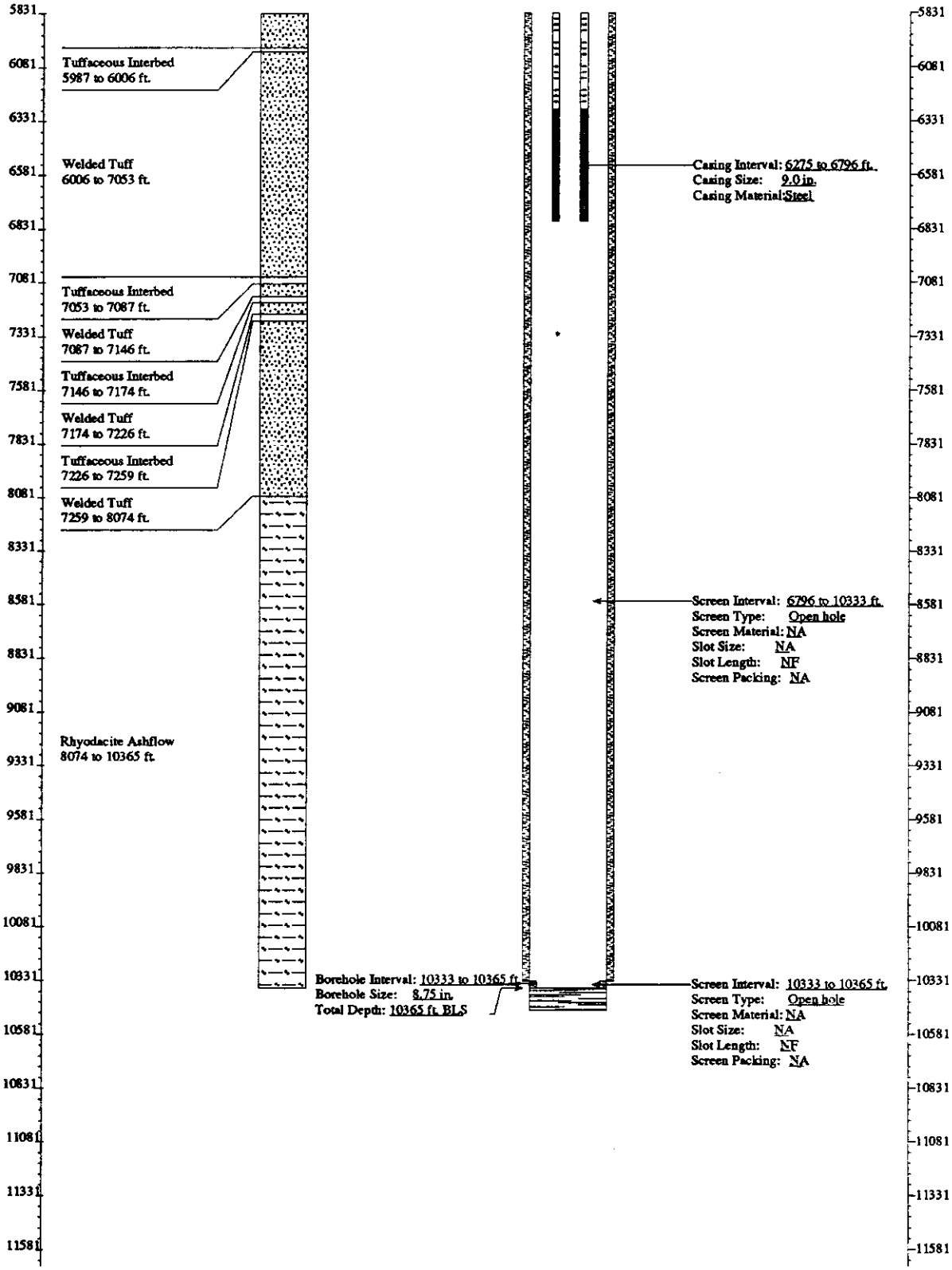


FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. SITE-06

A. WELL USE

1) Year well was drilled: 1956

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: None - well used exclusively for water level measurements.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock:(Yes X No _ Borehole size 15-inch Casing size 10-inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	10 I.D.	0 - 523	Butt Welded	25	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Puddled Clay	0 - 321	N.F.	Yes
Cement	321 - 325	3:1 Sand to Cement	Yes
Gravel	325 - 498	N.F.	N/A
Clay	498 - 523	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located in a topographically low area of the alluvial plain about 1 mile east of the Big Lost River.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched water above the monitored zone. (The saturated sand interbed reported by the driller from 352 to 358 feet bls was actually the top of the Snake River Plain aquifer (pers. comm. Rodger Jensen, USGS).

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: Uncertain, the integrity of the puddled clay seal could not be ascertained because no documentation was found for its composition or method of emplacement.

4) Gravel Pack. Does the well contain a gravel pack: (Yes X No _) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes X No _) Explanation Cement grout is installed above the gravel pack at 325 feet bls with puddled clay above.

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A _) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _)

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. SITE-06

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The integrity of the puddled clay seal could not be evaluated because no documentation was found for its composition or method of installation. The well is situated in a topograpically low area about 1 mile east of the Big Lost River channel, but is not in proximity to any potential sources of surface or subsurface contamination. (The well is located about 3 miles east of NRF and about 1.5 miles southeast of ARVFS). Therefore, a variance should be requested for the seal. Also, the casing thickness was not documented, which is a minor deficiency.

Remediation: None

GEOLOGIC LOG

Well Name SITE-06

Source: Driller's Log

****

Interval (feet below surface)

Begin	End	Description
0	10	Surficial Sediments
10	21	Clay and Sand
21	78	Red and Gray Basalt
78	85	Red Sandstone
85	105	Porous Gray Basalt
105	185	Dense Red and Gray Basalt
185	195	Red Cinders
195	245	Red and Black Basalt
245	255	Red Clay
255	352	Red / Gray / Brown Basalt
352	358	Black Sand (Wet)
358	400	Black Basalt
400	446	Red and Brown Cinders
446	470	Dense Brown Basalt
470	480	Brown Clay
480	495	Dense Brown Basalt
495	500	Brown Cinders
500	507	Red Clay
507	523	Gray Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: SITE-06

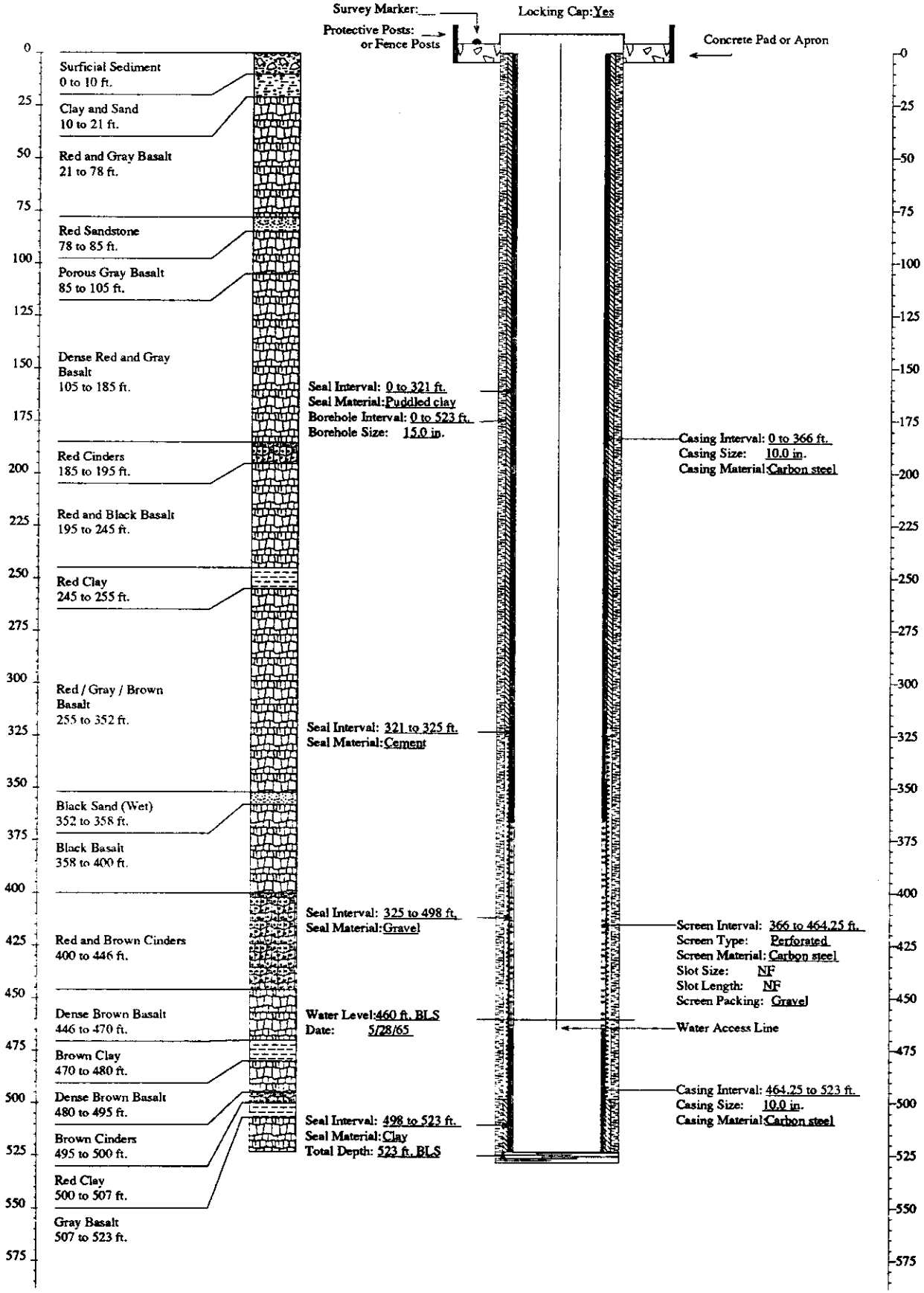
08/03/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1956
Total Depth: 523

Easting: 318630.25
Northing: 720067.15
Longitude: 1125106.49
Latitude: 433825.73
Completion Depth: 523

Driller: Cope
Geologist: E. Shuter
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 4837

Water Level: 460
Water Level Date: 5/28/65
Water Level Access: line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. SITE-14

A. WELL USE

1) Year well was drilled: 1956

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, ^3H, Cl^-, Cr

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size 20-inch (0-60 ft.), 16-inch (60-180 ft.), >12.25-inch (180-380 ft.) Casing size 12.25-inch I.D.) Explanation Bedrock occurs at 340 feet bls.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	12.25 I.D.	0 - 339.7	Welded	24	N.F.	N.F.
Steel	10 I.D.	320 - 376	Welded	N/A	N.F.	N.F.
Steel	8 I.D.	339 - 535	Threaded	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Clay and Soil Backfill	0 - 339.7	N.F.	No

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located more than 1 mile northeast of the Big Lost River.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent ground water movement within the annular space: It is uncertain. The well contains a clay and soil seal which is not approved by state well construction regulations. However, no evidence was found of surface water or perched groundwater near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A _) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. SITE-14

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well contains a clay and soil seal which is not approved in the state regulations. However, the well is located over 7 miles from TAN and NRF and over one mile from the Big Lost River. Since the well is not close to any potential sources of surface or subsurface contamination, a variance should be requested for the use of this material. In addition, the following minor deficiencies were noted: the casing thicknesses were not documented and the borehole is not the required 2 inches larger than the surface casing but is about the same size.

Remediation: None

GEOLOGIC LOG

Well Name SITE-14

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
0	25	Sand / Silt / Clay
25	45	Sand and Clay
45	55	Sand / Clay / Gravel
55	65	Sand and Gravel
65	85	Sand
85	332	Sand and Clay
332	335	Broken Basalt
335	340	Clay and Sand
340	360	Gray Basalt
360	385	Basalt / Sand / Gravel
385	403	Gray Basalt
403	485	Red-Brown Clay / Sand / Basalt
485	495	Clay
495	525	Gray Basalt (Sand Infillings)
525	535	Sand and Basalt
535	540	Gray Basalt and Sand
540	645	Black / Red / Gray Basalt
645	715	Black Basalt
715	716.7	Cinders

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: SITE-14

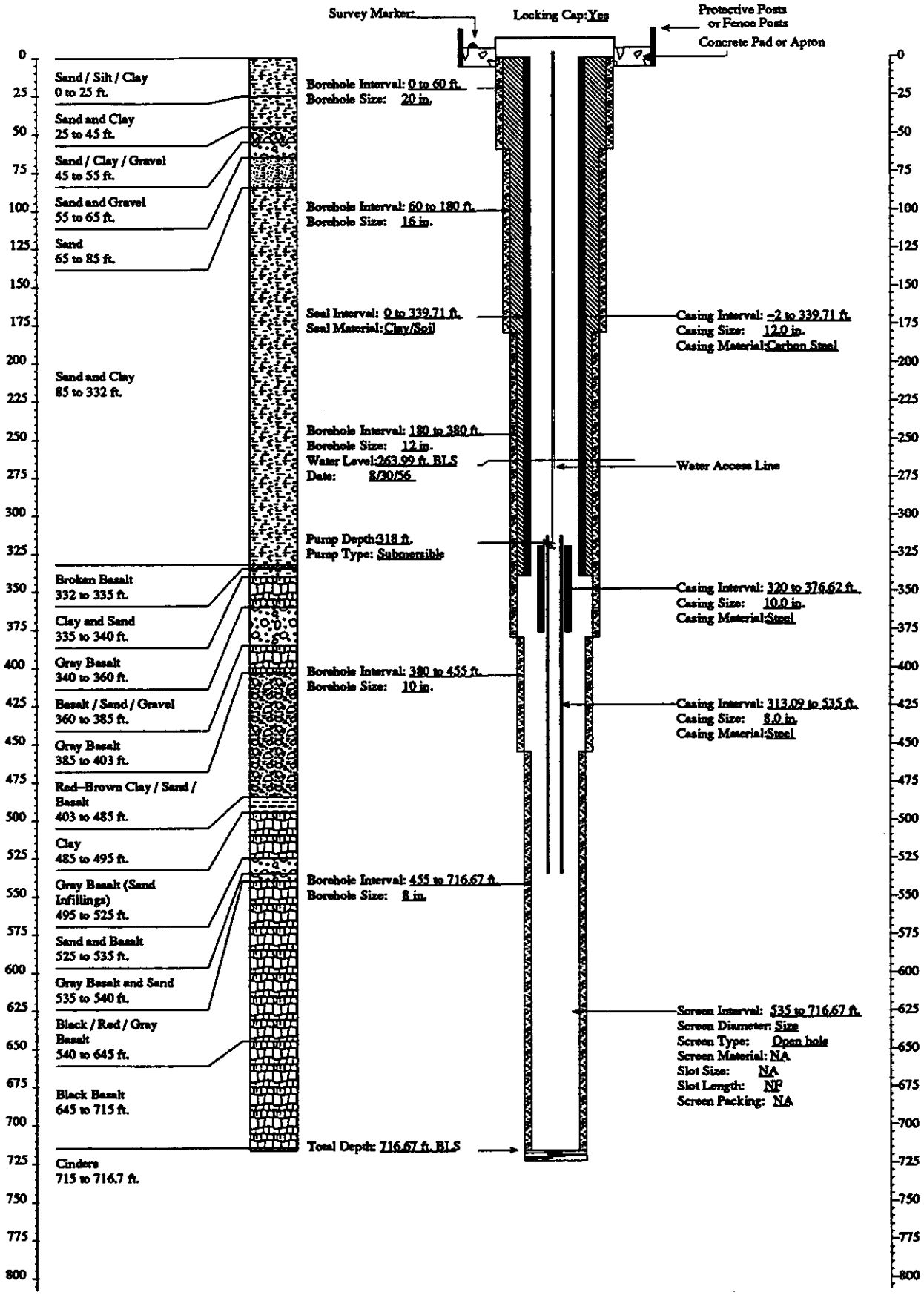
06/29/1994

Facility: MIDDLE
Well Type: Observation
Well Status: Active
Year Drilled: 1956
Total Depth: 716.67

Easting: 495033.303
Northing: 751166.037
Longitude: 1124634.4756
Latitude: 434334.32896
Completion Depth: 716.67

Driller: Cope
Geologist: A.Peckham, E.Shuler
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4797.39

Water Level: 263.99
Water Level Date: 8/30/56
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. SITE-17

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes _ No X N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 20 inch Casing size 18 inch (I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	18 (I.D. or O.D.?)	0 - 15	N.F.	18	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located almost 3 miles northwest of the NRF. No sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no evidence was found of surface or perched water near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located almost 3 miles northwest of the NRF facility and is not in proximity to any other sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration within the annular space is extremely low, a variance should be requested for this. Also, the casing thickness and joint type were not documented, which are minor deficiencies. Although the surface casing is installed to a depth of 15 feet instead of the required 18 feet, it extends 9 feet into the basalt.

Remediation: None

GEOLOGIC LOG

Well Name SITE-17

Source: Driller's Log

****

Interval (feet below surface)

Begin	End	Description
0	30	Gray Basalt
30	40	Cinders
40	60	Gray Basalt
60	65	Cinders
65	125	Gray to Brown Basalt
125	150	Cinders
150	155	Gray Basalt
155	186	Brown to Red Basalt
186	196	Cinders
196	205	Brownish Gray Basalt
205	225	Black to Red Basalt
225	229	Cinders
229	285	Red to Brown Basalt
285	315	Brown to Gray Basalt
315	354	Brown Basalt and Cinders
354	400	Black to Red Basalt
400	401	Cinders
401	442	Red and Brown Basalt
442	470	Gray Basalt
470	502	Brown to Red Basalt
502	515	Gray Basalt

COMPILED BY/ORGANIZATION: T.J. Clement / GAI Date April 13, 1993

GEOLOGIC LOG

Well Name SITE-17

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
515	530	Gray Basalt and Cinders
530	566	Gray to Red Basalt
566	569	Red Basalt and Cinders
569	585	Red Clay
585	589	Black Basalt
589	600	Red Clay

COMPILED BY/ORGANIZATION: T.J. Clement / GAI Date April 13, 1993

WellName: SITE-17

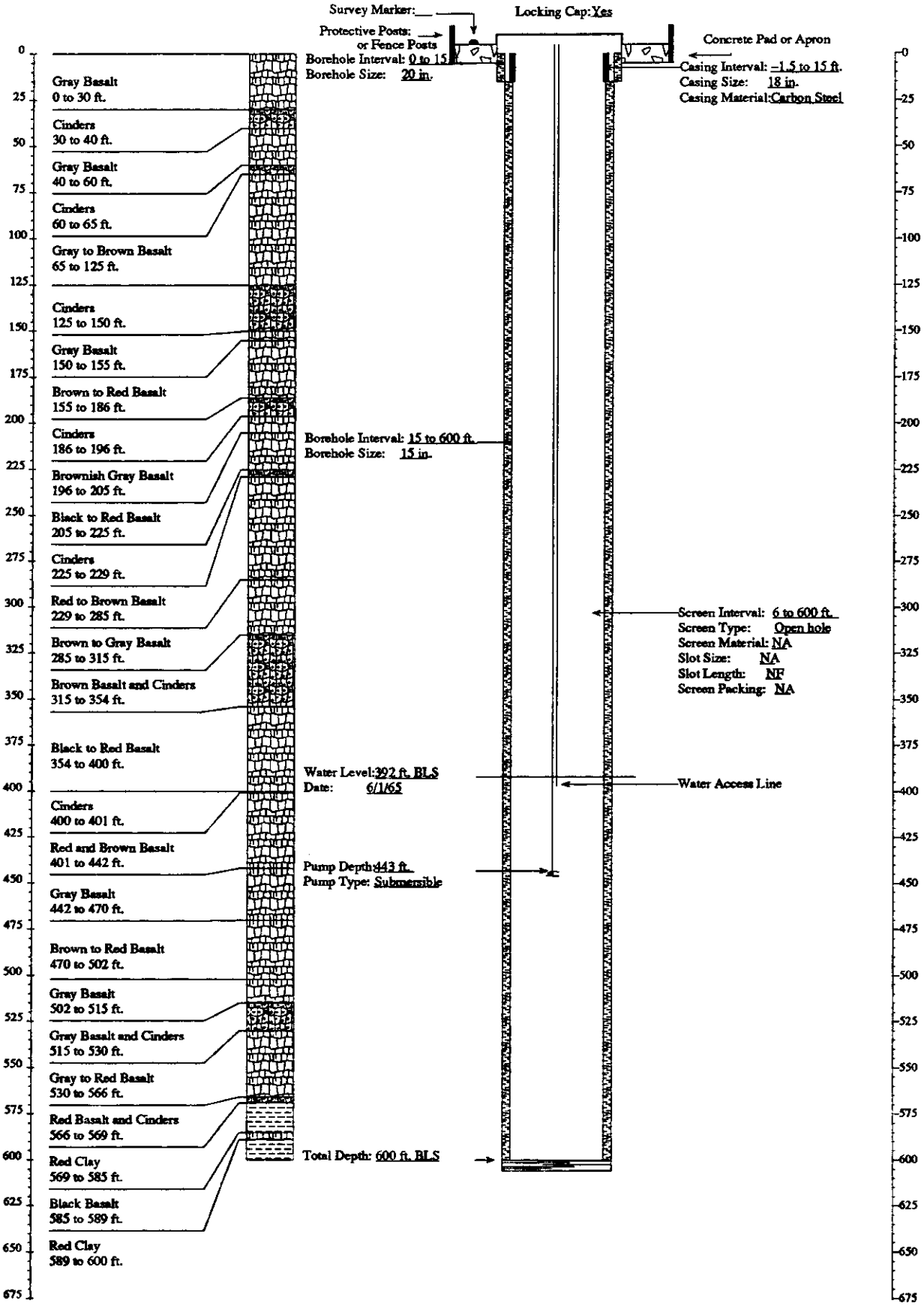
08/24/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1960
Total Depth: 600

Easting: 288601.17
Northing: 732589.93
Longitude: 1125756.46
Latitude: 434026.75
Completion Depth: 600

Driller: Vollmer
Geologist: E. Shuter
Drilling Method: Cable tool
Drilling Fluid: NF
Land Surface: 4880

Water Level: 392
Water Level Date: 6/1/65
Water Level Access: Line



CHECKLIST FOR ABANDONED/DESTROYED WELLS AND BORINGS

Location MIDDLE INEL Well Name/No. USGS-003A

A. Sources for Well Abandonment

1) What sources indicated that the well was plugged or destroyed:
(X) Comprehensive Well Survey status: Destroyed
( ) INEL Well Catalog (field survey by K. Beard) _
( ) Personal communication _
( ) Other _

2) Was the well located by field inspection and documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380)
( ) Well was located by field inspection.
(X) Well was not located by field inspection.

B. Abandonment Procedures

1) How was the well abandoned or destroyed:
( ) Backfilled
( ) Buried
( ) Grouted
(X) Other
The well was used as a seismic shot hole which destroyed it.
( ) Not documented

2) List procedure and amounts of material used to abandon the well:
N/A

C. Well Casing

1) Does the well contain surface or other well casing:
Yes X No _ Not Documented _
Explanation: The well contains wrought iron casing.

2) Was the annular space between the casing and borehole grouted:
Yes _ No _ Not Documented X N/A _

D. Compliance with State Regulations

State of Idaho Reg.3.12.1. Permanently abandoned wells may have the casing removed or left in place and shall be filled with bentonite grout, cement grout, concrete, puddling clay, or other material as required to stop the upward or downward movement of water and prevent the waste and/or contamination of the ground water.

1) Total depth of borehole 740 ft. Top of basalt 15 ft.

CHECKLIST FOR ABANDONED/DESTROYED WELLS AND BORINGS

Location MIDDLE INEL Well Name/No. USGS-003A

2) Was the well properly abandoned in accordance with Idaho State regulations:
Yes _ No X Not Documented _ Explanation: The well was used as a seismic shot hole and was destroyed.

3) Are additional abandonment procedures necessary:
Yes _ No _ Not Certain X
Explanation: Although the well was not abandoned according to state guidelines, additional abandonment procedures probably are not possible.

 GEOLOGIC LOG Well Name USGS-003A

Source: USGS Generalized Lithology Log

****

Interval (feet below surface)

Begin	End	Description
0	15	Topsoil and Clay
15	145	Basalt
145	150	Clay
150	335	Basalt
335	340	Cinders and Scoria
340	505	Basalt (No Sample 370-375 / 415-445 / 480-505 ft.)
505	640	Basalt (No Sample 560-580 / 610-615 / 620-635 ft.)
640	645	Cinders
645	665	Basalt
665	672	Basalt / Cinders / Sand
672	740	Basalt (No Sample 705-715 ft.)

COMPILED BY/ORGANIZATION: T.L. Morgan / GAI Date October 14, 1992

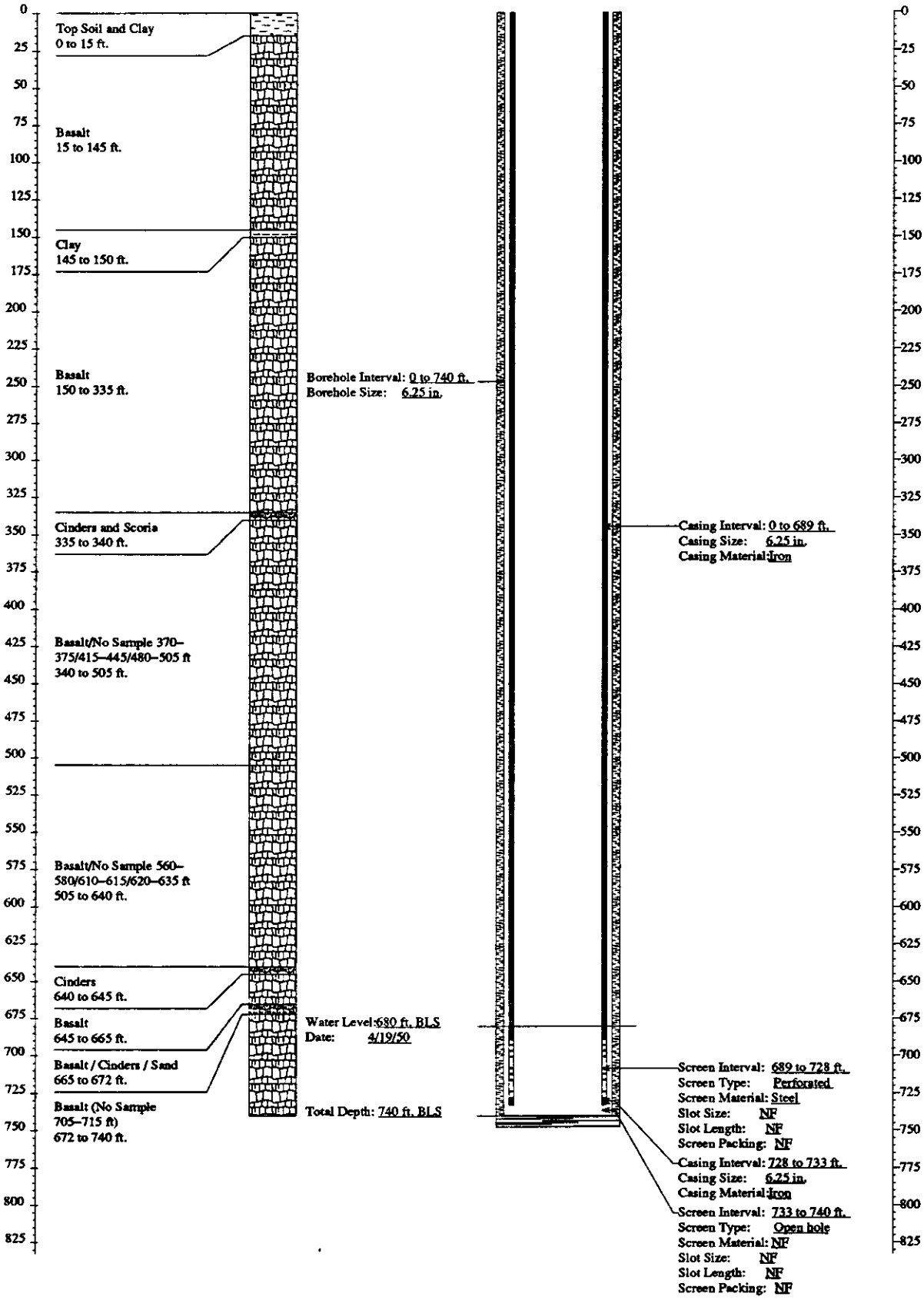
WellName: USGS–003A **Correction: Well destroyed when used as seismic shothole.** 06/17/1993

Facility: MIDDLE
Well Type: NA
Well Status: Destroyed
Year Drilled: 1950
Total Depth: 740

Easting: 394526.84
Northing: 714131.62
Longitude: 1123354.00
Latitude: 433732.00
Completion Depth: 733

Driller: Cope
Geologist: J.W.S, R. H. Carson
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 5179.22

Water Level: 680
Water Level Date: 4/19/50
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. USGS-004

A. WELL USE

1) Year well was drilled: 1950

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation -Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 8-inch Casing size 6.25-inch I.D.)
Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (1)	6.25 I.D.	0 - 322	N.F.	14	N.F.	N.F.

(1) Casing perforated from 285 to 315 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located near the eastern boundary of the INEL about 1 mile south of the Owsley irrigation canal.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes __ No X Insufficient data __) Explanation(Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent ground water movement within the annular space: No, there is no documented casing seal. However, there is no known surface or perched water near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface seal as required by state regulations. However, it is located in the east-central region of the INEL site about a mile south of the Owsley irrigation canal. Since it is not near any potential sources of surface or subsurface contamination, a variance should be requested for the lack of this seal. Although the well is completed in the Snake River Plain aquifer and the casing is unsealed, no evidence was found of perched water near the well. (Perched water would have to be sealed out if it were of a lower quality). In addition, the following minor deficiencies were noted: the casing thickness and joint type were not documented.

Remediation: None

GEOLOGIC LOG

Well Name USGS-004

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	5	Sandy Silt
5	25	Sand
25	295	Basalt
295	300	Sand
300	315	Sand and Gravel
315	330	Sand
330	405	Basalt
405	410	No Sample
410	440	Basalt
440	453	Sand
453	512	Basalt
512	515	Sand
515	530	Basalt
530	543	Silt
543	550	Basalt
550	553	No Sample

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS-004

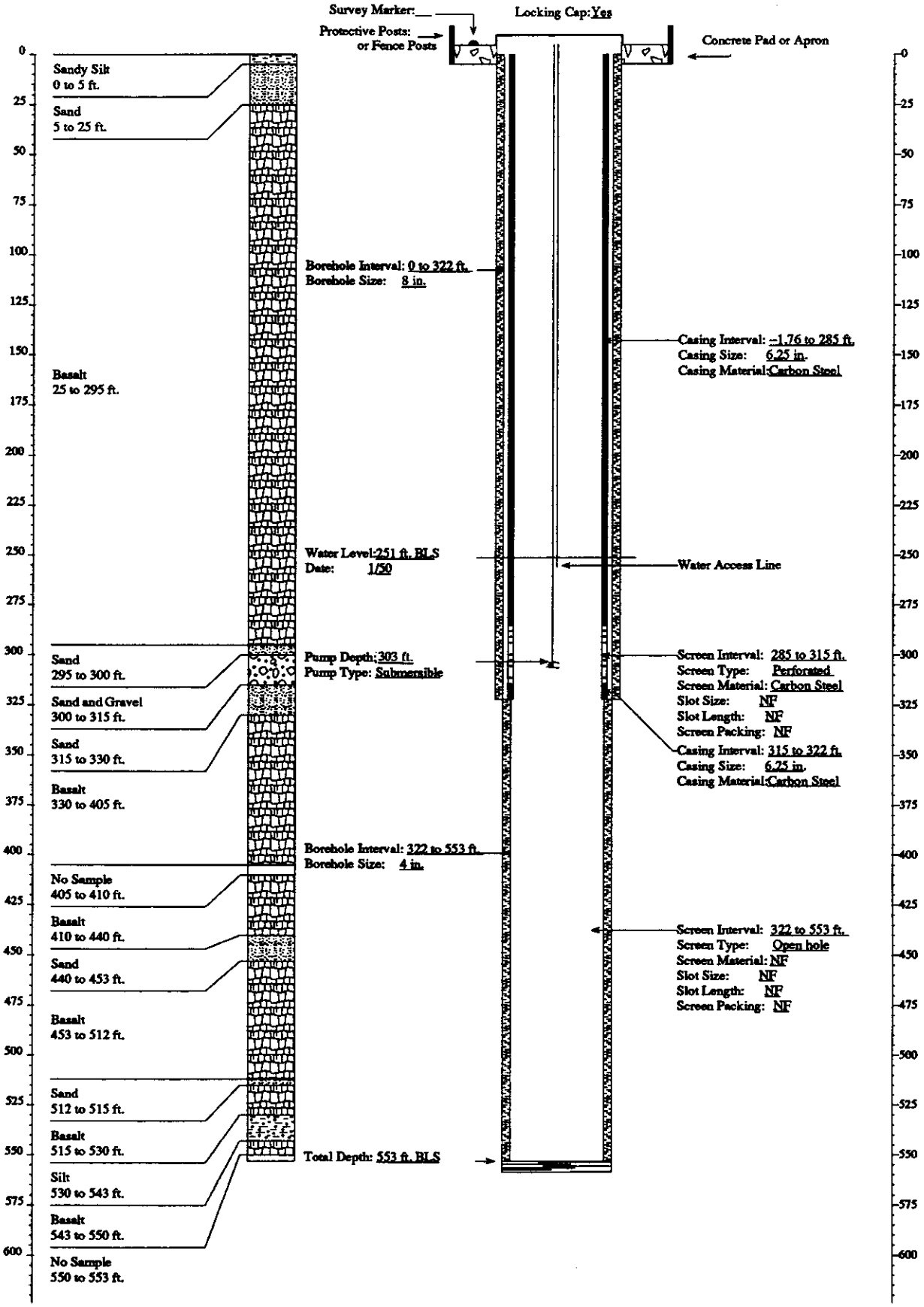
08/15/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1950
Total Depth: 553

Easting: 419230.18
Northing: 771132.62
Longitude: 1122822.00
Latitude: 434656.11
Completion Depth: 553

Driller: Strasser/Cope
Geologist: S.W.Fader, R.Carson
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4791.28

Water Level: 251
Water Level Date: 1/50
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. USGS-006

A. WELL USE

1) Year well was drilled: 1950

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 8-inch Casing size 6.25-inch I.D.)
Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 403.7	N.F.	16	N.F.	N.F.
Carbon Steel [1]	4.9 I.D.	394 - 487	N.F.	N/A	N.F.	N.F.
Carbon Steel	4.0 I.D.	0 - 532	N.F.	22	N.F.	N.F.

[1] The 4.9-inch casing is perforated from 452 to 475 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located in the central part of the INEL site where no known recharge sources exist.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the casing has no documented seal. However, no evidence was found of surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located over 7 miles east of NRF and is not in proximity to any potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of this seal. In addition, the casing thicknesses and joint types were not documented, which are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well Name USGS-006

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	5	Sand
5	10	Basalt
10	15	No Sample
15	30	Basalt
30	35	No Sample
35	45	Basalt
45	50	No Sample
50	120	Basalt
120	125	No Sample
125	247	Basalt
247	250	No Sample
250	350	Basalt
350	360	Sand
360	375	Silt
375	383	Basalt
383	385	Clay
385	391	Sand
391	395	No Sample
395	411	Gravelly Sand to Sand

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

 GEOLOGIC LOG Well Name USGS-006

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
411	435	Basalt
435	446	Clay
446	465	No Sample
465	470	Sand and Gravel
470	475	Sandy Clay
475	530	Silty Clayey Sand
530	536	Gravel
536	580	Sand
580	585	Basalt
585	596	Sand
596	601	Basalt
601	605	Sandy Silt
605	609	Basalt
609	620	Silt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS-006

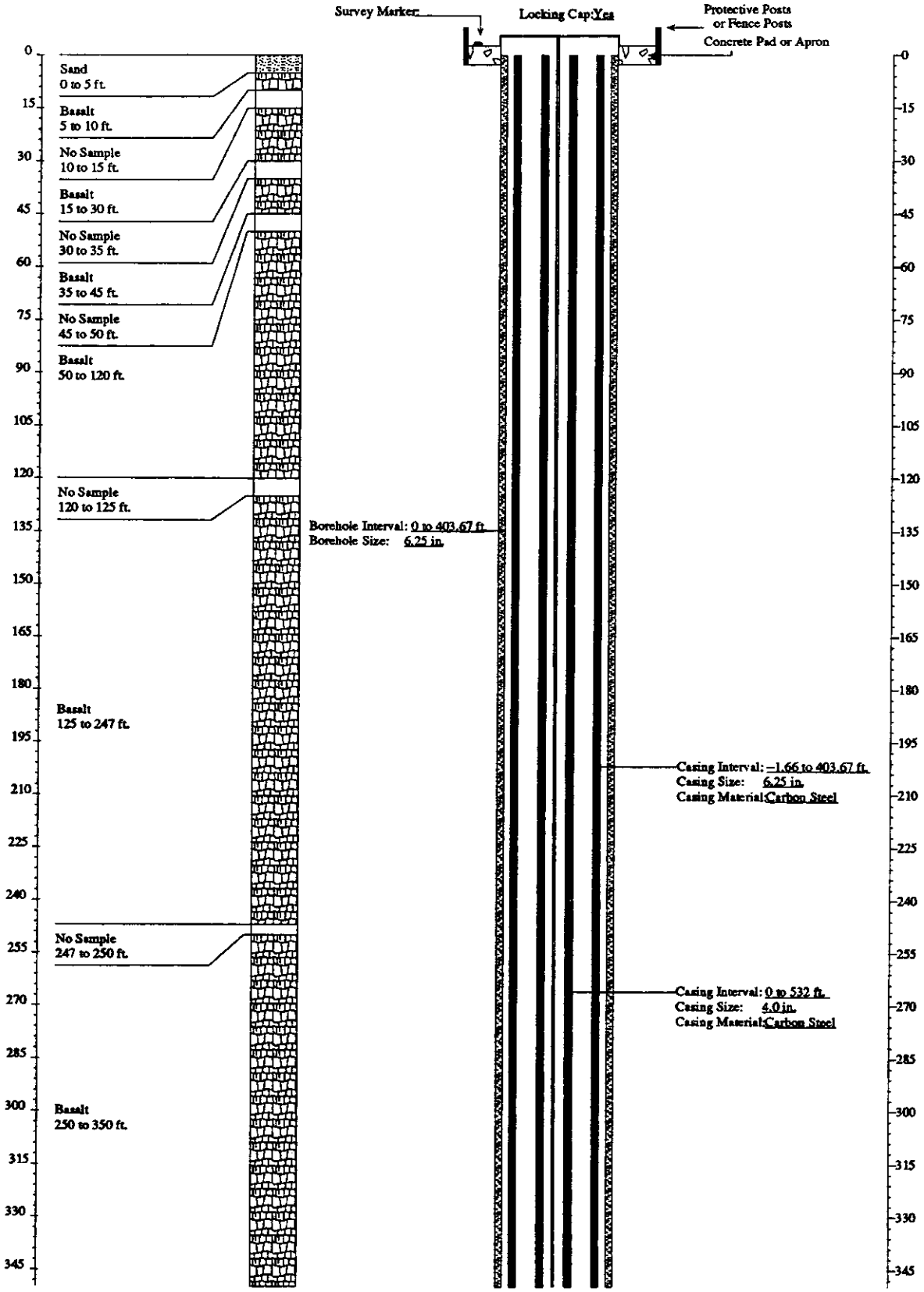
04/18/1994

Facility: MIDDLE
Well Type: Observation
Well Status: Active
Year Drilled: 1950
Total Depth: 620

Easting: 342974.450
Northing: 732576.302
Longitude: 1124536.66203
Latitude: 434031.12311
Completion Depth: 620

Driller: Cope
Geologist: R. Carson
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4899.124

Water Level: 439
Water Level Date: 05/01/50
Water Level Access: Line



WellName: USGS–006

04/18/1994

Facility: MIDDLE
Well Type: Observation
Well Status: Active
Year Drilled: 1950
Total Depth: 620

Easting: 342974.450
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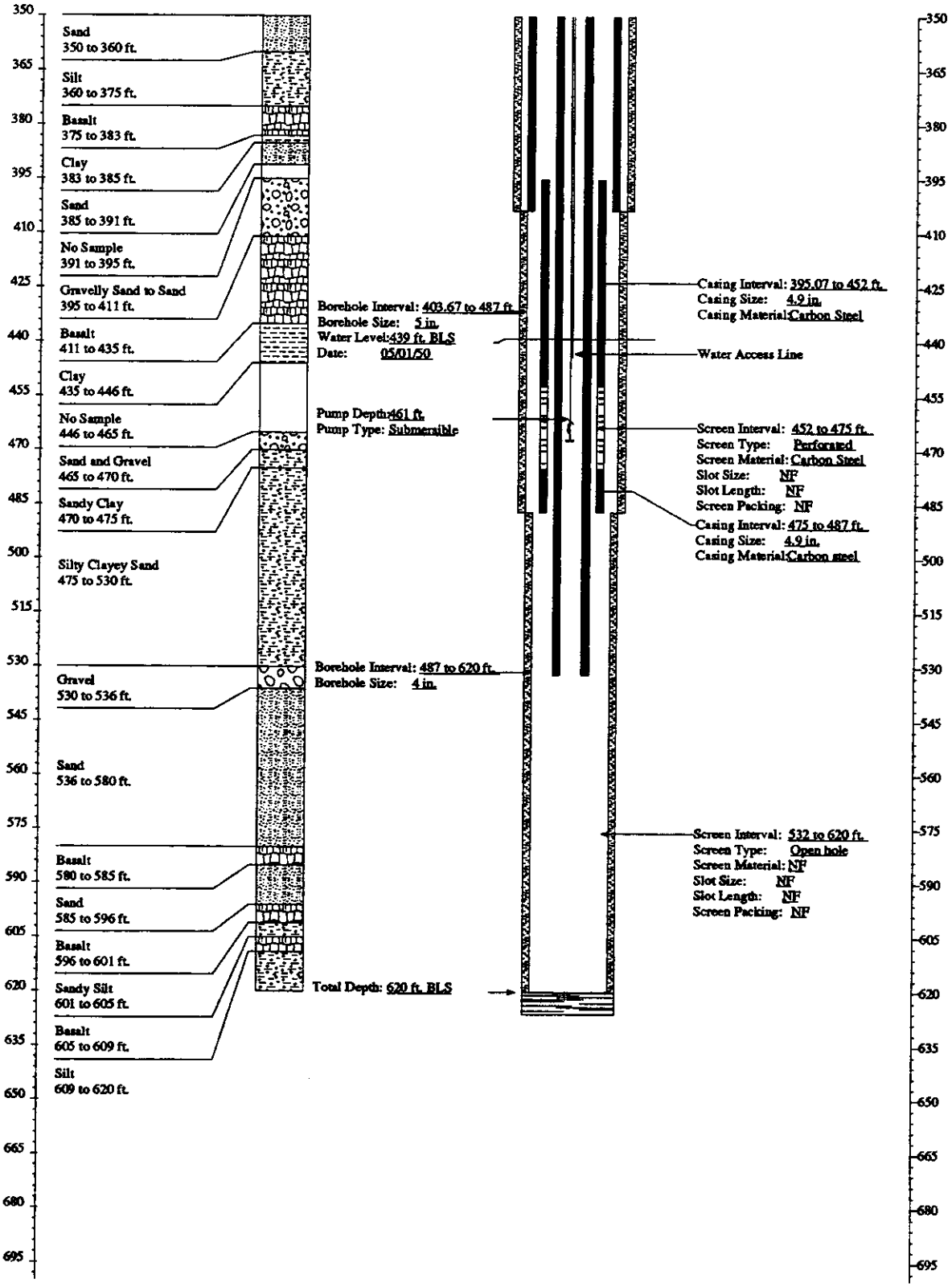
Water Level: 439
Water Level Date: 05/01/50
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. USGS-012

A. WELL USE

1) Year well was drilled: 1950

2) Current use for well:
(X)DOE 5400.1 Monitoring
(X)RCRA Monitoring
(X)CERCLA Characterization
( )Other: _
(X)USGS Observation
( )No Documented Use

3) Constituents monitored currently: USGS Observation (NRF Study) - Ag, Fe, Cr, Ni, Pb, Na, Hg, TOC, Cl, SO_4, F, Br, NH_4 (N), NO_2(dissolved), NO_2+NO_3 (N), orthophosphorous, Gross Alpha, Gross Beta

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: NRF Groundwater Monitoring Program (Informal - new plan being developed)

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1, RCRA & CERCLA - WEC (WAG 8) / Rick Nieslanik

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >16 inches Casing size 16 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel (surface casing)	16 I.D.	0 - 49	N.F.	0	N.F.	N.F.
N.F.	12 I.D.	0 - 387.5	N.F.	15	N.F.	N.F.
Steel	10 I.D.	335 - 587	N.F.	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is about 2.7 miles north of the NRF. No sources of recharge occur in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater in the area.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal; however, no surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Drilling Method Cable tool

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Carbon steel
Screen	Open hole (585 - 692 feet bls)
Pump	Submersible
Discharge Pipe	1.5-inch stainless steel
Measuring Line	1-inch steel

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between the metals concentrations from wells constructed of carbon steel and stainless steel at the RWMC.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No_) Explanation The water table occurs above the monitoring interval; therefore, the well only monitors dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes X No _) Monitoring interval(s) 585 - 692 feet bls Explanation The well monitors a 107-foot interval, which is excessive. This zone includes both basalt and a thick sedimentary interbed.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth 358 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation; DOE 5400.1, RCRA & CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The casing does not have a surface seal as required by state regulations. However, the well is located about 2.7 miles north of the NRF facility and is not in proximity to any sources of surface or subsurface contamination. Since no evidence was found for perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. In addition, the following minor deficiencies were noted: the casing thicknesses, joint types, and the 10 and 12-inch casing materials were not documented and the borehole is not the required 2 inches larger than the surface casing but is about the same size. Although the 16-inch casing has no stick-up, it is sealed at the surface by the concrete pad.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: DOE 5400.1, RCRA & CERCLA/RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated in Section F. The well does not comply with RCRA guidelines for the following reasons: (1) the casings are not sealed in the borehole above the monitored zone, which may affect the validity of groundwater samples and (2) the monitoring interval of 107 feet is considered excessive for compliance/detection use and includes a thick sedimentary interbed. Although the decontamination procedures, the use of drilling fluids and the well development were not documented, these are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well Name USGS-012

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	20	Clay
20	40	Gravel
40	50	Silt
50	55	No Sample
55	225	Basalt
225	285	Basalt and Cinders
285	493	Basalt
493	503	Sand and Sandstone
503	514	Basalt
514	517	Clay
517	525	Basalt and Cinders
525	530	Sandstone
530	537	Basalt
537	550	Sand
550	625	Sand / Silt / Clay
625	640	Basalt
640	645	No Sample
645	675	Basalt
675	692	No Sample

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS--012 Correction: Well is blocked at 563 ft.

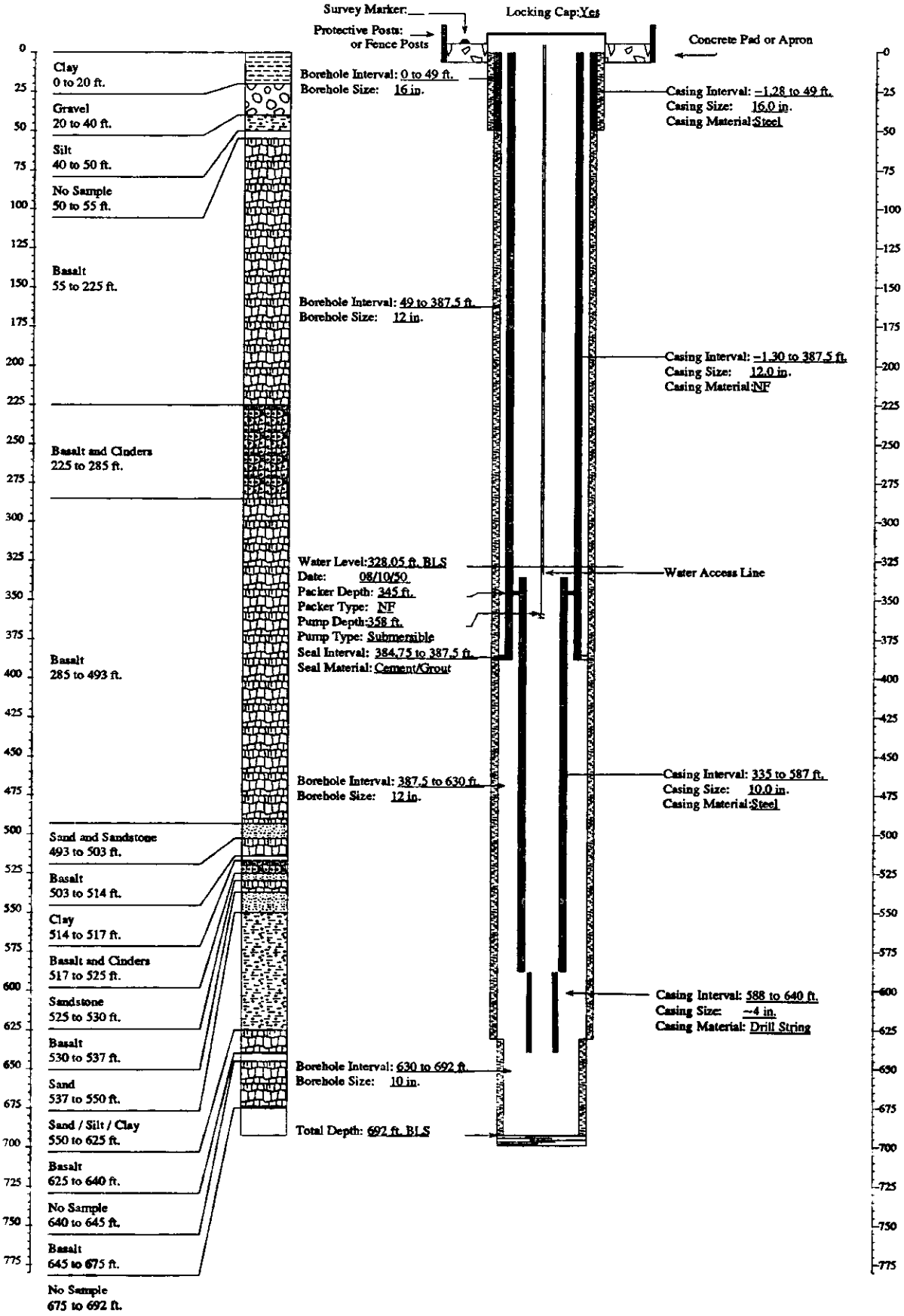
09/11/1993

Facility: MIDDLE
Well Type: Monitoring Well
Well Status: Active
Year Drilled: 1950
Total Depth: 692

Easting: 301109.97
Northing: 738472.46
Longitude: 1125507.00
Latitude: 434126.00
Completion Depth: 692

Driller: Cope
Geologist: J.R. Jones
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4820.5

Water Level: 328.05
Water Level Date: 08/10/50
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. USGS-015

A. WELL USE

1) Year well was drilled: 1951

2) Current use for well:
(X)DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
(X)CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation (NRF Study) - Ag, Fe, Cr, Ni, Pb, Na, Hg, TOC, Cl, SO_4, F, Br, NH_4 (N), NO_2(dissolved), NO_2 + NO_3 (N), orthophosphorus, Gross Alpha, Gross Beta

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: NRF Groundwater Monitoring Program (Informal - new plan is being developed)

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1, RCRA & CERCLA - WEC (WAG 8) / Rick Nieslanik

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)

5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 20 inch Casing size 16 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing) (1)	16 I.D.	0 - 41.6	N.F.	0	N.F.	N.F.
Carbon Steel (1)	10 I.D.	0 - 540	N.F	12	N.F.	N.F.
Carbon Steel (1)	8 I.D. or O.D.	1127 - 1229	N.F.	N/A	N.F.	N.F.

(1) Contradictory information exists concerning the casings installed in the well.
The USGS considers the well construction diagram in USGS report IDO-22045 to be the most accurate (pers. comm. Rodger Jensen, USGS).

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
No documented seal	0 - 610	N.F.	N.F.
Caved Material (1)	610 - 1479	N/A	N/A
(1) About 70% of this interval consists of sedimentary beds.			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located about 4 miles north of the NRF. No influent streams, percolation ponds or spreading areas are located near the well.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well does not have a documented seal of any type. However, no surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Drilling Method Cable tool

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Carbon steel
Screen	Open hole (540 - 610 feet bls)
Pump	Submersible
Discharge Pipe	1.5-inch stainless steel
Measuring Line	1-inch galvanized steel

Explanation EGG-ER 8496 documents that no significant difference (95% level) existed between the metals concentrations from wells constructed of carbon steel and stainless steel at the RWMC. Although galvanized steel may corrode under acidic conditions, the groundwater is not acidic at the INEL.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The water table occurs above the monitoring interval; therefore, the well monitors only dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval(s) 540-610 feet bls Explanation The well monitors a 70-foot zone, which is excessive but appears to consist of only one type of lithology.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material:(Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No X N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth _) 358 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** EGG-WM-9787; EGG-ER-8496; USGS Report IDO-22045; Personal Communication - Rodger Jensen, USGS (March and April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation; DOE 5400.1, RCRA & CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The surface casing does not have a seal as required by state regulations. However, the well is located about 4 miles north of NRF and is not in proximity to any potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of this seal. Also, the casing thicknesses and joint types were not documented, which are minor deficiencies. Although the 16-inch casing has no stick-up, it is sealed by a concrete pad.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: DOE 5400.1, RCRA & CERCLA/RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated in the preceding section. The well does not comply with RCRA guidelines because the monitoring interval of 70 feet is considered excessive for compliance/detection use. In addition, the well contains caved material from 610 to 1497 feet bls and is not sealed above and below the monitoring interval. This may affect the validity of the groundwater samples. Although the decontamination procedures, the use of drilling fluids and the well development were not documented, these are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well Name USGS-015

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	40	Silt / Sand / Gravel
40	94	Basalt and Cinders
94	105	Clay
105	337	Basalt and Cinders
337	341	Siltstone
341	420	Basalt and Cinders
420	427	Sand
427	435	Sand and Gravel
435	470	Sandy Clay
470	472	Sand
472	525	Sandy Clay
525	530	Sand and Gravel
530	540	Sand
540	611	Basalt
611	645	Silt
645	655	Silty Sand
655	660	Clayey Silt
660	815	Basalt / Cinders / Clay
815	827	Sandy Silt
827	845	Basalt
845	850	Silt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

 GEOLOGIC LOG Well Name USGS-015

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
850	875	Basalt and Cinders
875	885	Sandy Gravelly Silt
885	897	Sand and Gravel
897	907	Fine Gravel
907	925	Sand and Gravel
925	932	Silt and Gravel
932	945	Sand and Gravel
945	950	Gravel
950	955	Sand
955	963	Silt and Clay
963	970	Silty Sand
970	1016	Clay
1016	1040	Sand
1040	1060	Silt / Sand / Clay
1060	1400	Clay and Silt
1400	1405	Sand
1405	1408	Clay
1408	1480	Basalt
1480	1497	Clay and Silt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS–015

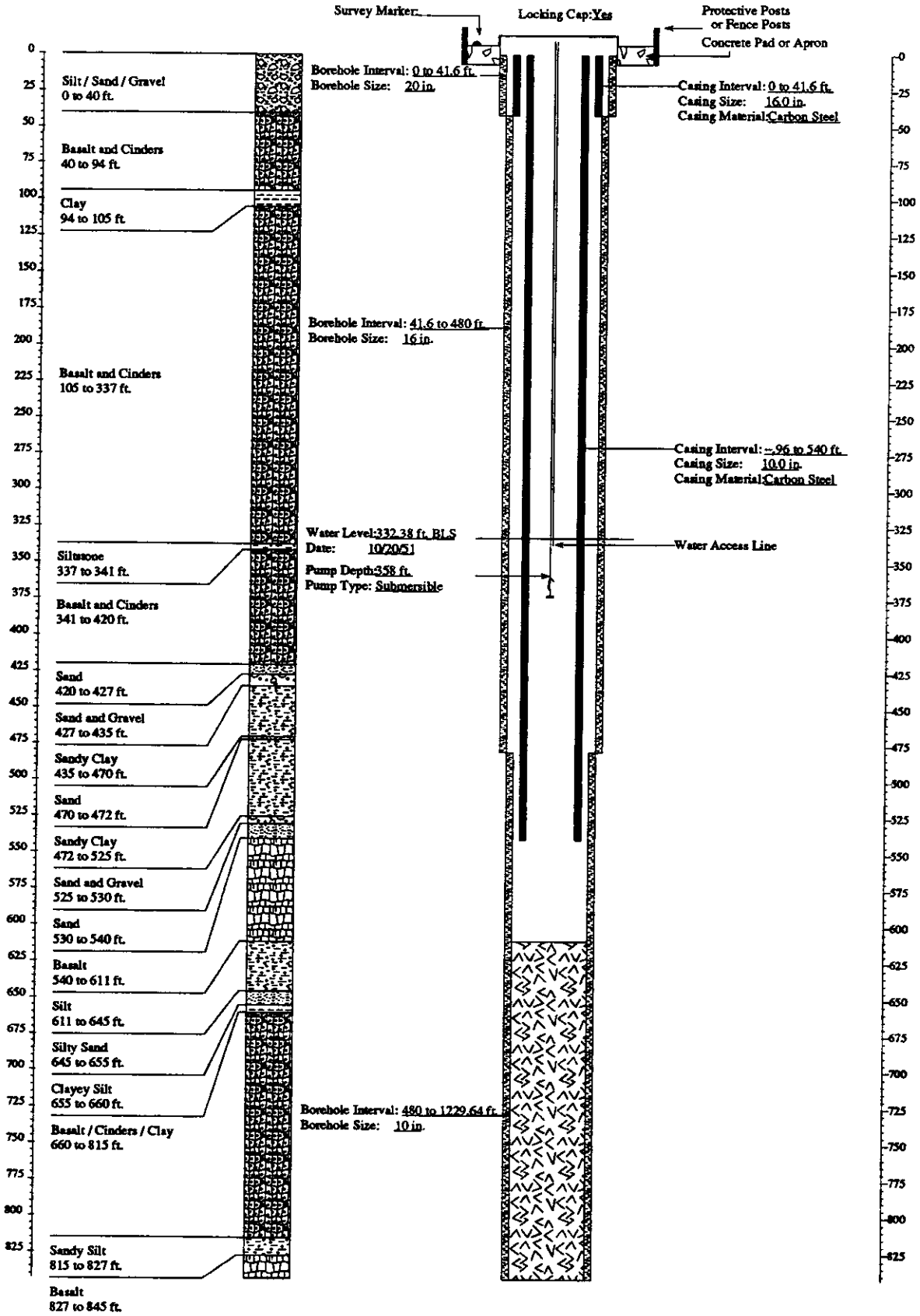
04/19/1994

Facility: MIDDLE
Well Type: Monitoring
Well Status: Active
Year Drilled: 1951
Total Depth: 1497

Easting: 300411.346
Northing: 745450.024
Longitude: 1125517.37224
Latitude: 434234.84589
Completion Depth: 1497

Driller: Cope
Geologist: R. Carson
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4812.425

Water Level: 332.38
Water Level Date: 10/20/51
Water Level Access: Line



WellName: USGS–015

04/19/1994

Facility: MIDDLE
Well Type: Monitoring
Well Status: Active
Year Drilled: 1951
Total Depth: 1497

Easting: 300411.346
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Longitude: 1125517.37224
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Driller: Cope
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Land Surface: 4812.425

Water Level: 332.38
Water Level Date: 10/20/51
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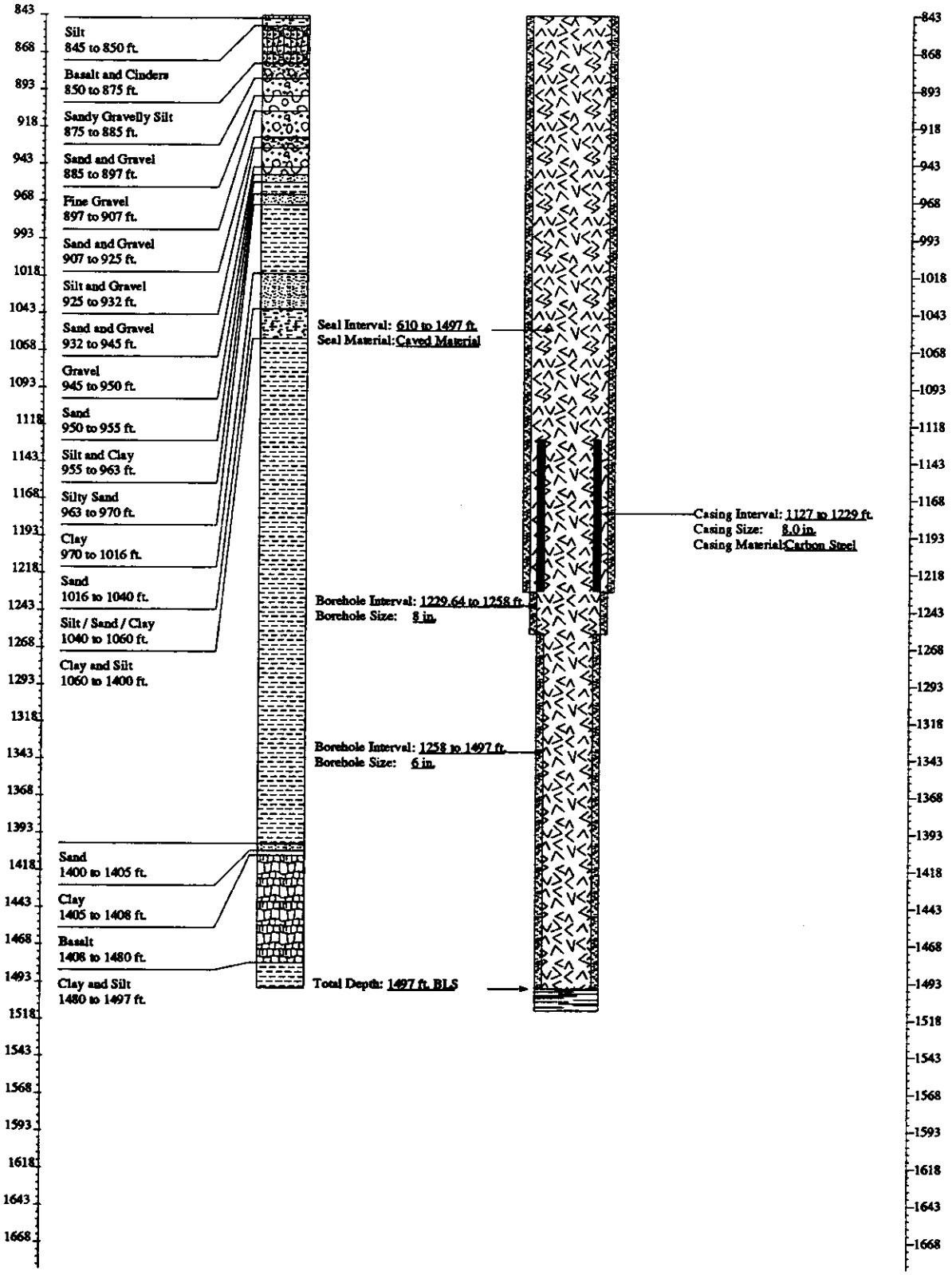

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. USGS-017

A. WELL USE

1) Year well was drilled: 1951

2) Current use for well:
(X)DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
(X)CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation (NRF Study) - Ag, Fe, Cr, Ni, Pb, Na, Hg, TOC, Cl, SO_4, F, Br, NH_4 (N), NO_2 (dissolved), NO_2 + NO_3 (N), orthophosphorous, Gross Alpha, Gross Beta

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: NRF Groundwater Monitoring Program (Informal - new plan being developed)

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1, RCRA & CERCLA - WEC (WAG 8) / Rick Nieslanik

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)

5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 8 inch Casing size 6.25 I.D.)

Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 406	N.F.	20	N.F.	N.F.
Carbon Steel	5.5 O.D.	365 - 496	N.F.	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F	N.F.	N.F.
Lead packer at 365 feet with a burlap packer below at 435 feet.			

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is approximately 1 mile east of the Big Lost River in the central part of the INEL. The well is interpreted to be beyond perched groundwater that would be created by the Big Lost River when it flows. No other known recharge source exists in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _)
Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well does not have a documented seal. However, no evidence was found for perched groundwater or surface water near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Drilling Method Cable tool

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Carbon steel
Screen	Perforated carbon steel 438-445 ft.bls / open hole (496-498 ft.bls)
Pump	Submersible
Discharge Pipe	1.5-inch stainless steel
Measuring Line	1-inch steel

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between the metals concentrations from wells constructed of carbon steel and stainless steel at the RWMC. Although galvanized steel may corrode under acidic conditions, the groundwater is not acidic at the INEL.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The water table occurs above the monitoring interval; therefore, the well monitors only dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No X) or does the well monitor more than one type of lithology: (Yes X No _) Monitoring interval(s) 438-445 feet bls (7-feet thick) and 496-498 feet bls (2 feet thick). The well monitors both basalt and sand.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X Well development type and duration _)

9) Is the pump intake location documented: (Yes X No _) Depth 403 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-WM-9787, EGG-ER-8496

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation; DOE 5400.1, RCRA & CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The casing does not have a surface seal as required by state regulations. The well is located about 2.5 miles northeast of NRF and over 0.5 miles from ARVFS. Since no evidence was found of perched water near the well and the potential for contaminant migration in the annulus is low, a variance should be requested for the lack of this seal. In addition, the following minor deficiencies were noted: the casing thicknesses and joint types were not documented.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: DOE 5400.1, RCRA & CERCLA/RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not comply with state regulations to the extent indicated in the preceding section. The well does not comply with RCRA guidelines for the following reasons: (1) the 5-inch casing is not sealed in the borehole, (2) the well monitors several different lithologies consisting of sand interbeds and basalt, (3) the well either monitors a 60-foot zone, which is excessive for compliance monitoring, or two zones separated by a 5-foot thick clay interbed at 475 feet bls, and (4) the well contains a lead packer 15 feet below the water table. Although a burlap packer was installed 70 feet below the lead packer and immediately above the perforated zone, the lead packer may no longer be effectively separated from the monitoring interval since the packers were installed in 1951. Although the decontamination procedures, the use of drilling fluids and the well development were not documented, these are minor deficiencies.

Remediation: The well should not be used for compliance purposes unless a distinct monitoring zone is sealed off. This may not be desirable if the USGS has historical groundwater sampling records for the well.

 GEOLOGIC LOG Well Name USGS-017

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	17	Loess / Gravel / Silt
17	80	Basalt and Cinders
80	90	Silt
90	120	Basalt
120	133	Cinders
133	253	Basalt
253	300	Cinders / Gravel / Clay
300	410	Basalt
410	412	Basalt and Silt
412	418	Basalt
418	430	Clay
430	435	Sand
435	440	Basalt
440	465	Sand
465	475	Basalt
475	480	Clay
480	487	Sand
487	498	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS–017

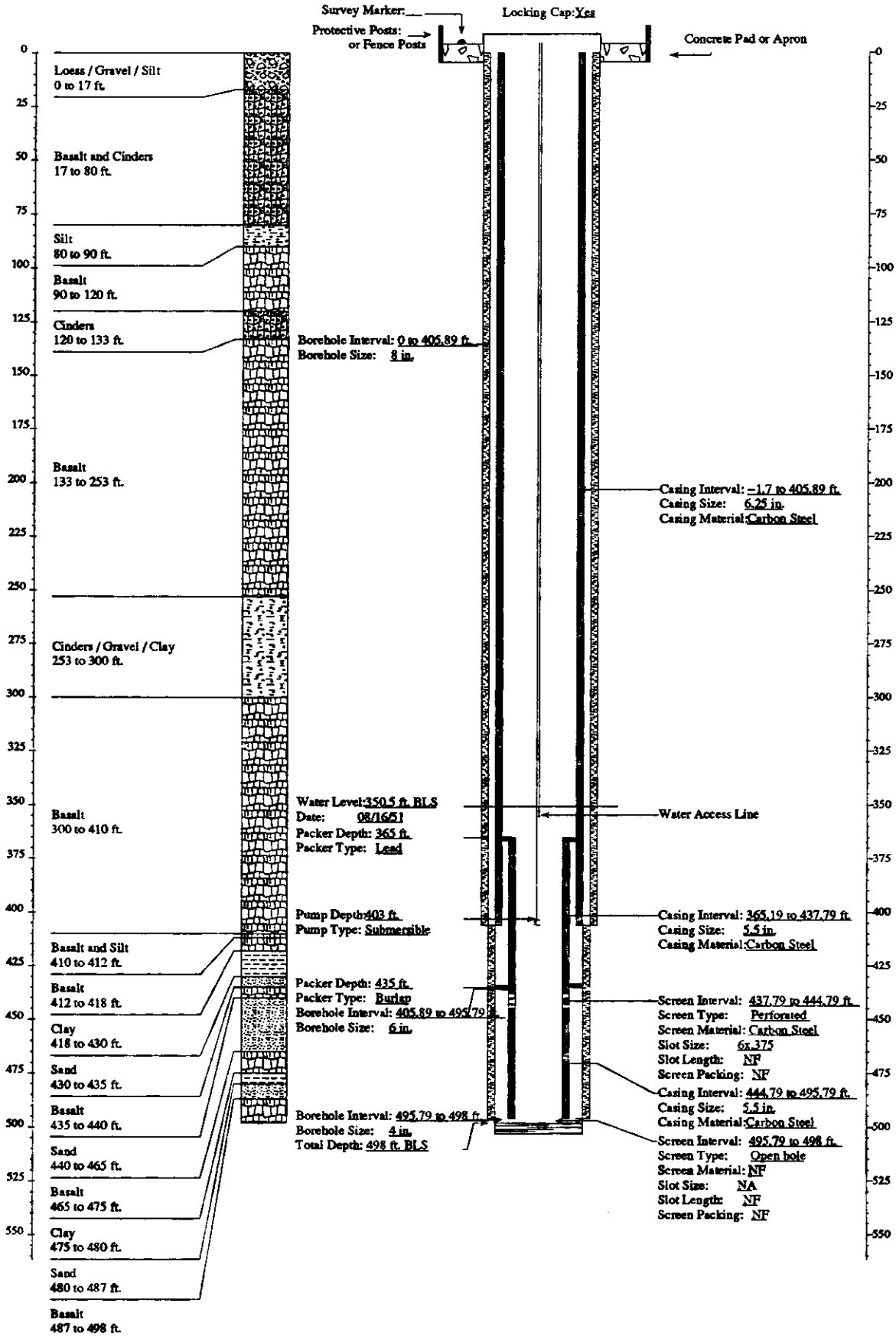
09/12/1993

Facility: MIDDLE
Well Type: Monitoring Well
Well Status: Active
Year Drilled: 1951
Total Depth: 498

Easting: 315197.30
Northing: 727312.28
Longitude: 1125154.00
Latitude: 433937.00
Completion Depth: 498

Driller: Cope
Geologist: Deutsch, Sisco
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4834.73

Water Level: 350.5
Water Level Date: 08/16/51
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL PAGE 1 of 7 Well Name/No. USGS-018

A. WELL USE

1) Year well was drilled: 1951

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann.

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >6.25 inches Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 255	N.F.	12	N.F.	N.F.
Carbon Steel (1)	4 I.D.	248 - 329	N.F.	N/A	N.F.	N.F.

(1) Casing perforated from 299 to 324 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No spreading areas, percolation ponds or influent streams are located in proximity to the well.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, there is no documented well seal. However, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface seal as required by state regulations. However, it is located in the central part of the INEL site and is not in proximity to any active or inactive INEL facilities. Since it is not near any potential sources of surface or subsurface contamination, a variance should be requested for the lack of this seal. Although the well is completed in the Snake River Plain aquifer and the casing is unsealed, no evidence was found of perched water near the well. (Perched water would have to be sealed out if it were of a lower quality). In addition, the following minor deficiencies were noted: the casing thicknesses and joint types were not documented and the borehole is not the required 2 inches larger than the surface casing but is about the same size.

Remediation: None

GEOLOGIC LOG

Well Name USGS-018

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	3	Sand
3	80	Basalt
80	100	Gravel and Sand
100	115	Clay and Silt
115	130	Silty Sand
130	135	Gravel and Sand
135	175	Silt and Clay
175	185	Silty Sand
185	195	Clayey Silt
195	205	Silty Sand
205	210	Clayey Silt
210	215	Sand
215	235	Sandy Silty Clay
235	255	Silty Sand to Sandy Silt
255	310	Basalt
310	329	Basalt and Cinders

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS–018

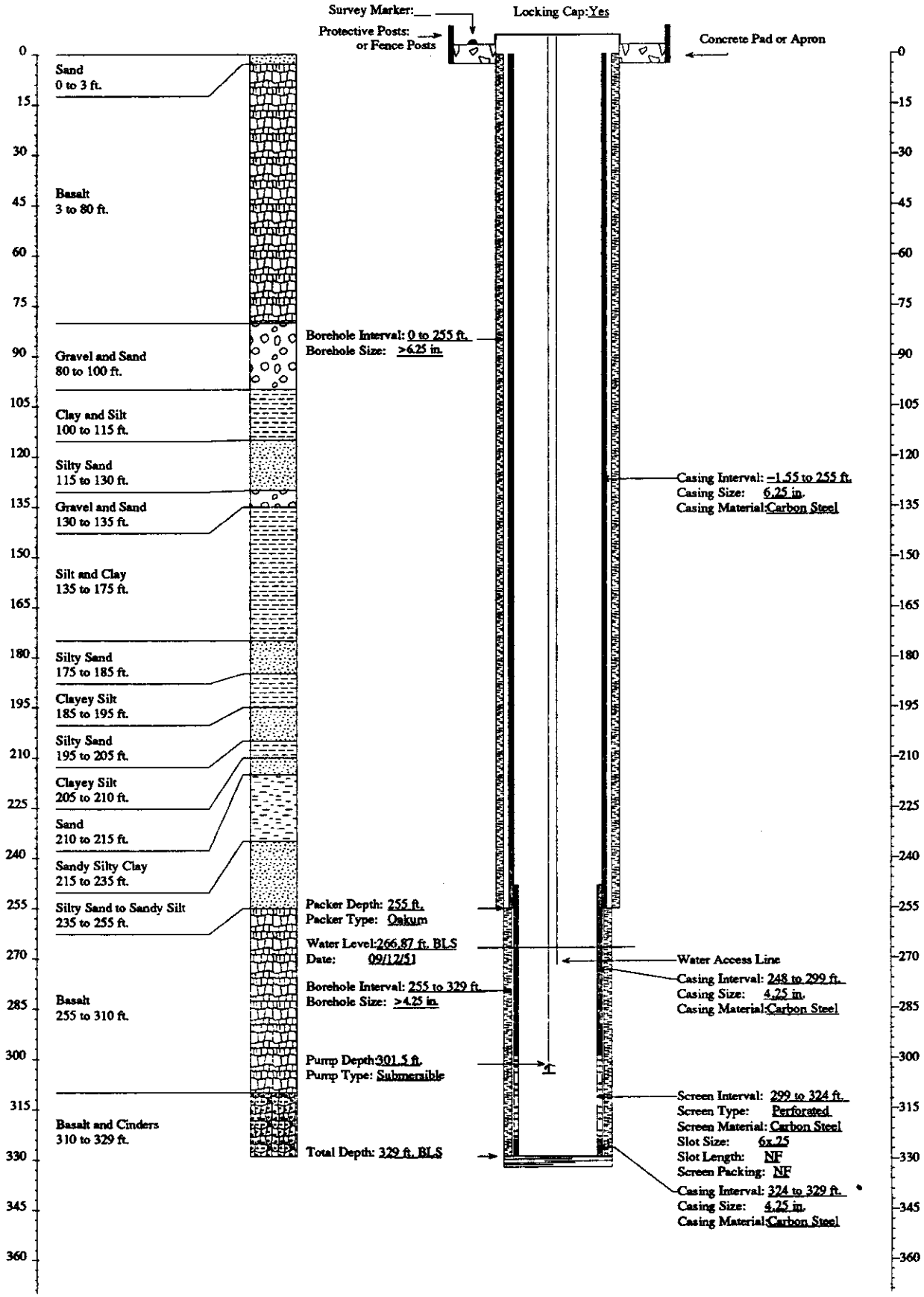
06/17/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1951
Total Depth: 329

Easting: 349631.55
Northing: 763804.99
Longitude: 1124409.00
Latitude: 434540.00
Completion Depth: 329

Driller: Cope
Geologist: S. West
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4806

Water Level: 266.87
Water Level Date: 09/12/51
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL PAGE 1 of 7 Well Name/No. USGS-019

A. WELL USE

1) Year well was drilled: 1951

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann.

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 10 inch Casing size 6 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6 I.D.	0 - 399.2	N.F.	22	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	399 (Bottom of Casing Set in Cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located more than 2 miles south of the sinks for the Little Lost River.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes __ No X Insufficient data __) Explanation(Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, there is no documented seal in this well except at the bottom of the casing. However, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _ .

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface seal as required by state regulations. However, it is located in the west-central region of the INEL site and is more than 2 miles south of the Little Lost River sinks. Since the well is not close to any potential sources of surface or subsurface contamination, a variance should be requested for the lack of this seal. Although the well is completed in the Snake River Plain aquifer and the casing is unsealed, no evidence was found of perched water near the well. (Perched water would have to be sealed out if it were of a lower quality according to the state regulations). Also, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-019

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	5	Clayey Sandy Silt
5	303	Basalt and Cinders
303	322	Sand
322	389	Silt
389	399.2	No Sample

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS-019

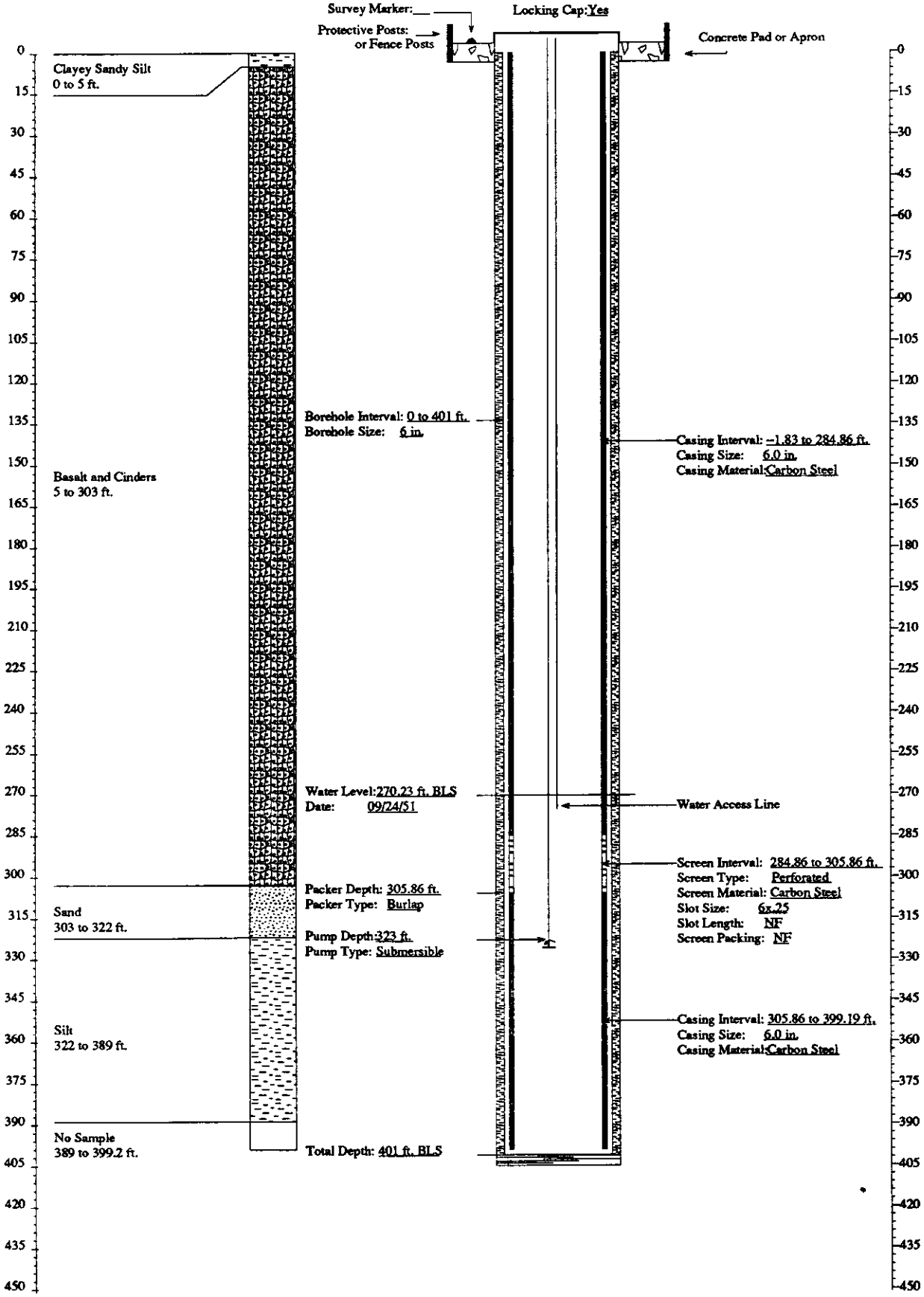
06/17/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1951
Total Depth: 401

Easting: 288795.30
Northing: 756814.31
Longitude: 1125757.00
Latitude: 434426.00
Completion Depth: 399.19

Driller: Cope
Geologist: P. T. Voegeli
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4800.3

Water Level: 270.23
Water Level Date: 09/24/51
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. USGS-021

A. WELL USE

1) Year well was drilled: 1952

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: None - well used exclusively for water level measurements.

4) Water level monitored: (Yes X No _ Insufficient data Well contains a recorder for water levels.)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:

(Yes X No _) Explanation Fence posts are adequate since the well is located in a wellhouse.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >6.25 inches Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 357	N.F.	12	N.F.	N.F.
Carbon Steel	5 I.D.	350.8 - 404.5	Butt Welded	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water or other sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well does not have a documented casing seal. However, no surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located in the central part of the INEL site and is not in proximity to any facilities or other sources of surface or subsurface contamination. Since no evidence was found for perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. In addition, the following minor deficiencies were noted: the casing thicknesses and the 6-inch casing joint type were not documented; the borehole is not 2 inches larger than the surface casing as required but is about the same size.

Remediation: None

GEOLOGIC LOG

Well Name USGS-021

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	3	Silty Sand
3	144	Basalt and Cinders
144	150	Sand
150	160	Silt and Sand
160	237	Basalt
237	250	Sand and Sandstone
250	290	Basalt
290	325	Silty Sand to Sandy Silt
325	335	Clay
335	340	Sand
340	360	Gravel
360	405	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS-021

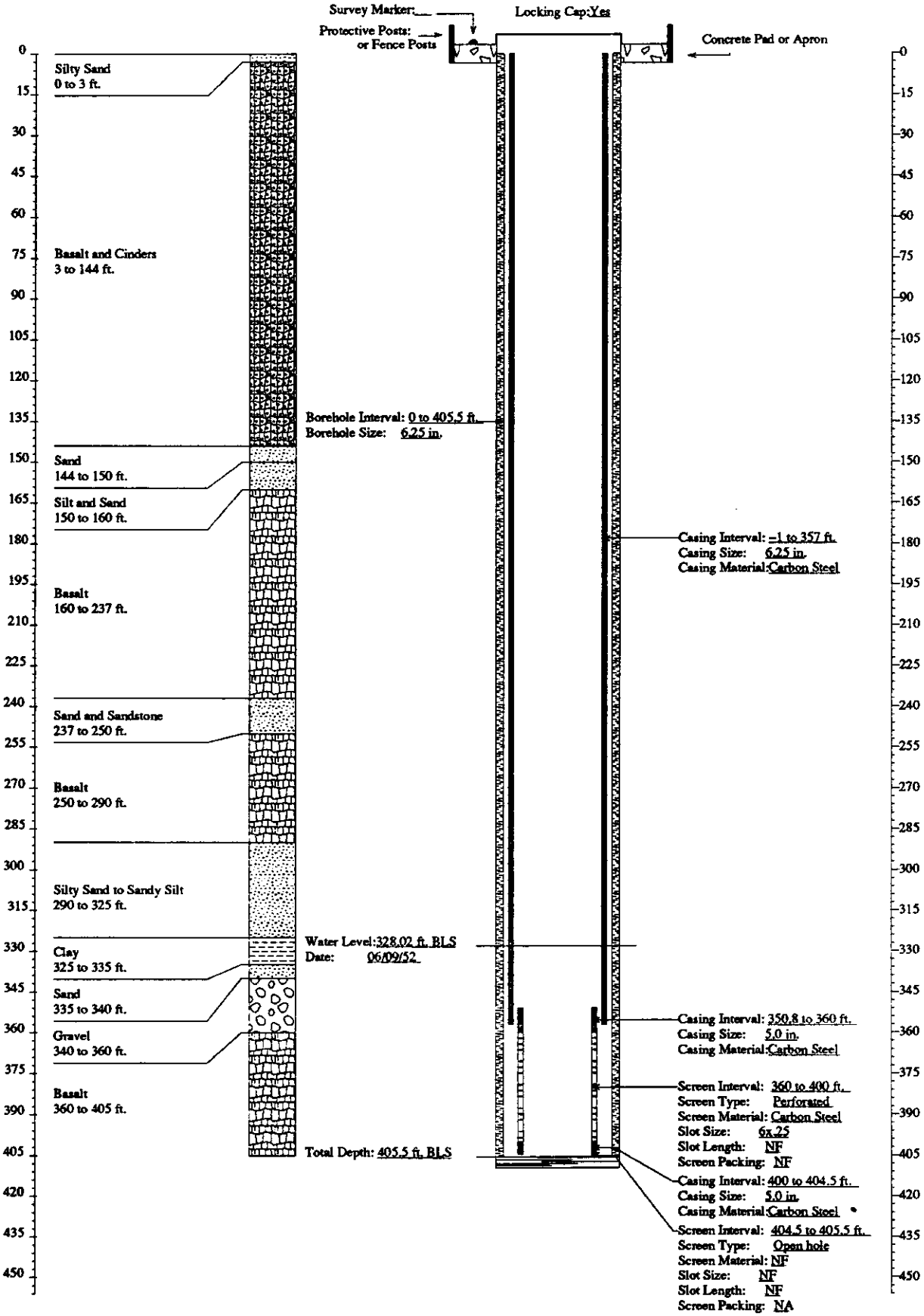
06/17/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1952
Total Depth: 405.5

Easting: 374714.48
Northing: 748155.19
Longitude: 1123826.00
Latitude: 434307.00
Completion Depth: 405.5

Driller: Cope
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4839.44

Water Level: 328.02
Water Level Date: 06/09/52
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. USGS-023

A. WELL USE

1) Year well was drilled: 1952

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >6.6 inch Casing size 6.6 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.6 O.D.	0 - 440	Threaded	27	N.F.	N.F.
Carbon Steel (1)	5 I.D.	430 - 463	Butt Welded	N/A	0.25	Yes

(1) Casing perforated from 410 to 430 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, there is no documented seal. However, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface seal as required by state regulations. However, the well is located in the west-central region of the INEL site and is not in proximity to any active or inactive INEL facilities or other sources of surface or subsurface contamination. Since the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. The following minor deficiencies also were noted: the thickness of the 6-inch casing was not documented and the borehole was not the required 2 inches larger than the casing but was about the same size.

Remediation: None

 GEOLOGIC LOG Well Name USGS-023

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	95	Basalt
95	100	Cinders
100	105	Basalt
105	125	Silt
125	235	Basalt
235	245	Cinders
245	250	No Sample
250	285	Basalt
285	290	Cinders
290	295	No Sample
295	410	Basalt and Cinders
410	420	No Sample
420	440	Basalt
440	450	Sand
450	455	No Sample
455	457	Basalt
457	460	Sand
460	463	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS–023

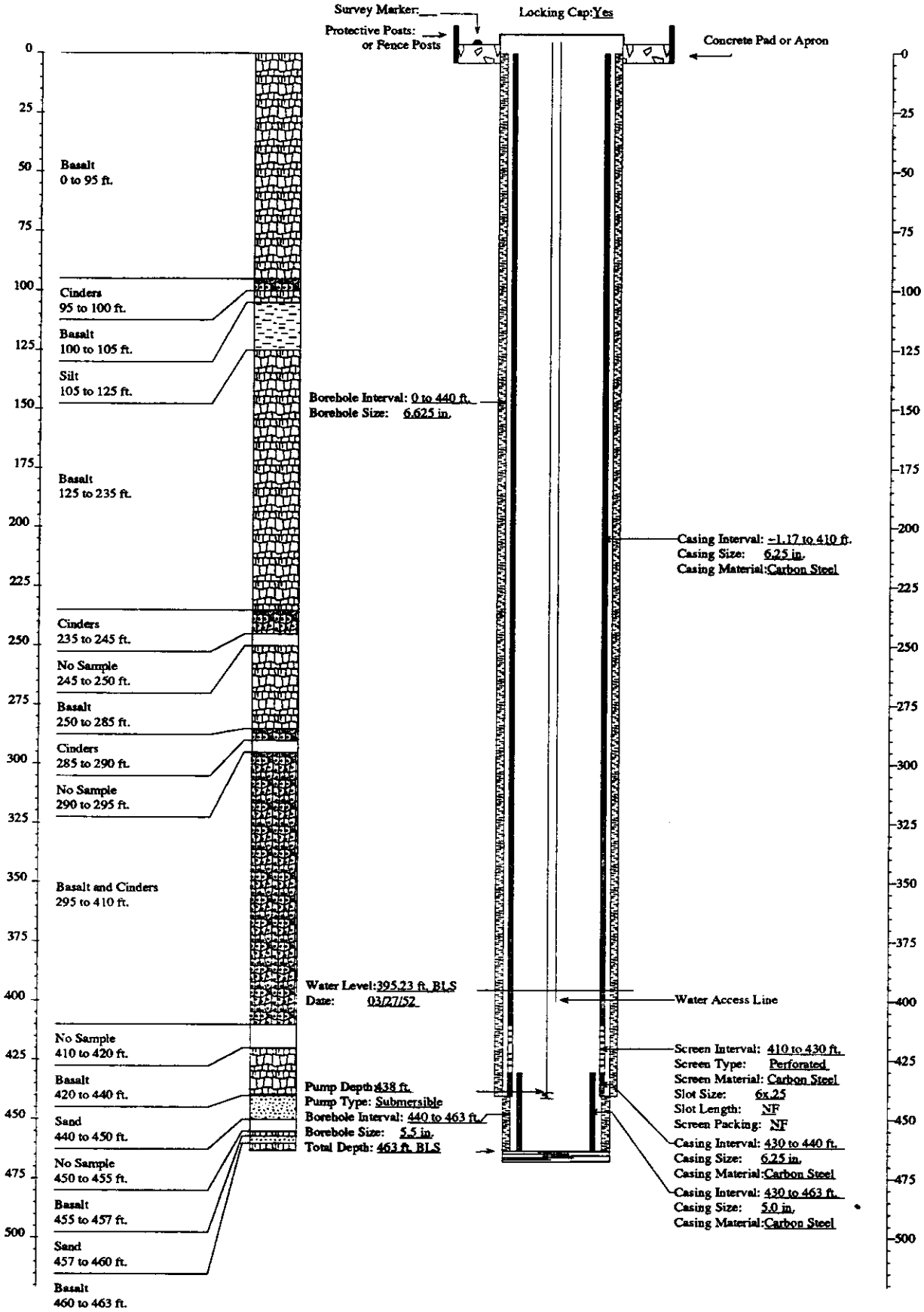
06/17/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1952
Total Depth: 463

Easting: 279624.41
Northing: 735538.72
Longitude: 1125959.00
Latitude: 434055.00
Completion Depth: 463

Driller: Cope
Geologist: M.D. and R.R.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4884.25

Water Level: 395.23
Water Level Date: 03/27/52
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL **Well Name/No.** USGS-028

A. WELL USE

1) Year well was drilled: 1953

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: None - well used exclusively for water level measurements.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 10 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 287	Welded	24	N.F.	N.F.
Carbon Steel (1)	5.6 I.D.	287 - 334	N.F.	N/A	N.F.	N.F.

(1) Casing perforated from 254 to 274 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	334 (casing-shoe set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, there is no documented seal in the well except at the bottom of the 5-inch casing. However, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A _) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface seal as required by state regulations. However, the well is located in the east-central region of the INEL site and is not close to any active or inactive INEL facilities or other potential sources of surface or subsurface contamination. Since the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. Also, the casing thicknesses and the 5-inch casing joint type were not documented, which are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-028

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	5	Clay
5	75	Basalt
75	80	Clay
80	210	Basalt
210	230	Silty Sandy Clay
230	275	Basalt
275	285	Sand
285	290	Basalt
290	310	Sand
310	334	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS-028

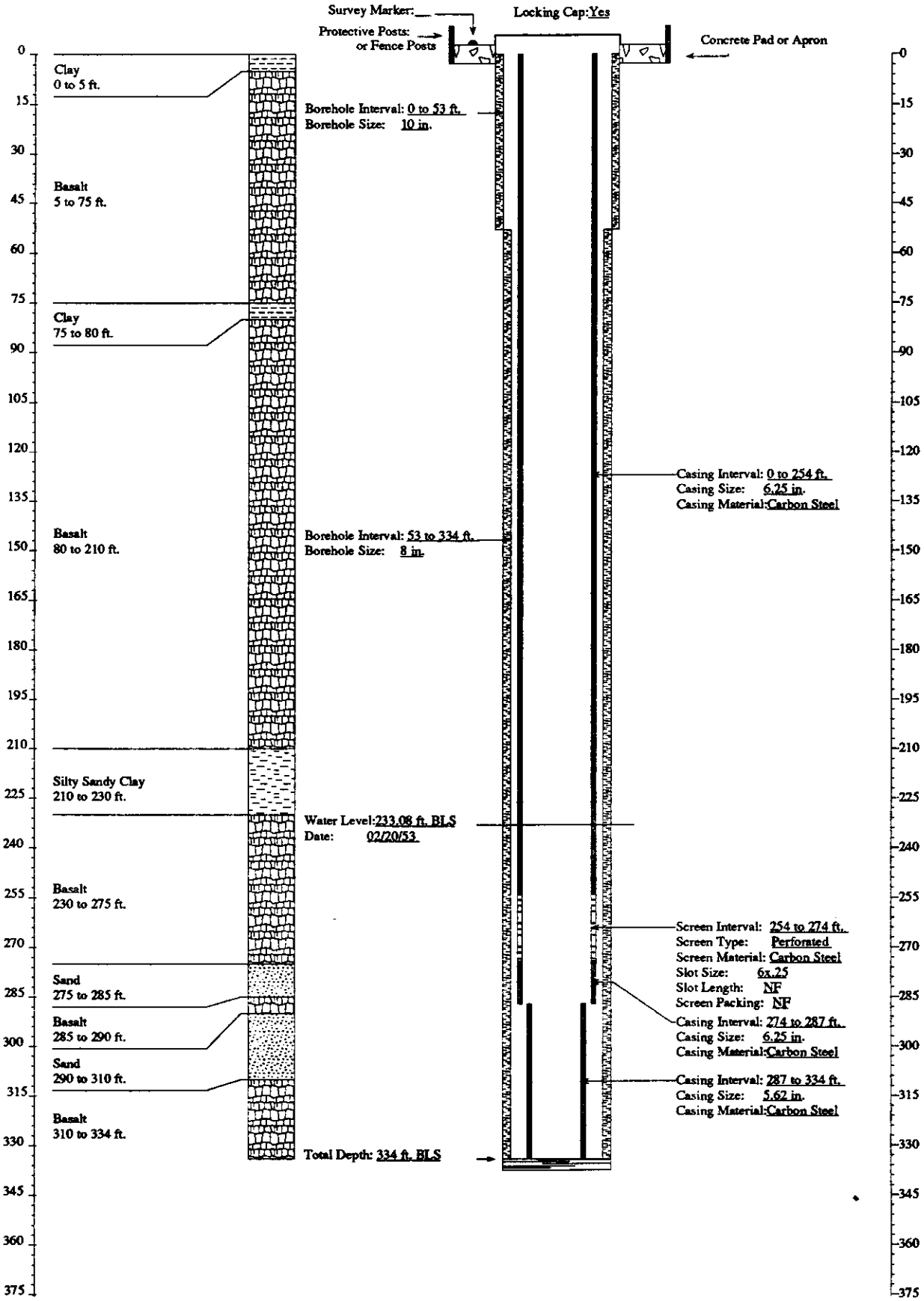
06/17/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1953
Total Depth: 334

Easting: 385454.68
Northing: 765613.24
Longitude: 1123601.00
Latitude: 434600.00
Completion Depth: 334

Driller: Strasser
Geologist: M. Deutsch
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4771.61

Water Level: 233.08
Water Level Date: 02/20/53
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL **Well Name/No.** USGS-029

A. WELL USE

1) Year well was drilled: 1953

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No X N/A _)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 8-inch Casing size 6.25-inch I.D.)
Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 328	Threaded	28	N.F.	N.F.
Carbon Steel (1)	5.62 I.D.	328 - 398	N.F.	N/A	N.F.	N.F.

(1) Casing perforated from 363 to 398 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, there is no documented seal. However, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located near the eastern boundary of the INEL site and is not in proximity to any facilities or other sources of surface or subsurface contamination. Since no evidence was found for perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. Also, the casing thicknesses and the joint type of the 5-inch casing were not documented, which are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-029

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	10	Clayey Silt
10	62	Basalt
62	67	No Sample
67	92	Basalt
92	96	Cinders
96	101	No Sample
101	115	Basalt and Cinders
115	120	No Sample
120	215	Basalt
215	220	No Sample
220	410	Basalt and Cinders
410	423	Sand
423	425.5	Basalt and Cinders

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS–029

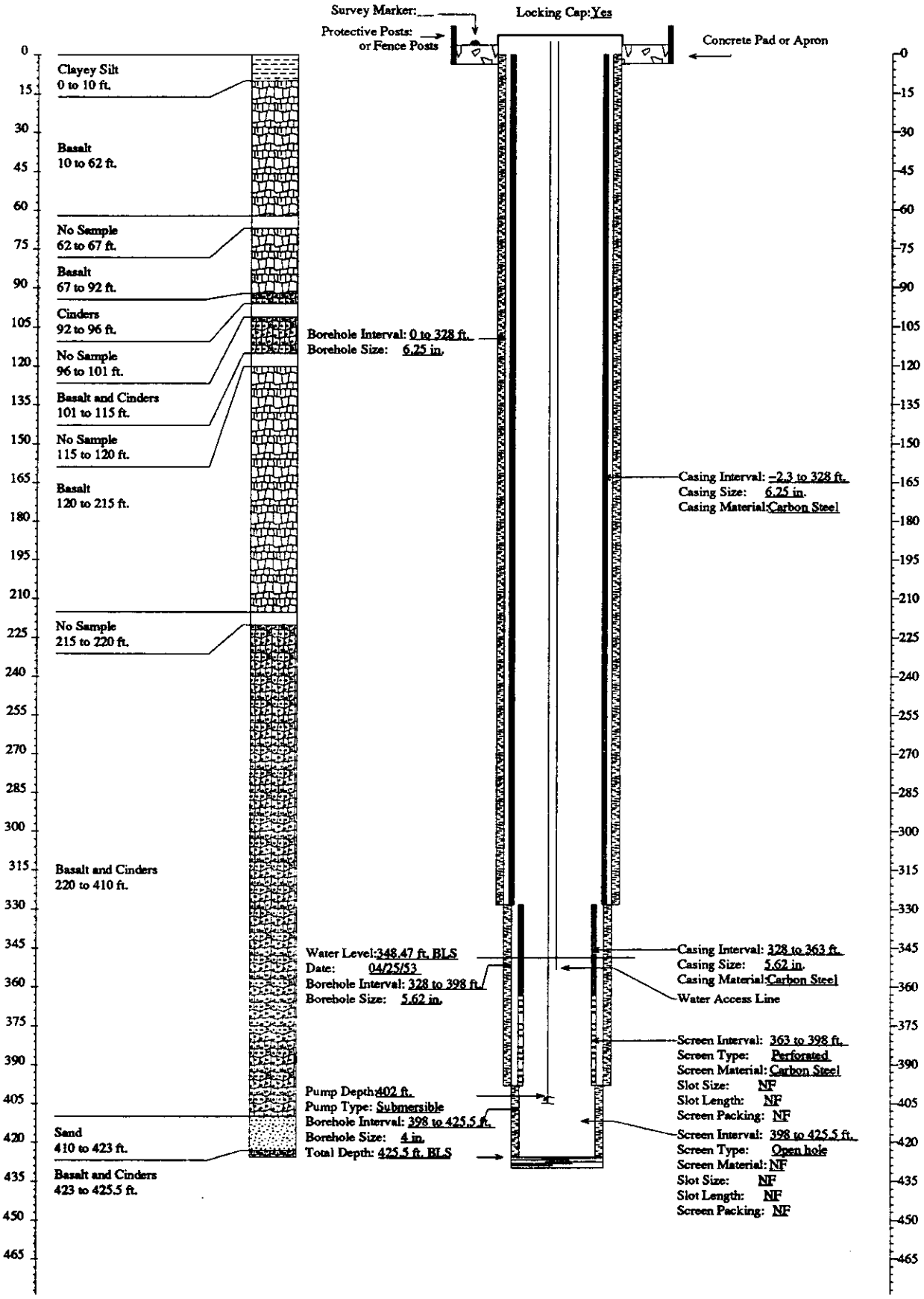
06/17/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1953
Total Depth: 425.5

Easting: 417037.90
Northing: 754029.21
Longitude: 1122851.00
Latitude: 434407.00
Completion Depth: 425.5

Driller: Strasser
Geologist: R.H.C.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4877.52

Water Level: 348.47
Water Level Date: 04/25/53
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-030A, 30B, 30C

A. WELL USE

1) Year well was drilled: 1953

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: N/A (The well can't be sampled.)

4) Water level monitored: (Yes X No _) The well contains 3 piezometers.

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 10-inch Casing size 8-inch I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-030A, 30B, 30C

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.000	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)(1)	8 I.D. or O.D.	0 - 357	Threaded	21.6	0.312	Yes
Carbon Steel (2)	2 I.D. or O.D.	0 - 300	Threaded	N.F.	N.F.	N.F.
Carbon Steel(3)	0.75 I.D. or O.D.	0 - 400	Threaded	N.F.	N.F.	N.F.
Carbon Steel(4) Carbon Steel Packer	1 I.D. or O.D. N.F.	0 - 725 540 - 543	Threaded N.F.	N.F. N/A	N.F. N/A	N.F. N/A

(1) Casing perforated 290 feet to 300 feet bls.
(2) Casing perforated 290 feet to 300 feet bls.
(3) Casing perforated 392.5 feet to 397.5 feet bls.
(4) Casing perforated 717.5 feet to 722.5 feet bls.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL PAGE 4 of 7 Well Name/No. USGS-030A, 30B, 30C

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
No Seal	0 - 326	N/A	N/A
Cement Grout	326 - 353	N.F.	Yes
Concrete ?	353 - 367	Sand/Gravel/Bentonite Grout	N.F.
Sand / Gravel	367 - 493	N.F.	N/A
Cement Grout	493 - 540	N.F.	Yes
Open Hole	543 - 750	N/A	N/A
Gravel	750 - 1006.5	N.F.	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located about 2 miles south of the Owsely irrigation canal and is not near any sources of recharge.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched water above the water table from the 1969 geophysical logs.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the 8-inch casing from the ground to 357 feet bls was not sealed. However, no surface or perched water occurs near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes X No _) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes X No _) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-030A, 30B, 30C

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: Although the well is sealed between its three piezometers, it does not have a surface seal around the 8-inch casing as required by state regulations. The well is located about 2 miles south of the Owsely irrigation canal and is not in proximity to any INEL facilities other potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration in the annulus is extremely low, a variance should be requested for the lack of this seal. Also, the casing thicknesses were not documented, which are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-030A, 30B, 30C

Source: Bureau of Reclamation Geophysical Log

****

Interval (feet below surface)

Begin	End	Description
0	5	Clay
5	10	Basalt
10	15	Ash
15	90	Basalt
90	93	Sandstone
93	97	Basalt
97	100	Sandstone
100	135	Basalt
135	145	Silt
145	150	Basalt
150	160	Silt
160	320	Basalt
320	347	Silt
347	402	Basalt
402	405	Sand
405	452.6	Gray Basalt
452.6	455.5	Clayey Silt
455.5	519.2	Gray Vesicular Basalt
519.2	551	Greenish-Black Vesicular Basalt
551	903	Gray Basalt
903	904.8	Clayey Silt

COMPILED BY/ORGANIZATION: T.L. Morgan / GAI Date February 3, 1993

GEOLOGIC LOG

Well Name USGS 030A, 30B, 30C

Source: Bureau of Reclamation Geophysical Log

****

Interval (feet below surface)

Begin	End	Description
904.8	966	Red-Purple Basalt
966	979	Gray Basalt
979	1001.5	Red-Purple Basalt

COMPILED BY/ORGANIZATION: T.L. Morgan / GAI Date February 3, 1993

WellName: USGS–030A, 30B, 30C

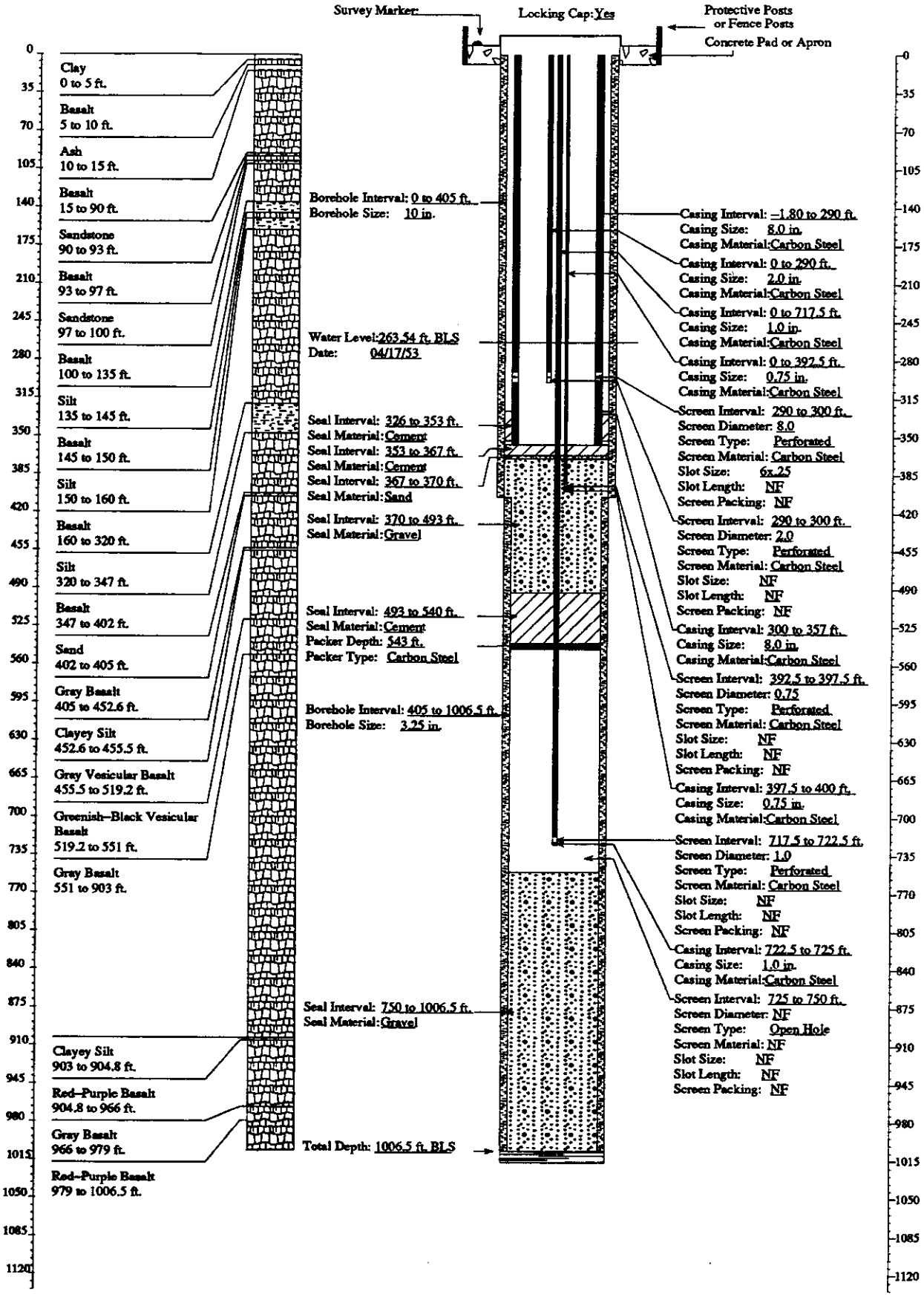
04/25/1994

Facility: MIDDLE
Well Type: Observation
Well Status: Active
Year Drilled: 1953
Total Depth: 1006.5

Easting: 403552.969
Northing: 765599.137
Longitude: 1123154.36482
Latitude: 434600.72256
Completion Depth: 1006.5

Driller: Strasser
Geologist: G.S.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4794.839

Water Level: 263.54
Water Level Date: 04/17/53
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL **Well Name/No. USGS-031**

A. WELL USE

1) Year well was drilled: 1953

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 10.25 inch Casing size 8.0 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	8 I.D.	0 - 306	Threaded	12	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	305 - 306 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water or other sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation(Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well has no documented annular seal except at the bottom of the casing. However, no surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The casing does not have a surface seal as required by state regulations. However, the well is located in the east-central region of the INEL site and is not in proximity to any facilities or other sources of surface or subsurface contamination. Since no evidence was found for perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. Also, the casing thickness was not documented, which is a minor deficiency.

Remediation: None

 GEOLOGIC LOG Well Name USGS-031

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	18	Silt
18	58	Basalt
58	65	Cinders
65	80	Basalt
80	95	Clay
95	162	Basalt
162	170	Clay
170	180	Basalt
180	185	Cinders
185	245	Basalt
245	252	Cinders
252	255	Clay
255	262	Basalt and Cinders
262	264	Clay
264	280	Basalt
280	290	Cinders
290	428	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS-031

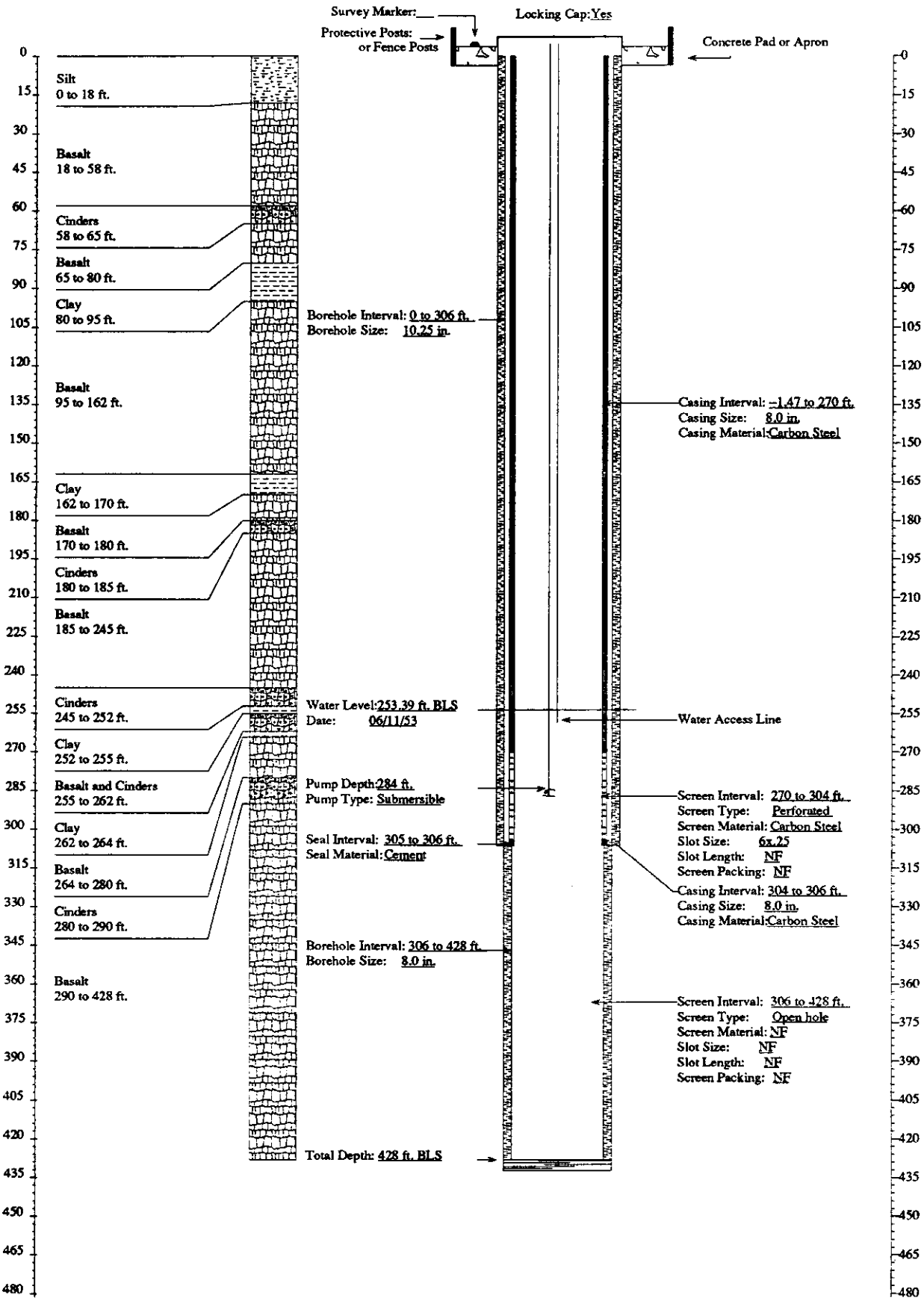
07/27/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1953
Total Depth: 428

Easting: 392805.53
Northing: 768208.58
Longitude: 1123421.00
Latitude: 434625.00
Completion Depth: 428

Driller: Strasser
Geologist: M. Deutsch
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4886.19

Water Level: 253.39
Water Level Date: 06/11/53
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL **Well Name/No.** USGS-032

A. WELL USE

1) Year well was drilled: 1953

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 10 inch Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (1)	6.25	0 - 324	Threaded	12	N.F.	N.F.

(1) Casing perforated from 308 to 324 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water or other sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The casing does not have a surface seal as required by state regulations. However, the well is located in the east-central region of the INEL site and is not in proximity to any facilities or other sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. Also, the casing thickness was not documented, which is a minor deficiency.

Remediation: None

 GEOLOGIC LOG Well Name USGS-032

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	5	Sand
5	10	Silt
10	27	Basalt
27	33	Cinders
33	40	Basalt
40	50	Cinders
50	57	Basalt
57	65	Cinders
65	75	Basalt
75	80	Cinders
80	135	Basalt
135	156	Cinders
156	172	Clay
172	224	Basalt
224	236	Cinders
236	375	Basalt
375	380	Clay
380	385	Basalt
385	392	Clay

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS–032

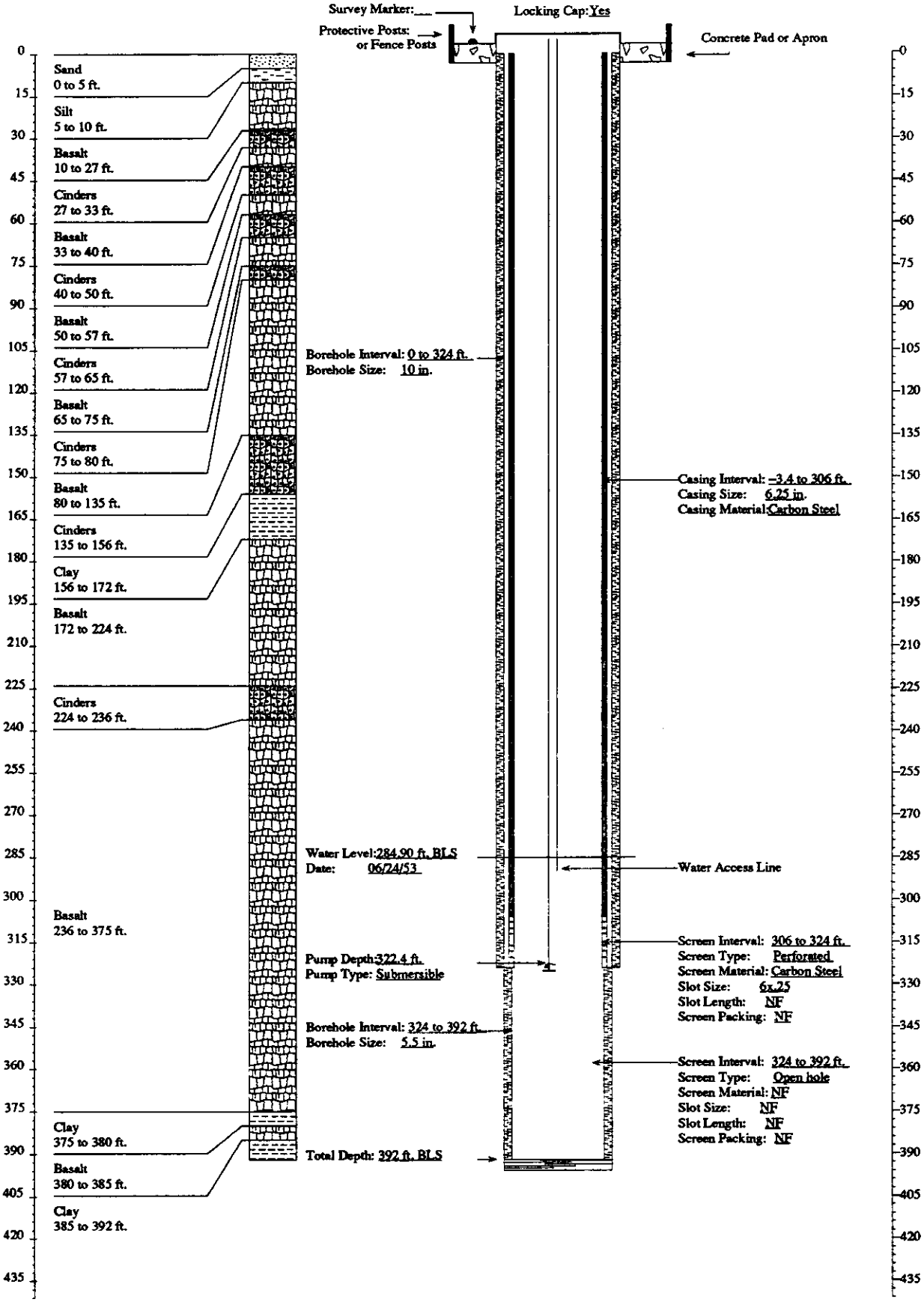
06/17/1993

Facility: MIDDLE
Well Type: Observation Well
Well Status: Active
Year Drilled: 1953
Total Depth: 392

Easting: 401563.57
Northing: 757839.63
Longitude: 1123221.00
Latitude: 434444.00
Completion Depth: 392

Driller: Strasser
Geologist: R.E.R.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4812.38

Water Level: 284.90
Water Level Date: 06/24/53
Water Level Access: Line



CHECKLIST FOR ABANDONED/DESTROYED WELLS AND BORINGS

Location MIDDLE INEL Well Name/No. USGS-033

A. Sources for Well Abandonment

1) What sources indicated that the well was plugged or destroyed:
(X) Comprehensive Well Survey status: Destroyed
( ) INEL Well Catalog (field survey by K. Beard) _
( ) Personal communication _
( ) Other _

2) Was the well located by field inspection and documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380)
( ) Well was located by field inspection.
(X) Well was not located by field inspection.

B. Abandonment Procedures

1) How was the well abandoned or destroyed:
( ) Backfilled
( ) Buried
( ) Grouted
(X) Other
The well was used as a seismic shot hole which destroyed it.
( ) Not documented

2) List procedure and amounts of material used to abandon the well: N/A

C. Well Casing

1) Does the well contain surface or other well casing:
Yes X No _ Not Documented _
Explanation: The well contains a 6-inch steel casing 0 - 408 ft. and may contain a 12 inch casing 0 - 11 feet bls.

2) Was the annular space between the casing and borehole grouted:
Yes _ No _ Not Documented X N/A _

D. Compliance with State Regulations

State of Idaho Reg.3.12.1. Permanently abandoned wells may have the casing removed or left in place and shall be filled with bentonite grout, cement grout, concrete, puddling clay, or other material as required to stop the upward or downward movement of water and prevent the waste and/or contamination of the ground water.

1) Total depth of borehole 516 ft. Top of basalt 10 ft.

CHECKLIST FOR ABANDONED/DESTROYED WELLS AND BORINGS

Location MIDDLE INEL Well Name/No. USGS-033

2) Was the well properly abandoned in accordance with Idaho State regulations:
Yes _ No X Not Documented _
Explanation: The well was used as a seismic shot hole and was destroyed.

3) Are additional abandonment procedures necessary:
Yes _ No _ Not Certain X
Explanation: Although the well was not abandoned according to state guidelines, additional abandonment procedures probably are not possible.

 GEOLOGIC LOG Well Name USGS-033

Source: USGS Generalized Lithologic Log and Driller's Log

****

Interval (feet below surface)

Begin	End	Description
0	10	Sandy Silt and Clay
10	40	Basalt
40	64	Cinders
64	68	Basalt
68	85	Cinders
85	140	Black to Red-Brown Basalt
140	155	Gray Basalt
155	180	Red-Brown Basalt
180	217	Cinders
217	220	Sandy Silt and Clay
220	230	Black Basalt
230	235	Gray Basalt
235	263	Black to Red-Brown Basalt
263	283	Gray Basalt
283	295	Cinders
295	308	Brown Basalt
308	340	Gray Basalt
340	345	Brown Basalt
345	350	Gray Basalt

COMPILED BY/ORGANIZATION: T.J. Clement / GAI Date September 30, 1992

GEOLOGIC LOG

Well Name USGS-033

Source: USGS Generalized Lithologic Log and Driller's Log

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Interval (feet below surface)

Begin	End	Description
350	365	Brown to Red Basalt
365	375	Cinders
375	415	Red to Brown Basalt (Water at 377 feet)
415	435	Gray Basalt (Dry)
435	443	Brown Basalt (Water at 439 feet)
443	460	Silty Sand
460	465	Sand and Basalt
465	470	Red and Black Basalt
470	475	Sand and Basalt
475	495	Silty Sand (Water at 492 feet)
495	500	No Sample
500	510	Brown Basalt
510	516	Gray Basalt (Dry)

COMPILED BY/ORGANIZATION: T.J. Clement / GAI Date September 30, 1992

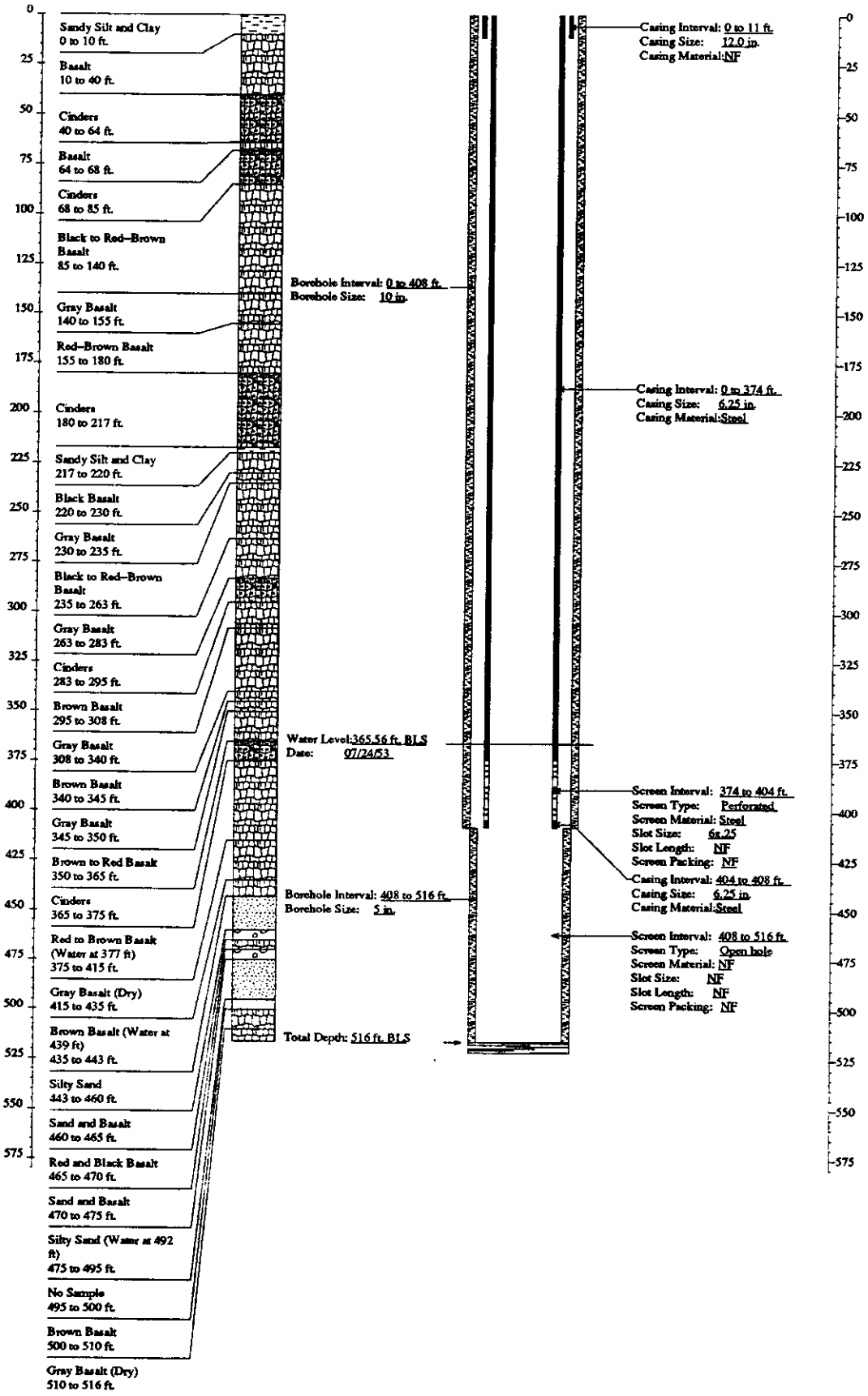
WellName: USGS-033 **Correction: Well destroyed when used as seismic shothole.** 06/17/1993

Facility: MIDDLE
Well Type: NA
Well Status: Destroyed
Year Drilled: 1953
Total Depth: 516

Easting: 400935.13
Northing: 748729.75
Longitude: 1123229.00
Latitude: 434314.00
Completion Depth: 516

Driller: Strasser
Geologist: Richard F. Ragsdale
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4885.1

Water Level: 365.56
Water Level Date: 07/24/53
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL **Well Name/No. USGS-098**

A. WELL USE

1) Year well was drilled: 1973

2) Current use for well:
(X)DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
(X)CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation (NRF Study) - ^3H, Cl^-, Na^+, Ag, Fe, Cr, Ni, Pb, Na, Hg, TOC, Cl, SO_4, F, Br, NH_4(N), NO_2(dissolved.), NO_2 + NO_3 (N), Orthophosphorous, Gross Alpha and Gross Beta

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: NRF Groundwater Monitoring Program (Informal - new plan being developed)

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1, RCRA & CERCLA - WEC (WAG 8) / Rick Nieslanik

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)

4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size 10 inch Casing size 8 inch (I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	8 (I.D. or O.D.?)	0 - 162	N.F.	4	N.F.	N.F.
Carbon Steel	6 (I.D. or O.D.?)	0 - 407	N.F.	22	N.F.	N.F.
Carbon Steel (1)	4 (I.D. or O.D.?)	401 - 505	Threaded	N/A	0.250	Yes

(1) Casing perforated from 401 to 421 and 463 to 505 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	162 (bottom of 8-inch casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water is located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented seal except at the bottom of the 8-inch casing. However, no surface water or perched groundwater exists near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Drilling Method Air Rotary

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No X)

Material

Casing Carbon steel

Screen Perforated carbon steel (401 - 421 feet bls and 463 - 505 feet bls)

Pump Submersible

Discharge Pipe 1.5-inch galvanized steel

Measuring Line 1-inch

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between the metals concentrations from wells constructed of carbon steel and stainless steel at the RWMC. Although galvanized steel may corrode under acidic conditions, the groundwater is not acidic at the INEL. The measuring pipe is constructed of 1-inch PVC which is not preferred in compliance/detection monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _)Explanation The water table occurs about 5 feet above the monitoring interval; therefore, the well monitors dissolved constituents and may also monitor "floaters".

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval(s) 401-421 feet bls and 463-505 feet bls Explanation Since the casing is perforated in two basalt zones which are separated by a 20-foot thick silty clay bed, the well monitors an interval of at least 60 feet, which is excessive and not discrete.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A X) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration The well was bailed but no information was found regarding the purge volume.

9) Is the pump intake location documented: (Yes X No _) Depth 423 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-WM-9787, EGG-ER-8496, Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, DOE 5400.1, RCRA & CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have an annular seal except at the bottom of the 8-inch casing, which does not comply with state regulations. However, the well is located over 2 miles southwest of NRF and is not in proximity to any potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. Also, the thickness and joint type of the 6 and 8-inch casings were not documented, which are minor deficiencies. Although the 8-inch casing extends 4 inches above ground instead of the required 12 inches, it is sealed at the surface by a large concrete pad.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: DOE 5400.1, RCRA & CERCLA/RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated above. The well does not comply with RCRA guidelines for the following reasons: (1) the casings above the monitored zone are not sealed in the borehole, which may affect the validity of the groundwater samples and (2) the monitored interval probably is not appropriate for compliance or detection use. The casing is perforated in two zones that are separated by a 20-foot thick silty clay bed. The well either monitors an 100-foot zone, which is considered excessive for RCRA use, or allows the mixing of water from two distinct zones. Although the decontamination procedures, the use of drilling fluids and the well development were not fully documented, these are minor deficiencies.

Remediation: Sealing the lower perforations or setting a packer between the two perforated zones would shorten the monitored zone. The lack of a casing seal above the monitored zone would still have to be addressed.

 GEOLOGIC LOG Well Name USGS-098

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	10	Sandy Silt and Broken Basalt
10	115	Basalt
115	160	Sandy Silt
160	225	Basalt
225	250	Basalt with Cinders and Sand
250	375	Basalt
375	380	Basalt with Sand Infilling
380	430	Basalt
430	450	Silty Clay
450	470	Basalt
470	500	Basalt with Silt Infilling

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-098

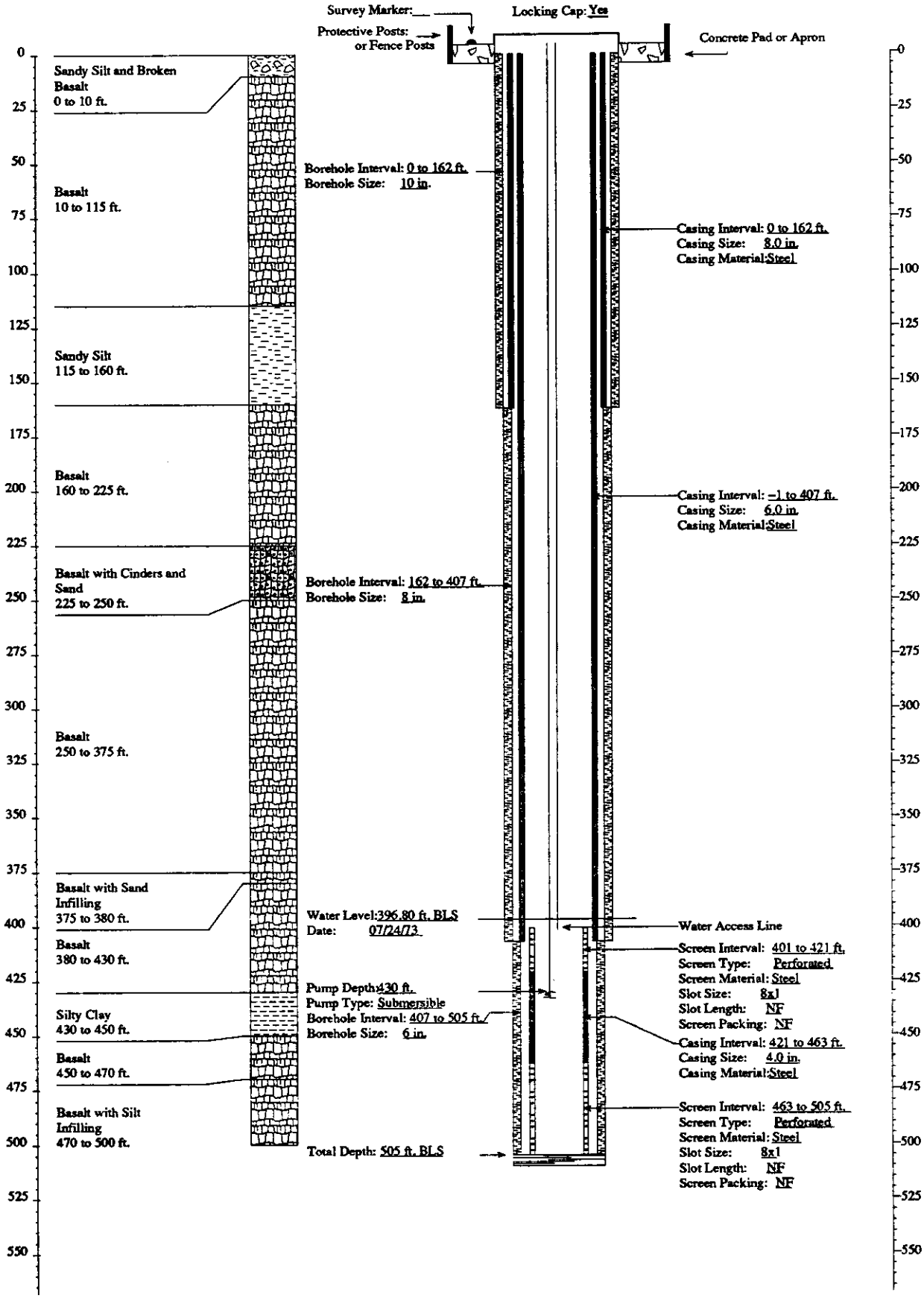
06/18/1993

Facility: MIDDLE
Well Type: Monitoring Well
Well Status: Active
Year Drilled: 1973
Total Depth: 505

Easting: 294316.03
Northing: 711296.68
Longitude: 1125636.00
Latitude: 433657.00
Completion Depth: 505

Driller: Andrew
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4883.4

Water Level: 396.80
Water Level Date: 07/24/73
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

A. WELL USE

1) Year well was drilled: 1974

2) Current use for well:
(X)DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
(X)CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation (NRF Study) - ^{3}H, Cl^{-}, Cr, Na^{+}, Ag, Fe, Ni, Pb, Na, Hg, TOC, Cl^{-}, SO_4^{-2}, F, Br, NH_4 (N), NO_2 (dissolved), NO_2 + NO_3 (N), Orthophosphorous, Gross Alpha and Gross Beta

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: NRF Groundwater Monitoring Program (Informal - new plan is being developed)

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1, RCRA & CERCLA - WEC (WAG 8) / Rick Nieslanik

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 10-inch Casing size 8-inch (I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the

auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel (surface casing)	8 (I.D. or O.D.?)	0 - 33	N.F.	0	0.25	Yes
Steel	6 (I.D. or O.D.?)	0 - 344.5	N.F.	19	0.25	Yes
Steel (1)	4 (I.D. or O.D.?)	303 - 449	Threaded	N/A	0.25	Yes

(1) Casing perforated from ~340 to 449 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	33 feet (bottom of 8-inch casing set in cement)	N.F.	Yes
Cement	344.5 feet (bottom of 6-inch casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located almost 2 miles south of NRF and more than 1 mile west of the Big Lost River.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented annular seal except at the bottom of the 6 and 8-inch casings. However, no evidence was found of perched groundwater near the well and no surface water is located in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Drilling Method Air Rotary

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No X)

	Material
Casing	Carbon steel
Screen	Perforated carbon steel (340-449 ft bls) and open hole (449-450 ft bls)
Pump	Submersible
Discharge Pipe	1.5-inch galvanized steel
Measuring Line	1-inch PVC

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between the metals concentrations from wells constructed of carbon steel and stainless steel at the RWMC. Although galvanized steel may corrode under acidic conditions, the groundwater is not acidic at the INEL. The measuring pipe is constructed of 1-inch PVC which is not preferred in compliance/detection monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The water table occurs within the monitoring interval; therefore, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes X No _)
Monitoring interval(s) about 385 feet bls (water table) to 450 feet bls
Explanation The well monitors a zone of about 65 feet, which is excessive and includes both cinders and basalt.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A X) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X Well development type and duration Compressed air was used as a method of development, but the results were not documented.

9) Is the pump intake location documented: (Yes X No _) Depth 423 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-WM-9787, EGG-ER-8496, Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, DOE 5400.1, RCRA & CERCLA/ State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have an annular seal except at the bottom of the 6 and 8-inch casings, which does not comply with state regulations. However, it is located almost 2 miles south of NRF and is over 1 mile from both the Big Lost River and the Experimental Field Station. Since no evidence was found of perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of this seal. Also, the 6 and 8-inch casing joint types were not documented, which are minor deficiencies. Although the 8-inch casing has no stick-up, it is sealed at the surface by a concrete pad.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: DOE 5400.1, RCRA & CERCLA/RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated in Section F. The well does not comply with RCRA guidelines for the following reasons: (2) the casings are not sealed in the borehole above the monitored zone, which may affect the validity of the groundwater samples and (2) the monitoring interval of about 65 feet is considered excessive for compliance/detection use and may result in the dilution of contaminant concentrations. In addition, the monitored interval crosses zones of variable permeability and includes a sedimentary interbed at the bottom of the well. Although the decontamination procedures, the use of drilling fluids and the well development were not documented, these are minor deficiencies.

Remediation: Although the bottom of the well could be sealed to make the well more acceptable for RCRA use, this may not be desirable if the USGS has historical groundwater sampling records for the well.

 GEOLOGIC LOG Well Name USGS-099

Source: Well Driller's Log

****

Interval (feet below surface)

Begin	End	Description
0	15	Sand and Gravel
15	34	Clay and Gravel
34	97	Gray Basalt
97	107	Brown Sand
107	115	Gray Basalt
115	120	Broken Basalt and Sand
120	131	Gray Basalt
131	146	Broken Brown Basalt
146	163	Brown Basalt
163	170	Broken Brown Basalt
170	218	Brown Basalt
218	232	Cinders
232	246	Broken Basalt
246	326	Basalt
326	334	Cinders
334	340	Broken Basalt
340	380	Basalt
380	388	Cinders
388	426	Hard Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

GEOLOGIC LOG

Well Name USGS-099

Source: Well Driller's Log

****

Interval (feet below surface)

Begin	End	Description
426	434	Cinders
434	436	Basalt
436	445	Cinders
445	450	Sediment

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-099

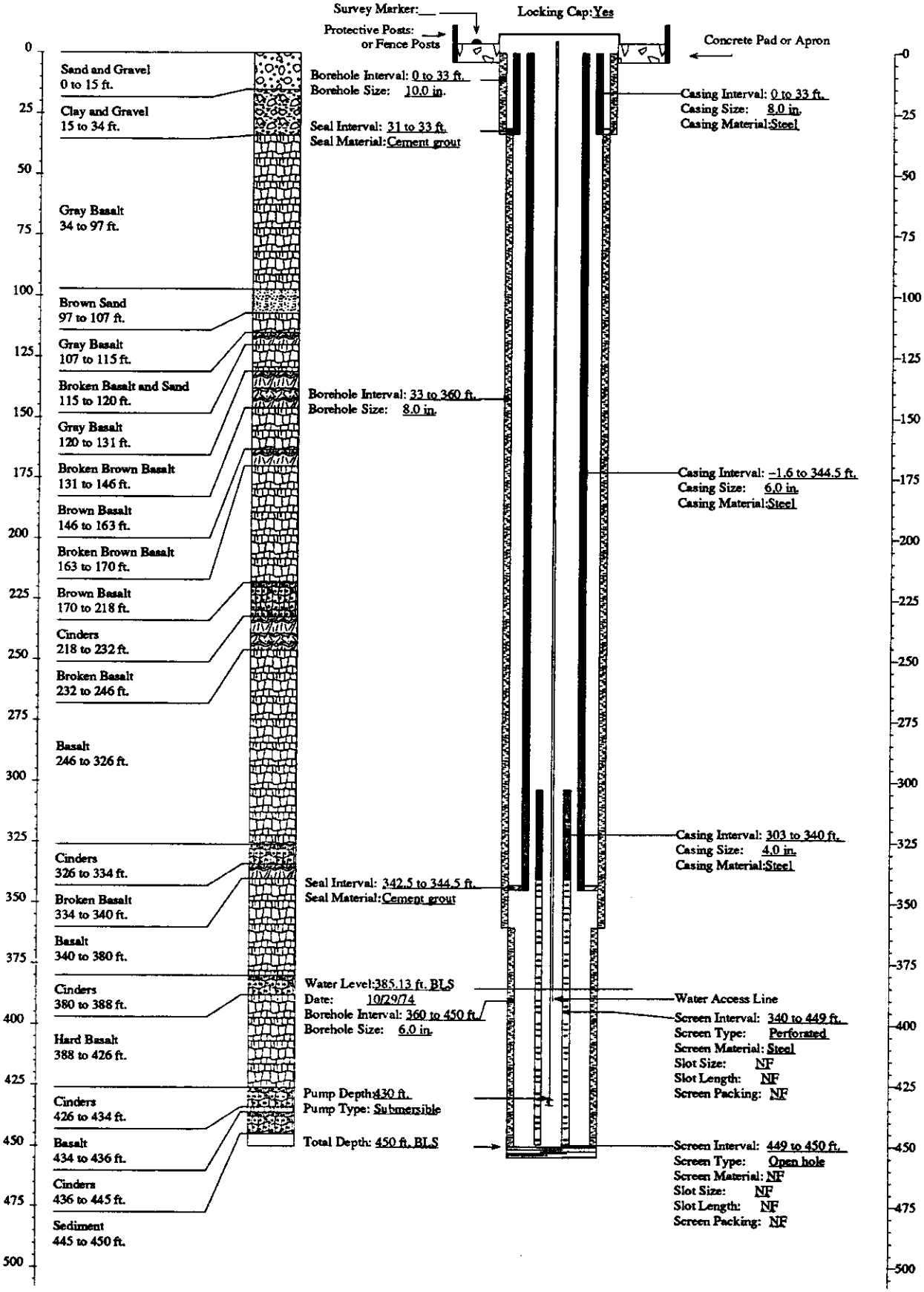
03/01/1994

Facility: MIDDLE
Well Type: Monitoring
Well Status: Active
Year Drilled: 1974
Total Depth: 450

Easting: 455778.606
Northing: 711905.193
Longitude: 1125524.1676
Latitude: 433703.40379
Completion Depth: 450

Driller: Andrew
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4875.93

Water Level: 385.13
Water Level Date: 10/29/74
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. WATER SUPPLY FOR INEL 1

A. WELL USE

1) Year well was drilled: 1979

2) Current use for well:
(X)DOE 5400.1 Monitoring
(X)RCRA Monitoring (X)USGS Observation
(X)CERCLA Characterization ( )No Documented Use
(X)Other: Formerly used as a water supply well.

3) Constituents monitored currently: USGS Observation (NRF Study) - Ag, ^3H, Fe, Cr, Ni, Pb, Na, Hg, TOC, Cl, SO_4, F, Br, NH_4 (N), NO_2(dissolved), NO_2+NO_3 (N), orthophosphorous, Gross Alpha, Gross Beta

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: NRF Groundwater Monitoring Program (Informal - new plan is being developed)

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1, RCRA & CERCLA - WEC (WAG 8) / Rick Nieslanik

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 14-inch Casing size 12-inch (I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual size most likely is larger than the one specified.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel (surface casing)	12 I.D. or O.D.?	0 - 28	N.F.	0	0.25	Yes
Steel	10 I.D. or O.D.?	0 - 314	N.F.	0	0.25	Yes
Steel	8 I.D. or O.D.?	0 - 340	N.F.	22	0.25	Yes
Steel [1]	6 I.D. or O.D.?	0 - 507	N.F.	N.F.	0.25	Yes

[1] Casing perforated from 340 to 497 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	N.F. - 28	N.F.	Yes
Steel Deflector	594 - 595	N/A	N/A
Cement Grout	595 - 710	N.F.	Yes
3-curie Logging Source	710	Lost in Well	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located between NRF and TRA. No sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence of perched groundwater was apparent from the neutron or gamma-gamma log.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the surface casing is grouted at 28 feet bls, but the top of the seal is not specified. Although no other annular seal is documented, no evidence was found of surface or perched water near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Drilling Method Air rotary

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Carbon steel
Screen	Perforated carbon steel (340-497 ft.bls) / open hole (507-595 ft.bls)
Pump	Grundfos submersible
Discharge Pipe	1.5-inch galvanized steel
Measuring Pipe	1-inch PVC

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between the metals concentrations from wells constructed of carbon steel and stainless steel at the RWMC. Although galvanized steel may corrode under acidic conditions, the groundwater is not acidic at the INEL. The PVC measuring pipe is not preferred for compliance/detection monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type 0.25 x 12-inch perforations

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The water table occurs within the sampling interval; therefore, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No _ Uncertain X) Monitoring interval(s) About 395 feet bls (water table) to 497 feet bls and 507 to 595 feet bls) Explanation The well is open to the formation in two zones, one 102 feet long and the other 88 feet long. Since the well is not sealed between them, it probably monitors an interval of about 255 feet, which is excessive. Also, no documentation was found for the lithology.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes X Not _ Uncertain/Not Documented _) Well development type and duration _) Although the results of the development were not documented, the well was used for production during the drilling of the deep INEL 1 well.

9) Is the pump intake location documented: (Yes X No _) Depth 423 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Grundfos submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-WM-9787, EGG-ER-8496, Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation; DOE 5400.1, RCRA, & CERCLA/Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: A 3-curie logging source was lost in the well at 710 feet. A steel deflector and 115 feet of cement were placed above the source. Whether this procedure complies with state regulations was not ascertained. The well also may not contain a surface seal as required by state regulations. Since the well is located about 1.5 miles from NRF and TRA and is not in proximity to any potential sources of surface or subsurface contamination, a variance should be requested for this seal. Also, the casing joint types and the 6-inch casing stick-up were not documented, which are minor deficiencies. Although the 10 and 12-inch casings have no stick-up, the casings are sealed at the ground surface by a concrete apron.

Remediation: None

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: MIDDLE INEL Well Name/No. WATER SUPPLY FOR INEL 1

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: DOE 5400.1, RCRA & CERCLA/RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated in Section F. The well does not comply with RCRA guidelines for the following reasons: (1) A 3-curie logging source is cemented in the bottom of the well. (2) The well is open to the formation in two intervals. Since the well is unsealed between them, it probably monitors an interval of about 255 feet. This is excessive for compliance/detection use and may result in the dilution of contaminant concentrations and (3) The casing is unsealed above the monitored zones, which affects the validity of the water samples. Also, no documentation was found for the lithology of the monitored zones. Although the decontamination procedures, use of drilling fluids and the well development were not documented, these are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Page 1 of 1 Well Name WATER SUPPLY FOR INEL 1

Source: There is no geologic log in the CWS file.

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Interval (feet below surface)

Begin	End	Description

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 25, 1992

WellName: WATER SUPPLY FOR INEL 1 Correction: Set seal top = 0 (0-28 ft.), original NF

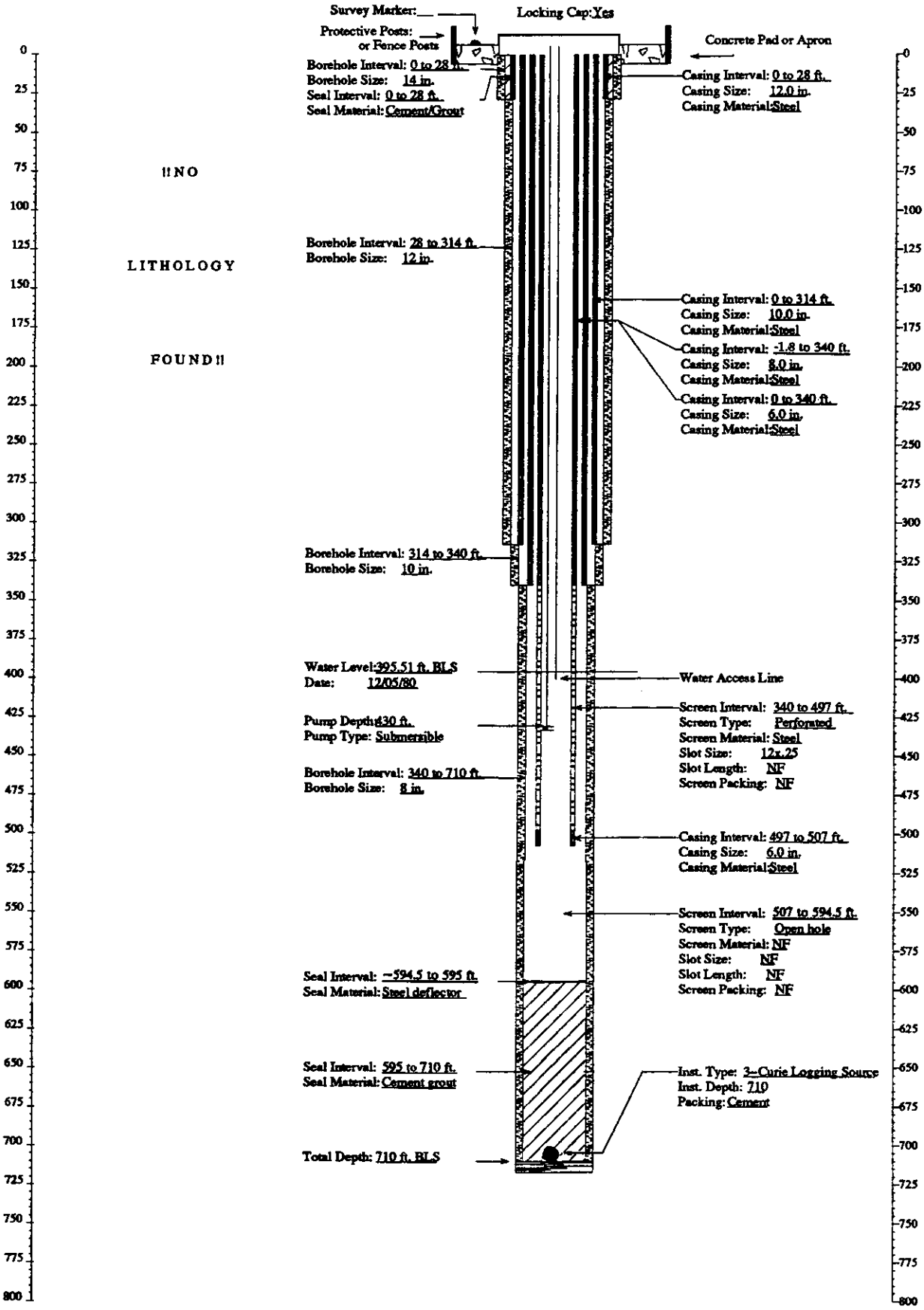
09/12/1993

Facility: MIDDLE
Well Type: Monitoring Well
Well Status: Active
Year Drilled: 1979
Total Depth: 710

Easting: 294334.02
Northing: 713220.41
Longitude: 1125636.00
Latitude: 433716.00
Completion Depth: ~594.5

Driller: Gailey
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4878.43

Water Level: 395.51
Water Level Date: 12/05/80
Water Level Access: Line



INEL–North

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: NORTH INEL **Well Name/No.** USGS-027

A. WELL USE

1) Year well was drilled: 1952

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+, NO_3^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _) _

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (1)	6.25 O.D.	0 - 312	N.F.	24	N.F.	N.F.

(1) Casing perforated from 250 to 260 and 298 to 308 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	312 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, there is no documented seal in the well except at the bottom of the casing. However, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface seal as required by state regulations. However, the well is located about a 1 mile north of the Owsley irrigation canal in the east-central region of the INEL site. Since the well is not in proximity to any potential sources of surface or subsurface contamination, a variance should be requested for the lack of a surface seal. Although the well is completed in the Snake River Plain aquifer and the casing is unsealed except at the bottom, no evidence was found of perched water near the well. (Perched water would have to be sealed out if it were of a lower quality according to the regulations). Also, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-027

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	11	Silt
11	55	Sand
55	100	Silt
100	115	Sand
115	137	Silt
137	167	Basalt
167	172	Silt
172	231	Basalt
231	235	Silt
235	312	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS–027

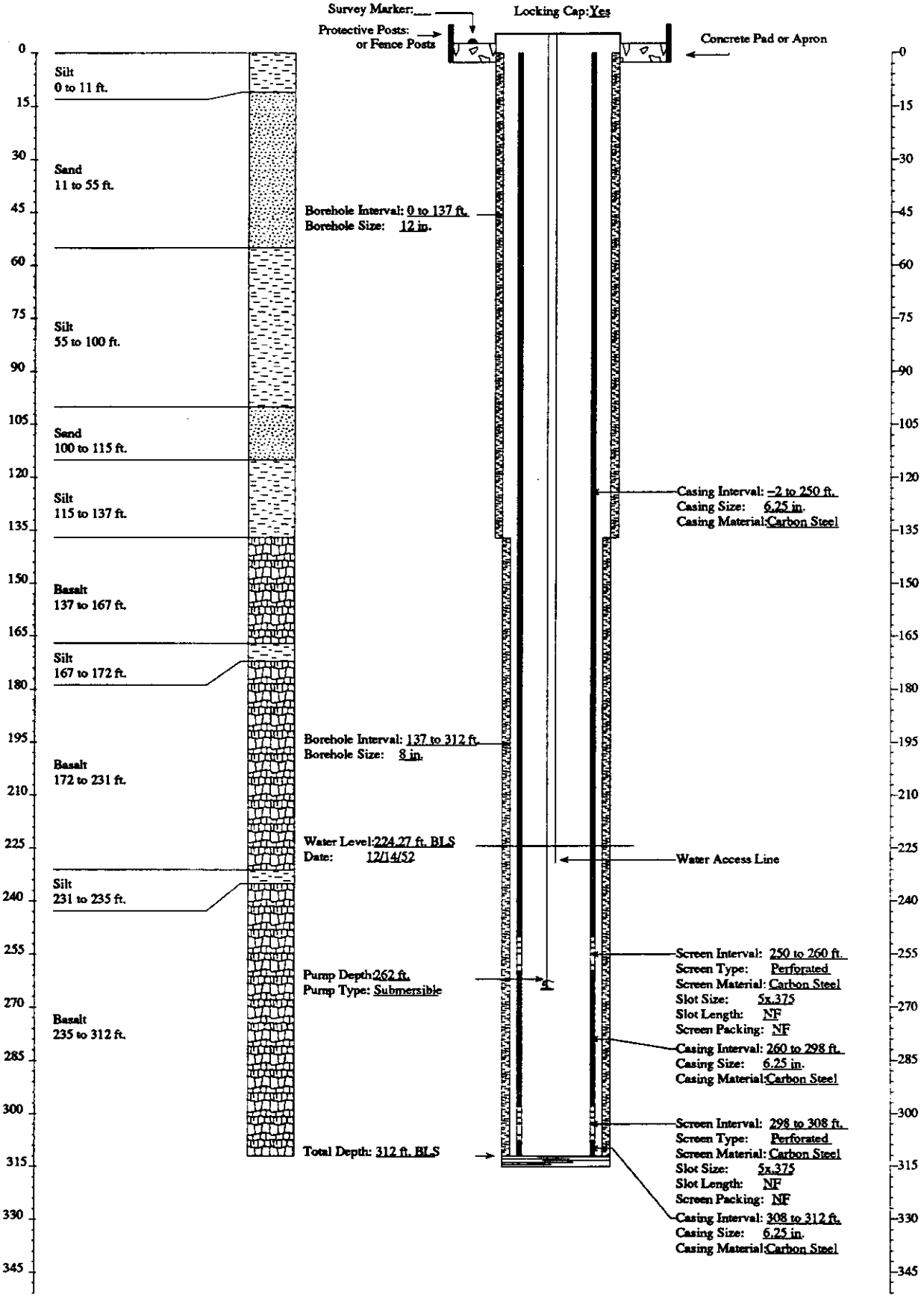
06/17/1993

Facility: NORTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1952
Total Depth: 312

Easting: 401896.03
Northing: 782847.66
Longitude: 1123218
Latitude: 434851
Completion Depth: 312

Driller: Strasser
Geologist: P. T. Voegeli
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4784.32

Water Level: 224.27
Water Level Date: 12/14/52
Water Level Access: Line



INEL–North

INEL–North

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: NORTH INEL **Well Name/No.** USGS-027

A. WELL USE

1) Year well was drilled: 1952

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+, NO_3^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _) _

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 12 inch Casing size 6.25 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (1)	6.25 O.D.	0 - 312	N.F.	24	N.F.	N.F.

(1) Casing perforated from 250 to 260 and 298 to 308 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	312 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, there is no documented seal in the well except at the bottom of the casing. However, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface seal as required by state regulations. However, the well is located about a 1 mile north of the Owsley irrigation canal in the east-central region of the INEL site. Since the well is not in proximity to any potential sources of surface or subsurface contamination, a variance should be requested for the lack of a surface seal. Although the well is completed in the Snake River Plain aquifer and the casing is unsealed except at the bottom, no evidence was found of perched water near the well. (Perched water would have to be sealed out if it were of a lower quality according to the regulations). Also, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well Name USGS-027

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	11	Silt
11	55	Sand
55	100	Silt
100	115	Sand
115	137	Silt
137	167	Basalt
167	172	Silt
172	231	Basalt
231	235	Silt
235	312	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS-027

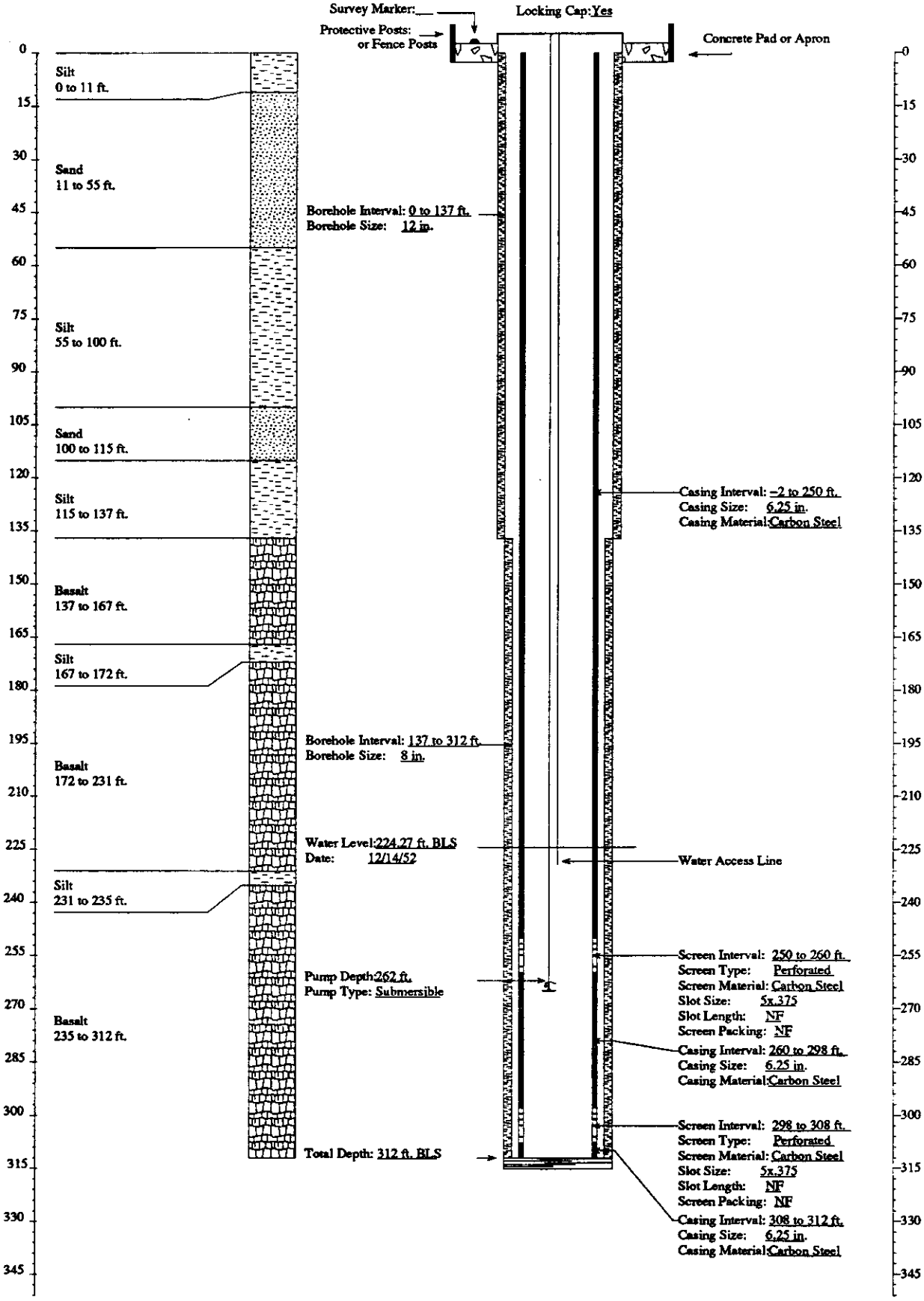
06/17/1993

Facility: NORTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1952
Total Depth: 312

Easting: 401896.03
Northing: 782847.66
Longitude: 1123218
Latitude: 434851
Completion Depth: 312

Driller: Strasser
Geologist: P. T. Voegeli
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4784.32

Water Level: 224.27
Water Level Date: 12/14/52
Water Level Access: Line



INEL–South

FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: Badging Facility (Main Gate) | PAGE 1 of 8 | Well Name/No. BADGING FACILITY WELL

A. WELL USE

1) Year well was drilled: 1985

2) Current use for well:
(X) Potable water production well
( ) Raw water production well

3) Well is: (X) Active ( ) Inactive

4) Program Plan: EG&G Drinking Water Monitoring Program

5) Responsible Organization/Contact Person: EG&G, Brad Andersen

6) Has a sanitary survey been performed on the drinking water system by the Idaho Department of Health and Welfare: (Yes X No _ Insufficient Data NA _) Date performed 12/6/90 Deficiencies reported relevant to scope of Fitness for Use Checklist / Corrective actions taken: At the time the sanitary survey was conducted it was recommended that the sample tap be revised to facilitate taking water samples. There was no documentation in the available information on whether or not this recommendation was acted on. An internal sanitary survey was completed by EG&G on 6-29-92. No additional deficiencies were noted at that time.

The following evaluation pertains to well construction and does not address the design of the distribution system outside of well house or water quality issues.

B. WELL MUST COMPLY WITH IDAHO DEPARTMENT OF HEALTH AND WELFARE RULES AND REGULATIONS, TITLE 1, CHAPTER 8, "IDAHO REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS", SPECIFICALLY SUBSECTION 01.08550 "STANDARDS FOR PUBLIC DRINKING WATER SYSTEMS." WELL MUST ALSO COMPLY WITH IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (JANUARY 1989). THESE CRITERIA WILL BE EVALUATED IN SECTION C.

In addition, the Department of Health and Welfare has adopted "Recommended Standards for Water Works" (Albany, New York, 1992). The criteria from this report not included in "State Regulations for Well Construction" will be discussed in Section D.

1) Well shall not be located in a pit. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _)

2) Is a well house provided for this well: (Yes X No _ Insufficient Data _ N/A _) (If no, proceed to section 3)

a) Well house shall be provided with a locking door. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) Well house shall be protected from flooding and adequately drained. Are these criteria met: (Yes _ No X Insufficient Data _ N/A _) Explanation: The well house is not sufficiently protected from flooding.

c) Floor drains shall not be connected to sewers, storm drains, or any other source of contamination. Is this criterion met:(Yes _ No Insufficient Data _ N/A X) Explanation: The well house is not equipped with a floor drain.

d) Sumps for well house floor drains shall not be within 30 feet of the well. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

e) Well house shall not be used to store toxic or hazardous materials. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

3) Is the well constructed with a pitless adapter or pitless unit: (Yes _ No X Insufficient Data _ N/A _) (If no, proceed to Section 4)

a) The unit shall be the type approved by the National Sanitation Division or Pitless Adaptor Division of the Water Systems Council. Is this criteria met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

b) The unit shall be designed to be watertight including the well cap and casing extension. Is this criterion met:
(Yes _ No _ Insufficient Data _ N/A _) Explanation: _

c) The unit shall be tested for leaks prior to being put into service. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

4) Well must not be located within 50 or 100 feet of any potential source of contamination and no closer to specific sources of contamination than set forth below.

a) The well must not be within 50 feet of sewer lines. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) The well must not be within 50 feet of canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances. Is this criterion met: (Yes _ No X Insufficient Data _ N/A _) Explanation: There is a ditch 20 ft. to the north of the well house.

c) The well must not be within 100 feet of a drainfield or a drainfield replacement area. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

d) Is the well within 50 feet of contaminated perched water bodies:
(Yes _ No X Insufficient Data _ N/A _) Explanation: There are no known perched water bodies in the vicinity of the Badging Facility Area.

5) Well casing shall extend a minimum of 12 inches above the ground surface and 6 inches above the well house floor. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

6) Well shall be vented with the open end screened and terminated downward at least 18 inches above the well house floor or ground surface. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

7) Well shall be equipped with the necessary valves and appurtenances to allow the well to be pumped to waste. Is this criterion met: (Yes X No Insufficient Data _ N/A _) Explanation: N.R.

8) A flow meter and sample tap shall be installed on discharge line. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

9) A pressure gauge shall be provided at all installations. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

10) Well shall be cased and sealed in such a manner that surface water can not enter the well and a watertight seal shall be provided at the top of the casing. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _)
Explanation: N.R.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4 inch thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port which has a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

a) If the well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 13 ft. bls., and 8 inch casing is installed from 0 ft. through 181 ft. bls.

b) If the well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size inches 12 Casing size inches 8)

c) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-coupled joints which shall be watertight or be approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480 which is a combination of Idaho State regulations for casing less than 6 inches in diameter and "Recommended Standards for Water Works" (1992) for casings greater than 26 inches in diameter.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 I.D.	6.625	.280
8	8.628	.322
10 I.D.	0.750	.365
12	12.750	.375
14	14.000	.375
16	16.000	.375
18	18.000	.375
20	20.000	.375
22	22.000	.500
24	24.000	.500
26	26.000	.500
28	28.000	.500
30	30.000	.500
32	32.000	.500
34	34.000	.500

Casing Type	Casing Diameter (inches)	Casing Interval (feet bls)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/State Regs. on Casing Thickness
Steel	8	0 - 181	Welded	13	0.250	No
Steel (1)	6	0 - 533	Welded	13	0.250	No
(1) Casing perforated from 482 to 532 feet bls.						

3) Seal

State of Idaho Reg. 3.3.1. and 3.3.2.1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters.

Annular Fill Material	Interval (feet bls)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	0 - 181	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to the top of bedrock: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 13 ft. bls. The 8 inch casing is sealed in cement from 0 - 181 ft. bls.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): (Yes _ No _ Insufficient Data _ N/A X) Explanation: There was no documentation of the method used to place the cement grout seal.

State of Idaho Reg. 3.3.1. The casing seal is to prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams, spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No _ Insufficient Data X N/A _) Explanation: None of the hydrologic features mentioned above are present in the vicinity of this well. However, there is a ditch within 20 ft. of the well house.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient Data _ N/A _) Explanation (Qualify data/specify perched intervals if applicable): There was no indication of any saturated zones on the geophysical logs at the time the logs were taken (1/8/85).

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: (Yes _ No X Insufficient Data _ N/A _) Explanation: The casing is not sealed below 181 ft. bls.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

D. WELL MUST COMPLY WITH "RECOMMENDED STANDARDS FOR WATER WORKS" (1992), A REPORT OF THE COMMITTEE OF THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS.

1) Does the well contain a packer that is in contact with the groundwater supply interval: (Yes _ No X Insufficient Data _ N/A _). If yes, is the packer comprised of materials that are toxic, will impair taste or odor, or facilitate bacterial contamination of the well water: (Yes _ No _ Packer Type _ N/A X)

2) Screen

a) Does the well contain perforated casing or a screen: (Yes X No Insufficient Data _ N/A _) If yes, the perforated screen or casing must be installed so that the pumping water level remains above it under operating conditions. The following determination was made from the available production water level data which will vary with changes in the static water levels (water table elevation); therefore, the following determination may not be valid under all conditions. Is the criterion met: (Yes _ No X Insufficient Data _ N/A _) Explanation: The reported water level is approximately 500 ft. bls.,and the perforated casing is installed starting at 482 ft. bls, so the production water level is 18 ft. below the initial perforations.

b) Is the perforated casing or screen constructed of material resistant to damage by chemical action from the groundwater or cleaning operations: Material Type Steel Explanation: Steel is an acceptable well construction material for casing or screen in a non-acidic environment such as the Snake River Plain aquifer, as is demonstrated in EG&G report EGG-ER-8496.

3) If the casing is constructed of nonferrous material, it must be resistant to the corrosiveness of the water. Is this criterion met:
(Yes _ No _ Insufficient Data _ N/A X)

4) Was the well adequately developed to remove native silts and clays, drilling mud or the finer fraction of the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: There is no documentation of well development in the available information for this well. However, the well has been in service since 1985 and is sufficiently developed at this time.

E. **THE PRIMARY SOURCE FOR THE WELL EVALUATION IS THE IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY. OTHER SOURCES:** EG&G letter, BDA-60-92 From B. D. Andersen to M. B. Hinman, "Potential Contamination of Drinking Water Wells and Water Storage Tanks" dated 8/26/1992. EG&G letter, REW-45-92 From R. E. Williams to J. R. Harper "Listing of Potable Water Wells Not In Compliance With State Standards." dated 4/22/92. Brad Andersen, Teresa Brock, and Dennis Walker, Personal Communication, 2/3/93. EG&G Internal Sanitary Survey Checklist, 6/22/92. Idaho Department of Health and Welfare, Division of Environmental Quality, Drinking Water Supply Report, INEL Main Gate, 12/6/90

N.F. Not Found
N/A Not Applicable
N.R. Not Required

F. **WELL FITNESS DETERMINATION**

Intended use: PRODUCTION/POTABLE WELL

( ) Well is acceptable for intended use.
(X) Well is acceptable for intended use if a variance is granted.
(X) Maintenance required to continue intended use.
(X) Remediation required to continue intended use.
( ) Decommission, well is unneeded or cannot be remediated.

DEFICIENCIES: The following deficiencies were identified: The well casing is not sealed below 181 ft. bls., there is a drainage ditch within 20 ft. of the well house, the water level is below the initial perforations in the casing and the sample tap may need to be raised. Since there are no perched water bodies identified in the vicinity of the main gate and no hydrologic features of sufficient recharge to generate a formidable perched water body, a variance could be obtained for lack of a casing seal below 181 ft. bls. The ditch within 20 ft. of the well house needs to be rerouted to accommodate State of Idaho separation distance regulations and the ground around the well house needs to be regraded to protect the well from flooding. Additionally, casing thicknesses do not comply with State regulations and the production water level falls below the perforated interval.

REMEDIATION: N.R.

GEOLOGIC LOG

Well Name BADGING FACILITY WELL

Source: Well Driller's Report

****

Interval (feet below surface)

Begin	End	Description
0	13	Alluvium
13	73	Basalt
73	89	Red Dirt
89	210	Basalt
210	213	Red Dirt
213	644	Basalt

COMPILED BY/ORGANIZATION: T. Norton / GAI Date 2/10/93

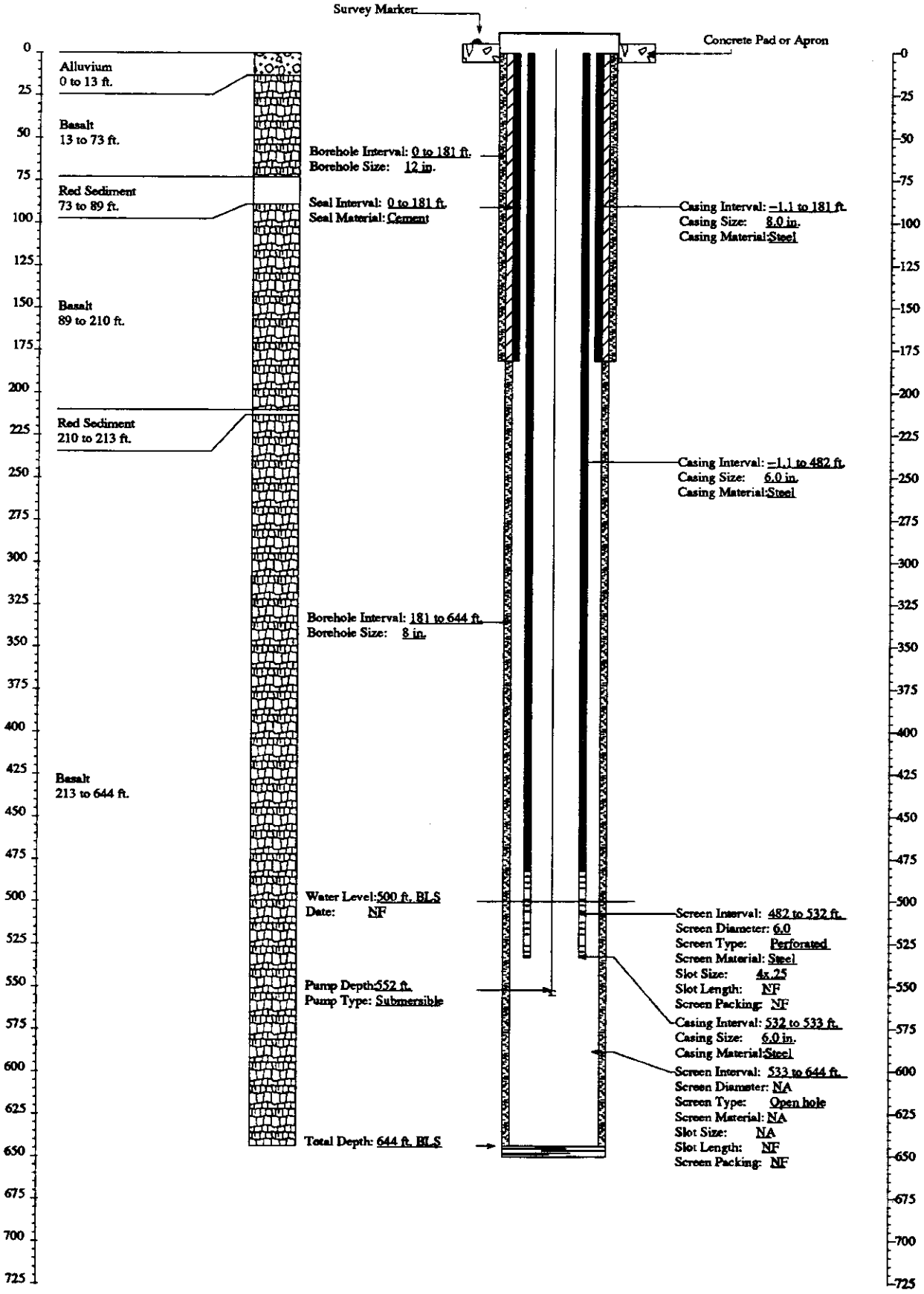
WellName: BADGING FACILITY WELL Corrections: WELL IS LOCATED IN A WELL HOUSE 06/21/1994

Facility: SOUTH
Well Type: Potable Water
Well Status: Active
Year Drilled: 1985
Total Depth: 644

Easting: 462253.86
Northing: 673015.82
Longitude: 1125351.4990
Latitude: 433039.90917
Completion Depth: 644

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4938.95

Water Level: 500
Water Level Date: NF
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. COREHOLE 1

A. WELL USE

1) Year well was drilled: 1978

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: None

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). he elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No _ Uncertain X Borehole size N.F.
Casing size 3-inch I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
N.F. (1)	3 I.D. or O.D.?	0 - 836	N.F.	N.F.	N.F.	N.F.
Drill Steel (stick-up only?)	2 I.D. or O.D.?	N.F.	N.F.	31	N.F.	N.F.
(1) The casing must extend deeper than 836 feet bls because perforations are noted at 991-1001 feet bls and 1905-1915 feet bls.						

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located in the southeastern region of the INEL site and no sources of recharge occur near the well.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched water above the water table from the 1978 neutron log.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no surface or perched water occurs near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type _ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. COREHOLE 1

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a annular surface seal as required by state regulations. However, the well is located in the southeastern region of the INEL site and is not in proximity to any facilities or other potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration in the annular spaces is extremely low, a variance should be requested for the lack of this seal. Also, the borehole size and the casing length, thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name COREHOLE 1

Source: No Lithology Log Found

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Interval (feet below surface)

Begin	End	Description

COMPILED BY/ORGANIZATION: F.S. Mocker / GAI Date August 28, 1992

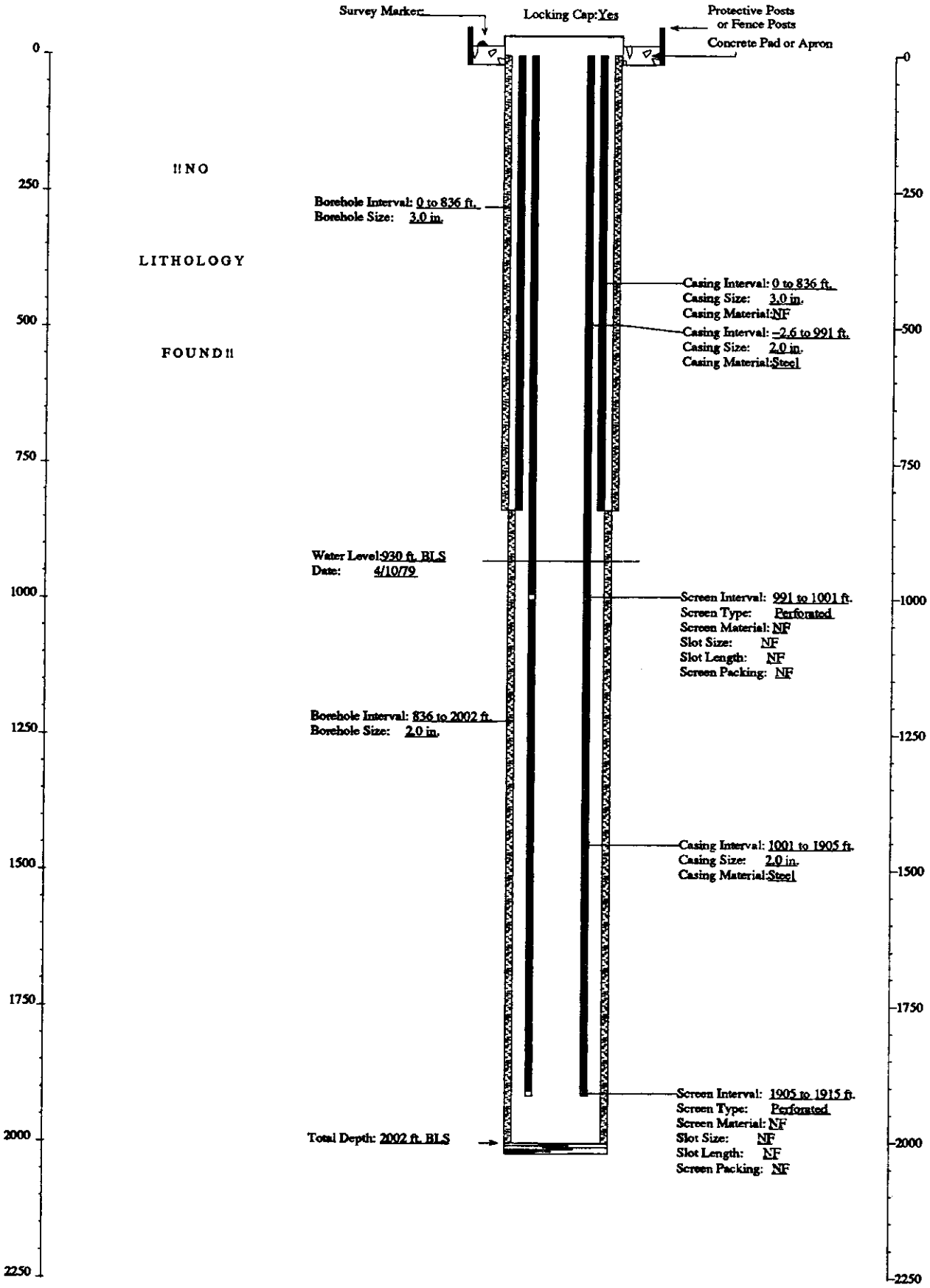
WellName: COREHOLE 1 Corrections:B.H. dia. 2 in.(org. NF)/ 2 in. casing added:0–991 & 1001–1905(org. NF) 04/18/1994

Facility: SOUTH
Well Type: Observation
Well Status: Active
Year Drilled: 1978
Total Depth: 2002

Easting: 362883.559
Northing: 665174.571
Longitude: 1124106.67399
Latitude: 432926.75516
Completion Depth: 2002

Driller: NF
Geologist: NF
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 5370.068

Water Level: 930
Water Level Date: 4/10/79
Water Level Access: NF



CHECKLIST FOR ABANDONED/DESTROYED WELLS AND BORINGS

Location SOUTH INEL Well Name/No. EOCR INJECTION WELL

A. Sources for Well Abandonment

1) What sources indicated that the well was plugged or destroyed:
(X) Comprehensive Well Survey status: Plugged and abandoned
(X) INEL Well Catalog (field survey by K. Beard) _
( ) Personal communication _
( ) Other _

2) Was the well located by field inspection and documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380)
(X) Well was located by field inspection.
( ) Well was not located by field inspection.

B. Abandonment Procedures

1) How was the well abandoned or destroyed:
( ) Backfilled
( ) Buried
(X) Grouted
( ) Other
( ) Not documented

2) List procedure and amounts of material used to abandon the well:
Not documented

C. Well Casing

1) Does the well contain surface or other well casing:
Yes X No _ Not Documented _
Explanation: An 8-inch black iron casing was set to a depth of 276 ft.

2) Was the annular space between the casing and borehole grouted:
Yes _ No _ Not Documented X N/A _

D. Compliance with State Regulations

State of Idaho Reg.3.12.1. Permanently abandoned wells may have the casing removed or left in place and shall be filled with bentonite grout, cement grout, concrete, puddling clay, or other material as required to stop the upward or downward movement of water and prevent the waste and/or contamination of the ground water.

1) Total depth of well 286 ft. Top of basalt 20 ft.

CHECKLIST FOR ABANDONED/DESTROYED WELLS AND BORINGS

Location SOUTH INEL Well Name/No. EOCR INJECTION WELL

2) Was the well properly abandoned in accordance with Idaho State regulations:
Yes X No _ Not Documented _
Explanation: The well was plugged with concrete.

3) Are additional abandonment procedures necessary:
Yes _ No X Not Certain _

GEOLOGIC LOG

Well Name EOCR INJECTION WELL

Source: 1961 Gamma Log

****

Interval (feet below surface)

Begin	End	Description
0	20	Surficial Sediment
20	75	Basalt
75	83	Sediment
83	150	Basalt
150	155	Sediment
155	286	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 31, 1992

WellName: EOCR INJECTION WELL

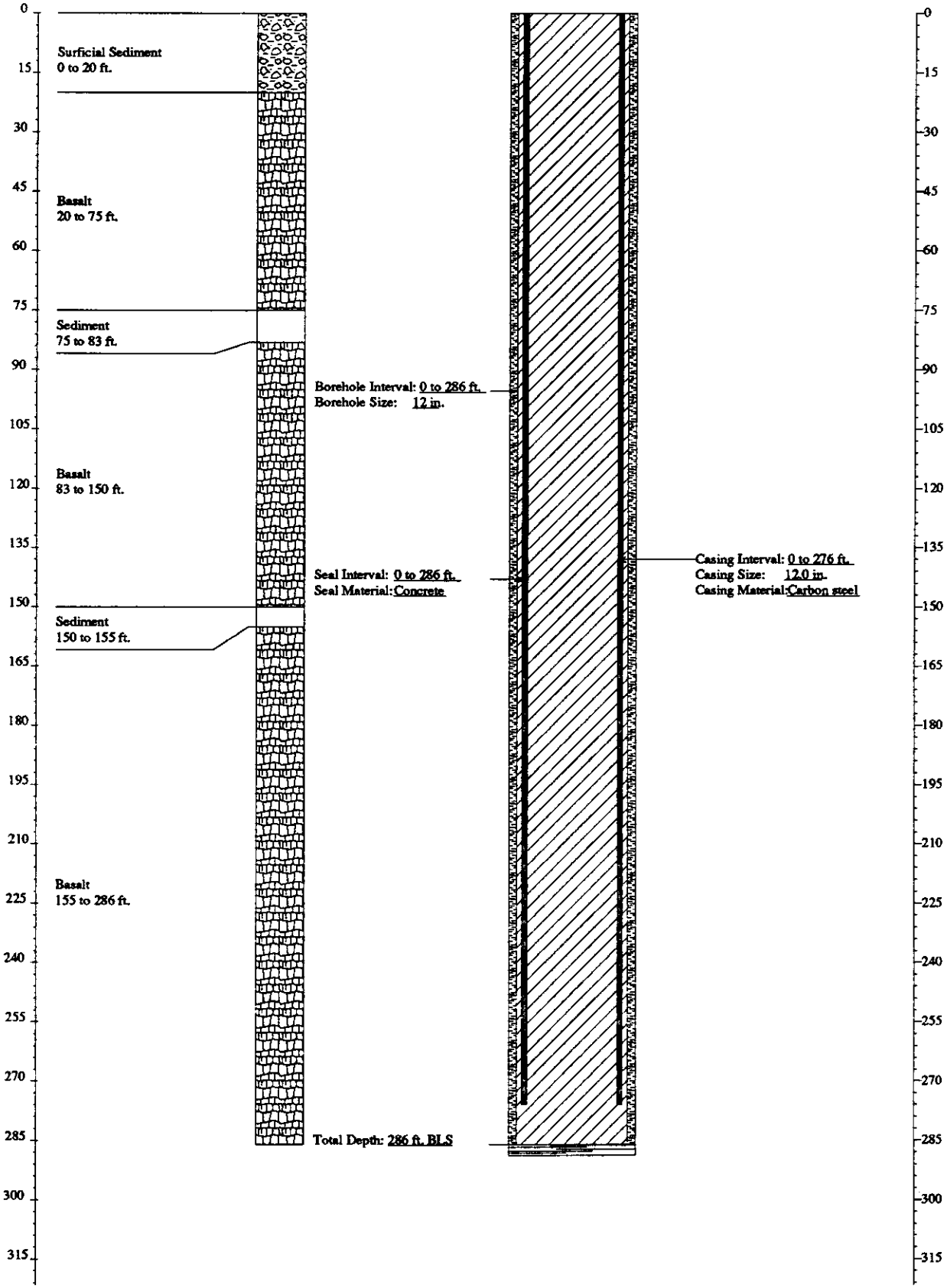
06/14/1993

Facility: SOUTH
Well Type: NA
Well Status: Abandoned
Year Drilled: 1962
Total Depth: 286

Easting: 306373
Northing: 676722
Longitude: 1125347.99
Latitude: 433116.62
Completion Depth: 285

Driller: Andrews
Geologist: E. Shuter
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 4937

Water Level: Dry
Water Level Date: NF
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH (STF) (Bldg. EOCR 605)

Well Name/No. EOCR PRODUCTION WELL

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
(X) Potable water production well
( ) Raw water production well

3) Well is: ( ) Active (X) Inactive

4) Program Plan: N/A

5) Responsible Organization/Contact Person: EG&G, Will Wyland

6) Has a sanitary survey been performed on the drinking water system by the Idaho Department of Health and Welfare: (Yes _ No X Insufficient Data NA _) Date performed N/A Deficiencies reported relevant to scope of Fitness for Use Checklist / Corrective actions taken: T. Norton of Golder Associates Inc. inspected the well and well house on 2/19/93, for compliance with Idaho State drinking water regulations. Only the following deficiency was noted: The casing vent was 18 inches above the well house floor but was not screened nor turned down. The electricity had also been disconnected from the pump.

The following evaluation pertains to well construction and does not address the design of the distribution system outside of well house or water quality issues.

B. WELL MUST COMPLY WITH IDAHO DEPARTMENT OF HEALTH AND WELFARE RULES AND REGULATIONS, TITLE 1, CHAPTER 8, "IDAHO REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS", SPECIFICALLY SUBSECTION 01.08550 "STANDARDS FOR PUBLIC DRINKING WATER SYSTEMS." WELL MUST ALSO COMPLY WITH IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (JANUARY 1989). THESE CRITERIA WILL BE EVALUATED IN SECTION C.

In addition, the Department of Health and Welfare has adopted "Recommended Standards for Water Works" (Albany, New York, 1992). The criteria from this report not included in "State Regulations for Well Construction" will be discussed in Section D.

1) Well shall not be located in a pit. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _)

2) Is a well house provided for this well: (Yes X No _ Insufficient Data _ N/A _) (If no, proceed to section 3)

a) Well house shall be provided with a locking door. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) Well house shall be protected from flooding and adequately drained. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

c) Floor drains shall not be connected to sewers, storm drains, or any other source of contamination. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: The well house is not equipped with a floor drain.

d) Sumps for well house floor drains shall not be within 30 feet of the well. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

e) Well house shall not be used to store toxic or hazardous materials. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

3) Is the well constructed with a pitless adapter or pitless unit: (Yes _ No X Insufficient Data _ N/A _) (If no, proceed to Section 4)

a) The unit shall be the type approved by the National Sanitation Division or Pitless Adaptor Division of the Water Systems Council. Is this criteria met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

b) The unit shall be designed to be watertight including the well cap and casing extension. Is this criterion met: (Yes _ No _ Insufficient Data N/A_) Explanation: _

c) The unit shall be tested for leaks prior to being put into service. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

4) Well must not be located within 50 or 100 feet of any potential source of contamination and no closer to specific sources of contamination than set forth below.

a) The well must not be within 50 feet of sewer lines. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) The well must not be within 50 feet of canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

c) The well must not be within 100 feet of a drainfield or a drainfield replacement area. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

d) Is the well within 50 feet of contaminated perched water bodies:
(Yes _ No X Insufficient Data _ N/A _) Explanation: The available geophysical logs for this well are incomplete and do not allow for a determination with respect to detecting any perched water bodies. However, there are no known perched water bodies at the STF/OMRE/EOCR area, and there are no hydrologic features currently present at the site that would generate any perched water bodies.

5) Well casing shall extend a minimum of 12 inches above the ground surface and 6 inches above the well house floor. Are these criteria met:
(Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

6) Well shall be vented with the open end screened and terminated downward at least 18 inches above the well house floor or ground surface. Are these criteria met: (Yes _ No X Insufficient Data _ N/A _) Explanation: The casing vent is 18 inches above the well house floor, however, it is not terminated downward or screened.

7) Well shall be equipped with the necessary valves and appurtenances to allow the well to be pumped to waste. Is this criterion met: (Yes X No Insufficient Data _ N/A _) Explanation: _

8) A flow meter and sample tap shall be installed on discharge line. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

9) A pressure gauge shall be provided at all installations. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

10) Well shall be cased and sealed in such a manner that surface water can not enter the well and a watertight seal shall be provided at the top of the casing. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _)
Explanation: N.R.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4-inch thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port which has a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

a) If the well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 3 ft. bls., and 24-inch casing is installed from 2 ft. als. through 812.56 ft. bls.

b) If the well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size inches 28 Casing size inches 24)

c) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-coupled joints which shall be watertight or be approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480 which is a combination of Idaho State regulations for casing less than 6 inches in diameter and "Recommended Standards for Water Works" (1992) for casings greater than 26 inches in diameter.

FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH (STF) (Bldg. EOCR 605)

Well Name/No. EOCR PRODUCTION WELL

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 I.D.	6.625	.280
8	8.628	.322
10 I.D.	0.750	.365
12	12.750	.375
14	14.000	.375
16	16.000	.375
18	18.000	.375
20	20.000	.375
22	22.000	.500
24	24.000	.500
26	26.000	.500
28	28.000	.500
30	30.000	.500
32	32.000	.500
34	34.000	.500

Casing Type	Casing Diameter (inches)	Casing Interval (feet bls)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/State Regs. on Casing Thickness
Steel	24	-2 - 812	N.F.	24	0.312, 0.281, 0.250	No
Steel	20	705.56 - 847.91	N.F.	N/A	0.344	No
Steel	16	761.81 - 1051.56	N.F.	N/A	0.312	No

3) Seal

State of Idaho Reg. 3.3.1. and 3.3.2.1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters.

Annular Fill Material	Interval (feet bls)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Clay	0 - 812.56	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to the top of bedrock: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 3 ft. bls., the clay surface seal is installed from 0 - 812.56 ft. bls.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): (Yes _ No _ Insufficient Data X N/A _) Explanation: The method used to install the clay annular fill was not documented in the available information.

State of Idaho Reg. 3.3.1. The casing seal is to prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams, spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X Insufficient Data _ N/A _) Explanation: N.R.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient Data _ N/A _) Explanation (Qualify data/specify perched intervals if applicable): The geophysical logs for this well are incomplete and a determination with respect to saturated zone was unable to be made. However, there are no known perched water bodies in the vicinity of STF.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: (Yes X No _ Insufficient Data _ N/A _) Explanation: The annular space is backfilled with clay from 0 - 812.56 ft. bls. the static water level is at approximately 495 ft. bls. so the casing is adequately sealed to prevent the movement of groundwater within the annular space.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

D. WELL MUST COMPLY WITH "RECOMMENDED STANDARDS FOR WATER WORKS" (1992), A REPORT OF THE COMMITTEE OF THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS.

1) Does the well contain a packer that is in contact with the groundwater supply interval: (Yes _ No X Insufficient Data _ N/A _). If yes, is the packer comprised of materials that are toxic, will impair taste or odor, or facilitate bacterial contamination of the well water: (Yes _ No _ Packer Type _ N/A X)

2) Screen

a) Does the well contain perforated casing or a screen: (Yes _ No X Insufficient Data _ N/A _) If yes, the perforated screen or casing must be installed so that the pumping water level remains above it under operating conditions. The following determination was made from the available production water level data which will vary with changes in the static water levels (water table elevation); therefore, the following determination may not be valid under all conditions. Is the criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: The well was completed with an open borehole construction.

b) Is the perforated casing or screen constructed of material resistant to damage by chemical action from the groundwater or cleaning operations: Material Type N/A Explanation: N.R.

3) If the casing is constructed of nonferrous material, it must be resistant to the corrosiveness of the water. Is this criterion met:
(Yes _ No _ Insufficient Data _ N/A X)

4) Was the well adequately developed to remove native silts and clays, drilling mud or the finer fraction of the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: The well was pumped for a 48 hour period at approximately 1000 gpm starting on June 27, 1960.

E. THE PRIMARY SOURCE FOR THE WELL EVALUATION IS THE IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY. OTHER SOURCES: T. Norton, Golder Associates Inc., Personal Inspection 2/19/93. Golder Associates Inc., Draft "STF/EOCR/OMRE Groundwater Monitoring Plan", Section 11.11, 1992.

N.F. Not Found
N/A Not Applicable
N.R. Not Required

F. WELL FITNESS DETERMINATION

Intended use: **PRODUCTION/POTABLE WELL**

( ) Well is acceptable for intended use.
( ) Well is acceptable for intended use if a variance is granted.
(X) Maintenance required to continue intended use.
( ) Remediation required to continue intended use.
( ) Decommission, well is unneeded or cannot be remediated.

DEFICIENCIES: The casing vent is not terminated downward and is not screened. If the well were to be reactivated the casing vent would have to be modified and power restored. Additionally, the casing thicknesses do not comply with State regulations and the casing joint types were not documented.

REMEDIATION: N.R.

GEOLOGIC LOG

Well Name EOCR PRODUCTION WELL

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
0	3	Soil
3	29	Basalt
29	43	Broken Basalt and Cinders
43	59	Basalt
59	62	Clay
62	73	Broken Basalt and Sand
73	111	Basalt
111	121	Broken Basalt and Sand
121	182	Basalt
182	188	Cinders
188	198	Basalt
198	207	Broken Basalt and Cinders
207	219	Basalt
219	238	Basalt and Cinders
238	271	Basalt
271	276	Basalt and Cinders
276	328	Basalt
328	342	Basalt and Cinders
342	441	Basalt

COMPILED BY/ORGANIZATION: T. Norton / GAI Date 2/20/93

GEOLOGIC LOG

Well Name EOCR PRODUCTION WELL

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
441	448	Broken Basalt and Clay
448	542	Basalt
542	548	Cinders
548	652	Basalt
652	668	Broken Basalt and Sand
668	676	Sand and Clay
676	694	Basalt
694	815	Clay and Sandy Clay
815	819	Broken Basalt and Clay
819	845	Broken Basalt
845	851	Sandy Clay
851	904	Broken Basalt and Clay
904	916	Clay
916	944	Basalt
944	972	Basalt and Sand
972	996	Broken Basalt and Clay
996	1028	Basalt
1028	1038	Basalt and Clay
1038	1060	Basalt and Cinders

COMPILED BY/ORGANIZATION: T. Norton / GAI Date 2/20/93

GEOLOGIC LOG

Well Name EOCR
PRODUCTION WELL

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
1060	1081	Basalt
1081	1104	Basalt and Cinders
1104	1118	Basalt
1118	1122	Basalt and Cinders
1122	1125	Clay
1125	1224	Basalt
1224	1236	Red Cinders
1236	1237	Basalt

COMPILED BY/ORGANIZATION: T. Norton / GAI Date 2/20/93

WellName: EOCR PRODUCTION WELL Corrections:WELL IS LOCATED IN A WELL HOUSE

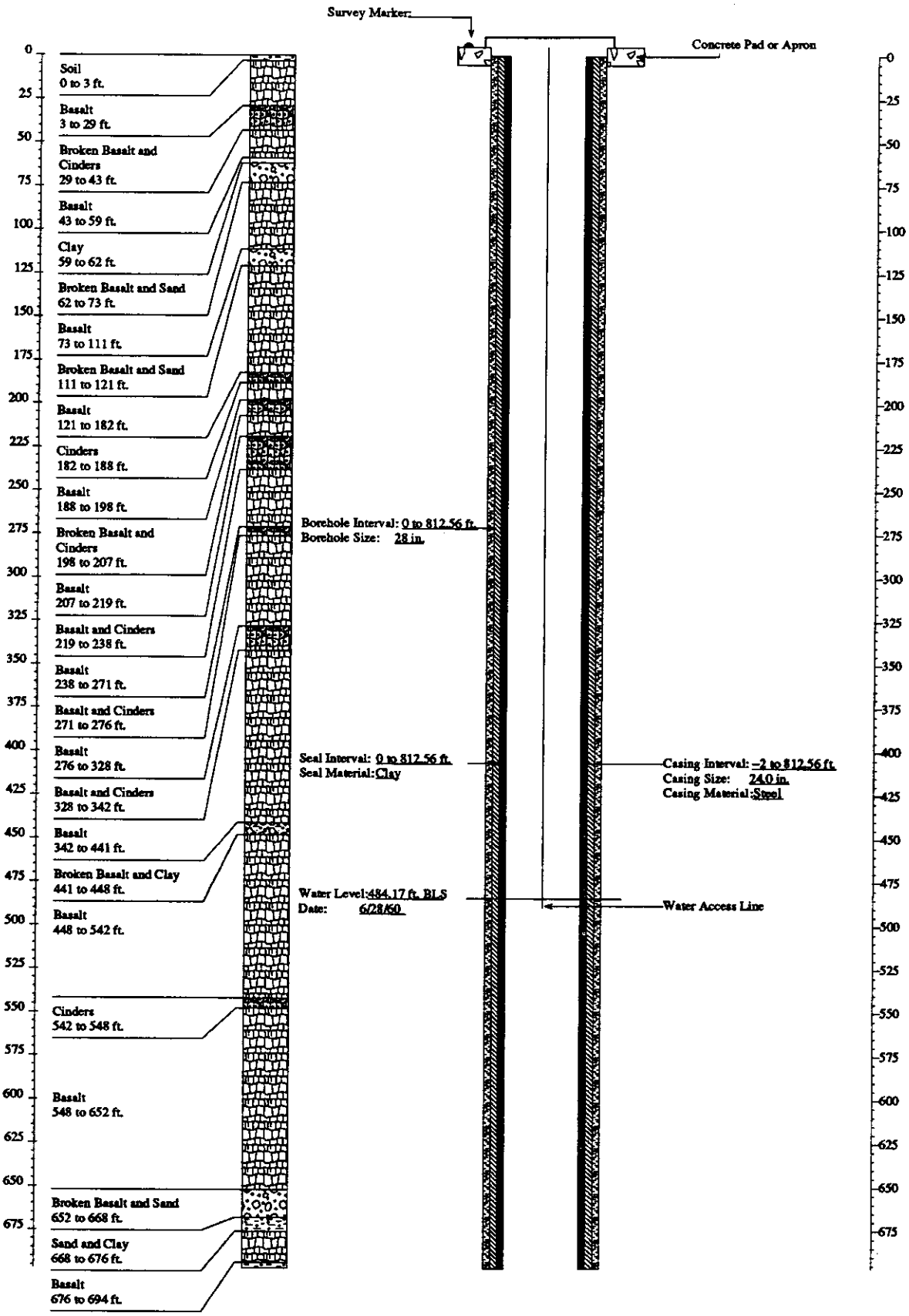
03/08/1994

Facility: SOUTH
Well Type: Potable Water
Well Status: Inactive
Year Drilled: 1960
Total Depth: 1237

Easting: 462098.99
Northing: 677057.45
Longitude: 1125354.0827
Latitude: 433119.81078
Completion Depth: 1237

Driller: Strasser
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4943.31

Water Level: 484.17
Water Level Date: 6/28/60
Water Level Access: Line



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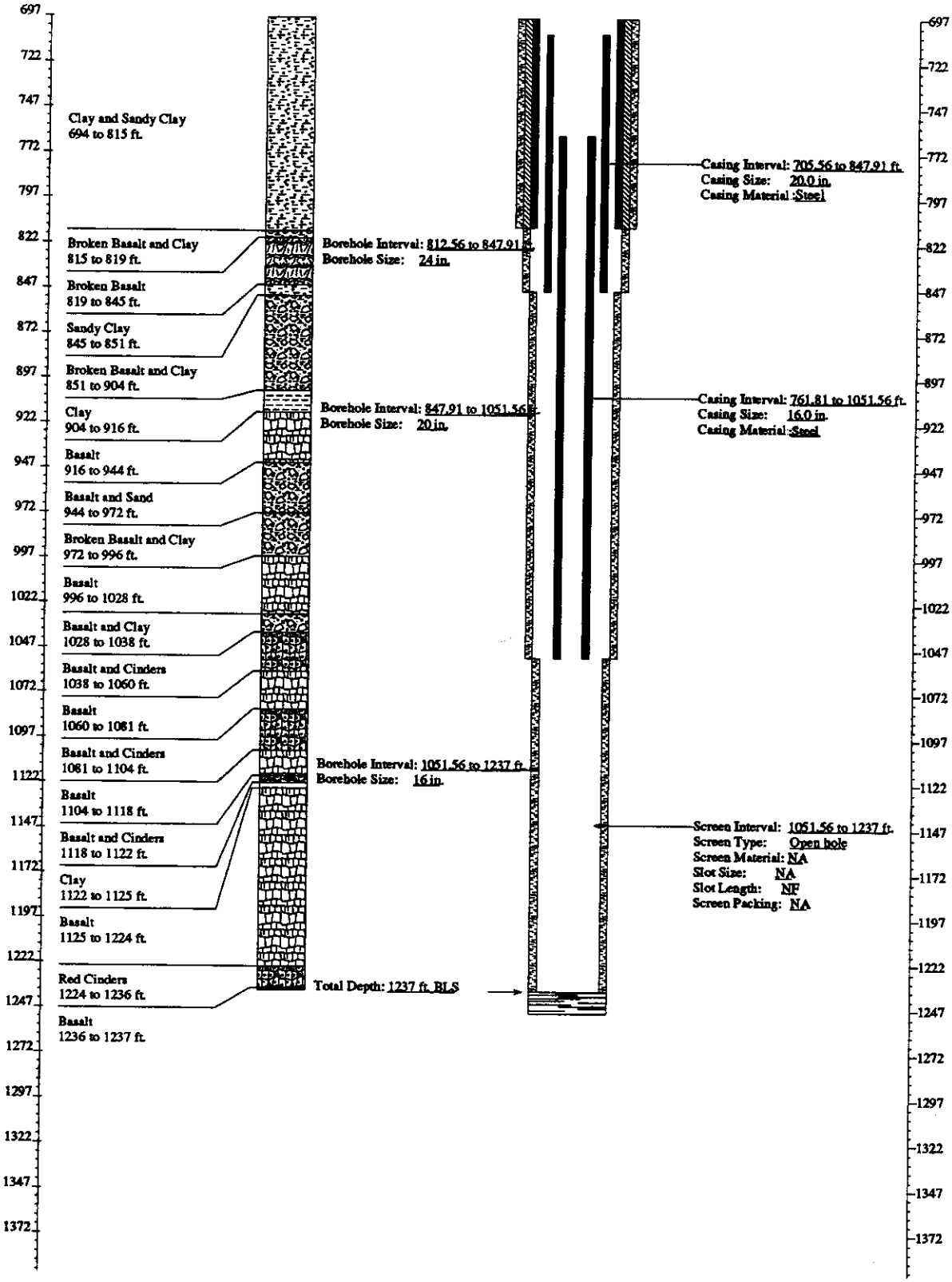

FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH INEL Well Name/No. FIRE STATION WELL

A. WELL USE

1) Year well was drilled: 1957

2) Current use for well:
( ) Potable water production well
(X) Raw water production well

3) Well is: (X) Active ( ) Inactive

4) Program Plan: EG&G Drinking Water Monitoring Program

5) Responsible Organization/Contact Person: EG&G, Brad Andersen

6) Has a sanitary survey been performed on the drinking water system by the Idaho Department of Health and Welfare: (Yes _ No X Insufficient Data NA _) Date performed N/A Deficiencies reported relevant to scope of Fitness for Use Checklist / Corrective actions taken: An internal EG&G sanitary survey was conducted on 11/5/91. The following deficiencies were noted; the ground did not slope away from the well house, the pressure gauge was not working and the discharge points for the floor drain were not known. B.D. Andersen and D. Walker (pers. comm. 2/3/93) indicated that the pressure gauge had been fixed.

The following evaluation pertains to well construction and does not address the design of the distribution system outside of well house or water quality issues.

B. WELL MUST COMPLY WITH IDAHO DEPARTMENT OF HEALTH AND WELFARE RULES AND REGULATIONS, TITLE 1, CHAPTER 8, "IDAHO REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS", SPECIFICALLY SUBSECTION 01.08550 "STANDARDS FOR PUBLIC DRINKING WATER SYSTEMS." WELL MUST ALSO COMPLY WITH IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (JANUARY 1989). THESE CRITERIA WILL BE EVALUATED IN SECTION C.

In addition, the Department of Health and Welfare has adopted "Recommended Standards for Water Works" (Albany, New York, 1992). The criteria from this report not included in "State Regulations for Well Construction" will be discussed in Section D.

1) Well shall not be located in a pit. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _)

2) Is a well house provided for this well: (Yes X No _ Insufficient Data _ N/A _) (If no, proceed to section 3)

   a) Well house shall be provided with a locking door. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

   b) Well house shall be protected from flooding and adequately drained. Are these criteria met: (Yes _ No X Insufficient Data _ N/A _) Explanation: The ground surface does not slope away from the well house.

   c) Floor drains shall not be connected to sewers, storm drains, or any other source of contamination. Is this criterion met: (Yes _ No _ Insufficient Data X N/A _) Explanation: There are two floor drains in the well house and their discharge points are not known.

   d) Sumps for well house floor drains shall not be within 30 feet of the well. Is this criterion met: (Yes _ No _ Insufficient Data X N/A _) Explanation: See C.3.c

   e) Well house shall not be used to store toxic or hazardous materials. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

3) Is the well constructed with a pitless adapter or pitless unit: (Yes _ No X Insufficient Data _ N/A _) (If no, proceed to Section 4)

   a) The unit shall be the type approved by the National Sanitation Division or Pitless Adaptor Division of the Water Systems Council. Is this criteria met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

   b) The unit shall be designed to be watertight including the well cap and casing extension. Is this criterion met: (Yes _ No _ Insufficient Data N/A_) Explanation: _

   c) The unit shall be tested for leaks prior to being put into service. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

4) Well must not be located within 50 or 100 feet of any potential source of contamination and no closer to specific sources of contamination than set forth below.

a) The well must not be within 50 feet of sewer lines. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) The well must not be within 50 feet of canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

c) The well must not be within 100 feet of a drainfield or a drainfield replacement area. Is this criterion met: (Yes _ No _ Insufficient Data X N/A _) Explanation: The well may be located within 100 ft. of a septic tank or drain field.

d) Is the well within 50 feet of contaminated perched water bodies: (Yes _ No X Insufficient Data _ N/A _) Explanation: There are no known perched water bodies in the vicinity of the Fire Station well.

5) Well casing shall extend a minimum of 12 inches above the ground surface and 6 inches above the well house floor. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

6) Well shall be vented with the open end screened and terminated downward at least 18 inches above the well house floor or ground surface. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

7) Well shall be equipped with the necessary valves and appurtenances to allow the well to be pumped to waste. Is this criterion met: (Yes _ No X Insufficient Data _ N/A _) Explanation: N.R.

8) A flow meter and sample tap shall be installed on discharge line. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

9) A pressure gauge shall be provided at all installations. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

10) Well shall be cased and sealed in such a manner that surface water can not enter the well and a watertight seal shall be provided at the top of the casing. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _)
Explanation: N.R.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4-inch thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port which has a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

a) If the well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 43 ft. bls., and 10-inch casing is installed from 1.7 ft als. through 516 ft. bls.

b) If the well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size inches 16 Casing size inches 10)

c) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-coupled joints which shall be watertight or be approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480 which is a combination of Idaho State regulations for casing less than 6 inches in diameter and "Recommended Standards for Water

Works" (1992) for casings greater than 26 inches in diameter.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 I.D.	6.625	.280
8	8.628	.322
10 I.D.	0.750	.365
12	12.750	.375
14	14.000	.375
16	16.000	.375
18	18.000	.375
20	20.000	.375
22	22.000	.500
24	24.000	.500
26	26.000	.500
28	28.000	.500
30	30.000	.500
32	32.000	.500
34	34.000	.500

Casing Type	Casing Diameter (inches)	Casing Interval (feet bls)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/State Regs. on Casing Thickness
Steel [1]	10	-1.7 - 516	N.F.	18	N.F.	N/A
[1] Casing perforated from 427 to 467 and 501 to 511 feet bls.						

3) Seal

State of Idaho Reg. 3,3,1. and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters.

Annular Fill Material	Interval (feet bls)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Clay	0 - 429.4	N.F.	Yes
Grout	429.4 - 435.4	N.F.	Yes
Gravel Pack	435.4 - 513.1	N.F.	Yes
Grout	513.1 - 518.1	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to the top of bedrock: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvial/basalt interface is at approximately 43 ft. bls. and the clay seal is emplaced from 0 - 429.4 ft. bls.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): (Yes X No _ Insufficient Data _ N/A _) Explanation: A 1 inch tremie pipe was used to place the grout seals and gravel pack.

State of Idaho Reg. 3.3.1. The casing seal is to prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams, spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X Insufficient _ Data _ N/A _) Explanation: None of the hydrologic features mentioned above are in the vicinity of the fire station.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient Data _ N/A _) Explanation (Qualify data/specify perched intervals if applicable): There were no geophysical logs identified for this well in the available information. However, there is not a water source in the vicinity with enough recharge capable of generating a substantial perched water body.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: (Yes X No _ Insufficient Data _ N/A _) Explanation: The clay annular fill from 0 - 429.4 ft. bls. provides an adequate casing seal.

4) Gravel Pack. Does the well contain a gravel pack: (Yes X No _) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: The cement gravel pack seal installed from 429.4 - 435.4 ft. bls. is an adequate seal to prevent ground water from entering the gravel pack through the annulus from above.

D. WELL MUST COMPLY WITH "RECOMMENDED STANDARDS FOR WATER WORKS" (1992), A REPORT OF THE COMMITTEE OF THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS.

1) Does the well contain a packer that is in contact with the groundwater supply interval: (Yes _ No X Insufficient Data _ N/A _). If yes, is the packer comprised of materials that are toxic, will impair taste or odor, or facilitate bacterial contamination of the well water: (Yes _ No _ Packer Type _ N/A X)

2) Screen

a) Does the well contain perforated casing or a screen: (Yes X No Insufficient Data _ N/A _) If yes, the perforated screen or casing must be installed so that the pumping water level remains above it under operating conditions. The following determination was made from the available production water level data which will vary with changes in the static water levels (water table elevation); therefore, the following determination may not be valid under all conditions. Is the criterion met: (Yes _ No X Insufficient Data _ N/A _) Explanation: The reported production water level is approximately 428 ft. bls.,and the perforated casing is installed starting at 427 ft. bls, so the production water level is 1 ft. below the initial perforations.

b) Is the perforated casing or screen constructed of material resistant to damage by chemical action from the groundwater or cleaning operations: Material Type Steel Explanation: Steel is an acceptable well construction material for casing or screen in a non-acidic environment such as the Snake River Plain aquifer, as is demonstrated in EG&G report EGG-ER-8496.

3) If the casing is constructed of nonferrous material, it must be resistant to the corrosiveness of the water. Is this criterion met:
(Yes _ No _ Insufficient Data _ N/A X)

4) Was the well adequately developed to remove native silts and clays, drilling mud or the finer fraction of the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: There is no documentation of well development in the available information, however, the well has been in service since 1957 and is sufficiently developed at this time.

E. **THE PRIMARY SOURCE FOR THE WELL EVALUATION IS THE IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY. OTHER SOURCES:** EG&G letter, BDA-60-92 From B. D. Andersen to M. B. Hinman, "Potential Contamination of Drinking Water Wells and Water Storage Tanks" dated 8/26/92. EG&G letter, REW-45-92 From R. E. Williams to J. R. Harper "Listing of Potable Water Wells Not In Compliance With State Standards." dated 4/22/92. Brad Andersen, Teresa Brock, and Dennis Walker, Personal Comm., 2-3-93. EG&G, Internal Sanitary Survey Checklist, 11/5/91.

N.F. Not Found
N/A Not Applicable
N.R. Not Required

F. WELL FITNESS DETERMINATION

Intended use: PRODUCTION/POTABLE WELL

( ) Well is acceptable for intended use.
( ) Well is acceptable for intended use if a variance is granted.
(X) Maintenance required to continue intended use.
( ) Remediation required to continue intended use.
( ) Decommission, well is unneeded or cannot be remediated.

DEFICIENCIES: The deficiencies identified for this well which are not in compliance with Idaho State regulations are as follows: The discharge point for the floor drains are not known and the proximity of the well to the septic tank and drainfield are also not known. Both items should be investigated and addressed if they are found not to be in compliance with Idaho State regulations. It should be noted that this well is occasionally used as a raw water production but is no longer used at a potable production well and has been posted as such at the potable discharge points. The ground surface around the well house should be regraded to prevent flooding of the well. Additionally the casing joint type and casing thickness were not documented

REMEDIATION: N.R.

GEOLOGIC LOG

Well Name FIRE STATION WELL

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
0	40	Gravel and Clay
40	70	Basalt
70	80	No Sample
80	95	Basalt
95	100	No Sample
100	115	Cinders
115	125	No Sample
125	135	Cinders
135	140	Basalt
140	164	Cinders
164	170	Broken Basalt
170	175	No Sample
175	210	Cinders
210	215	Basalt
215	220	Cinders
220	265	Basalt
265	270	Cinders
270	320	Basalt
320	325	Sand

GEOLOGIC LOG

Well Name FIRE STATION WELL

Source: Driller's Log

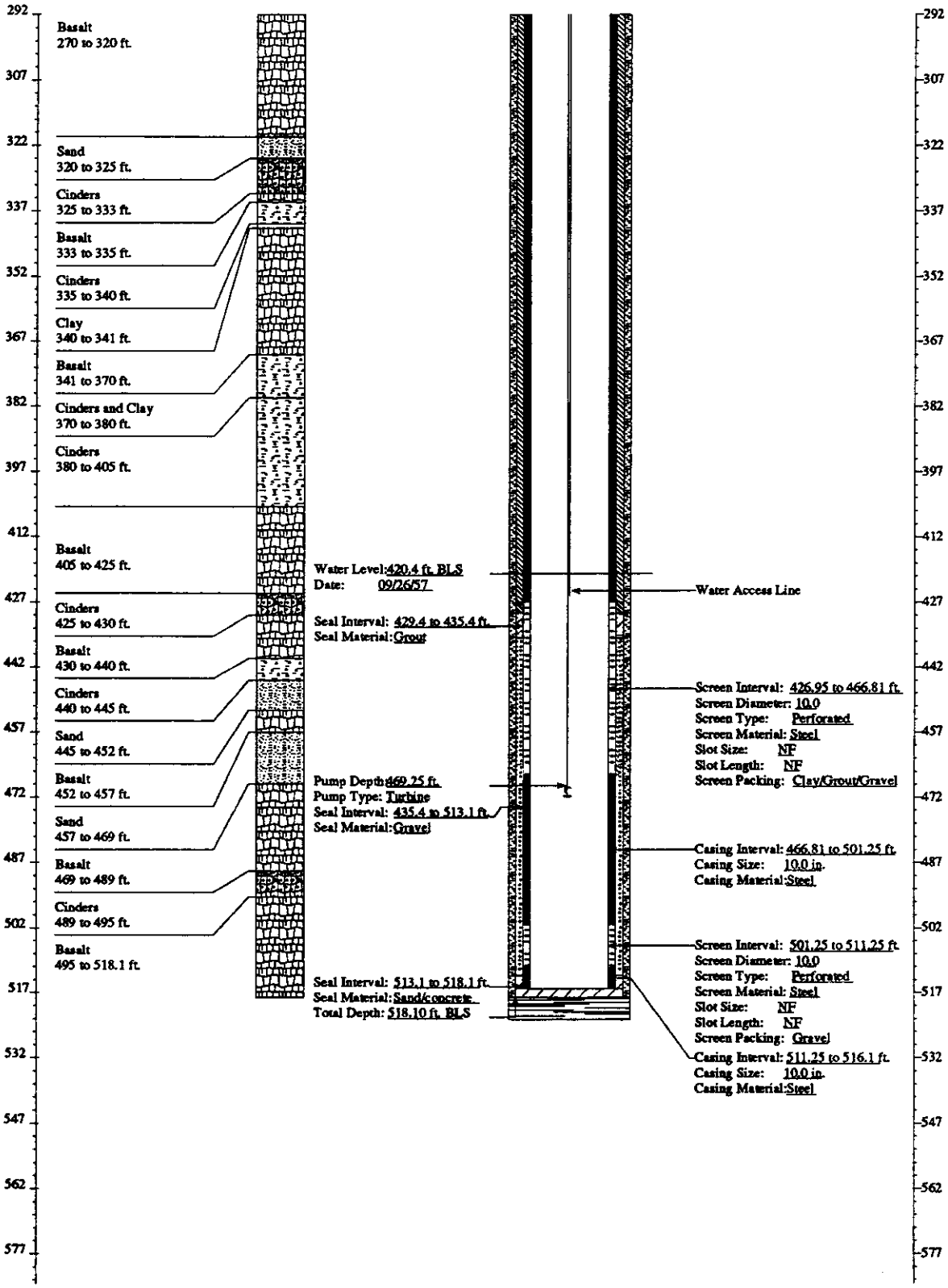
****

Interval (feet below surface)

Begin	End	Description
325	333	Cinders
333	335	Basalt
335	340	Cinders
340	341	Clay
341	370	Basalt
370	380	Cinders and Clay
380	405	Cinders
405	425	Basalt
425	430	Cinders
430	440	Basalt
440	445	Cinders
445	452	Sand
452	457	Basalt
457	469	Sand
469	489	Basalt
489	495	Cinders
495	518.1	Basalt

WellName: FIRE STATION WELLCorrections:Well is located in a well house. 04/25/1994

Facility: SOUTH	Easting: 295185.47	Driller: Vollmer	Water Level: 420.4
Well Type: Production	Northing: 704351.01	Geologist: Alan E. Peckham	Water Level Date: 09/26/57
Well Status: Active	Longitude: 1125623.30349	Drilling Method: Cable tooled	Water Level Access: Line
Year Drilled: 1957	Latitude: 433548.48578	Drilling Fluid: NF	
Total Depth: 518.10	Completion Depth: 516.1	Land Surface: 4901.13	



FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH INEL (U.S. 20 Argonne Rest Area) Well Name/No. HIGHWAY 3

A. WELL USE

1) Year well was drilled: 1967

2) Current use for well:
(X) Potable water production well
( ) Raw water production well

3) Well is: (X) Active ( ) Inactive

4) Program Plan: Idaho State Drinking Water Regulations

5) Responsible Organization/Contact Person: Idaho Department of Highways, Jim Hutchinson

6) Has a sanitary survey been performed on the drinking water system by the Idaho Department of Health and Welfare: (Yes _ No X Insufficient Data NA _) Date performed N.R. Deficiencies reported relevant to scope of Fitness for Use Checklist / Corrective actions taken: _

The following evaluation pertains to well construction and does not address the design of the distribution system outside of well house or water quality issues.

B. WELL MUST COMPLY WITH IDAHO DEPARTMENT OF HEALTH AND WELFARE RULES AND REGULATIONS, TITLE 1, CHAPTER 8, "IDAHO REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS", SPECIFICALLY SUBSECTION 01.08550 "STANDARDS FOR PUBLIC DRINKING WATER SYSTEMS." WELL MUST ALSO COMPLY WITH IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (JANUARY 1989). THESE CRITERIA WILL BE EVALUATED IN SECTION C.

In addition, the Department of Health and Welfare has adopted "Recommended Standards for Water Works" (Albany, New York, 1992). The criteria from this report not included in "State Regulations for Well Construction" will be discussed in Section D.

1) Well shall not be located in a pit. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _)

2) Is a well house provided for this well: (Yes _ No X Insufficient Data _ N/A _) (If no, proceed to section 3)

a) Well house shall be provided with a locking door. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

b) Well house shall be protected from flooding and adequately drained. Are these criteria met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

c) Floor drains shall not be connected to sewers, storm drains, or any other source of contamination. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

d) Sumps for well house floor drains shall not be within 30 feet of the well. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

e) Well house shall not be used to store toxic or hazardous materials. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

3) Is the well constructed with a pitless adapter or pitless unit: (Yes X No Insufficient Data _ N/A _) (If no, proceed to Section 4)

a) The unit shall be the type approved by the National Sanitation Division or Pitless Adaptor Division of the Water Systems Council. Is this criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: _

b) The unit shall be designed to be watertight including the well cap and casing extension. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: _

c) The unit shall be tested for leaks prior to being put into service. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: The system was leak tested on 10/7/67.

4) Well must not be located within 50 or 100 feet of any potential source of contamination and no closer to specific sources of contamination than set forth below.

a) The well must not be within 50 feet of sewer lines. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: The well is located approximately 60 ft. from the rest stop building and over 100 ft. from the septic tank.

b) The well must not be within 50 feet of canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: The well is located approximately 65 ft. from the highway (U.S.20) drainage ditch.

c) The well must not be within 100 feet of a drainfield or a drainfield replacement area. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: The drainfield is estimated to be over 200 ft. away from the well.

d) Is the well within 50 feet of contaminated perched water bodies: (Yes _ No _ Insufficient Data X N/A _) Explanation: The well is located approximately 300 ft. from the Big Lost River drainage, which during periods when it flows may generate perched water bodies that could conceivably reach the well.

5) Well casing shall extend a minimum of 12 inches above the ground surface and 6 inches above the well house floor. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: The casing extends more than 12 inches above ground surface, but it is not located in a well house.

6) Well shall be vented with the open end screened and terminated downward at least 18 inches above the well house floor or ground surface. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

7) Well shall be equipped with the necessary valves and appurtenances to allow the well to be pumped to waste. Is this criterion met: (Yes X No_ Insufficient Data_ N/A _) Explanation: B. Bogart indicated on 2/24/93, that the well could be pumped to waste through the lawn sprinklers.

8) A flow meter and sample tap shall be installed on discharge line. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

9) A pressure gauge shall be provided at all installations. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

10) Well shall be cased and sealed in such a manner that surface water can not enter the well and a watertight seal shall be provided at the top of the casing. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4-inch thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port which has a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes _ No X Insufficient Data _)

2) Casing

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

a) If the well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 30 ft. bls., and 8-inch casing is installed from 1.46 ft. als. through 680 ft. bls.

b) If the well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size inches 12 Casing size inches 8)

c) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-coupled joints which shall be watertight or be approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480 which is a combination of Idaho State regulations for casing less than 6 inches in diameter and "Recommended Standards for Water Works" (1992) for casings greater than 26 inches in diameter.

FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH INEL (U.S. 20 Argonne Rest Area) Well Name/No. HIGHWAY 3

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 I.D.	6.625	.280
8	8.628	.322
10 I.D.	0.750	.365
12	12.750	.375
14	14.000	.375
16	16.000	.375
18	18.000	.375
20	20.000	.375
22	22.000	.500
24	24.000	.500
26	26.000	.500
28	28.000	.500
30	30.000	.500
32	32.000	.500
34	34.000	.500

Casing Type	Casing Diameter (inches)	Casing Interval (feet bls)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/State Regs. on Casing Thickness
Steel	8	-1.46 - 680	Welded	17	0.280	No

3) Seal

State of Idaho Reg. 3.3.1. and 3.3.2.1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters.

Annular Fill Material	Interval (feet bls)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Clay and Soil	0 - 30	N.F.	No
Cement	30 - 35	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to the top of bedrock: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 30 ft. bls. Cement was placed from 30 to 35 ft. bls. and a clay and soil mixture was placed from 30 ft. bls. to ground surface. However, clay and soil are not approved as a seal by state regulations.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): (Yes _ No _ Insufficient Data X N/A _) Explanation: The method used to place the surface seal is not documented in the available information.

State of Idaho Reg. 3.3.1. The casing seal is to prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams, spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _ Insufficient Data _ N/A _) Explanation: See B.4.c and B.4.d

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No _ Insufficient Data X N/A _) Explanation (Qualify data/specify perched intervals if applicable): A complete set of geophysical logs were not available for comparison with respect to identifying potential saturated zones at the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: (Yes _ No X Insufficient Data _ N/A _) Explanation: The well is completed with an open annulus well below 35 ft. bls.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

D. WELL MUST COMPLY WITH "RECOMMENDED STANDARDS FOR WATER WORKS" (1992), A REPORT OF THE COMMITTEE OF THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS.

1) Does the well contain a packer that is in contact with the groundwater supply interval: (Yes _ No X Insufficient Data _ N/A _). If yes, is the packer comprised of materials that are toxic, will impair taste or odor, or facilitate bacterial contamination of the well water: (Yes _ No _ Packer Type _ N/A X)

2) Screen

a) Does the well contain perforated casing or a screen: (Yes _ No X Insufficient Data _ N/A _) If yes, the perforated screen or casing must be installed so that the pumping water level remains above it under operating conditions. The following determination was made from the available production water level data which will vary with changes in the static water levels (water table elevation); therefore, the following determination may not be valid under all conditions. Is the criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

b) Is the perforated casing or screen constructed of material resistant to damage by chemical action from the groundwater or cleaning operations: Material Type N/A Explanation: N.R.

3) If the casing is constructed of nonferrous material, it must be resistant to the corrosiveness of the water. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X)

4) Was the well adequately developed to remove native silts and clays, drilling mud or the finer fraction of the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: The well was developed in October of 1967 by pumping the well at 30 gpm for 48 hours.

E. THE PRIMARY SOURCE FOR THE WELL EVALUATION IS THE IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY. OTHER SOURCES: T. Norton, Golder Associates Inc., Personal inspection, 2/19/93. Jim Hutchinson of the Idaho Department of Highways, Personal Communication 2/23/93. Billy Bogart of the Idaho Department of Highways, Personal Communication 2/24/93

F. WELL FITNESS DETERMINATION

Intended use: PRODUCTION/POTABLE WELL

( ) Well is acceptable for intended use.
(X) Well is acceptable for intended use if a variance is granted.
( ) Maintenance required to continue intended use.
( ) Remediation required to continue intended use.
( ) Decommission, well is unneeded or cannot be remediated.

DEFICIENCIES: The following deficiencies were identified for this well: the surface seal does not meet Idaho State regulations because the cement seal does not run from ground surface to bedrock and the casing seal below 30 ft. bls. is absent. A variance could be requested for the improper surface seal and lack of casing seal, however, if water quality is of question, remediation may be required for the surface and casing seals due to the proximity of the well to the Big Lost River drainage. Additionally, there is no access to take water levels and the casing thickness does not comply with State regulations.

REMEDIATION: N.R.

N.F. Not Found
N/A Not Applicable
N.R. Not Required

GEOLOGIC LOG

Well Name HIGHWAY 3

Source: Well Driller's Report

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Interval (feet below surface)

Begin	End	Description
0	30	Gravel and Clay
30	80	Basalt
80	83	Broken Basalt
83	155	Broken Basalt
155	205	Basalt
205	250	Clay
250	276	Basalt
276	283	Basalt and Clay
283	305	Basalt
305	350	Cinders and Clay
350	400	Basalt
400	418	Cinders
418	470	Basalt / Cinders / Clay
470	478	Basalt
478	515	Basalt and Cinders
515	580	Basalt
580	597	Basalt and Clay
597	605	Sandy Clay and Cinders
605	650	Basalt

COMPILED BY/ORGANIZATION: T. Norton / GAI Date 2/16/93

GEOLOGIC LOG

Well Name HIGHWAY 3

Source: Well Driller's Report

****

Interval (feet below surface)

Begin	End	Description
650	672	Cinders
672	750	Basalt

COMPILED BY/ORGANIZATION: T. Norton / GAI Date 2/16/93

WellName: HIGHWAY 3

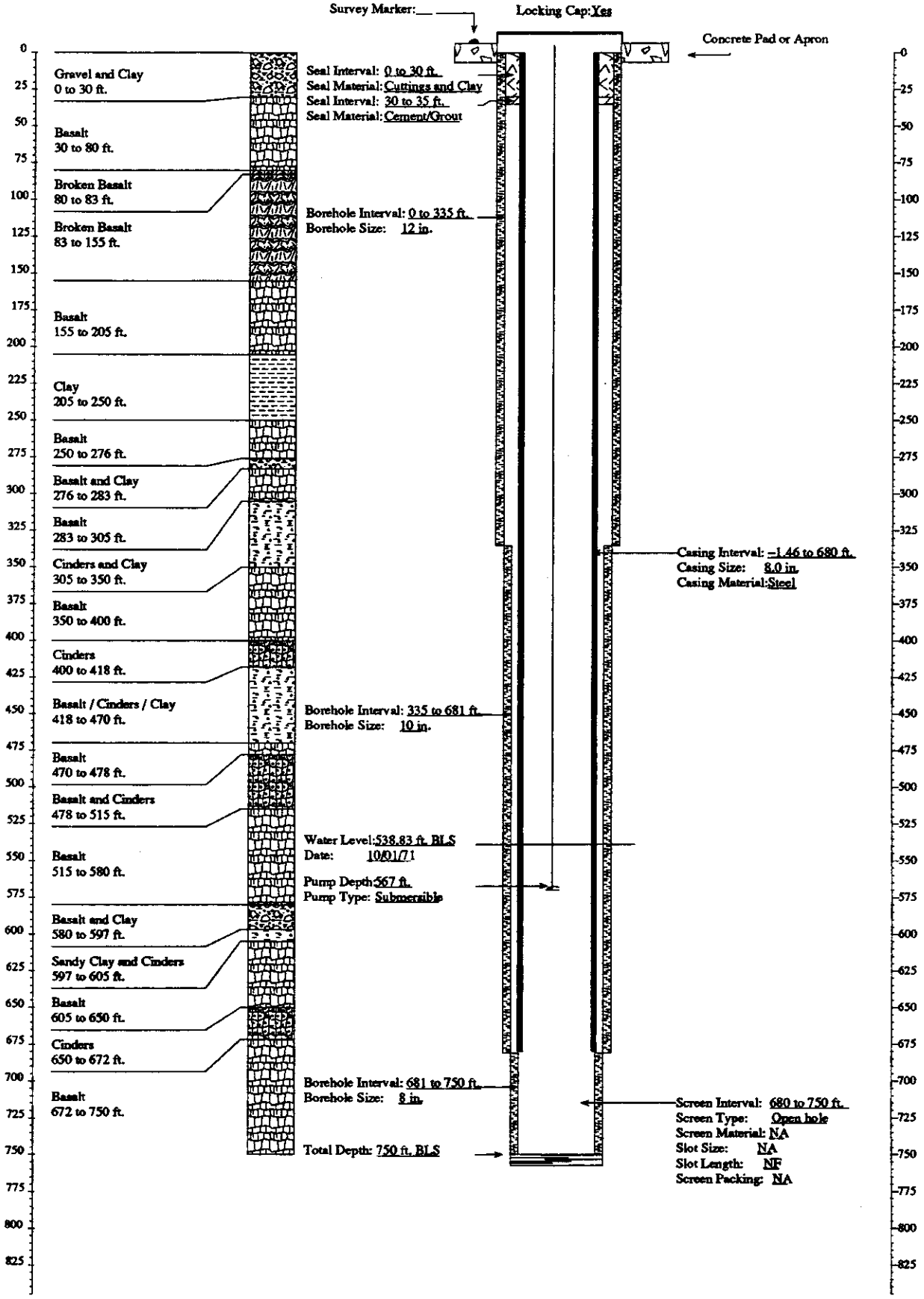
08/22/1993

Facility: SOUTH
Well Type: Potable Water Well
Well Status: Active
Year Drilled: 1967
Total Depth: 750

Easting: 277297.85
Northing: 687160.41
Longitude: 1130025.00
Latitude: 433256.00
Completion Depth: 750

Driller: Boley/Henry/Weech
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4980.88

Water Level: 538.83
Water Level Date: 10/01/71
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. NPR TEST

A. WELL USE

1) Year well was drilled: 1984

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes _ No X)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No X N/A _)
6) Based on location of well, is existing or planned surface completion adequate: (Yes _ No X) Explanation A survey marker should be installed to comply with INEL Best Management Practices.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ N/A _ Borehole size 10-inch (0 to 8 feet), 8-inch (8 to 599 feet) Casing size 6-inch (I.D. or O.D.?)
Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel [1]	6 (I.D. or O.D.?)	0 - 599	N.F.	22	N.F.	N.F.

[1] Casing perforated from 500 to 535 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	0 (?) - 20	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, although only the depth of the surface seal is documented, no surface water or perched groundwater occurs near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

	Material
Casing	
Screen	
Pump	
Discharge Pipe	
Explanation	

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The integrity of the surface seal could not be evaluated since only the depth of the seal is documented. However, the well is located about 1.8 miles north of PBF and is not in proximity to any potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the possible lack of this seal. Also, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: A survey marker was not installed at the well during the sitewide surface upgrades and should be placed in order to comply with INEL Best Management Practices.

GEOLOGIC LOG

Well Name NPR TEST

Source:Core Log

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Interval (feet below surface)

Begin	End	Description
0	6.8	No Data
6.8	28	Gray Basalt (Fractured 17-19 ft.)
28	45	Fractured Gray Basalt
45	91.5	Gray to Brown Basalt
91.5	102	Highly Fractured Vesicular Red to Gray Basalt
102	102.5	Orange Clayey Silt (Loess)
102.5	113	No Data / Void at 103 ft.
113	124	Fractured Gray Basalt
124	131	Gray Basalt
131	137	Fractured Gray Basalt / Void 133.5-136 ft.
137	160	Gray to Lt. Red Basalt
160	165	Fractured Vesicular Lt. Red to Gray Basalt
165	180	Gray Basalt
180	184	Fractured Vesicular Gray Basalt with Clay Infilling
184	194.5	Gray Basalt
194.5	197	Vesicular Grayish Red Basalt
197	242	Gray Basalt
242	266.5	Red-Brown Clayey Silt/ No Data 243-265.6 ft.
266.5	278.5	Gray Basalt
278.5	279.3	Sediment
279.3	292	Gray Basalt (Highly Fractured at Top)

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 25, 1992

GEOLOGIC LOG

Well Name NPR TEST

Source:Core Log

****

Interval (feet below surface)

Begin	End	Description
292	297.5	Fractured Vesicular Lt. Red Basalt
297.5	328	Gray Basalt (No Data 299-304 ft.)
328	338	Fractured Gray to Red Basalt with Clay Infilling
338	344	Vesicular Lt. to Blackish Red Basalt
344	355	Dense Red to Gray Basalt (Mostly Crystalline)
355	399	Gray Basalt (Highly Fractured 385-387 ft.)
399	402.5	No Data
402.5	414	Reddish to Brown Clayey Silt (Loess)
414	415.5	Vesicular Gray Basalt
415.5	426	No Data
426	459	Mostly Black Basalt/Highly Fractured 434-436 ft. (No Data-6 discontinuous feet)
459	463	Fractured Gray Basalt (No Data 461-463 ft.)
463	517	Mostly Gray Basalt (Highly Fractured 492-493 ft.)
517	522	Fractured Red to Gray Basalt
522	537.6	Black Basalt
537.6	555.5	Gray Basalt (0.1 ft. Silty Sand at Top)
555.5	599.2	No Data (Possibly Sand Interbed)
599.2	609	Grayish Black Basalt (Highly Fractured 602-604 ft.)

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 25, 1992

WellName: NPR TEST

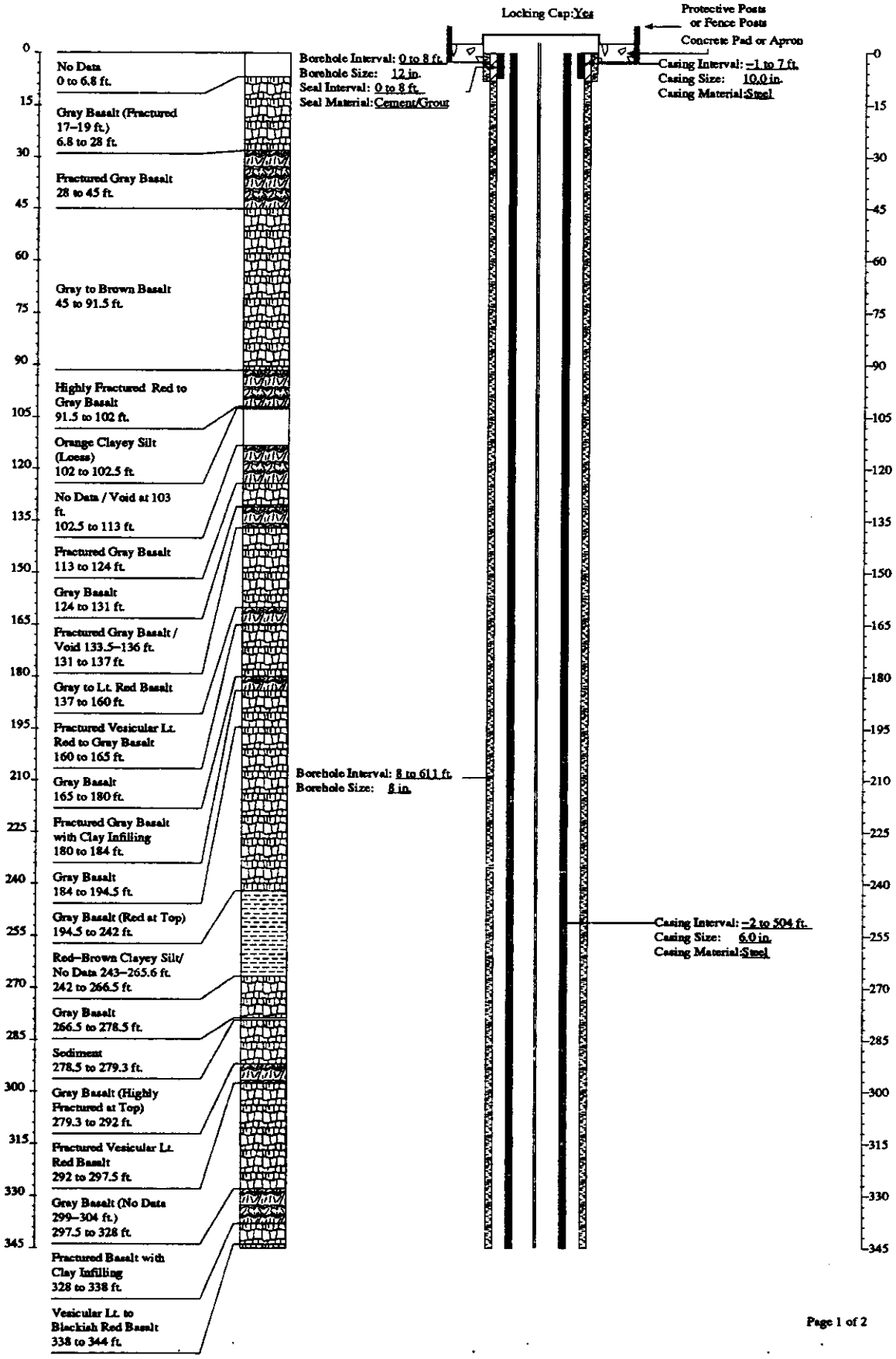
06/20/1994

Facility: SOUTH
Well Type: Observation
Well Status: Active
Year Drilled: 1984
Total Depth: 611

Easting: 312209.817
Northing: 698219.907
Longitude: 1125231.26085
Latitude: 433449.43445
Completion Depth: 600

Driller: McCabe
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4933.146

Water Level: 459.35
Water Level Date: 07/26/84
Water Level Access: Line



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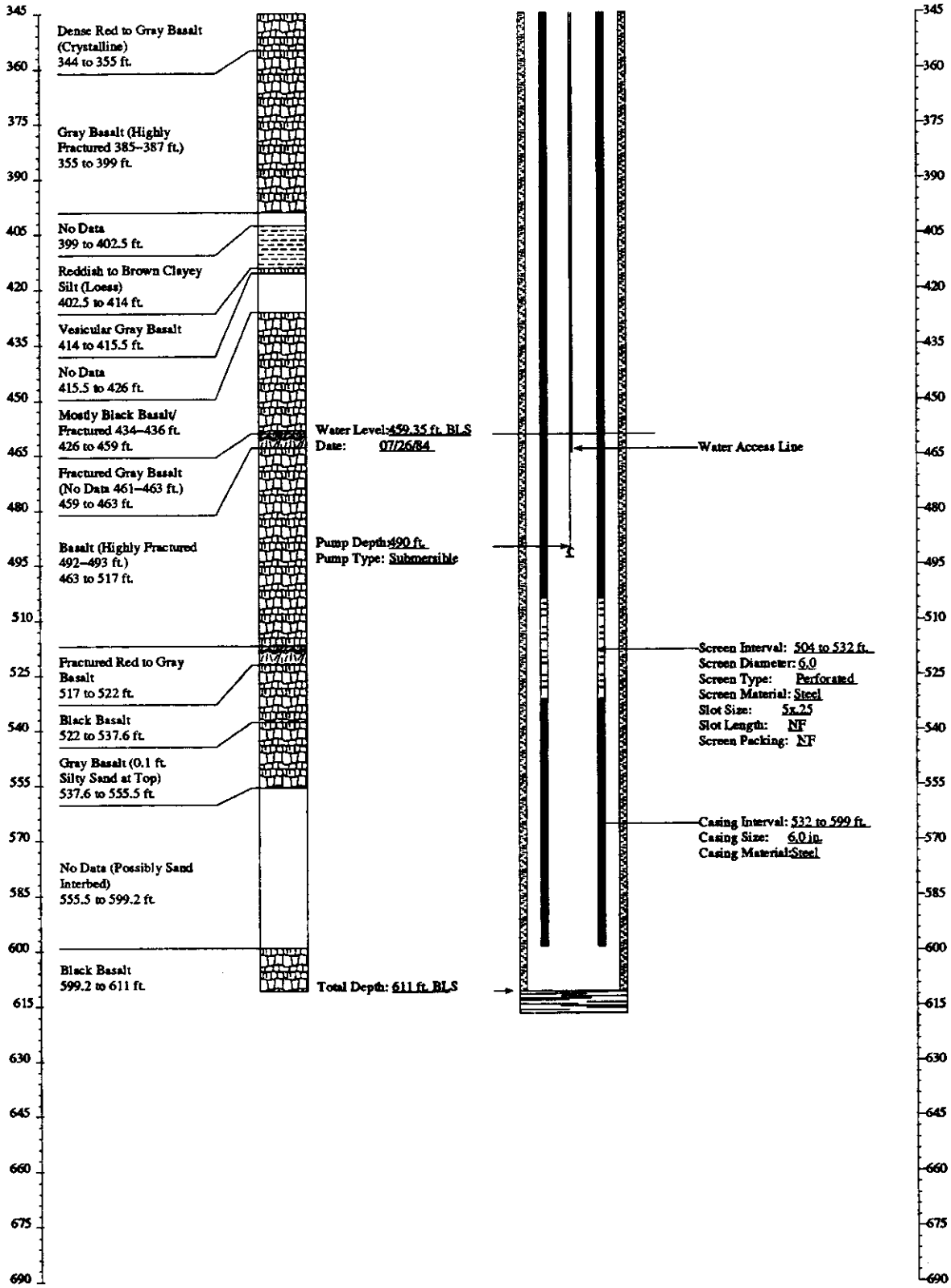


FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH (STF) (Bldg. ECOR 601) Well Name/No. OMRE

A. WELL USE

1) Year well was drilled: 1956

2) Current use for well:
(X) Potable water production well
( ) Raw water production well

3) Well is: ( ) Active (X) Inactive

4) Program Plan: N/A

5) Responsible Organization/Contact Person: EG&G, Will Wyland.

6) Has a sanitary survey been performed on the drinking water system by the Idaho Department of Health and Welfare: (Yes X No _ Insufficient Data NA _) Date performed 12/7/90 Deficiencies reported relevant to scope of Fitness for Use Checklist / Corrective actions taken: At the time the sanitary survey was taken there were several deficiencies reported, since that time, the mechanical equipment in the well house has been removed and only a sealed casing remains.

The following evaluation pertains to well construction and does not address the design of the distribution system outside of well house or water quality issues.

B. WELL MUST COMPLY WITH IDAHO DEPARTMENT OF HEALTH AND WELFARE RULES AND REGULATIONS, TITLE 1, CHAPTER 8, "IDAHO REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS", SPECIFICALLY SUBSECTION 01.08550 "STANDARDS FOR PUBLIC DRINKING WATER SYSTEMS." WELL MUST ALSO COMPLY WITH IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (JANUARY 1989). THESE CRITERIA WILL BE EVALUATED IN SECTION C.

In addition, the Department of Health and Welfare has adopted "Recommended Standards for Water Works" (Albany, New York, 1992). The criteria from this report not included in "State Regulations for Well Construction" will be discussed in Section D.

1) Well shall not be located in a pit. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _)

2) Is a well house provided for this well: (Yes X No _ Insufficient Data _ N/A _) (If no, proceed to section 3)

a) Well house shall be provided with a locking door. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) Well house shall be protected from flooding and adequately drained. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

c) Floor drains shall not be connected to sewers, storm drains, or any other source of contamination. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

d) Sumps for well house floor drains shall not be within 30 feet of the well. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

e) Well house shall not be used to store toxic or hazardous materials. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

3) Is the well constructed with a pitless adapter or pitless unit: (Yes _ No X Insufficient Data _ N/A _) (If no, proceed to Section 4)

a) The unit shall be the type approved by the National Sanitation Division or Pitless Adaptor Division of the Water Systems Council. Is this criteria met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

b) The unit shall be designed to be watertight including the well cap and casing extension. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

c) The unit shall be tested for leaks prior to being put into service. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

4) Well must not be located within 50 or 100 feet of any potential source of contamination and no closer to specific sources of contamination than set forth below.

a) The well must not be within 50 feet of sewer lines. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) The well must not be within 50 feet of canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

c) The well must not be within 100 feet of a drainfield or a drainfield replacement area. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

d) Is the well within 50 feet of contaminated perched water bodies: (Yes No X Insufficient Data _ N/A _) Explanation: There are no known perched water bodies in the STF vicinity and the likelihood of one is remote since there is no surface water features present that could supply enough recharge to generate a substantial perched water body.

5) Well casing shall extend a minimum of 12 inches above the ground surface and 6 inches above the well house floor. Are these criteria met: (Yes X No Insufficient Data _ N/A _) Explanation: N.R.

6) Well shall be vented with the open end screened and terminated downward at least 18 inches above the well house floor or ground surface. Are these criteria met: (Yes _ No X Insufficient Data _ N/A _) Explanation: N.R.

7) Well shall be equipped with the necessary valves and appurtenances to allow the well to be pumped to waste. Is this criterion met: (Yes _ No X Insufficient Data _ N/A _) Explanation: N.R.

8) A flow meter and sample tap shall be installed on discharge line. Are these criteria met: (Yes _ No X Insufficient Data _ N/A _) Explanation: N.R.

9) A pressure gauge shall be provided at all installations. Is this criterion met: (Yes _ No X Insufficient Data _ N/A _) Explanation: N.R.

10) Well shall be cased and sealed in such a manner that surface water can not enter the well and a watertight seal shall be provided at the top of the casing. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _)
Explanation: N.R.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4-inch thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port which has a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater: (Yes X No Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 10 ft. bls., and 14-inch casing is installed from 1 ft als. through 680 ft. bls.

b) If the well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size inches 20 Casing size inches 14)

c) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-coupled joints which shall be watertight or be approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480 which is a combination of Idaho State regulations for casing less than 6 inches in diameter and "Recommended Standards for Water Works" (1992) for casings greater than 26 inches in diameter.

FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH (STF) PAGE 5 of 9 Well Name/No. OMRE

(Bldg. ECOR 601)

Permanent Steel Casing Minimum Specifications		
Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 I.D.	6.625	.280
8	8.628	.322
10 I.D.	0.750	.365
12	12.750	.375
14	14.000	.375
16	16.000	.375
18	18.000	.375
20	20.000	.375
22	22.000	.500
24	24.000	.500
26	26.000	.500
28	28.000	.500
30	30.000	.500
32	32.000	.500
34	34.000	.500

Casing Type	Casing Diameter (inches)	Casing Interval (feet bls)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/State Regs. on Casing Thickness
Steel (1)	14	-1 - 681	N.F.	12	N.F.	N/A
Steel	12	448 - 672	N.F.	N/A	N.F.	N/A
Steel	10	670 - 828	Welded and Threaded	N/A	N.F.	N/A
Steel (2)	8	800 - 940	N.F.	N/A	N.F.	N/A
(1) Casing perforated from 535 to 626 feet bls.						
(2) Casing perforated from 920 to 938 feet bls.						

3) Seal

State of Idaho Reg. 3.3.1. and 3.3.2.1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters.

Annular Fill Material	Interval (feet bls)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N/A	N/A	N/A

a) Does the surface seal extend at a minimum from ground surface to the top of bedrock: (Yes _ No X Insufficient Data _ N/A _) Explanation: There was no documentation of the placement of a surface seal in the available information and is assumed to be absent.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event):
(Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

State of Idaho Reg. 3.3.1. The casing seal is to prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams, spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X Insufficient Data _ N/A _) Explanation: None of the hydrologic features mentioned above are present in the vicinity of this well.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient Data _ N/A _) Explanation (Qualify data/specify perched intervals if applicable): Geophysical logs were not available for this well. However, see B, 4, d.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: (Yes _ No X Insufficient Data _ N/A _) Explanation: There is no documentation of a casing seal being installed in the available information and it is assumed to be absent.

4) Gravel Pack. Does the well contain a gravel pack: (Yes X No _) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No X Insufficient Data N/A _) Explanation: N.R.

D. WELL MUST COMPLY WITH "RECOMMENDED STANDARDS FOR WATER WORKS" (1992), A REPORT OF THE COMMITTEE OF THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS.

1) Does the well contain a packer that is in contact with the groundwater supply interval: (Yes X No _ Insufficient Data _ N/A _). If yes, is the packer comprised of materials that are toxic, will impair taste or odor, or facilitate bacterial contamination of the well water: (Yes X No _ Packer Type Lead N/A _)

2) Screen

a) Does the well contain perforated casing or a screen: (Yes X No Insufficient Data _ N/A _) If yes, the perforated screen or casing must be installed so that the pumping water level remains above it under operating conditions. The following determination was made from the available production water level data which will vary with changes in the static water levels (water table elevation); therefore, the following determination may not be valid under all conditions. Is the criterion met: (Yes _ No X Insufficient Data _ N/A _)
Explanation: The reported production water level is approximately 723 ft. bls., and the perforated casing is installed starting at 535 ft. bls, so the production water level is 188 ft. below the initial perforations.

b) Is the perforated casing or screen constructed of material resistant to damage by chemical action from the groundwater or cleaning operations: Material Type Steel Explanation: Steel is an acceptable well construction material for casing or screen in a non-acidic environment such as the Snake River Plain aquifer, as is demonstrated in EG&G report EGG-ER-8496.

3) If the casing is constructed of nonferrous material, it must be resistant to the corrosiveness of the water. Is this criterion met:
(Yes _ No _ Insufficient Data _ N/A X)

4) Was the well adequately developed to remove native silts and clays, drilling mud or the finer fraction of the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: There is no documentation of well development in the available information for this well. However, the well should have been sufficiently developed, while it was in service from 1956 until 1991.

E. **THE PRIMARY SOURCE FOR THE WELL EVALUATION IS THE IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY. OTHER SOURCES:** EG&G letter, BDA-60-92 From B. D. Andersen to M. B. Hinman, "Potential Contamination of Drinking Water Wells and Water Storage Tanks" dated 8/26/1992. EG&G letter, REW-45-92 From R. E. Williams to J. R. Harper "Listing of Potable Water Wells Not In Compliance With State Standards." dated 4/22/92. Brad Andersen, Teresa Brock, and Dennis Walker, Personal Communication 2/3/93. Idaho Department of Health and Welfare, Division of Environmental Quality, Drinking Water Supply Report STF/OMRE 12/7/90. Golder Associates Inc., "Draft STF/EOCR/OMRE Groundwater Monitoring Plan" Section 11.11, 1992

N.F. Not Found
N/A Not Applicable
N.R. Not Required

F. WELL FITNESS DETERMINATION

Intended use: PRODUCTION/POTABLE WELL

( ) Well is acceptable for intended use.
(X) Well is acceptable for intended use if a variance is granted.*
(X) Maintenance required to continue intended use.
( ) Remediation required to continue intended use.
( ) Decommission, well is unneeded or cannot be remediated.

DEFICIENCIES: * Operating under the assumption that the well is brought back in to production, the operating equipment in the well would be installed in compliance with Idaho State regulations, a variance could be obtained for an ungrouted casing, since there does not appear to be an eminent danger of perched groundwater or surface water entering or transporting contaminants through the annular space. Any variance requested would also have to address the lead packer since it is in contact with the aquifer. Additionally, information on the type of casing joints and casing thicknesses is not complete.

REMEDIATION: N.R.

GEOLOGIC LOG

Well Name OMRE

Source: Drilling Log

****

Interval (feet below surface)

Begin	End	Description
0	10	Alluvium
10	70	Basalt
70	75	Clay
75	135	Basalt
136	146	Sandy Conglomerate
146	212	Basalt
212	230	No Sample
230	321	Basalt
321	330	Porous Basalt
330	422	Basalt
422	427	Clay
427	595	Basalt
595	597	Porous Basalt
597	620	Basalt
620	625	Porous Basalt
625	636	Basalt
636	660	Sandy Clay
660	680	Basalt
680	685	Sandy Clay

COMPILED BY/ORGANIZATION: T.Norton / GAI Date 2/10/93

GEOLOGIC LOG

Well Name OMRE

Source: Drilling Log

****

Interval (feet below surface)

Begin	End	Description
685	715	Basalt
715	720	Clay
720	725	Basalt
725	730	Basalt and Clay
730	735	Basalt
735	745	Basalt and Clay
745	811	Clay
811	814	Porous Basalt
814	824	Clay
824	905	Basalt
905	912	Shale
912	919	Clay
919	928	Basalt
928	942	Porous Basalt

COMPILED BY/ORGANIZATION: T.Norton / GAI Date 2/10/93

WellName: OMRE

Corrections: WELL IS LOCATED IN A WELL HOUSE

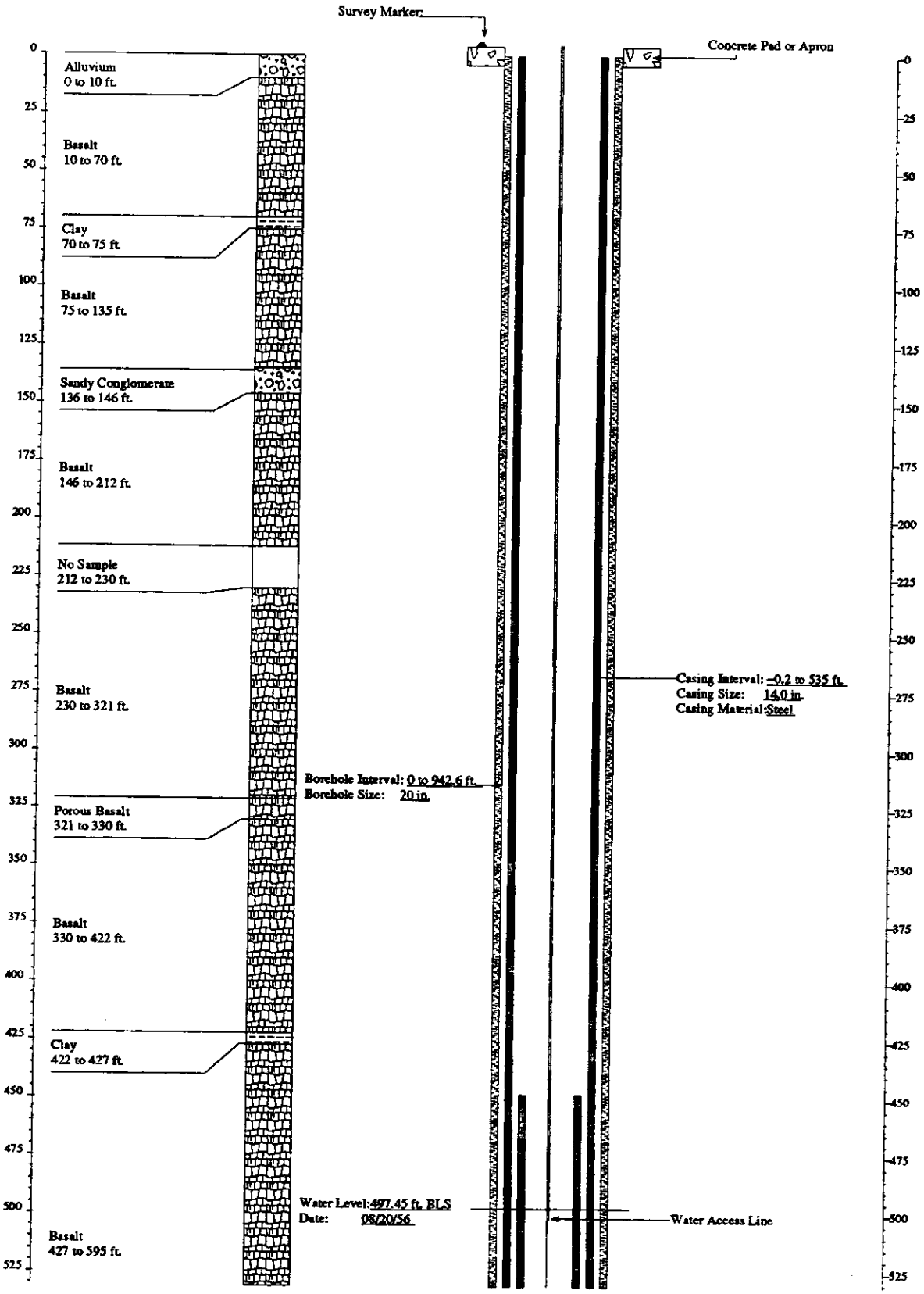
06/23/1994

Facility: SOUTH
Well Type: Potable Water
Well Status: Inactive
Year Drilled: 1957
Total Depth: 942.6

Easting: 462451.13
Northing: 676703.74
Longitude: 1125349.2614
Latitude: 433116.34814
Completion Depth: 942.6

Driller: Strasser
Geologist: Alan E. Peckham
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4939.83

Water Level: 497.45
Water Level Date: 08/20/56
Water Level Access: Line



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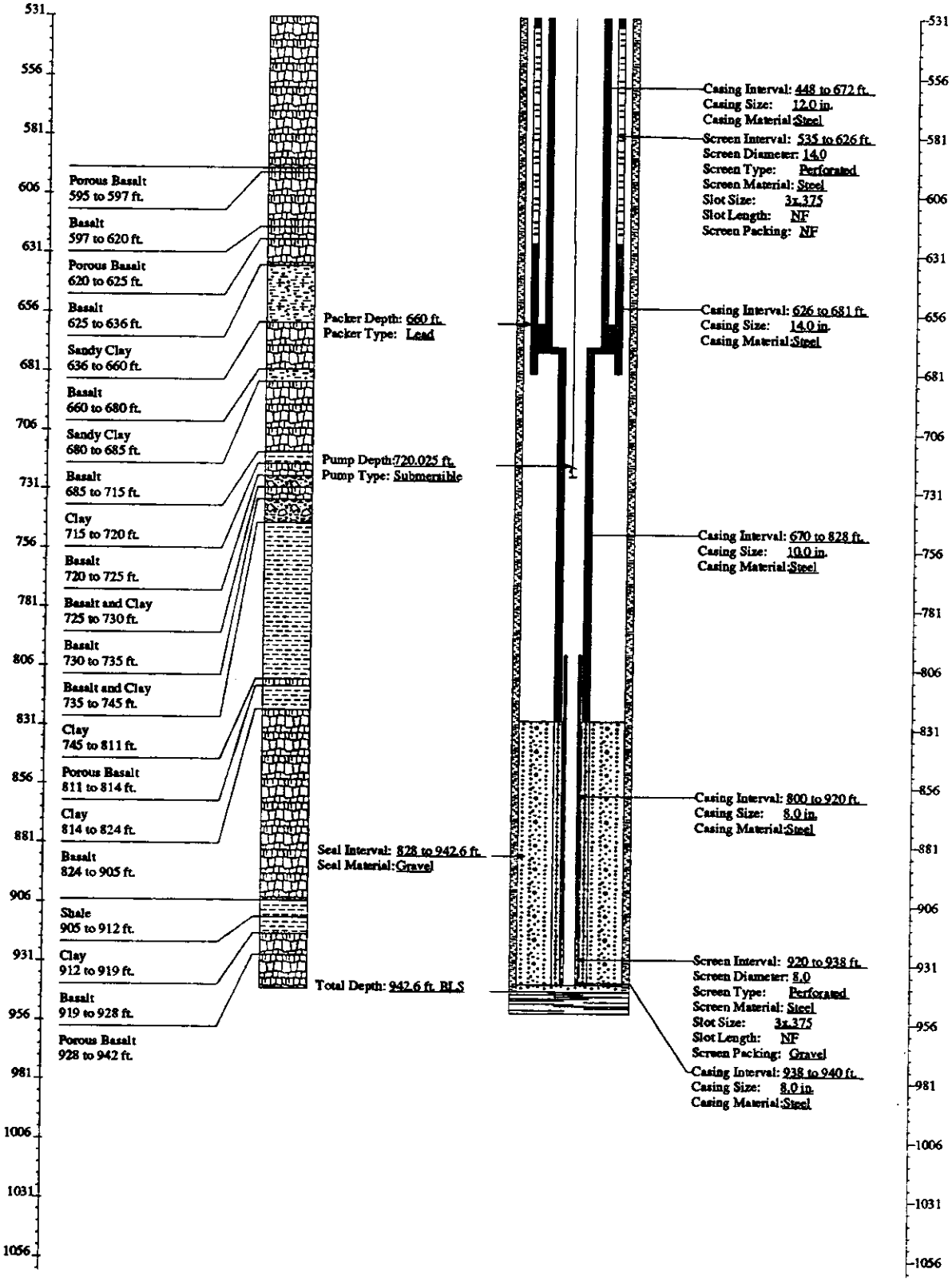


FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH INEL Well Name/No. RIFLE RANGE WELL

A. WELL USE

1) Year well was drilled: 1988

2) Current use for well:
(X) Potable water production well
( ) Raw water production well

3) Well is: (X) Active ( ) Inactive

4) Program Plan: EG&G Drinking Water Monitoring Program

5) Responsible Organization/Contact Person: EG&G, Brad Andersen

6) Has a sanitary survey been performed on the drinking water system by the Idaho Department of Health and Welfare: (Yes X No _ Insufficient Data NA _) Date performed 12/5/90 Deficiencies reported relevant to scope of Fitness for Use Checklist / Corrective actions taken: At the time the sanitary survey was conducted the well casing was not vented and the well was not plumbed to pump to waste. Only the casing vent has been installed since the time of the inspection.

The following evaluation pertains to well construction and does not address the design of the distribution system outside of well house or water quality issues.

B. WELL MUST COMPLY WITH IDAHO DEPARTMENT OF HEALTH AND WELFARE RULES AND REGULATIONS, TITLE 1, CHAPTER 8, "IDAHO REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS", SPECIFICALLY SUBSECTION 01.08550 "STANDARDS FOR PUBLIC DRINKING WATER SYSTEMS." WELL MUST ALSO COMPLY WITH IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (JANUARY 1989). THESE CRITERIA WILL BE EVALUATED IN SECTION C.

In addition, the Department of Health and Welfare has adopted "Recommended Standards for Water Works" (Albany, New York, 1992). The criteria from this report not included in "State Regulations for Well Construction" will be discussed in Section D.

1) Well shall not be located in a pit. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _)

2) Is a well house provided for this well: (Yes X No _ Insufficient Data _ N/A _) (If no, proceed to section 3)

a) Well house shall be provided with a locking door. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) Well house shall be protected from flooding and adequately drained. Are these criteria met: (Yes _ No X Insufficient Data _ N/A _) Explanation: Standing water can collect in the doorway when the well is discharged.

c) Floor drains shall not be connected to sewers, storm drains, or any other source of contamination. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: The well house is not equipped with a floor drain.

d) Sumps for well house floor drains shall not be within 30 feet of the well. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

e) Well house shall not be used to store toxic or hazardous materials. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

3) Is the well constructed with a pitless adapter or pitless unit: (Yes _ No X Insufficient Data _ N/A _) (If no, proceed to Section 4)

a) The unit shall be the type approved by the National Sanitation Division or Pitless Adaptor Division of the Water Systems Council. Is this criteria met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

b) The unit shall be designed to be watertight including the well cap and casing extension. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

c) The unit shall be tested for leaks prior to being put into service. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

4) Well must not be located within 50 or 100 feet of any potential source of contamination and no closer to specific sources of contamination than set forth below.

a) The well must not be within 50 feet of sewer lines. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) The well must not be within 50 feet of canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

c) The well must not be within 100 feet of a drainfield or a drainfield replacement area. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

d) Is the well within 50 feet of contaminated perched water bodies: (Yes _ No X Insufficient Data _ N/A _) Explanation: See C,3,c

5) Well casing shall extend a minimum of 12 inches above the ground surface and 6 inches above the well house floor. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

6) Well shall be vented with the open end screened and terminated downward at least 18 inches above the well house floor or ground surface. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

7) Well shall be equipped with the necessary valves and appurtenances to allow the well to be pumped to waste. Is this criterion met: (Yes X No Insufficient Data _ N/A _) Explanation: The EG&G internal sanitary survey (dated 10/4/91) indicates that well can be pumped to waste, but is discharged inside the well house.

8) A flow meter and sample tap shall be installed on discharge line. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

9) A pressure gauge shall be provided at all installations. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

10) Well shall be cased and sealed in such a manner that surface water can not enter the well and a watertight seal shall be provided at the top of the casing. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4-inch thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port which has a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

a) If the well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 55 ft. bls., and 8-inch casing is installed from 1 ft. als. through 150 ft. bls.

b) If the well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size inches 12 Casing size inches 8)

c) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-coupled joints which shall be watertight or be approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480 which is a combination of Idaho State regulations for casing less than 6 inches in diameter and "Recommended Standards for Water Works" (1992) for casings greater than 26 inches in diameter.

Permanent Steel Casing Minimum Specifications		
Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 I.D.	6.625	.280
8	8.628	.322
10 I.D.	0.750	.365
12	12.750	.375
14	14.000	.375
16	16.000	.375
18	18.000	.375
20	20.000	.375
22	22.000	.500
24	24.000	.500
26	26.000	.500
28	28.000	.500
30	30.000	.500
32	32.000	.500
34	34.000	.500

Casing Type	Casing Diameter (inches)	Casing Interval (feet bls)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/State Regs. on Casing Thickness
Steel	8	-1 - 150	N.F.	12	0.250	No
Steel	6	-1 - 310	N.F.	12	0.250	No
Steel (1)	5	305 - 625	N.F.	N/A	0.250	Yes
(1) Casing perforated from 600 to 620 feet bls.						

3) Seal

State of Idaho Reg. 3.3.1. and 3.3.2.1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters.

Annular Fill Material	Interval (feet bls)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	0 - 150	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to the top of bedrock: (Yes X No _ Insufficient Data _ N/A _) Explanation: The cement surface seal runs from 0-150 ft. bls., the alluvium/basalt interface is at approximately 55 ft. bls.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event):
(Yes _ No _ Insufficient Data X N/A _) Explanation: The method used to emplace the cement seal is not documented in the available information.

State of Idaho Reg. 3.3.1. The casing seal is to prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams, spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X Insufficient Data _ N/A _) Explanation: The well is not located in proximity to any of the hydrologic features mentioned above.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient Data _ N/A _) Explanation (Qualify data/specify perched intervals if applicable): There is no indication of saturated zones in the geophysical logs (taken on 6/2/88) or any documentation of perched water bodies in the available information.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: (Yes _ No X Insufficient Data _ N/A _) Explanation: There is no casing seal between 150 ft. bls. and the water table at approximately 508 ft. bls., however, there is no indication of the presents of perched water in the vicinity of the Gun Range.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No _ Insufficient Data X NA _) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ Insufficient Data X N/A _) Explanation: N.R.

D. WELL MUST COMPLY WITH "RECOMMENDED STANDARDS FOR WATER WORKS" (1992), A REPORT OF THE COMMITTEE OF THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS.

1) Does the well contain a packer that is in contact with the groundwater supply interval: (Yes _ No _ Insufficient Data X N/A _). If yes, is the packer comprised of materials that are toxic, will impair taste or odor, or facilitate bacterial contamination of the well water: (Yes _ No _ Packer Type _ N/A X)

2) Screen

a) Does the well contain perforated casing or a screen: (Yes X No Insufficient Data _ N/A _) If yes, the perforated screen or casing must be installed so that the pumping water level remains above it under operating conditions. The following determination was made from the available production water level data which will vary with changes in the static water levels (water table elevation); therefore, the following determination may not be valid under all conditions. Is the criterion met: (Yes _ No _ Insufficient Data X N/A _) Explanation: There is no production water level reported in the available information. The static water level is approximately 508 ft. bls., the initial casing perforations are at 600 ft. bls., It is likely that the production water level does not fall below 600 ft.

b) Is the perforated casing or screen constructed of material resistant to damage by chemical action from the groundwater or cleaning operations: Material Type Steel Explanation: Steel is an acceptable well construction material for casing or screen in a non-acidic environment such as the Snake River Plain aquifer, as is demonstrated in EG&G report EGG-ER-8496.

3) If the casing is constructed of nonferrous material, it must be resistant to the corrosiveness of the water. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X)

4) Was the well adequately developed to remove native silts and clays, drilling mud or the finer fraction of the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: There is no documentation of well development in the available information for this well. However, the well has been in service since 1990 and is sufficiently developed at this time.

E. **THE PRIMARY SOURCE FOR THE WELL EVALUATION IS THE IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY. OTHER SOURCES:** EG&G letter, BDA-60-92 From B. D. Andersen to M. B. Hinman, "Potential Contamination of Drinking Water Wells and Water Storage Tanks" dated 8/26/1992. EG&G letter, REW-45-92 From R. E. Williams to J. R. Harper "Listing of Potable Water Wells Not In Compliance With State Standards." dated 4/22/92. Brad Andersen, Teresa Brock, and Dennis Walker, Personal Communication, 2-3-93. Idaho Department of Health and Welfare, Division of Environmental Quality, Drinking Water Supply Report, INEL Gun Range, 2/5/93

N.F. Not Found
N/A Not Applicable
N.R. Not Required

F. WELL FITNESS DETERMINATION

Intended use: PRODUCTION/POTABLE WELL

( ) Well is acceptable for intended use.
(X) Well is acceptable for intended use if a variance is granted.
(X) Maintenance required to continue intended use.
( ) Remediation required to continue intended use.
( ) Decommission, well is unneeded or cannot be remediated.

DEFICIENCIES: The 8 and 6 inch casing thicknesses do not meet the Idaho State regulations, and the type of casing joints are not documented. The pump to waste capabilities for this well are not ideal, but are functional. Additionally, there is no casing seal from 150 ft. bls. down to the water table but there are no indications of perched water in the vicinity of the well. A variance could be obtained for the lack of a casing seal below 150 ft. The ground surface should be graded around the well house to enhance drainage.

REMEDIATION: N.R.

GEOLOGIC LOG

Well Name Rifle Range Well

Source: No Information Found

****

Interval (feet below surface)

Begin	End	Description

COMPILED BY/ORGANIZATION: T. Norton / GAI Date 2/10/93

WellName: RIFLE RANGE WELL

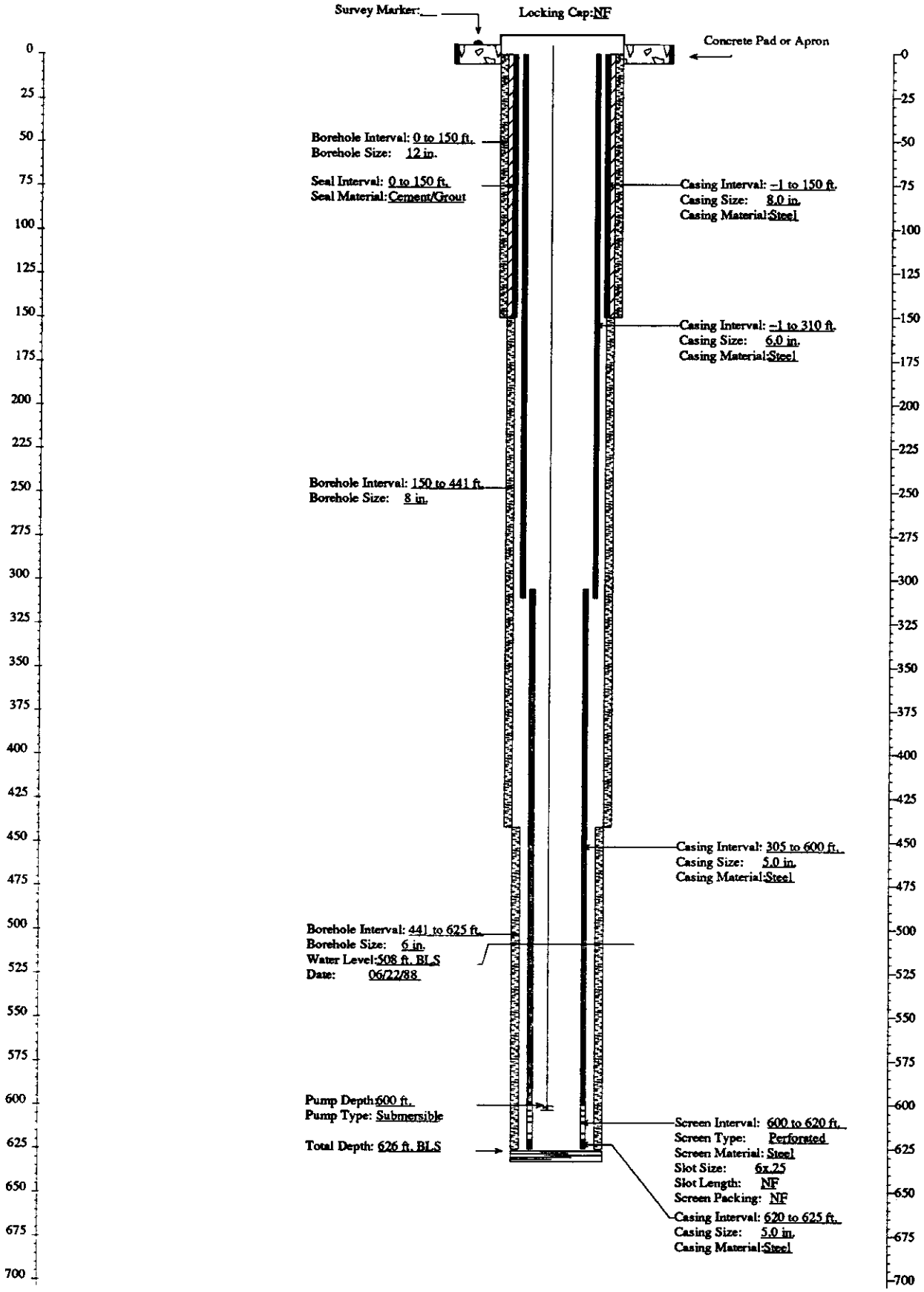
06/15/1993

Facility: SOUTH
Well Type: Potable Water Well
Well Status: Active
Year Drilled: 1988
Total Depth: 626

Easting: 282850.40
Northing: 685735.60
Longitude: 1125908.00
Latitude: 433243.00
Completion Depth: 620

Driller: Cushman
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4967.46

Water Level: 508
Water Level Date: 06/22/88
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST POTABLE WATER/PRODUCTION WELL

LOCATION: SOUTH INEL (Experimental Field Station) Well Name/No. SITE-04

A. WELL USE

1) Year well was drilled: 1957

2) Current use for well:
( ) Potable water production well
(X) Raw water production well

3) Well is: (X) Active ( ) Inactive

4) Program Plan: N/A

5) Responsible Organization/Contact Person: EG&G, Paula Fee

6) Has a sanitary survey been performed on the drinking water system by the Idaho Department of Health and Welfare: (Yes _ No X Insufficient Data NA _) Date performed N/A Deficiencies reported relevant to scope of Fitness for Use Checklist / Corrective actions taken: T. Norton of Golder Associates Inc. inspected the well and well house on 2/19/93, for compliance with Idaho State drinking water regulations. Only the following deficiencies were found: the casing was not vented and it was not apparent if there was access for taking water levels.

The following evaluation pertains to well construction and does not address the design of the distribution system outside of well house or water quality issues.

B. WELL MUST COMPLY WITH IDAHO DEPARTMENT OF HEALTH AND WELFARE RULES AND REGULATIONS, TITLE 1, CHAPTER 8, "IDAHO REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS", SPECIFICALLY SUBSECTION 01.08550 "STANDARDS FOR PUBLIC DRINKING WATER SYSTEMS." WELL MUST ALSO COMPLY WITH IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (JANUARY 1989). THESE CRITERIA WILL BE EVALUATED IN SECTION C.

In addition, the Department of Health and Welfare has adopted "Recommended Standards for Water Works" (Albany, New York, 1992). The criteria from this report not included in "State Regulations for Well Construction" will be discussed in Section D.

1) Well shall not be located in a pit. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _)

2) Is a well house provided for this well: (Yes X No _ Insufficient Data _ N/A _) (If no, proceed to section 3)

a) Well house shall be provided with a locking door. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) Well house shall be protected from flooding and adequately drained. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: The surrounding ground surface is sloped away from the well house.

c) Floor drains shall not be connected to sewers, storm drains, or any other source of contamination. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: The well house is not equipped with a floor drain.

d) Sumps for well house floor drains shall not be within 30 feet of the well. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A X) Explanation: N.R.

e) Well house shall not be used to store toxic or hazardous materials. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

3) Is the well constructed with a pitless adapter or pitless unit: (Yes _ No X Insufficient Data _ N/A _) (If no, proceed to Section 4)

a) The unit shall be the type approved by the National Sanitation Division or Pitless Adaptor Division of the Water Systems Council. Is this criteria met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

b) The unit shall be designed to be watertight including the well cap and casing extension. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

c) The unit shall be tested for leaks prior to being put into service. Is this criterion met: (Yes _ No _ Insufficient Data _ N/A _) Explanation: _

4) Well must not be located within 50 or 100 feet of any potential source of contamination and no closer to specific sources of contamination than set forth below.

a) The well must not be within 50 feet of sewer lines. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

b) The well must not be within 50 feet of canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

c) The well must not be within 100 feet of a drainfield or a drainfield replacement area. Is this criterion met:
(Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

d) Is the well within 50 feet of contaminated perched water bodies: (Yes No _ Insufficient Data X N/A _) Explanation: The well is located approximately 1000 ft. from the Big Lost River drainage, which in flowing years may generate a perched water body that could conceivably reach the well.

5) Well casing shall extend a minimum of 12 inches above the ground surface and 6 inches above the well house floor. Are these criteria met: (Yes X No Insufficient Data _ N/A _) Explanation: N.R.

6) Well shall be vented with the open end screened and terminated downward at least 18 inches above the well house floor or ground surface. Are these criteria met: (Yes _ No X Insufficient Data _ N/A _) Explanation: The casing is not vented.

7) Well shall be equipped with the necessary valves and appurtenances to allow the well to be pumped to waste. Is this criterion met: (Yes X No Insufficient Data _ N/A _) Explanation: N.R.

8) A flow meter and sample tap shall be installed on discharge line. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

9) A pressure gauge shall be provided at all installations. Is this criterion met: (Yes X No _ Insufficient Data _ N/A _) Explanation: N.R.

10) Well shall be cased and sealed in such a manner that surface water can not enter the well and a watertight seal shall be provided at the top of the casing. Are these criteria met: (Yes X No _ Insufficient Data _ N/A _)
Explanation: N.R.

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "RULES AND REGULATIONS WELL CONSTRUCTION STANDARDS" (1989)

1) Surface Completion

State of Idaho Reg. 3.2.1. The top of the casing shall be completely covered with a 1/4-inch thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3.11. The well shall be equipped with an access port which has a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes _ No _ Insufficient Data X)

2) Casing

State of Idaho Reg. 3.3.4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

a) If the well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater: (Yes X No Insufficient Data _ N/A _) Explanation: The alluvium/basalt interface is at approximately 16 ft. bls., and 8.25-inch casing is installed from 2 ft. als. through 495.2 ft. bls.

b) If the well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size inches 15.25 Casing size inches 8.25)

c) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-coupled joints which shall be watertight or be approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480 which is a combination of Idaho State regulations for casing less than 6 inches in diameter and "Recommended Standards for Water Works" (1992) for casings greater than 26 inches in diameter.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 I.D.	6.625	.280
8	8.628	.322
10 I.D.	0.750	.365
12	12.750	.375
14	14.000	.375
16	16.000	.375
18	18.000	.375
20	20.000	.375
22	22.000	.500
24	24.000	.500
26	26.000	.500
28	28.000	.500
30	30.000	.500
32	32.000	.500
34	34.000	.500

Casing Type	Casing Diameter (inches)	Casing Interval (feet bls)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/State Regs. on Casing Thickness
Steel [1]	8.25	-2 - 495.24	N.F.	24	0.250	No

[1] Casing perforated 416 - 491 feet bls.

3) Seal

State of Idaho Reg. 3.3.1. and 3.3.2.1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters.

Annular Fill Material	Interval (feet bls)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Clay and Soil	0 - 368.39	N.F.	Yes
Cement Grout	368.39 - 374.39	N.F.	Yes
Gravel Pack	374.39 - 491.39	N.F.	Yes
Cement Grout	491.39 - 495.24	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to the top of bedrock: (Yes X No _ Insufficient Data _ N/A _) Explanation: The alluvial/basalt interface is at approximately 16 ft. bls. A clay/mud/soil mixture was placed from 368.39 ft. bls. to ground surface.

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event):
(Yes _ No _ Insufficient Data X N/A _) Explanation: The method used to place was not documented in the available information.

State of Idaho Reg. 3.3.1. The casing seal is to prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams, spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No _ Insufficient Data X N/A _) Explanation: See B.4.d.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No _ Insufficient Data X N/A _) Explanation (Qualify data/specify perched intervals if applicable): The available geophysical logs for this well were incomplete and did not allow for a determination with respect to identifying perched water zones.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: (Yes _ No _ Insufficient Data X N/A _) Explanation: A clay and soil casing seal was placed in the annular space but there was no indication of the percent of clay to soil, consequently, a determination as to the adequacy of the seal can not be made.

4) Gravel Pack. Does the well contain a gravel pack: (Yes X No _) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: The cement gravel pack seal placed from 368.39 - 374.39 should provide an adequate seal to prevent groundwater from entering the gravel pack through the annulus from above.

D. WELL MUST COMPLY WITH "RECOMMENDED STANDARDS FOR WATER WORKS" (1992), A REPORT OF THE COMMITTEE OF THE GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS.

1) Does the well contain a packer that is in contact with the groundwater supply interval: (Yes _ No X Insufficient Data _ N/A _). If yes, is the packer comprised of materials that are toxic, will impair taste or odor, or facilitate bacterial contamination of the well water: (Yes _ No _ Packer Type _ N/A X)

2) Screen

a) Does the well contain perforated casing or a screen: (Yes X No Insufficient Data _ N/A _) If yes, the perforated screen or casing must be installed so that the pumping water level remains above it under operating conditions. The following determination was made from the available production water level data which will vary with changes in the static water levels (water table elevation); therefore, the following determination may not be valid under all conditions. Is the criterion met: (Yes _ No X Insufficient Data _ N/A _) Explanation: The reported production water level is approximately 450 ft. bls. and the perforated casing is installed starting at 416 ft. bls, so the production water level is 34 ft. below the initial perforations.

b) Is the perforated casing or screen constructed of material resistant to damage by chemical action from the groundwater or cleaning operations: Material Type Steel Explanation: Steel is an acceptable well construction material for casing or screen in a non-acidic environment such as the Snake River Plain aquifer, as is demonstrated in EG&G report EGG-ER-8496.

3) If the casing is constructed of nonferrous material, it must be resistant to the corrosiveness of the water. Is this criterion met:
(Yes _ No _ Insufficient Data _ N/A X)

4) Was the well adequately developed to remove native silts and clays, drilling mud or the finer fraction of the gravel pack: (Yes X No _ Insufficient Data N/A _) Explanation: There is no documentation of well development in the available information for this well.

E. **THE PRIMARY SOURCE FOR THE WELL EVALUATION IS THE IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY. OTHER SOURCES:** T. Norton, Golder Associates Inc., Personal Site Inspection, 2/18/93. Jim Branstitre of EG&G, Personal Communication 2/18/93.

N.F. Not Found
N/A Not Applicable
N.R. Not Required

F. WELL FITNESS DETERMINATION

Intended use: PRODUCTION/POTABLE WELL

( ) Well is acceptable for intended use.
(X) Well is acceptable for intended use if a variance is granted.
( ) Maintenance required to continue intended use.
( ) Remediation required to continue intended use.
( ) Decommission, well is unneeded or cannot be remediated.

DEFICIENCIES: J. Branstitre, EG&G facility operation and maintenance stated on 2/18/93, that Site 04 well was only used occasionally for non-potable purposes. The clay and soil surface and casing seal may not constitute an adequate seal and it is not an approved seal by the State, as a result, a variance should be obtained. The casing thickness does not comply with state regulation and it is not documented what type of casing joints were used when installing the well. Whether or not water levels can be obtained is also of question. If the well was designated as a potable water production well, the lack of a casing vent would also have to be addressed.

REMEDIATION: N.R. for non-potable water production well.

GEOLOGIC LOG

Well Name SITE-04

Source: Well Driller's Log

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Interval (feet below surface)

Begin	End	Description
0	16.6	Gravel / Sand / Clay
16.6	84	Basalt
84	88	Clay and Cinders
88	95	Clay
95	125	Basalt
125	130	Basalt and Clay
130	206	Basalt
206	210	Basalt and some Sand
210	335	Basalt
335	346	Clay
246	250	Basalt
350	352	Basalt and Clay
352	390	Basalt
390	413	Cinders
413	420	Basalt and Cinders
420	425	Basalt
425	431	Cinders and Basalt
431	437	Cinders
437	452	Cinders / Sand
452	496	Basalt

COMPILED BY/ORGANIZATION: T.Norton / GAI Date 2/12/93

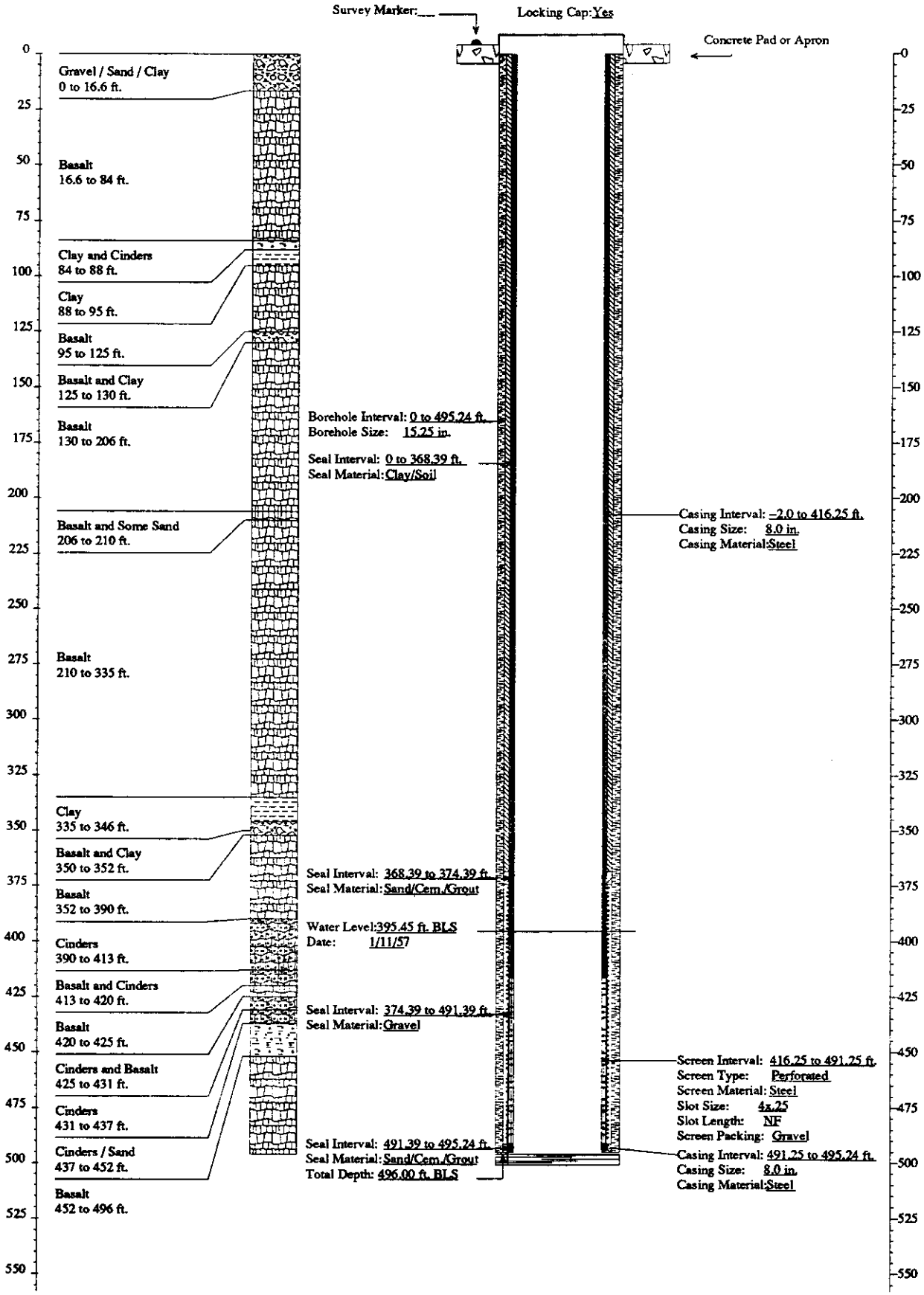
WellName: SITE--04 **Correction: WELL IS LOCATED IN A WELL HOUSE.** 08/03/1993

Facility: SOUTH
Well Type: Production Well
Well Status: Active
Year Drilled: 1957
Total Depth: 496.00

Easting: 304203.24
Northing: 707267.35
Longitude: 1125421.12
Latitude: 433618.10
Completion Depth: 495.24

Driller: Cope
Geologist: R.H.C. & E. Shuter
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4795.03

Water Level: 395.45
Water Level Date: 1/11/57
Water Level Access: NF



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. SITE-09

A. WELL USE

1) Year well was drilled: 1960

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+, NO_3^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)

b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimumdepth of 18 feet or bedrock, whichever is greater: (Yes X No N/A)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 20 inch Casing size 10 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (1)	10 I.D.	0 - 1000	N.F.	21	N.F.	N.F.

(1) The casing may have been perforated and deformed at 680 - 750 feet bls according to a 1970 caliper log (pers. comm. Rodger Jensen, USGS).

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Puddling Clay	0 - 1000	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located over 4300 feet northeast of STF. No known source of recharge exists in the area of the well.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent ground water movement within the annular space: It is uncertain. The integrity of the puddling clay seal could not be evaluated because no documentation was found for its composition or method of installation. However, no known surface or perched water exists in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A _) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication, Rodger Jensen, USGS (Feb. 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The integrity of the puddling clay seal could not be evaluated because no information was found for its composition or method of emplacement. However, the well is located over 4300 feet northeast of STF and is not near any potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration in the annulus is extremely low, a variance from state well construction regulations should be requested for the seal. Also, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well SITE-09

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
0	85	Black and Red Basalt
85	95	Basalt with Some Cinders
95	100	Black Basalt
100	115	Brown Clay
115	120	Cinders and Clay
120	140	Clay and Loose Basalt
140	142	Soft Black Basalt
142	160	Hard Black Basalt
160	197	Gray Basalt / Caving Below 185 ft.
197	200	Brown Clay
200	215	Hard Gray Basalt
215	218	Black Basalt
218	220	Cinders
220	240	Black Basalt
240	255	Red Basalt and Cinders
255	283	Black and Red Basalt
283	284	Cinders
284	290	Red Basalt
290	315	Red Basalt and Cinders
315	408	Hard Black Basalt
408	430	Gray Basalt

COMPILED BY/ORGANIZATION: T.J. Clement / GAI Date March 5, 1993

 GEOLOGIC LOG Well Name SITE-09

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
430	445	Red Clay
445	481	Black and Red Basalt
481	485	Soft Gray Basalt
485	495	Red and Black Basalt
495	498	Red and Black Sand
498	502	Red and Black Basalt
502	515	Black Basalt and Sand
515	540	Soft Red Basalt
540	555	Black Basalt and Sand
555	565	Basalt / Clay / Sand
565	620	Black and Red Basalt
620	630	Black Basalt and Sand
630	660	Red Chalk (?)
660	665	Black Basalt
665	685	Gray Basalt with Clay Infillings
685	686	Gray Sandstone
686	695	Red Sandstone to Sand
695	705	Black Basalt
705	735	Brown to Red Clay

COMPILED BY/ORGANIZATION: T.J. Clement / GAI Date March 5, 1993

GEOLOGIC LOG

Well Name SITE-09

Source: Driller's Log

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Interval (feet below surface)

Begin	End	Description
735	745	Brown Clay with Some Sand
745	805	Brown Plastic Clay
805	815	Basalt with Clay Infillings
815	835	Black Basalt
835	875	Gray Basalt
875	902	Red and Black Basalt
902	915	Brown Clay
915	942	Gray Basalt
942	955	Red-Brown Clay
955	970	Clay and Basalt
970	997	Clay
997	1015	Hard Basalt
1015	1045	Clay / Sand / Basalt
1045	1070	Clay and Sand
1070	1085	Brown Clay
1085	1140	Clay and Sand

COMPILED BY/ORGANIZATION: T.J. Clement / GAI Date March 5, 1993

WellName: SITE–09

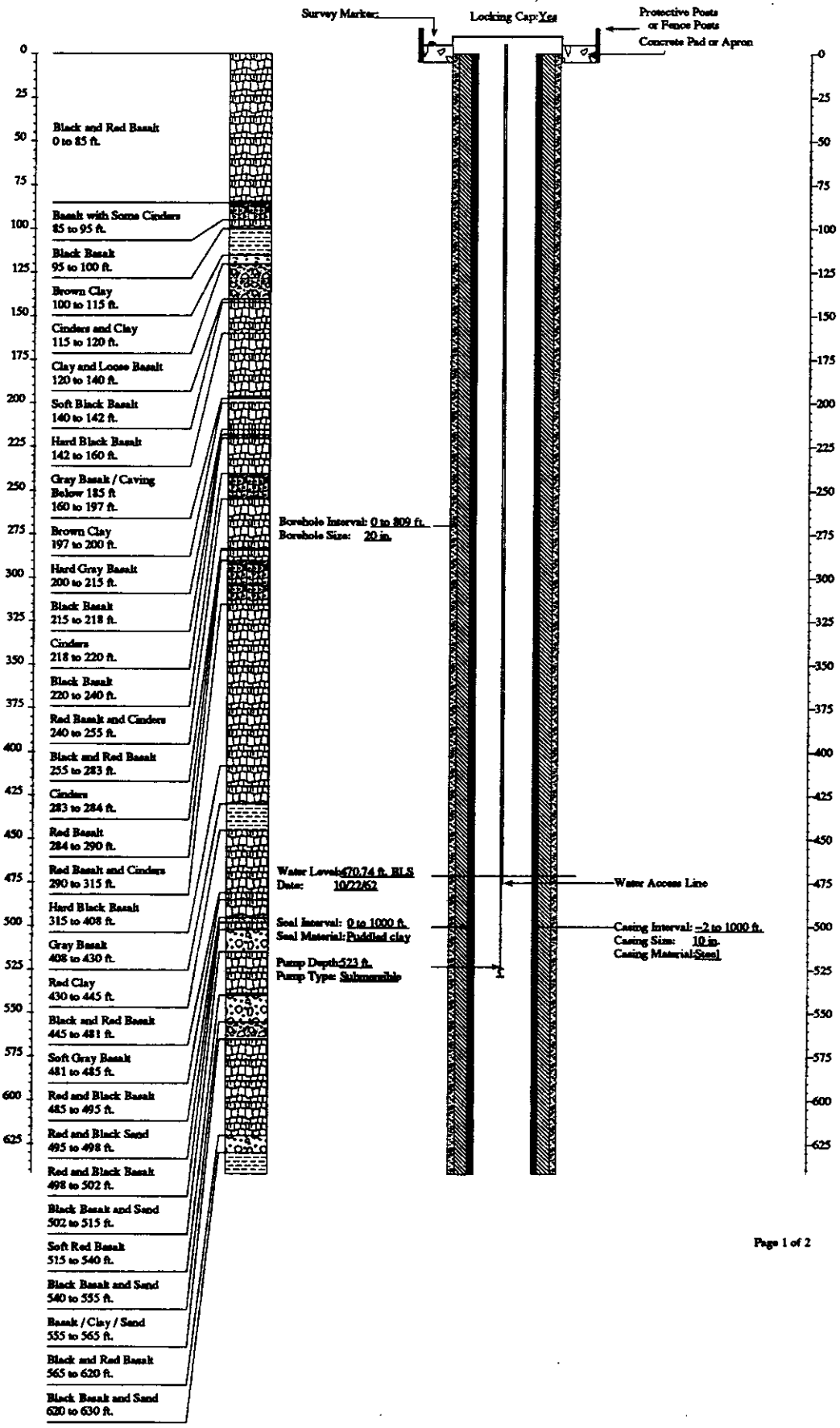
04/22/1994

Facility: SOUTH
Well Type: Observation
Well Status: Active
Year Drilled: 1960
Total Depth: 1140

Easting: 309855.574
Northing: 677323.044
Longitude: 1125300.79503
Latitude: 433122.85609
Completion Depth: 1140

Driller: Cushman
Geologist: R. Shuter
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4926.027

Water Level: 470.74
Water Level Date: 10/22/62
Water Level Access: Line



WellName: SITE–09

04/22/1994

Facility: SOUTH
Well Type: Observation
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Water Level Date: 10/22/62
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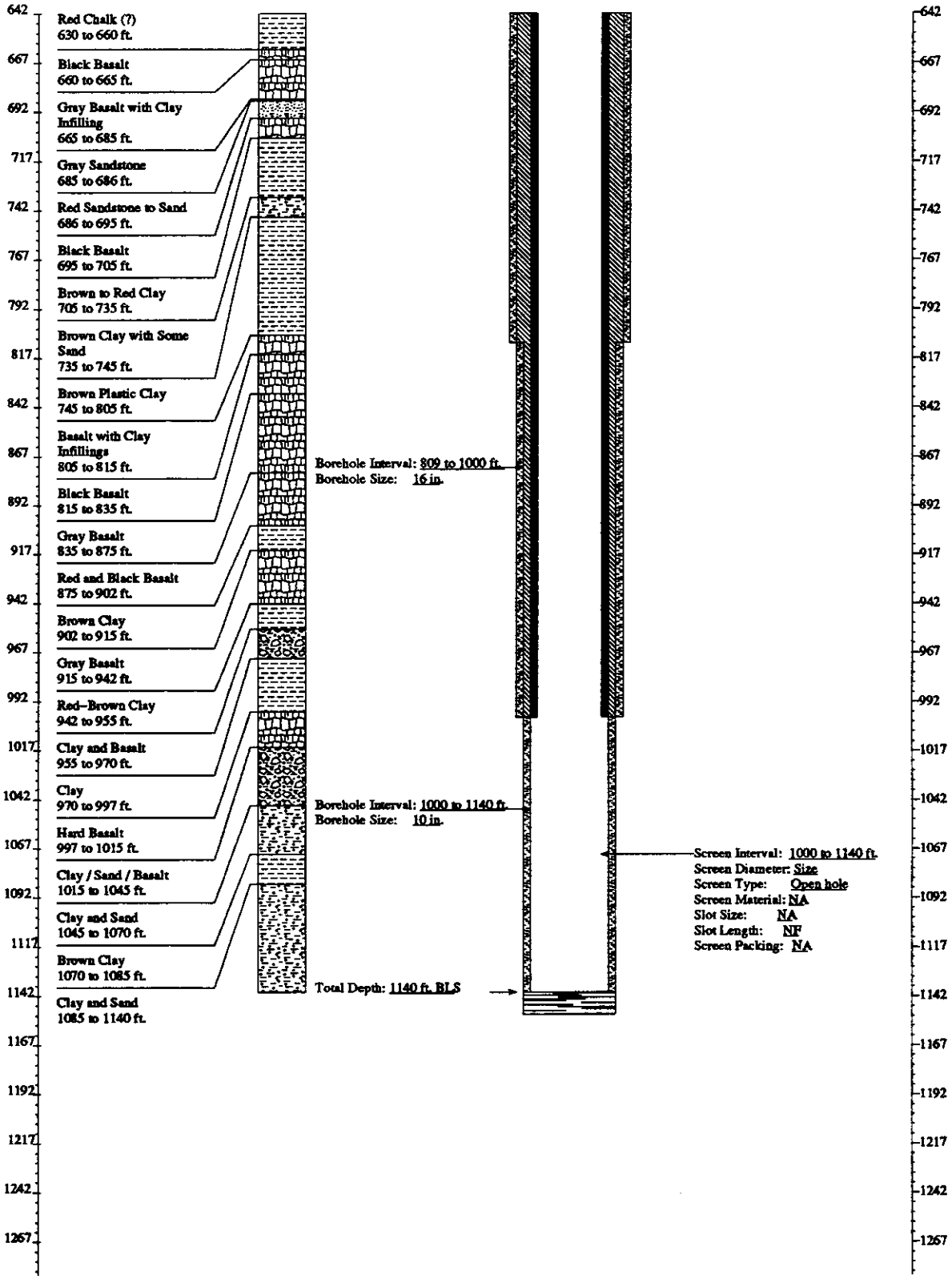

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-001

A. WELL USES

1) Year well was drilled: 1949

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future DOE 5400.1 and CERCLA monitoring.

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: Sitewide Groundwater Monitoring Plan (1992 Draft) - DOE 5400.1

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1 - EG&G (IRTS) / Jerry Sehlke; CERCLA - EG&G (WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >6.25 inches Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 433	N.F.	14	N.F.	N.F.
Carbon Steel [1]	5 I.D.	423 - 636	N.F.	N/A	N.F.	N.F.

[1] Casing perforated from 600 to 630 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
No Documented Seal	N.F.	N.F.	N.F.
Lead Packer	426	N/A	N/A

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located in the southern part of the INEL. No recharge sources exist near the well.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes __ No X Insufficient data __) Explanation(Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well does not have any documented casing seals. However, no surface water or perched groundwater is known to occur in the area of the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity N.F.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

Material

Casing Carbon Steel

Screen Perforated Carbon Steel

Pump Grundfos Submersible

Discharge Pipe 1.5-inch Stainless Steel

Explanation Stainless steel is acceptable for compliance/detection monitoring. EGG-ER-8496 documents that no significant difference (95% level) existed between metals concentrations in the groundwater for wells constructed of carbon steel and stainless steel at the RWMC. The measuring pipe for water levels is constructed of 1-inch steel. Although steel may corrode in acidic environments, the groundwater is not acidic at the INEL.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type Perforated casing

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The water table occcurs within the monitoring interval; therefore, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X)

Monitoring interval Water table (approximately 582 feet bls) to 636 feet bls. The monitoring interval of about 54 feet is excessive but appears to consist of only one lithology type.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration N.F.

9) Is the pump intake location documented: (Yes X No _) Depth 612 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Grundfos Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** EGG-ER-8496; EGG-WM-9787; Personal Communication - Rodger Jensen, USGS (Feb. and April 1993); Sitewide Groundwater Monitoring Plan (1992 Draft)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located near the southern boundary of the INEL site and is not close to any active or inactive INEL facilities. The well is about 100 yards from Highway 26 and is situated below the grade of the road. Since no evidence was found of perched conditions near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of this seal. Also, the following minor deficiencies were noted: the casing thicknesses and joint types were not documented and the borehole was not the required 2 inches larger than the casing to the required depth of 18 feet but was about the same size.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent cited in section F. The well may not comply with RCRA guidelines for the following reasons: (1) the annulus is not sealed between the borehole and the 6-inch casing above the monitoring interval and (2) the the monitoring interval of about 54 feet may be considered excessive for compliance/ detection monitoring and may result in the dilution of contaminant concentrations. Since the well appears to monitor a discrete zone consisting of one lithology type, approval of the 54-foot monitoring interval should be obtained before the well is used for RCRA purposes. The well also contains a lead packer at 426 feet. Although the packer is about 150 feet above the water table, it could affect the validity of the water samples if excess lead is detected in the groundwater. No documentation was found for decontamination procedures, well development, or the use of drilling fluids; however, these are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-001

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	6	Silt
6	115	Basalt
115	120	Cinders
120	140	Basalt
140	144	Cinders
144	165	Basalt
165	205	Cinders
205	243	Basalt
243	254	Cinders
254	278	Basalt
278	284	Cinders
284	319	Basalt
319	322	Cinders
322	635	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS--001

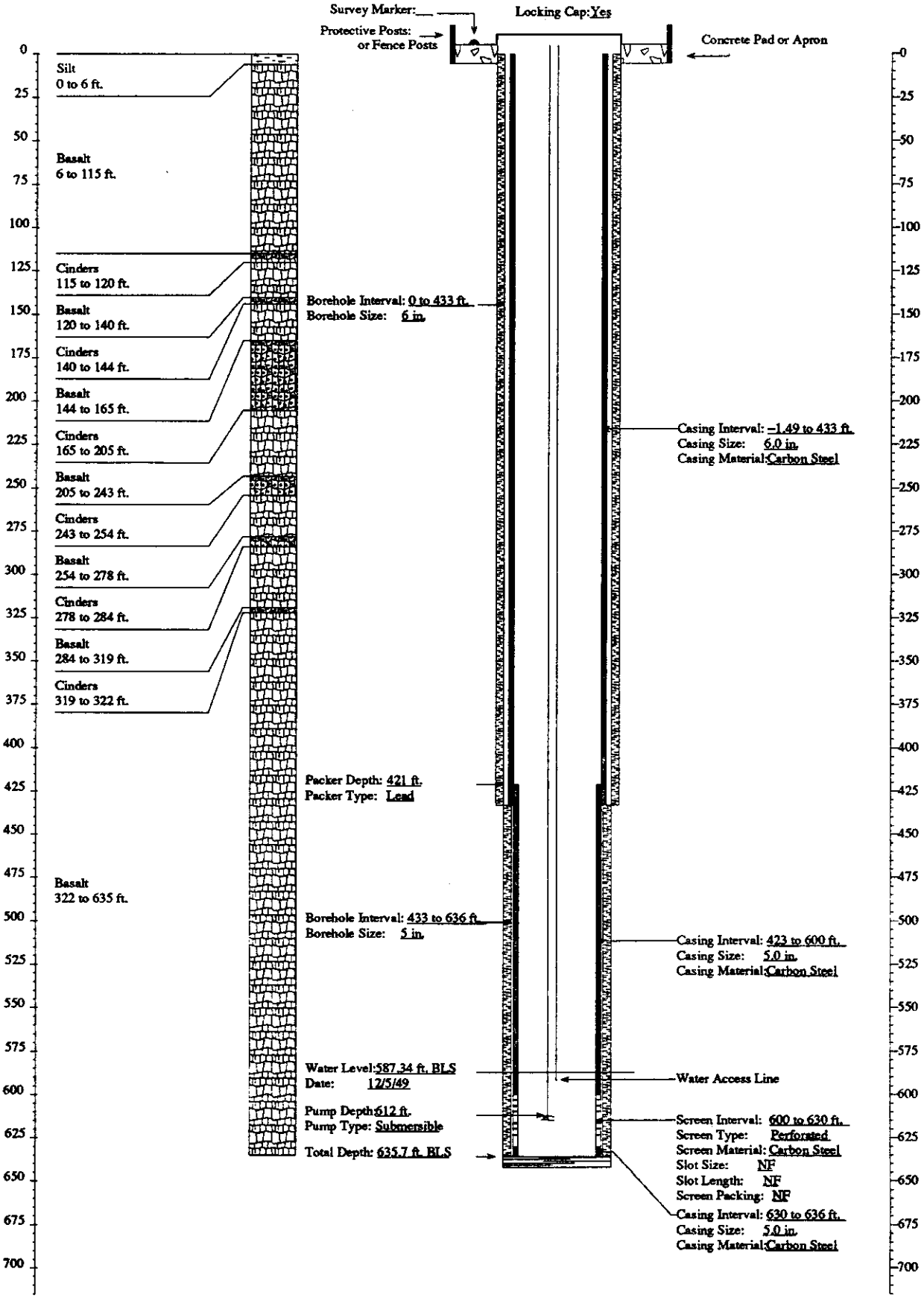
06/17/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1949
Total Depth: 635.7

Easting: 335650.56
Northing: 650501.23
Longitude: 1124708.00
Latitude: 432700.00
Completion Depth: 635.7

Driller: Cope
Geologist: Irminger,Shuter,etc.
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 5023.68

Water Level: 587.34
Water Level Date: 12/5/49
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-002

A. WELL USE

1) Year well was drilled: 1949

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No _ Uncertain/Not Documented X Borehole size N.F.
Casing size 6.25 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.25 I.D.	0 - 434	N.F.	14	N.F.	N.F.
Carbon Steel (1)	5 I.D.	427 - 704	N.F.	N/A	N.F.	N.F.

(1) Casing perforated from 675 to 696 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A X Uncertain/not documented _ Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is in the southern area of the INEL. There are no known recharge sources in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, there is no documented seal; however, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use. for minor construction details.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface seal as required by state regulations. However, the well is located about 3 miles southwest of ANL-W and is not in proximity to any other potential sources of surface or subsurface contamination. Since no evidence was found of perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of this seal. In addition, the borehole size and the casing thicknesses and joint types were not documented, which are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well Name USGS-002

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	80	Basalt
80	102	No Sample
102	111	Basalt
111	122	No Sample
122	135	Basalt
135	163	No Sample
163	270	Basalt
270	385	No Sample
385	400	Basalt
400	420	No Sample
420	466	Basalt
466	470	Cinders
470	540	Basalt
540	546	Cinders
546	588	Basalt
588	600	No Sample
600	610	Cinders
610	640	Basalt and Cinders
640	650	No Sample
650	655	Cinders
655	704	No Sample

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS-002

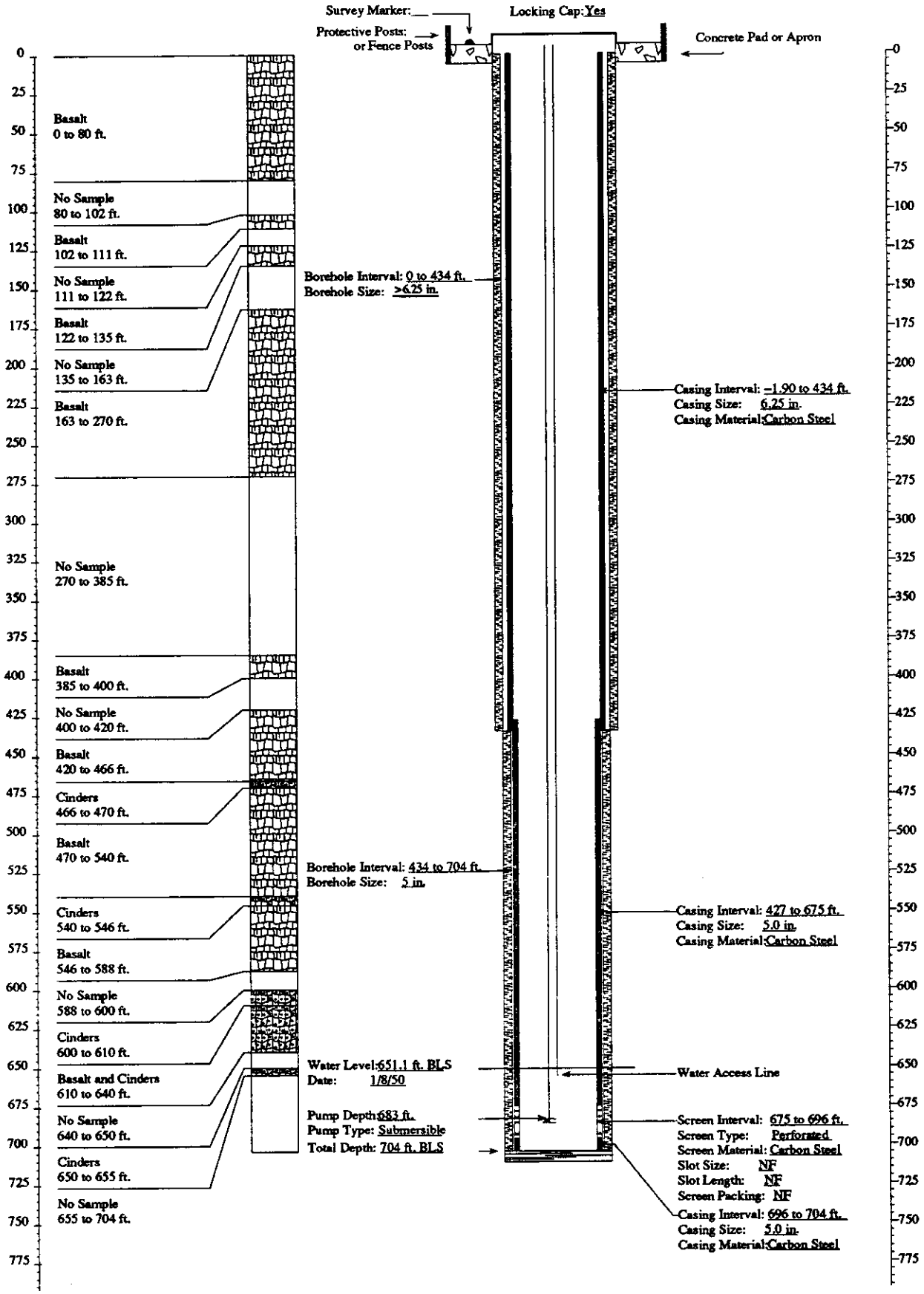
06/17/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1949
Total Depth: 704

Easting: 352578.66
Northing: 688857.25
Longitude: 1124323.00
Latitude: 433320.00
Completion Depth: 704

Driller: Cope
Geologist: Jones,Carson,Sisco
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 5125.87

Water Level: 651.1
Water Level Date: 1/8/50
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-005

A. WELL USES

1) Year well was drilled: 1950

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future DOE 5400.1 and CERCLA Monitoring.

3) Constituents monitored currently: USGS Observation - Na^+, NO_3^-, ^3H, ^{90}Sr, Cl^-.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: DOE 5400.1 - Sitewide Groundwater Monitoring Plan (1992 Draft)

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1 / EG&G (IRTS) Jerry Sehlke; CERCLA - EG&G (WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 8-inch Casing size 6.25-inch I.D.)

Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (Inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (1)	6.25 I.D.	0 - 500	N.F.	14	N.F.	N.F.

(1) Casing perforated from 475 to 497 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located in the southern portion of the INEL. There are no surface water bodies located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes __ No X Insufficient data __) Explanation(Qualify data/specify perched intervals if applicable) _

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented seal. However, no evidence was found of perched groundwater near the well and no surface water bodies are located in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity N.F.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

Material

Casing Carbon Steel

Screen Perforated Carbon Steel Casing

Pump Stainless Steel

Discharge Pipe 1.5-inch Stainless Steel

Explanation Stainless steel is acceptable for compliance/detection monitoring. Report EGG-ER-8496 documents that no significant difference (95% level) existed between the metals concentrations in the groundwater of carbon steel wells and stainless steel wells at the RWMC. The measuring pipe for water levels is constructed of 1-inch steel. Although steel may corrode in acidic environments, the groundwater is not acidic at the INEL.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type Perforated carbon steel casing

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The well is adequately constructed to monitor "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No _ Uncertain X) Monitoring interval(s) Water table (approximately 462 feet) to 500 feet. The monitoring interval of about 38 feet is slightly excessive and includes a 25-foot thick zone that was not defined lithologically.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration N.F.

9) Is the pump intake location documented: (Yes X No _) Depth 488 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** EGG-ER-8496; EGG-WM-9787; Personal Communciation - Rodger Jensen, USGS (April 1993); Sitewide Groundwater Monitoring Plan (1992 Draft)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface seal as required by state regulations. However, it is located about 3 miles northeast of SPERT and is not close to any other potential sources of surface or subsurface contamination. Therefore, a variance should be requested for the lack of this seal. Although the well is completed in the Snake River Plain aquifer, no evidence was found of perched water near the well. In addition, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent cited in Section F. The well may not comply with RCRA guidelines for the following reasons: (1) the casing is not sealed above the monitored zone, which may affect the integrity of groundwater samples and (2) the monitored zone of about 38 feet may be slightly excessive for compliance/detection monitoring and may result in the dilution of contaminant concentrations. Although the well appears to monitor a discrete zone consisting of one type of lithology, a variance should be obtained before the well is used for RCRA purposes. Also, no documentation was found for decontamination procedures, well development, or the use of drilling fluids, which are minor deficiencies.

Remediation: None

GEOLOGIC LOG

Well Name USGS-005

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	7	Sand
7	130	Basalt
130	145	No Sample
145	180	Basalt
180	190	No Sample
190	200	Basalt
200	205	No Sample
205	335	Basalt
335	345	Sand and Gravel
345	430	Basalt
430	436	Basalt and Cinders
436	470	Basalt
470	495	No Sample
495	500	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20. 1992

WellName: USGS–005

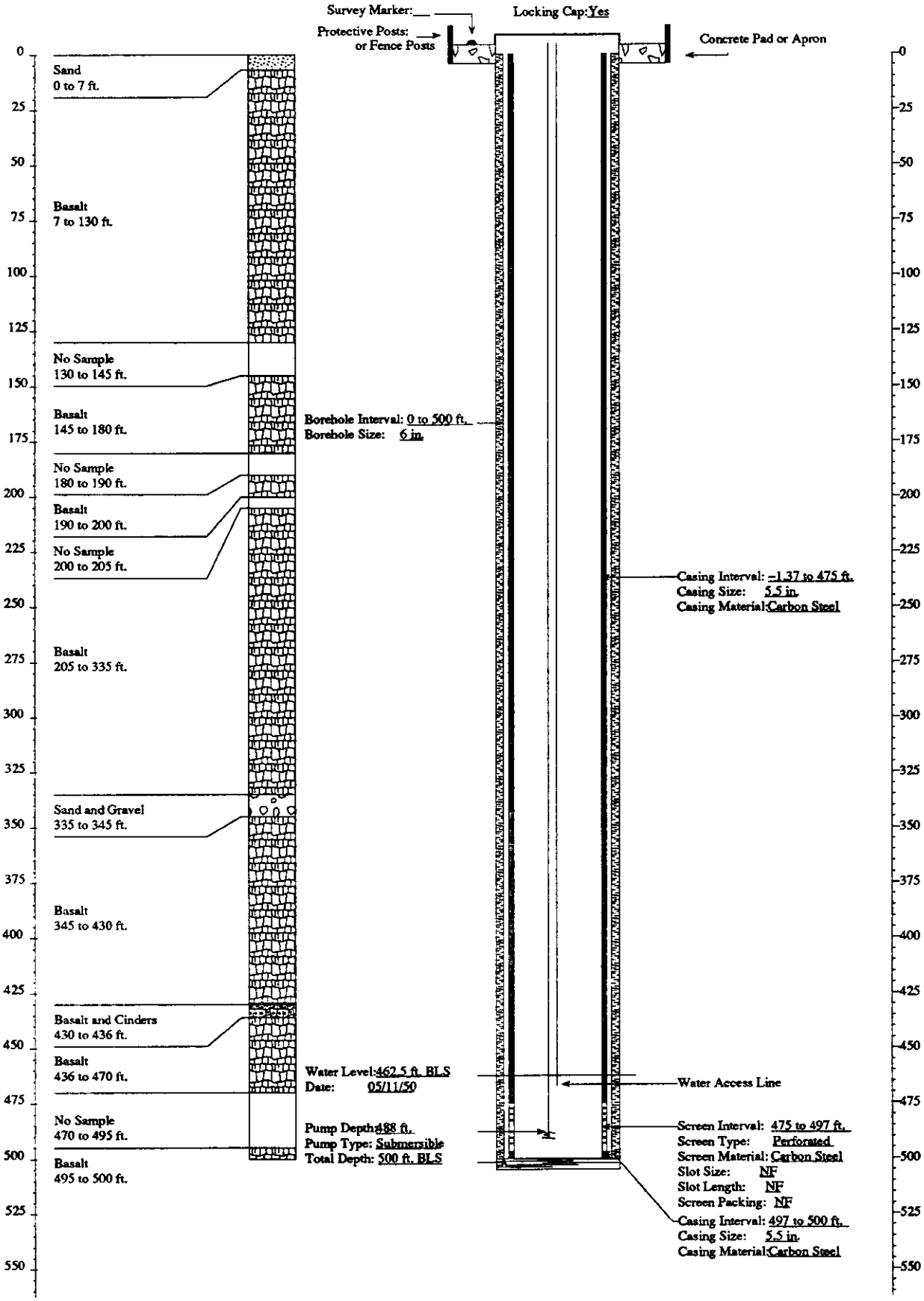
06/17/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1950
Total Depth: 500

Easting: 325006.14
Northing: 703538.25
Longitude: 1124938.00
Latitude: 433543.00
Completion Depth: 452.8

Driller: Cope
Geologist: S.W. Fader, R.Carson
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4938.00

Water Level: 462.5
Water Level Date: 05/11/50
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-009

A. WELL USES

1) Year well was drilled: 1951

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future DOE 5400.1 and CERCLA monitoring

3) Constituents monitored currently: USGS Observation - NO_3^-, Na^+, ^3H, ^{90}Sr, Cl^-.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: INEL Groundwater Monitoring Plan - DOE 5400.1

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1 - EG&G (IRTS) / Jerry Sehlke; CERCLA - EG&G (WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >8 inches Casing size 8 inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	8 I.D.	0 - 243	N.F.	11	N.F.	N.F.
Carbon Steel	6.25 I.D.	236 - 654	N.F.	N/A	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located in the INEL spreading area near the RWMC.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No _ Insufficient data X) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of saturated formations above the water table. However, when the spreading area contains water, perched water may exist near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the casing is not sealed adequately to prevent the downward movement of surface water or perched groundwater from the spreading areas.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _N/A X)

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity N.F.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Carbon Steel
Screen	Perforated Carbon Steel
Pump	Submersible Pump
Discharge Pipe	1.5-inch Galvanized Steel

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between metals concentrations in the groundwater from stainless steel and carbon steel wells at RWMC. Although the galvanized steel measuring pipe is susceptible to corrosion in acidic environments, the groundwater at the INEL is not acidic.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type Perforated casing

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The well is adequately designed to monitor dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No _ Uncertain X) Monitoring interval Water table (approximately 602 feet bls) to 654 feet bls. The monitoring interval of about 52 feet is considered excessive. This interval contains basalt, basalt and cinders, and a 5-foot thick zone that was not defined lithologically.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration N.F.

9) Is the pump intake location documented: (Yes X No _) Depth 635 feet bls

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Pump Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-ER-8496, EGG-WM-9787, Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not contain a surface and casing seal as required by state regulations. The well is located in the INEL spreading area near the RWMC facility and the borehole may provide a conduit for the migration of surface and perched groundwater to the Snake River Plain aquifer. These waters potentially could contain contaminants from activities upstream, including agriculture. Also, the following minor deficiencies were noted: the casing thicknesses and joint types were not documented and the borehole was not the required 2 inches larger than the surface casing but rather was about the same size.

Remediation: A seal should be installed from the surface to approximately 225 feet, the maximum depth of known perched water at the RWMC.

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent indicated in Section F. The well does not comply with RCRA guidelines because the monitoring interval of 52 feet is considered excessive for compliance/detection monitoring and may result in the dilution of contaminants. In addition, the lithology of this zone is not completely defined and the annular space between the casings and the borehole are not sealed. These deficiencies could affect the validity of the groundwater samples. Therefore, a variance should be obtained before the well is used for RCRA purposes. Also, no documentation was found for well development, the use of drilling fluids and decontamination procedures, which are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well Name USGS-009

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	10	Clay
10	152	Basalt
152	200	Sand and Gravel
200	235	Basalt
235	240	Sand and Gravel
240	285	Basalt
285	310	No Sample
310	325	Basalt
325	330	No Sample
330	360	Basalt
360	365	No Sample
365	370	Basalt
370	380	No Sample
380	415	Basalt
415	420	Cinders
420	503	Basalt
503	508	Gravel
508	615	Basalt and Cinders
615	620	No Sample
620	654	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 20, 1992

WellName: USGS-009

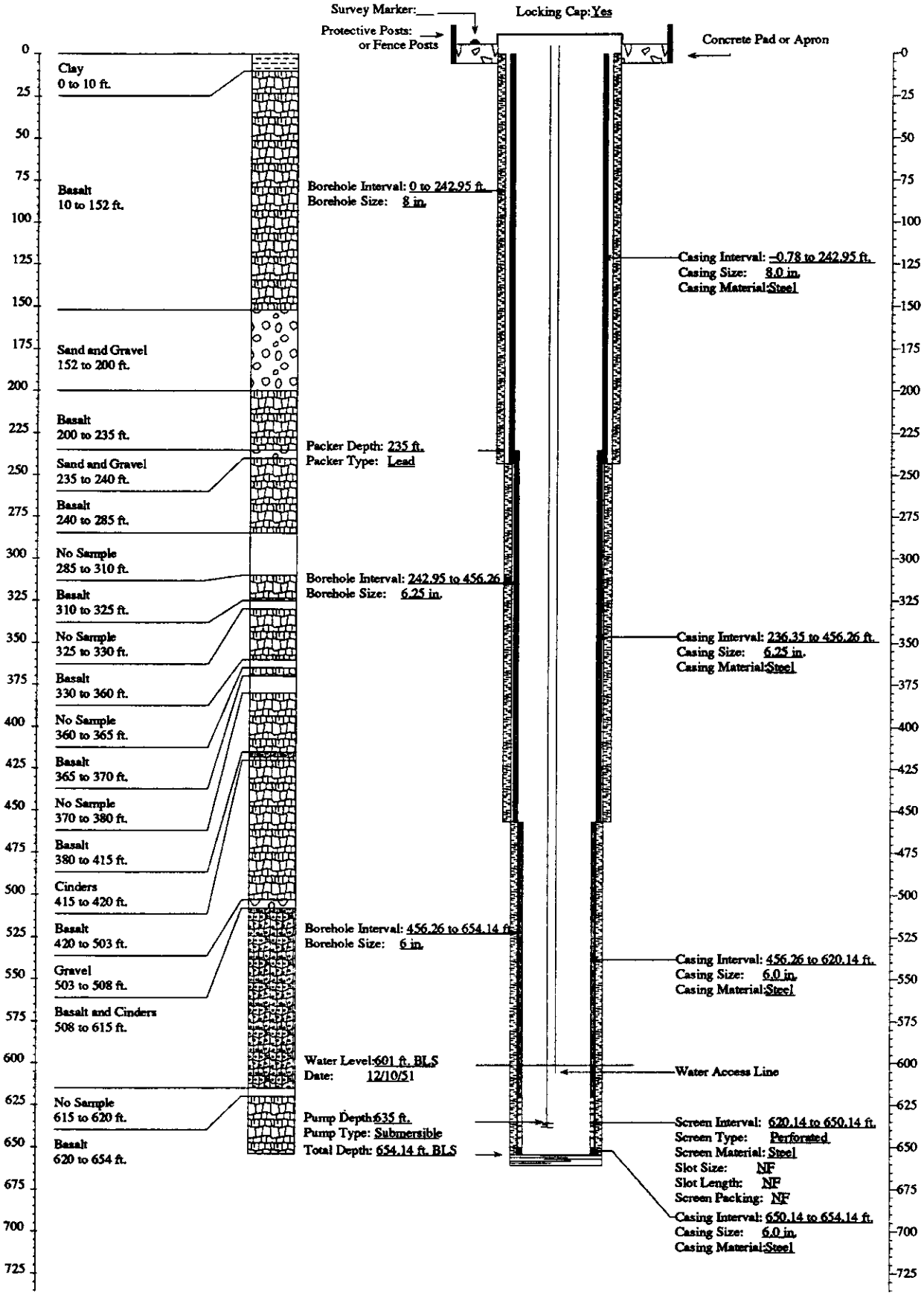
06/17/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1951
Total Depth: 654.14

Easting: 257724.53
Northing: 655267.74
Longitude: 1130445.00
Latitude: 432740.00
Completion Depth: 654.14

Driller: Strasser
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 5031.87

Water Level: 601
Water Level Date: 12/10/51
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-022

A. WELL USE

1) Year well was drilled: 1951

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _) _

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >6.6 inch Casing size 6.6 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (1)	6 I.D./6.6 O.D.	0 - 657	Threaded	16	0.3	Yes

(1) Casing perforated from 619 to 633 and 654 to 655 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well does not have a documented casing seal. However, no known surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: Personal Communication - Rodger Jensen, USGS (Feb. and April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is completed in the Snake River Plain aquifer and does not contain an annular surface seal as required by state regulations. Although the well is on the west side of the INEL site and is not in proximity to any facilities, it is situated in a low area and surface runoff is causing a silting problem in the well. Also, the following minor deficiency was noted: the borehole is not the required 2 inches larger than the casing diameter but is about the same size.

Remediation: A surface seal should be installed to prevent the migration of surface runoff down the annular space and to comply with state regulations.

 GEOLOGIC LOG Well Name USGS-022

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	10	Sandy Silt
10	223	Basalt and Cinders
223	235	Sandy Silt
235	335	Basalt and Cinders
335	346	Cinders and Scoria
346	480	Basalt
480	482	Siltstone
482	500	Cinders
500	620	Basalt
620	625	No Sample
625	656	Basalt and Cinders
656	657	No Sample

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

06/17/1993

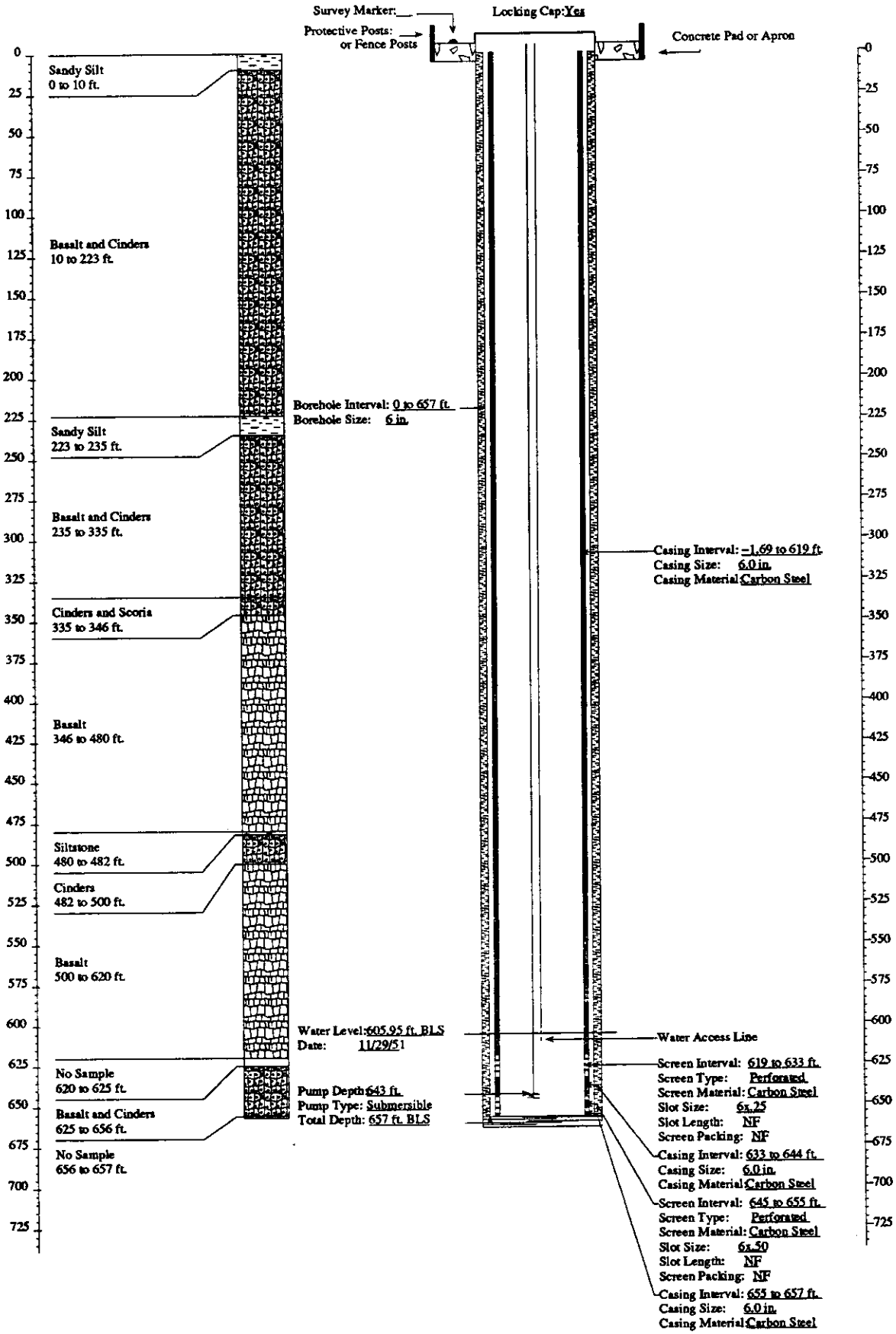
WellName: USGS-022

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1951
Total Depth: 657

Easting: 264650.24
Northing: 696000.10
Longitude: 1130317.00
Latitude: 433422.00
Completion Depth: 657

Driller: Cope
Geologist: J. R. Jone
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 5049.2

Water Level: 605.95
Water Level Date: 11/29/51
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL **Well Name/No.** USGS-083

A. WELL USE

1) Year well was drilled: 1962

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+, NO_3^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 10 inch Casing size 6.63 inch O.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
3 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel	6.63 O.D.	0 - 516	N.F.	25	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No Uncertain/Not documented X)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water or other sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no documented casing seal. However, no perched groundwater or surface water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation,/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The casing does not have a surface seal as required by state regulations. However, the well is located south of the CFA complex and is not in proximity to any INEL facilities or other sources of surface or subsurface contamination. Since no evidence was found for perched water near the well and the potential for contaminant migration within the annulus is extremely low, a variance should be requested for the lack of a surface seal. Also, the casing thickness and joint type were not documented, which are minor deficiencies.

Remediation: None

 GEOLOGIC LOG Well Name USGS-083

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	10	Brown Clay
10	20	Broken Basalt
20	40	Basalt
40	50	Broken Basalt
50	80	Basalt
80	92	Brown Sand and Clay
92	105	Basalt and Clay
105	115	Broken Basalt
115	215	Basalt
215	225	Red Cinders / Clay / Basalt
225	307	Basalt
307	315	Red Cinders
315	320	Red Basalt
320	325	Basalt and Red Clay
325	355	Basalt
355	370	Broken Basalt and Brown Clay
370	464	Basalt
464	480	Red Cinders
480	640	Basalt
640	650	Broken Basalt
650	715	Basalt
715	752	Brown Sandy Clay

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS-083

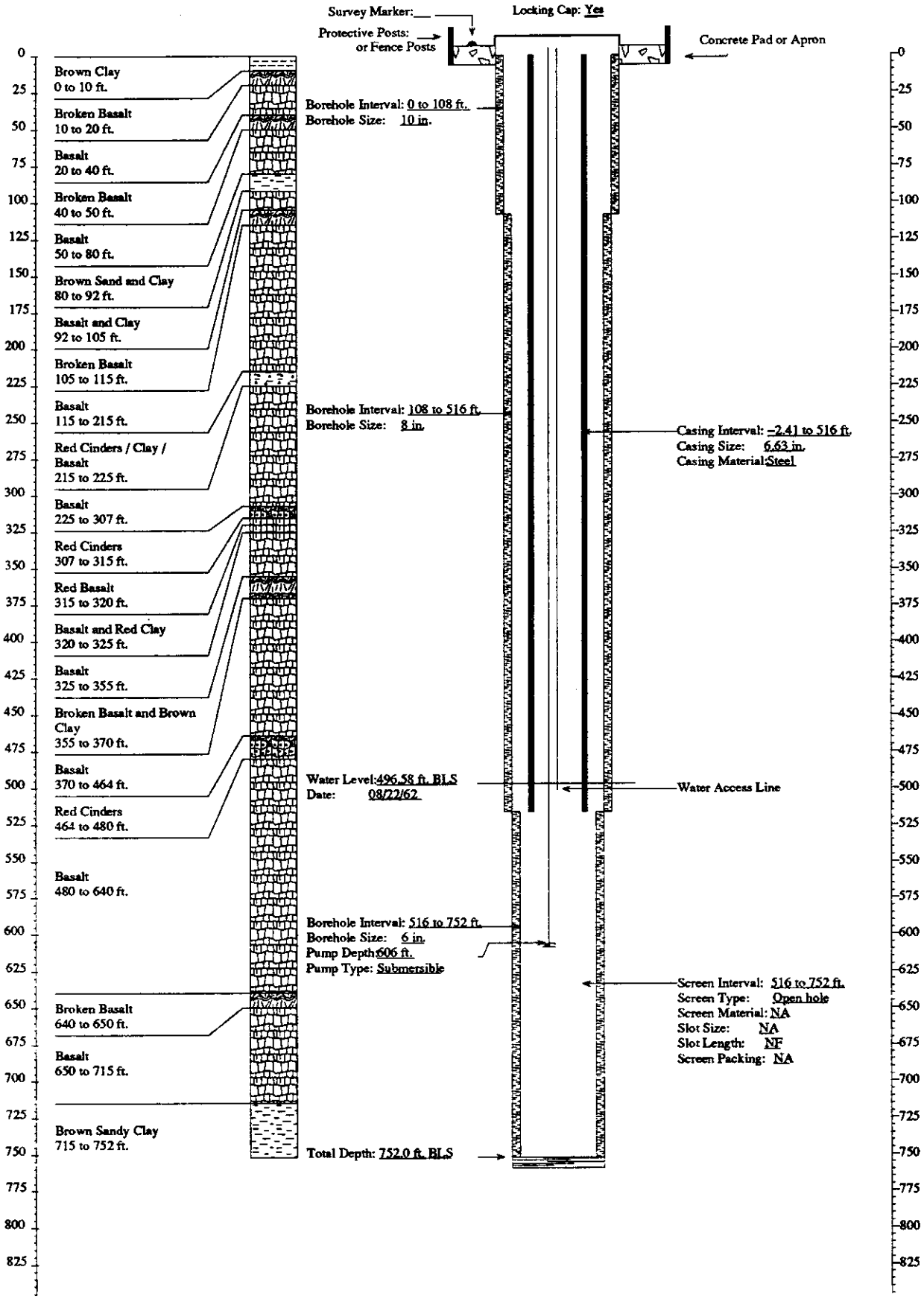
06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1962
Total Depth: 752.0

Easting: 295467.26
Northing: 671393.82
Longitude: 1125615.32
Latitude: 433023.03
Completion Depth: 752.0

Driller: Hopkins
Geologist: NF
Drilling Method: Cable tooled
Drilling Fluid: NF
Land Surface: 4942.69

Water Level: 496.58
Water Level Date: 08/22/62
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-086

A. WELL USES

1) Year well was drilled: 1966

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other :The well is proposed for future DOE 5400.1 and CERCLA monitoring. It is also used by the Bureau of Land Management, who drilled the well.

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: INEL Groundwater Monitoring Plan - DOE 5400.1

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1 / - EG&G (IRTS) / Jerry Sehlke; CERCLA - EG&G (WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes X No _) or Fence posts: (Yes _ No X)
3) Concrete pad/apron present: (Yes X No _)

4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes _ No X Borehole size >8 inch Casing size 8 inch (I.D. or O.D.?)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	8 (I.D. or O.D.?)	0 - 48	N.F.	25	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Fill Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
N.F.	N.F.	N.F.	N.F.

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation The well is located approximately 2 miles west of INEL spreading area A.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found of perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well does not have a documented annular seal. However, no known surface or perched water occurs near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation X) Additive(s)/Quantity N.F.

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Open Hole Completion
Screen	Open Hole Completion
Pump	Submersible pump
Discharge Pipe	1.5-inch Galvanized Steel
Water Level Measuring Pipe	1-inch Galvanized Steel

Explanation Although galvanized steel may corrode in acidic environments, the groundwater is not acidic at the INEL.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Open hole completion

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The water table occurs within the monitoring interval; therefore, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes X No _) Monitoring interval Water table (approximately 644 feet bls) to 691 feet bls. The well monitors an interval of about 47 feet, which is excessive and includes 11 feet of a clay interbed at the bottom of the well.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X Well development type and duration N.F.

9) Is the pump intake location documented: (Yes X No _) Depth 678 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Pump Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-WM-9787, Personal Communication - Rodger Jensen, USGS (Feb. and April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not have a surface casing seal as required by state regulations. However, the well is located in the southwestern region of the INEL site about 2 miles west of the INEL spreading areas. Since the well is not in proximity to any sources of surface or subsurface contamination and no evidence was found of perched groundwater near the well, a variance should be requested for the lack of this seal. Also, the following minor deficiencies were noted: the casing thickness and joint type were not documented and the borehole was not the required 2 inches larger than the surface casing but was about the same size.

Remediation: None

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-086

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
(X) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent stated above. The well does not comply with RCRA guidelines because the the monitoring interval of 47 feet may be considered excessive for compliance/detection use. This interval also includes 11 feet of a clay interbed at the bottom of the well. Since these factors may result in the the dilution or absorbtion of potential contaminants, a variance should be requested before the well is used for RCRA purposes. The lack of a casing and seal for a length of about 595 feet above the monitored zone also may affect the validity of the sampling results. Although the well development, the decontamination procedures and the use of drilling fluids were not documented, these are minor deficiencies.

Remediation: The bottom of the well, which is an open hole completion, could be sealed to make the well more acceptable for RCRA purposes. However, the Bureau of Land Management uses the well to provide water for livestock, so this may not be feasible.

GEOLOGIC LOG

Well Name USGS-086

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	45	Alluvium
45	75	Broken Basalt
75	110	Porous Basalt
110	115	Basalt
115	195	Broken Basalt
195	200	Clay
200	240	Basalt
240	250	Broken Basalt
250	270	Basalt
270	280	Porous Basalt
280	310	Basalt
310	325	Broken Basalt
325	360	Basalt
360	425	Porous Basalt
425	475	Basalt
475	490	Broken Basalt
490	615	Basalt
615	680	Cinders
680	691	Clay

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 21, 1992

WellName: USGS–086

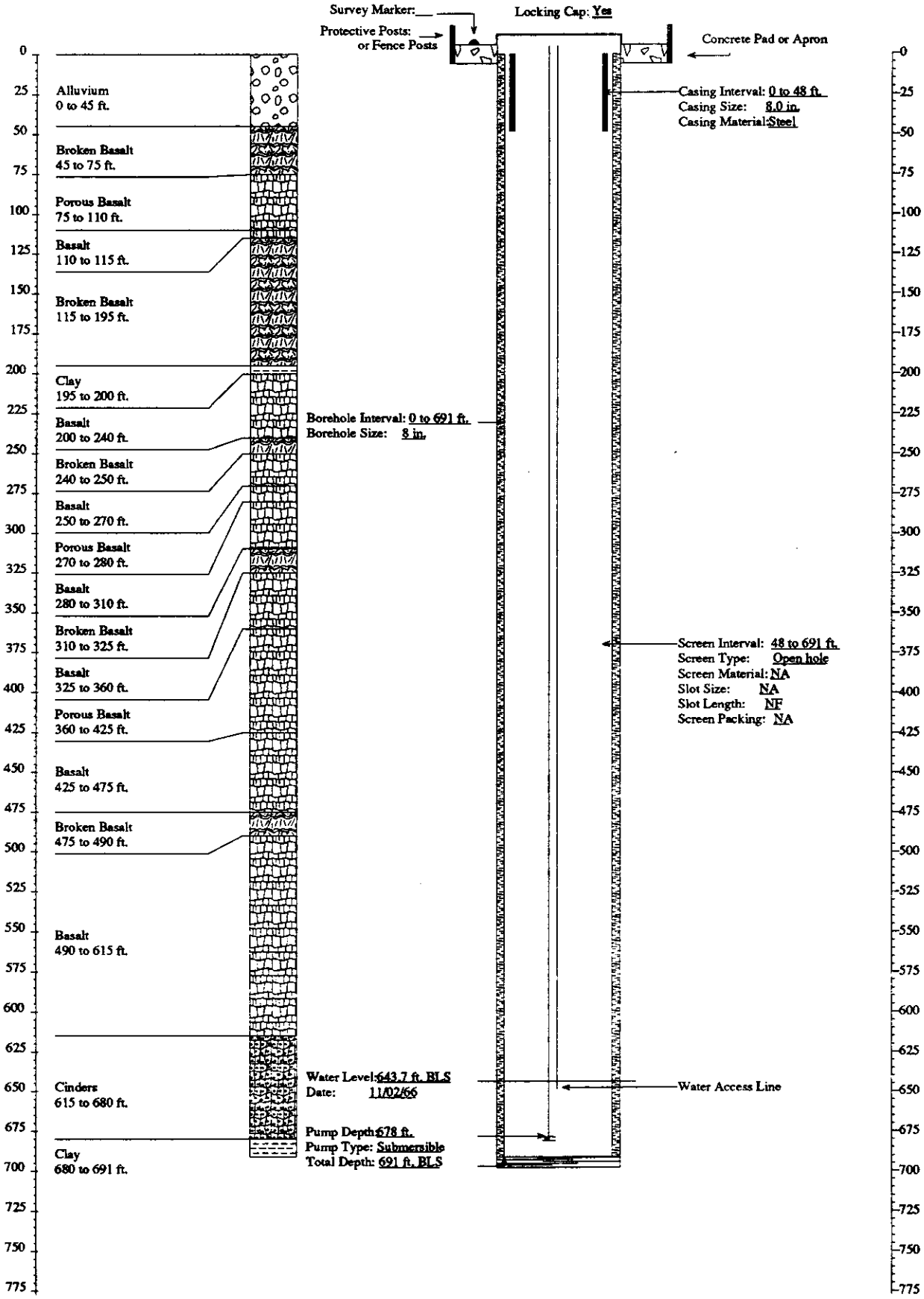
06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1966
Total Depth: 691

Easting: 243477.99
Northing: 667073.33
Longitude: 1130800.00
Latitude: 432935.00
Completion Depth: 691

Driller: Vollmer
Geologist: NF
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 5081.02

Water Level: 643.7
Water Level Date: 11/02/66
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL **Well Name/No.** USGS-101

A. WELL USES

1) Year well was drilled: 1974

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future CERCLA & DOE 5400.1 monitoring

3) Constituents monitored currently: USGS Observation - ^{3}H, Cl, Cr, Na

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: INEL Groundwater Monitoring Plan - DOE 5400.1

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1 - EG&G(IRTS) / Jerry Sehlke; CERCLA - EG&G (WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of

bedrock: (Yes X No _ Uncertain _ Borehole size 10-inch Casing size 8-inch (I.D. or O.D.?) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	8 (I.D. or O.D.?)	0 - 29	N.F.	0	0.25	Yes
Carbon Steel	6 (I.D. or O.D.?)	0 - 774	N.F.	22	0.25	Yes
Carbon Steel [1]	4 (I.D. or O.D.?)	750 - 865	Threaded	N/A	0.25	Yes

[1] Casing perforated from 750 to 865 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	25 - 30 (bottom of 8-inch casing)	6 bags	Yes
Cement	744 (bottom of 6-inch casing set in cement)	10 sacks with 2% CaCl and 6% NaCl	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes _ No X Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented _ Explanation for seal emplacement The cement at the base of the surface casing was poured from the ground surface.

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water or other sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _)

Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent ground water movement within the annular space: No, the well contains no documented seal except at the bottom of the 6 and 8-inch casings. However, no surface water or perched groundwater is located near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Drilling Method Air drilled

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No X)

	Material
Casing	Carbon Steel
Screen	Perforated Carbon Steel
Pump	Submersible Pump
Discharge Pipe	1.5-inch galvanized steel
Water Level Measuring Pipe	PVC

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed in the metals concentrations of the groundwater from wells constructed of carbon steel and stainless steel. The galvanized steel may corrode in an acidic environment; however, the groundwater is not acidic at the INEL. The use of PVC is not preferred in compliance monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type Perforated casing

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitored interval, the well monitors both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes X No _) Monitoring interval(s) Water table (about 765 feet bls) to 865 feet bls. The monitoring interval of about 100 feet is excessive and includes interlayers of basalt, broken basalt and cinders.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration _

9) Is the pump intake location documented: (Yes X No _) Depth 798 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-ER-8496, EGG-WM-9787, Personal Communication - Rodger Jensen, USGS (Feb. and April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well does not comply with state regulations because it is sealed only at the bottom of the casings. Although the well is about 3 miles south of ANL-West, the nearest INEL facility, it is is situated on the highway department's right of way about 150 feet from Highway 20 (pers. comm. Rodger Jensesn, USGS). The concrete pad and the cement grout at 25-35 feet bls would protect the well from surface contamination except that bedrock occurs at 3 feet bls and consists of broken basalt to 25 feet bls. Although the well is completed in the Snake River Plain aquifer and is mostly unsealed, no evidence was found of perched water that would have to be sealed out of the well. Also, the joint type of the 6 and 8-inch casings were not documented, which are minor deficiencies. The 8-inch casing has no stick-up, but it is sealed at the surface by a concrete pad.

Remediation: The annular space around the surface casing should be sealed from the ground to 18 feet bls to prevent the migration of potential surface contaminants and to comply with state regulations.

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and intended use.
( ) Well complies with applicable regulations and intended use except for minor details.
( ) Well does not meet applicable regulations, a variance must be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for intended use.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state well construction regulations to the extent documented in section F. The well does not comply with RCRA guidelines for the following reasons: (1) the casings are not sealed in the borehole above the monitoring zone, which may affect the validity of the groundwater samples and (2) the monitoring interval of about 100 feet is considered excessive for compliance/detection monitoring and may result in the dilution of contaminant concentrations. Although the interval crosses layers of variable permeability, the more permeable zones dominate and probably are fairly well connected. Also, the following minor deficiencies were noted: no documentation was found for the well development or decontamination procedures and the PVC water level measuring pipe is not preferred in compliance monitoring due to its absorbing/leaching characteristics.

Remediation: None

 GEOLOGIC LOG Well Name USGS-101

Source: Well Driller's Report

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Interval (feet below surface)

Begin	End	Description
0	3	Topsoil
3	25	Broken Gray Basalt
25	45	Brown Basalt
45	50	Broken Brown Basalt
50	80	Brown Basalt
80	118	Hard Brown Basalt
118	123	Broken Basalt
123	183	Brown Basalt
183	186	Broken Brown Basalt
186	213	Basalt
213	218	Cinders
218	230	Basalt
230	246	Cinders
246	251	Broken Basalt
251	297	Basalt
297	303	Broken Basalt
303	332	Basalt
332	345	Cinders
345	358	Basalt

COMPILED BY/ORGANIZATION: J.M.Sabel / GAI Date August 24, 1992

 GEOLOGIC LOG Well Name USGS-101

Source: Well Driller's Log

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Interval (feet below surface)

Begin	End	Description
358	363	Broken Basalt
363	377	Basalt
377	383	Cinders
383	401	Broken Basalt
401	439	Hard Basalt
439	457	Broken Basalt
457	483	Basalt
483	495	Cinders
495	528	Basalt
528	535	Broken Basalt
535	553	Basalt
553	574	Cinders
574	583	Basalt
583	592	Broken Basalt
592	648	Hard Basalt
648	655	Cinders
655	695	Basalt
695	711	Broken Basalt
711	740	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

 GEOLOGIC LOG Well Name USGS-101

Source: Well Driller's Log

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Interval (feet below surface)

Begin	End	Description
740	752	Broken Basalt
752	765	Basalt
765	772	Cinders
772	788	Basalt
788	795	Broken Basalt
795	802	Basalt
802	815	Cinders
815	820	Broken Basalt
820	830	Basalt
830	835	Cinders
835	840	Basalt
840	852	Cinders
852	865	Broken Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-101

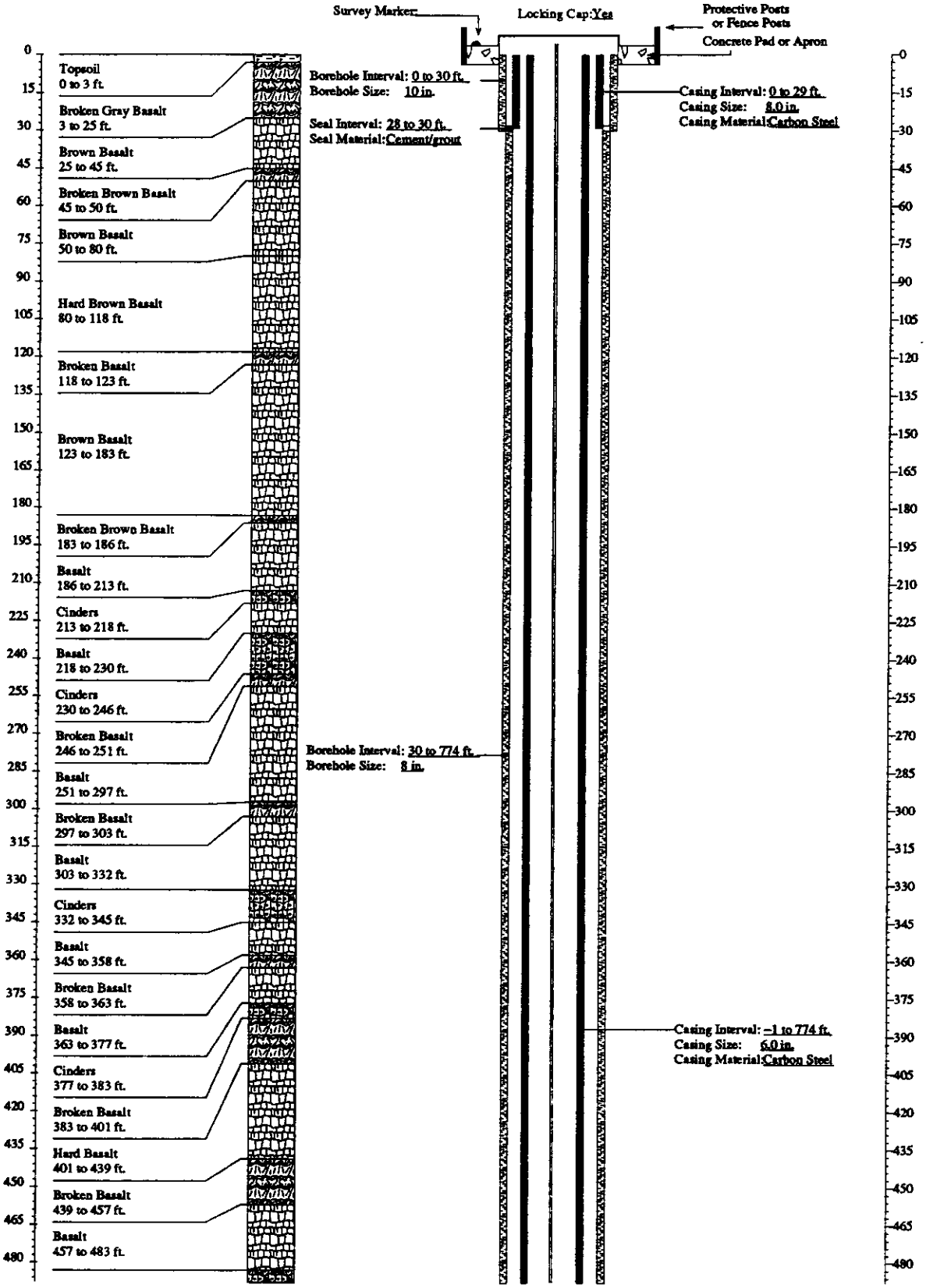
04/22/1994

Facility: SOUTH
Well Type: Observation
Well Status: Active
Year Drilled: 1974
Total Depth: 865

Easting: 374809.428
Northing: 686264.547
Longitude: 1123819.91445
Latitude: 433255.75093
Completion Depth: 865

Driller: Andrew
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 5251.597

Water Level: 766.37
Water Level Date: 09/24/74
Water Level Access: Line



WellName: USGS-101

04/22/1994

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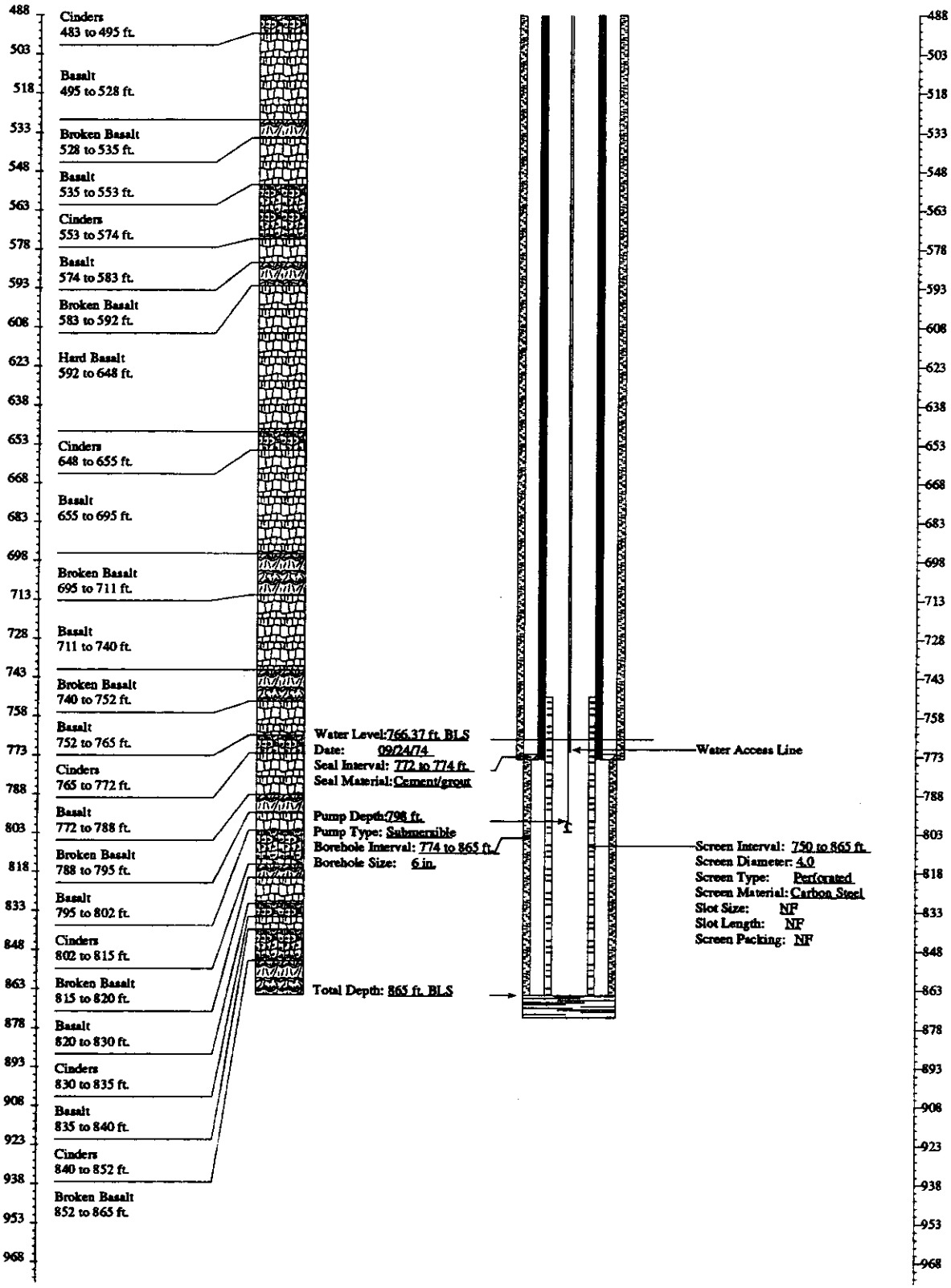

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-103

A. WELL USES

1) Year well was drilled: 1980

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future DOE 5400.1 & CERCLA Monitoring.

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes X No _) If yes, specify regulating program plan: INEL Groundwater Monitoring Plan - DOE 5400.1

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE - EG&G (IRTS) / Jerry Sehlke; CERCLA - EG&G (WAG 10)/ Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size 16-inch (0-10 ft.), 10-inch (10-575 ft.) Casing size 12-inch I.D. (0-10 ft.), 8-inch I.D. or O.D.? (0-575 ft.) Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3.2.1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3.2.2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12 I.D.	0 - 10	N.F.	3	N.F.	N.F.
Carbon Steel	8 (I.D. or O.D.?)	0 - 575	N.F.	17	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement	0 - 10 (12-inch casing seal)	N.F.	Yes
Cement	0 - 40 (8-inch casing seal)	N.F.	Yes
Cement	575 (bottom of casing set in cement)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water is located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the casing is unsealed below the top of basalt at 25 feet bls. However, no surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Drilling Method Air Rotary

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Open Hole Completion
Screen	Open Hole Completion
Pump	Submersible Pump
Discharge Pipe	1.5-inch Galvanized Steel

Explanation Although, galvanized steel may corrode in an acidic environment, the groundwater is not acidic at the INEL. The measuring pipe for water levels is also constructed of steel.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Open Hole completion

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation The well is adequately constructed to monitor "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval(s) Water table (about 585 feet bls) to 760 feet bls. The monitoring interval of 185 feet is excessive and includes basalt and fractured basalt.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration N.F.

9) Is the pump intake location documented: (Yes X No _) Depth 615 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Pump Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-WM-9787, Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located near the southern boundary of the INEL site and is not close to any INEL facilities or other potential sources of contamination. The well is adequately sealed to a depth of 40 feet and complies with state well construction regulations except that the casing thicknesses and joint types were not documented, which are minor deficiencies. Although the 12-inch casing extends less than the required 12 inches above ground, the well is adequately sealed from surface contamination. The well is completed in the Snake River Plain aquifer and contains no annular seal below a depth of 40 feet; however, no evidence was found of perched water near the well that would have to be sealed out.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state well construction regulations to the extent cited in section F. The well does not comply with RCRA guidelines for the following reasons: (1) the borehole is not sealed above the monitored interval, which may affect the validity of the groundwater samples and (2) the monitored interval of about 185 feet is considered excessive for compliance/detection use and may result in the dilution of contaminant concentrations. This interval also includes basalt zones with extremely variable permeabilities. In addition, no documentation was found for the well development and decontamination procedures, which are minor deficiencies.

Remediation: None. However, the 8-inch casing could be perforated and grouted in the borehole and the well completed in the fractured zone at 650 to 710 feet bls to make the well more acceptable for RCRA use.

GEOLOGIC LOG

Well Name USGS-103

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	15	Clayey Silt with Basalt Fragments
15	20	Consolidated Clayey Silt
20	60	Basalt with Sediment Infillings
60	170	Basalt
170	260	Sediment
260	360	Basalt
360	390	Altered Rhyolite (?)
390	460	Rhyolite (?)
460	650	Dense Basalt
650	710	Fractured Basalt
710	760	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-103

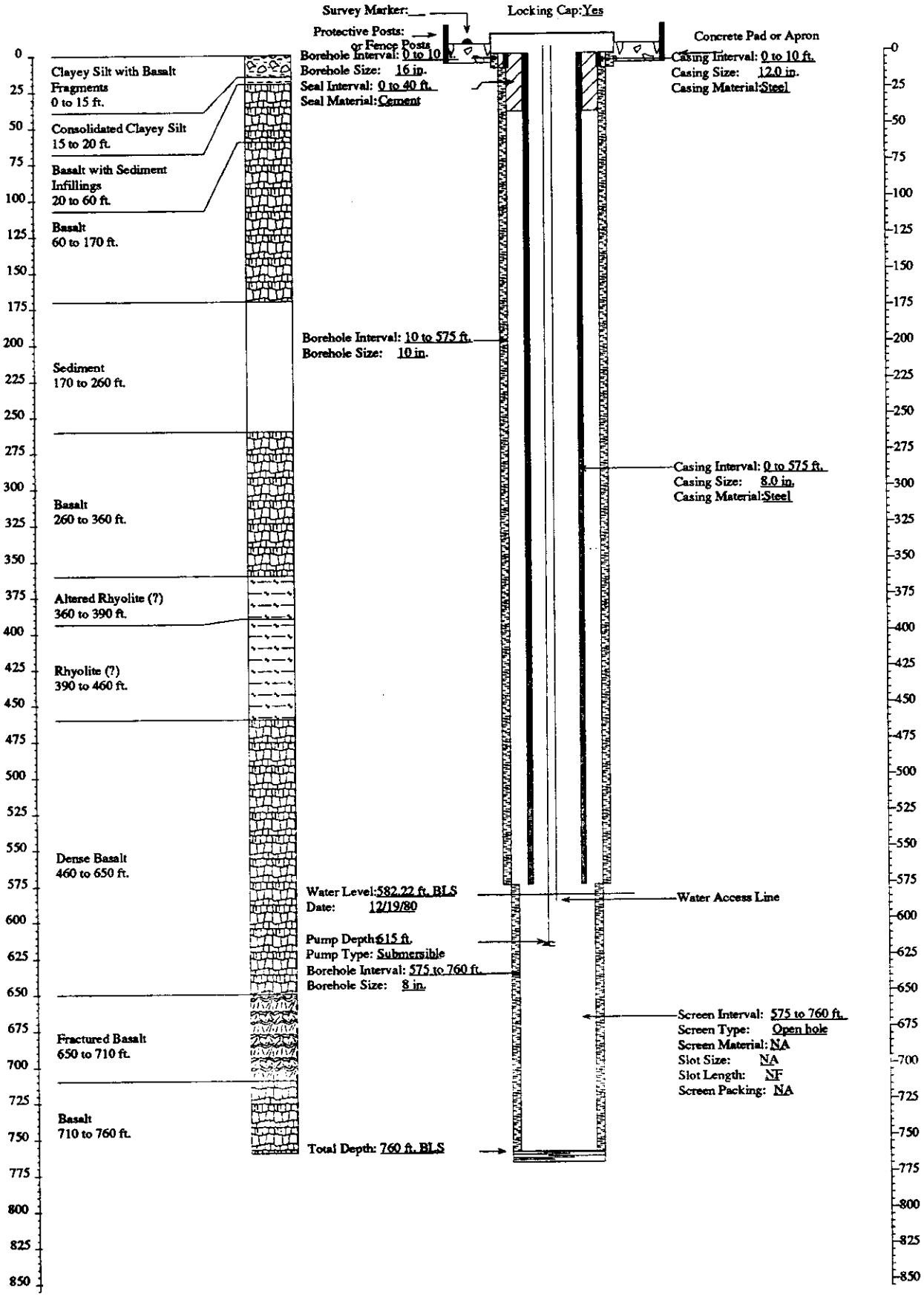
Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1980
Total Depth: 760

Easting: 295932.40
Northing: 652206.60
Longitude: 1125606.61
Latitude: 432713.58
Completion Depth: 760

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 5007.28

06/18/1993

Water Level: 582.22
Water Level Date: 12/19/80
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-104

A. WELL USE

1) Year well was drilled: 1980

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring
( )CERCLA Characterization
( )Other: _
(X)USGS Observation
( )No Documented Use

3) Constituents monitored currently: USGS Observation - ^{+}H, Cl^{-}, Na^{+}, NO_3^{-}

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size 16-inch (0 - 10 feet), 10-inch (10 - 550 feet) Casing size 12-inch I.D. (0 - 10 feet), 8-inch I.D. or O.D.? (0 - 550 feet). Explanation: Since the recorded borehole size is usually the auger or bit size, the actual borehole is larger than the size specified in most cases.

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12 I.D.	0 - 10	N.F.	3	N.F.	N.F.
Carbon Steel	8 (I.D. or O.D.?)	0 - 550	N.F.	33	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	0 - 10 (12-inch casing seal)	N.F.	Yes
Cement Grout	0 - 25 (8-inch casing seal)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No sources of recharge are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well is unsealed below 25 feet bls (the top of basalt). However, no surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-104

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located about 2.5 miles south of the CFA. The well is adequately sealed and complies with state regulations except that the casing thicknesses and joint types were not documented, which are minor deficiencies. Although the 12-inch casing extends less than the required 12 inches above ground, it is adequately sealed from surface contamination. The well is completed in the Snake River Plain aquifer and contains no annular seal below a depth of 25 feet; however, no evidence was found of perched water near the well. (Lower quality perched water would have to be sealed out of the well according to the regulations).

Remediation: None

GEOLOGIC LOG

Well Name USGS-104

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	5	Silty Sediment
5	25	Fractured Basalt
25	30	Cinders
30	100	Basalt
100	125	Fractured Basalt
125	140	Sediment with Cinders and Basalt
140	150	Clay
150	315	Basalt
315	345	Clayey Silt
345	365	Fractured Basalt
365	575	Dense Basalt
575	700	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-104

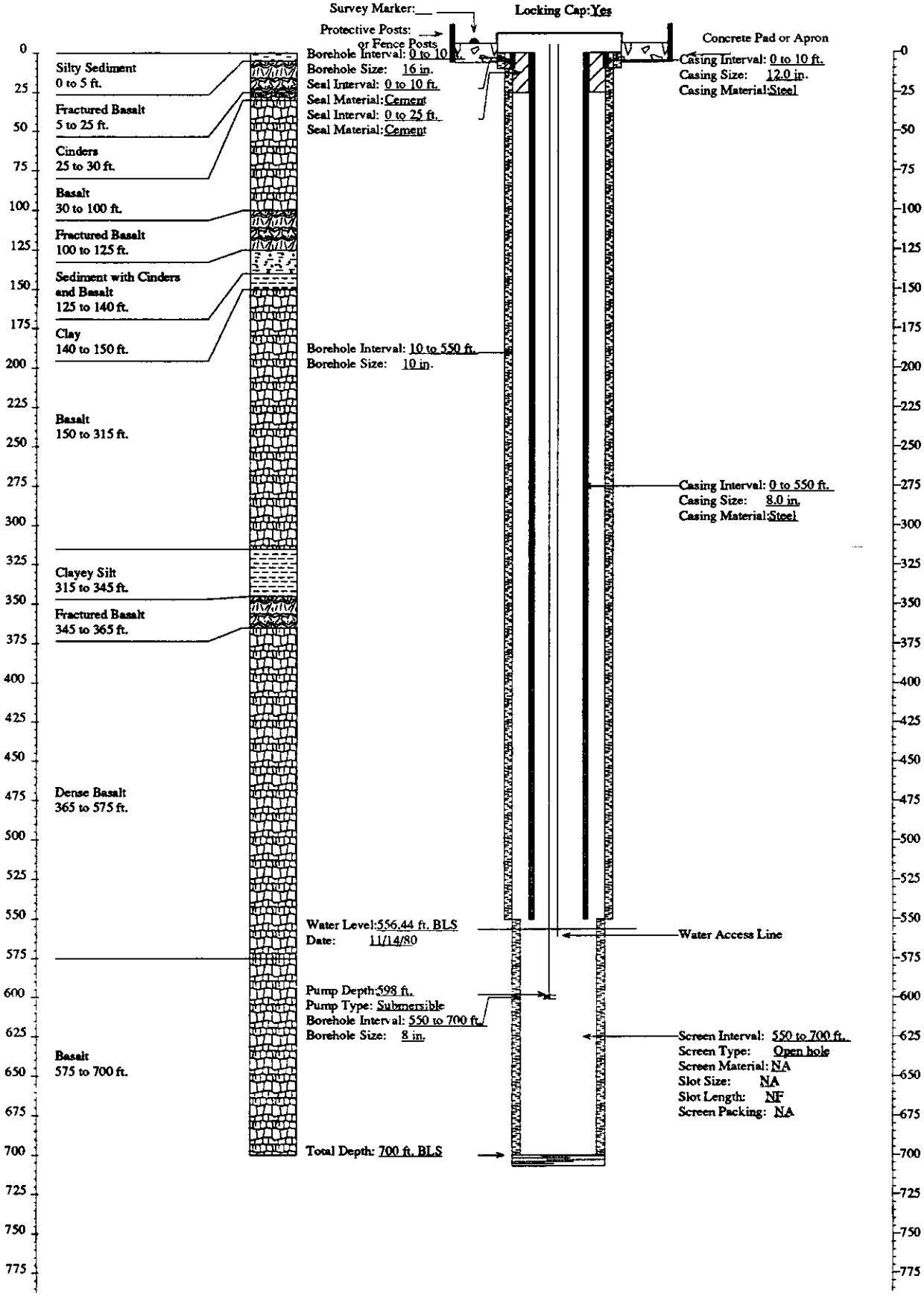
06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1980
Total Depth: 700

Easting: 295910.00
Northing: 662584.50
Longitude: 1125608.21
Latitude: 432856.07
Completion Depth: 700

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4991.37

Water Level: 556.44
Water Level Date: 11/14/80
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL **Well Name/No.** USGS-105

A. WELL USES

1) Year well was drilled: 1980

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future DOE 5400.1 and CERCLA Monitoring.

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: INEL Groundwater Monitoring Plan - DOE 5400.1 and CERCLA

7) Responsible organization/Contact person: DOE 5400.1 - EG&G (IRTS)/ Jerry Sehlke; USGS Observation - USGS / Larry Mann; CERCLA - EG&G (WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes _ No _ Uncertain _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16-inch Casing size 12-inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel (surface casing)	12 I.D.	0 - 10	N.F.	1	N.F.	N.F.
Steel	8 (I.D. or O.D.?)	0 - 400	N.F.	29	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	0 - 10 feet (12-inch casing seal)	N.F.	Yes
Cement Grout	0 - 30 feet (8-inch casing seal)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well is unsealed below 30 feet bls. However, no surface or perched water occurs in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Drilling Method Air Rotary

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Open Hole Completion
Screen	Open Hole Completion
Pump	Submersible Pump
Discharge Pipe	1.5-inch Galvanized Steel
Water Level Measuring Line	1-inch steel.

Explanation Although galvanized steel or steel may corrode in acidic environments, the groundwater is not acidic at the INEL.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Open hole construction

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitored zone, the well detect both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval Water table (approximately 669 feet bls) to 800 feet bls. The monitoring interval of about 130 feet is excessive and includes zones of fractured basalt, basalt and cindery basalt.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A X)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration N.F.

9) Is the pump intake location documented: (Yes X No _) Depth 700 feet

10) Does the pump type collect representative ground-water samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-WM-9787

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located on the south-central border of the INEL and is completed in the Snake River Plain aquifer. The well is adequately sealed at the surface and complies with state regulations except that the casing thicknesses and joint types were not documented, which are minor deficiencies. Although the 12-inch casing extends less than the required 12 inches above ground, it is adequately sealed from surface contamination. The 8-inch casing is unsealed below a depth of 30 feet; however, no evidence was found of perched water near the well. (Lower quality perched water would have to be sealed out of the well according to the regulations).

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations to the extent stated in section F. The well does not comply with RCRA guidelines for the following reasons: (1) the borehole is not sealed above the monitoring interval, which may affect the validity of the groundwater samples and (2) the monitoring interval of about 130 feet is excessive for compliance/ detection use and may result in the dilution of contaminant concentrations. Although no documentation was found for the well development or decontamination procedures, these are minor deficiencies.

Remediation: None. However, a 4-inch casing could be grouted in the well to partially seal the borehole and decrease the length of the monitored zone.

GEOLOGIC LOG

Well Name USGS-105

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	5	Clay
5	10	Basalt
10	15	Cinders
15	85	Basalt
85	155	Basalt with Sediment Infillings
155	200	Fractured Basalt
200	245	Basalt
245	335	Rhyolite (?)
335	345	Altered Rhyolite (?)
345	350	Clay
350	505	Dense Basalt
505	510	Clay
510	635	Dense Basalt
635	680	Fractured Basalt
680	690	Basalt with Cinders
690	710	Basalt
710	800	Fractured Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-105

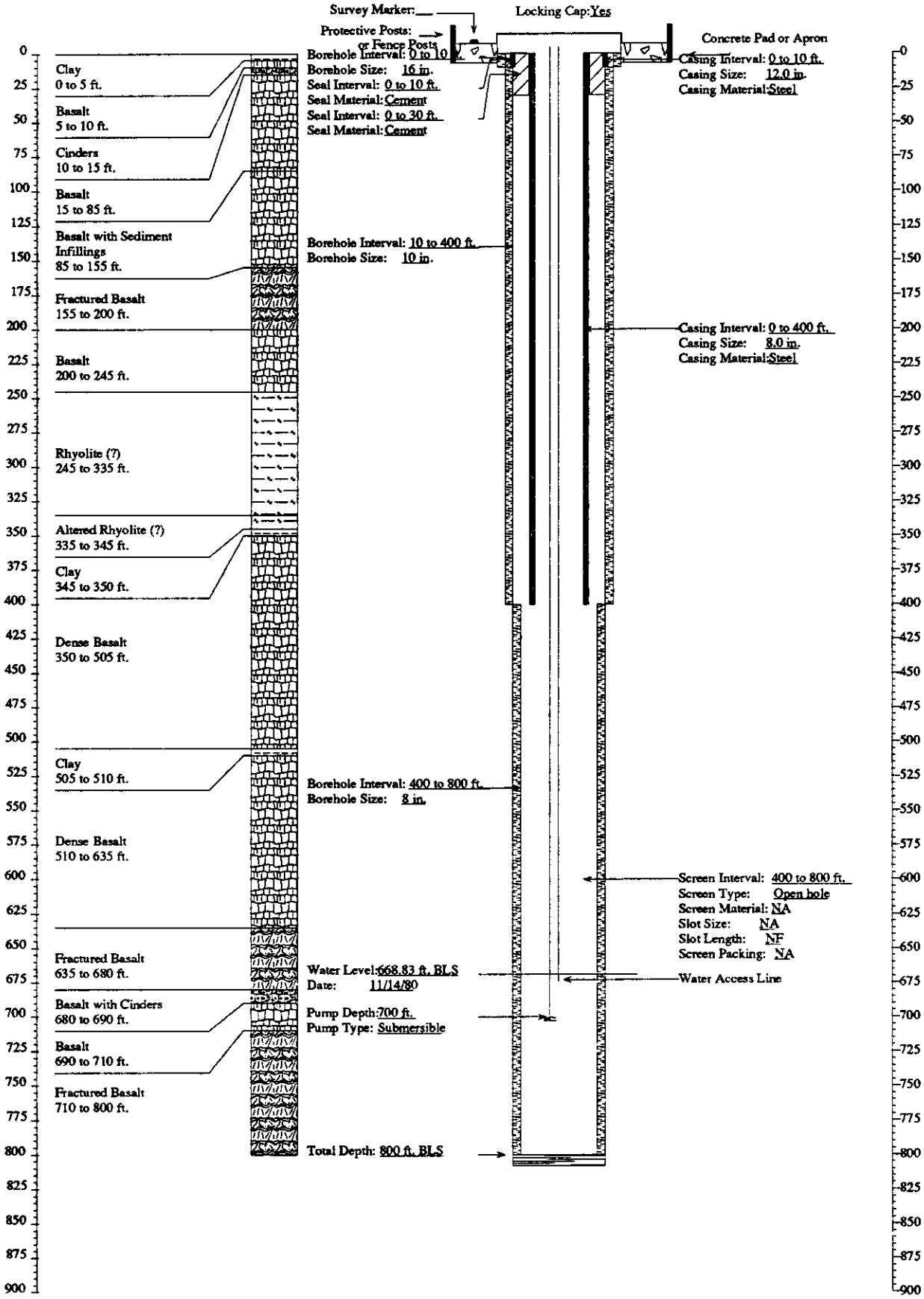
06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1980
Total Depth: 800

Easting: 277389.90
Northing: 651362.80
Longitude: 1130017.85
Latitude: 432703.48
Completion Depth: 800

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 5095.03

Water Level: 668.83
Water Level Date: 11/14/80
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-106

A. WELL USE

1) Year well was drilled: 1980

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16-inch Casing size 12-inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12 I.D.	0 - 10	N.F.	2	N.F.	N.F.
Carbon Steel	8 (I.D. or O.D.?)	0 - 400	N.F.	18	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	0 - 10 feet (12-inch casing seal)	N.F.	Yes
Cement Grout	0 - 30 feet (8-inch casing seal)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well is unsealed below 30 feet. However, there is no known surface or perched water in the area and the top of basalt is at 3 feet.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: None

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located about 2 miles east of the RWMC facility and is not close to any other potential source of contamination. The well is adequately sealed to a depth of 30 feet and complies with state well construction regulations except for the following minor deficiencies: the casing thicknesses and joint types were not documented and the 12-inch casing extends 2 inches above ground instead of the required 12 inches. Although it is completed in the Snake River Plain aquifer and the casing is unsealed below 30 feet, no evidence was found of perched water near the well. (Lower quality perched water would have to be sealed out according to the regulations).

Remediation: None

GEOLOGIC LOG

Well Name USGS-106

Source: USGS Generalized Lithologic Log

****

Interval (feet below surface)

Begin	End	Description
0	3	Silty Sediment
3	135	Basalt
135	150	Clayey Silt
150	205	Clayey Silt with Cinders
205	250	Basalt
250	275	Clayey Silt
275	300	Basalt
300	310	Clayey Silt
310	470	Dense Basalt
470	475	Clayey Silt
475	575	Basalt
575	580	Clay
580	675	Dense Basalt
675	720	Fractured Basalt
720	735	Clay
735	760	Fractured Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-106

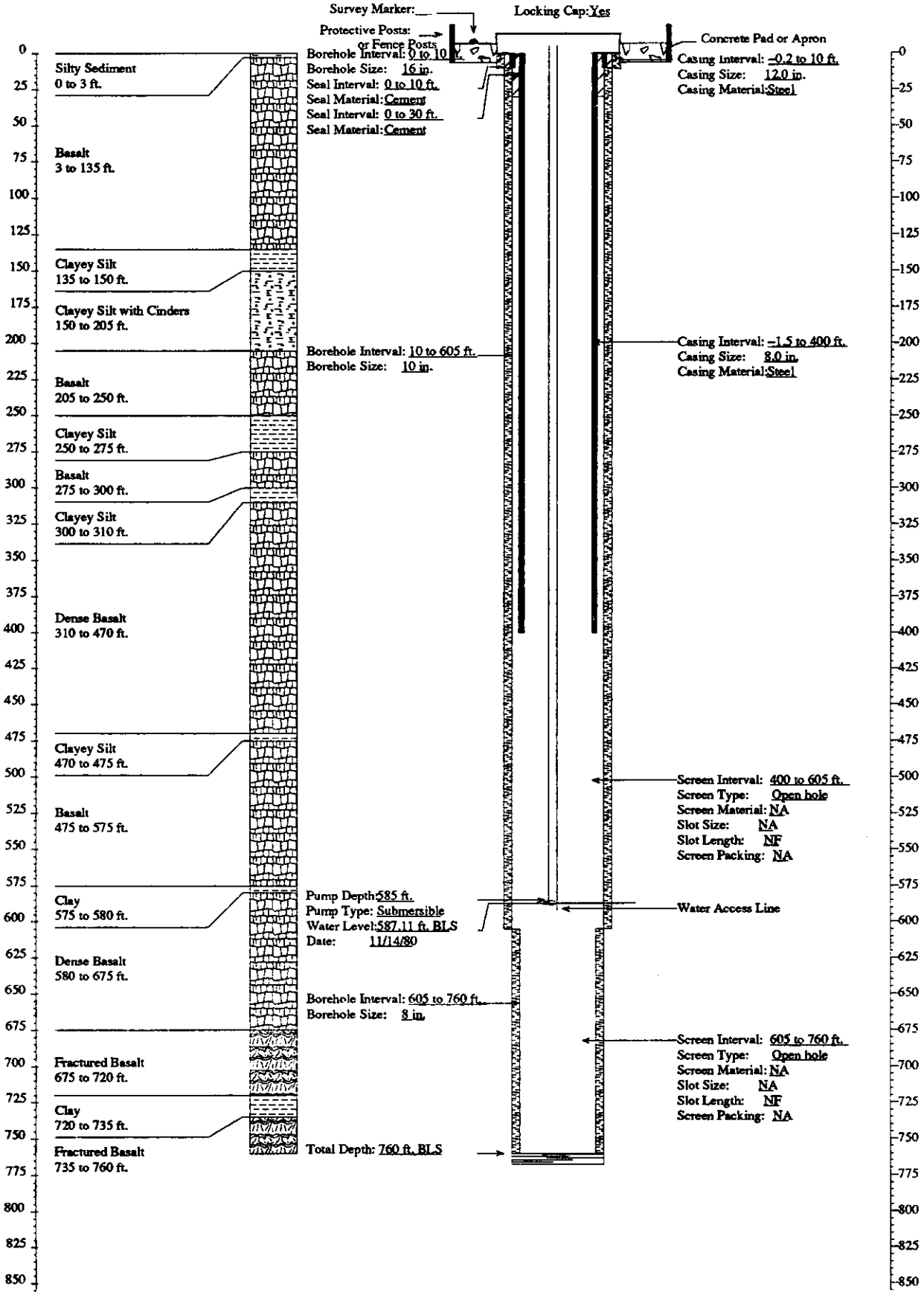
06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1980
Total Depth: 760

Easting: 280997.40
Northing: 669059.70
Longitude: 1125931.33
Latitude: 432958.61
Completion Depth: 760

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 5016.76

Water Level: 587.11
Water Level Date: 11/14/80
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL **Well Name/No. USGS-107**

A. WELL USE

1) Year well was drilled: 1980

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
( )Other: _

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+, NO_3^-

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes _ No X) If yes, specify regulating program plan: _

7) Responsible organization/Contact person: USGS / Larry Mann

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)
6) Based on location of well, is existing or planned surface completion adequate:
(Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16-inch Casing size 12-inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Steel (surface casing)	12 I.D.	0 - 10	N.F.	2	N.F.	N.F.
Steel	8 (I.D. or O.D.?)	0 - 200	N.F.	18	N.F.	N.F.
Steel	6 (I.D. or O.D.?)	0 - 270	N.F.	22	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	0 - 10 (12-inch casing seal)	N.F.	Yes
Cement Grout	0 - 30 est. (8-inch casing seal)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well is unsealed below 30 feet. However, there is no known surface or perched water in the area.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes _ No X). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation _) Explanation _

2) Were drilling additives used: (Yes _ No _ Uncertain/No documentation _) Drilling Method _ Additive(s)/Quantity _

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No _)

Material

Casing _____

Screen _____

Pump _____

Discharge Pipe _____

Explanation _____

4) Is the screen factory fabricated: (Yes _ No _ No screen _) Type _

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes _ No _) Explanation _

6) Is the monitoring interval greater than 30 feet in length: (Yes _ No _) or does the well monitor more than one type of lithology: (Yes _ No _) Monitoring interval(s) _ Explanation _

7) Is a filter pack present: (Yes _ No _) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A _) Does it extend no more than 2 feet above screen: (Yes _ No _ N/A_) Filter pack type _ Filter pack interval _

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented _) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented _) Well development type and duration _

9) Is the pump intake location documented: (Yes _ No _) Depth _

10) Does the pump type collect representative groundwater samples: (Yes _ No _ Not Documented _) Type_ Explanation _

E. **THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES:** Personal Communication - Rodger Jensen, USGS (April 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located about 1.75 miles south of the STF facility and is not close to any other potential source of contamination. The well is sealed to a depth of about 30 feet bls and complies with state well construction regulations except that the casing thicknesses, joint types and the stickup of the 6-inch casing were not documented, which are minor deficiencies. Although the 12-inch casing extends less than the required 12 inches above ground, the casing is adequately sealed from surface contamination. The well is completed in the Snake River Plain aquifer and contains no annular seal below a depth of about 30 feet; however, no evidence of perched water was found near the well.

Remediation: None

GEOLOGIC LOG

Well Name USGS-107

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	3	Silty Sediment
3	55	Basalt
55	65	Clayey Silt
65	115	Basalt
115	220	Basalt with Sediment Infillings
220	255	Basalt with some Crevices
255	330	Dense Basalt
330	400	Fractured Basalt
400	445	Basalt
445	450	Clay
450	500	Dense Basalt
500	525	Fractured Basalt
525	640	Basalt
640	690	Basalt with Sediment Infillings

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-107

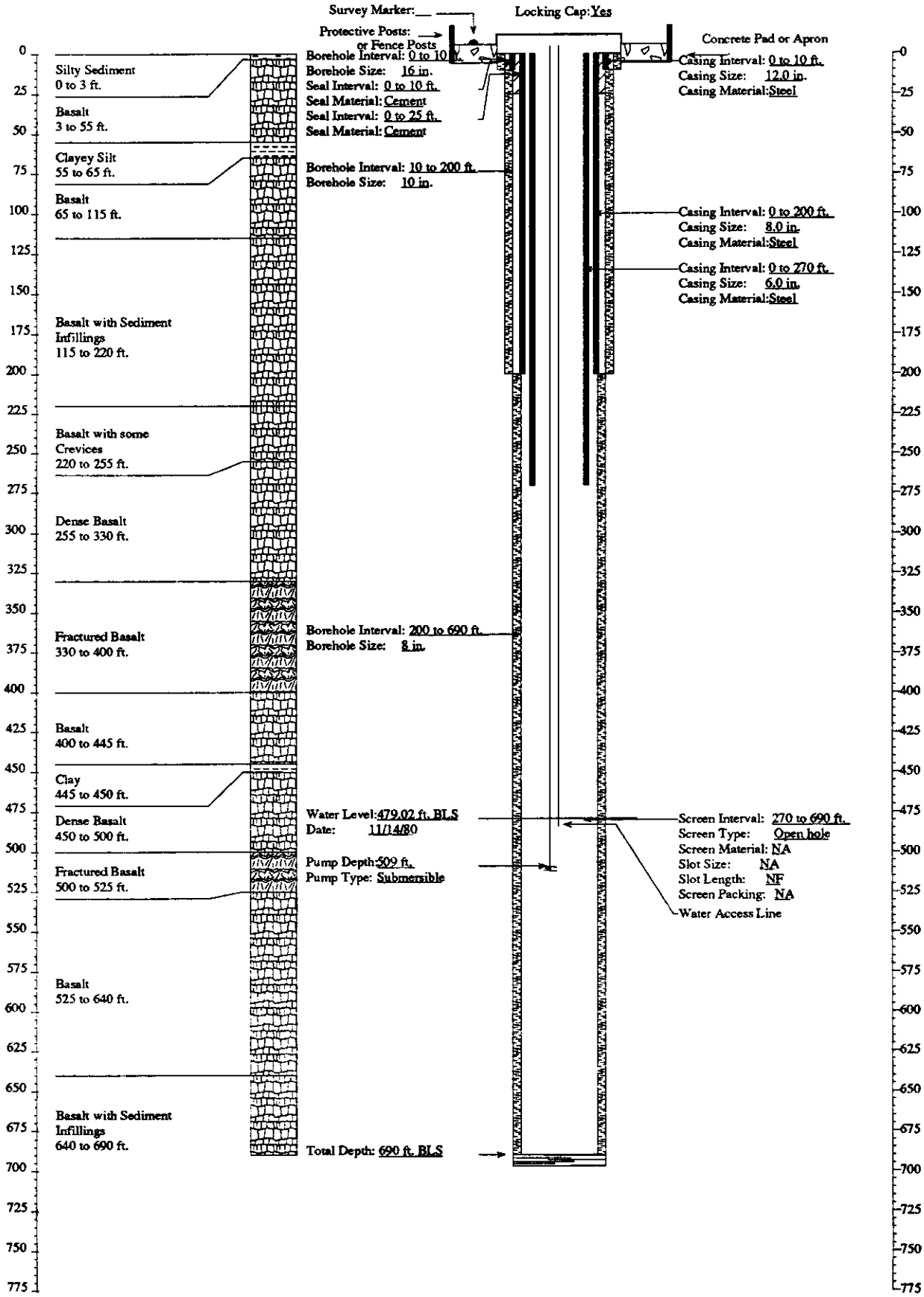
06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1980
Total Depth: 690

Easting: 307791.50
Northing: 667130.20
Longitude: 1125327.60
Latitude: 432942.01
Completion Depth: 690

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 4918.98

Water Level: 479.02
Water Level Date: 11/14/80
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-108

A. WELL USES

1) Year well was drilled: 1980

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future DOE 5400.1 and CERCLA Monitoring.

3) Constituents monitored currently: ^3H, Cl^-, Na^+ - USGS Observation

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: Sitewide Groundwater Monitoring Plan (1992 Draft) - DOE 5400.1

7) Responsible organization/Contact person: DOE 5400.1 - EG&G (IRTS) / Jerry Sehlke; USGS Observation - USGS / Larry Mann; CERCLA - EG&G (WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Uncertain _ Borehole size 16-inch (0-10 ft.), 10-inches (10-400 ft.) Casing size 12-inch I.D. (0-10 ft.), 8-inch I.D. or O.D.?(0-400 ft.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12 I.D.	0 - 10	N.F.	1	N.F.	N.F.
Carbon Steel	8 (I.D. or O.D.?)	0 - 400	N.F.	19	N.F.	N.F.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	0 - 10 feet (12-inch casing seal)	N.F.	Yes
Cement Grout	0 - 30 feet (8-inch casing seal)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well is unsealed below 30 feet. However, no evidence was found of perched groundwater or surface water near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Drilling Method Air Rotary

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

	Material
Casing	Open Hole Completion
Screen	Open Hole Completion
Pump	Submersible Pump
Discharge Pipe	1.5-inch Galvanized Steel
Water Level Measuring Pipe	1-inch steel

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between the metals concentrations in the groundwater from wells constructed of carbon steel and stainless steel at the RWMC. Although galvanized steel or steel may corrode under acidic conditions, the groundwater is not acidic at the INEL.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Open hole completion

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitored zone, the well is designed to detect both"floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes _ No X) Monitoring interval(s) Water level (approximately 607 feet bls) to 760 feet bls. The monitoring interval of about 150 feet is excessive.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X Well development type and duration N.F.)

9) Is the pump intake location documented: (Yes X No _) Depth 637 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-ER-8496, EGG-WM-9787, Sitewide Groundwater Monitoring Plan (1992 Draft)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located on the south-central border of the INEL site and is not close to any facilities or other potential sources of contamination. The well is sealed to a depth of 30 feet and complies with state regulations except that the casing thicknesses and joint types were not documented, which are minor deficiencies. Although the 12-inch casing does not extend the required 12 inches above ground, it is adequately sealed from surface surface contamination. The well is completed in the Snake River Plain aquifer and contains no annular seal below 30 feet; however, no evidence was found of perched water near the well. (Lower quality perched water would have to be sealed out of the well according to the regulations).

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state well construction regulations as stated above. The well does not comply with RCRA guidelines for the following reasons: (1) the borehole is unsealed above the monitoring interval, which may affect the validity of the groundwater samples and (2) the monitoring interval of about 150 feet is excessive for compliance/detection use and may result in the dilution of contaminant concentrations. Although no documentation was found for the well development or decontamination procedures, these are minor deficiencies.

Remediation: None. However, a 4-inch casing could be grouted in the well. This would partially seal the borehole and decrease the length of the monitored zone.

 GEOLOGIC LOG Well Name USGS-108

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	3	Silty Sediment
3	185	Basalt
185	275	Sediment
275	320	Basalt
320	325	Sediment
325	355	Basalt
355	385	Silty Sediment
385	430	Rhyolite (?)
430	590	Dense Basalt
590	625	Fractured Basalt
625	760	Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-108

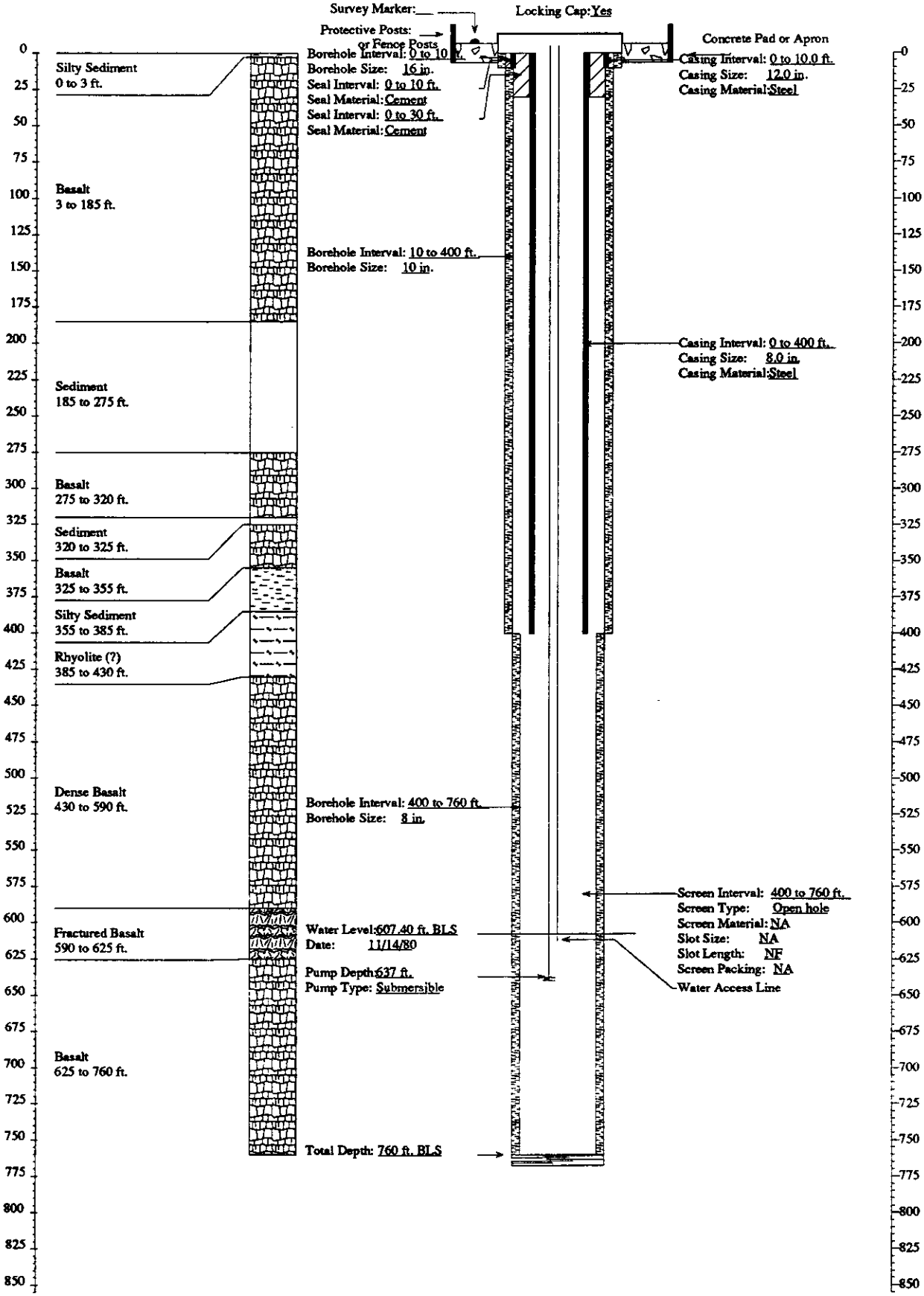
06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1980
Total Depth: 760

Easting: 285605.00
Northing: 650810.60
Longitude: 1125826.42
Latitude: 432658.83
Completion Depth: 760

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 5031.30

Water Level: 607.40
Water Level Date: 11/14/80
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-109

A. WELL USES

1) Year well was drilled: 1980

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future DOE 5400.1 and CERCLA Monitoring.

3) Constituents monitored currently: USGS Observation - ^{+}H, Cl^{-}, Na^{+}.

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring: (Yes X No _) If yes, specify regulating program plan: INEL Groundwater Monitoring Plan - DOE 5400.1

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1 - EG&G (IRTS) / Jerry Sehlke; CERCLA - EG&G (WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16-inch Casing size 12-inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12 I.D.	0 - 10	N.F.	3	N.F.	N.F.
Carbon Steel	8 (I.D. or O.D.?)	0 - 175	N.F.	30	N.F.	N.F.
Carbon Steel	6 (I.D. or O.D.?)	175 - 340	N.F.	N/A	N.F.	N.F.
Carbon Steel (1)	4 (I.D. or O.D.?)	0 - 800	N.F.	30	N.F.	N.F.

(1) Casing perforated from 600 to 800 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	0 - 10 (12-inch casing seal)	N.F.	Yes
Cement Grout	0 - 30 feet (8-inch casing seal)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3.3.1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes X No _) Explanation The well is located about 0.5 mile from INEL spreading area D.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes X No _ Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) Perched water cascades down the annular space in the well when water is ponded in spreading area D (pers. comm. Rodger Jensen, USGS).

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no seal below 30 feet bls. Perched water flows down the annular space of the well when water is ponded in spreading area D.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation _

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Drilling Method Air Rotary

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes X No _)

Material

Casing Carbon Steel Casing

Screen Perforated Carbon Steel

Pump Submersible Pump

Discharge Pipe 1.5-inch Galvanized Steel

Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between metals concentrations in the groundwater of carbon steel and stainless steel wells at the RWMC. Although galvanized steel may corrode in acidic environments, the groundwater is not acidic at the INEL. The measuring pipe for water levels is also constructed of 1-inch galvanized steel.

4) Is the screen factory fabricated: (Yes _ No _ No screen X) Type Perforated casing

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitored zone, the well is designed to detect both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes X No _) Monitoring interval(s) Water table (approximately 620 feet bls) to 800 feet bls. The monitoring interval of about 180 feet is excessive and includes interbeds of dense basalt, fractured basalt and cinders.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend more than 2 feet above screen: (Yes _ No _ N/A X)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration N.F.

9) Is the pump intake location documented: (Yes X No _) Depth 620 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Submersible Pump Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected volatile organics at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-ER-8496, EGG-WM-9787, Personal communication - Rodger Jensen, USGS (April, 1993)

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
(X) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located on the south-central border of the INEL site and is completed in the Snake River Plain aquifer. Although the well is not close to any facilities, it is located about 0.5 mile from INEL spreading area D. The well is sealed to a depth of 30 feet bls but perched water cascades down the annular space below this when water is ponded in area D. In addition, the casing thicknesses and joint types were not documented, which are minor deficiencies. Although the 12-inch casing extends 3 inches above ground instead of the required 12 inches, the well is adequately sealed from surface contamination.

Remediation: The 6-inch casing should be sealed in the borehole to prevent potentially lower quality water from INEL spreading area D from flowing down the well to the Snake River Plain aquifer.

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulations except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state well construction regulations as stated above. The well does not comply with RCRA guidelines for the following reasons: (1) the casings above the monitoring interval are not sealed in the borehole, which may affect the validity of the groundwater samples and (2) the monitoring interval of about 180 feet is excessive for compliance/detection use and may result in the dilution of contaminant concentrations. This interval also includes zones with extremely variable permeability. Although no documentation was found for the well development or decontamination procedures, these are minor deficiencies.

Remediation: The 6-inch casing should be sealed as recommended in Section F. However, this will not remediate the length of the monitoring interval.

GEOLOGIC LOG

Well Name USGS-109

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	3	Silty Sediments
3	15	Basalt
15	20	Cinders
20	185	Basalt
185	200	Silt
200	215	Basalt
215	230	Clayey Silt
230	320	Rhyolite (?)
320	420	Basalt
420	425	Clayey Silt
425	525	Dense Basalt
525	550	Fractured Basalt
550	665	Dense Basalt
665	670	Cinders
670	690	Fractured Basalt
690	715	Basalt
715	735	Fractured Basalt
735	800	Dense Basalt

COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-109

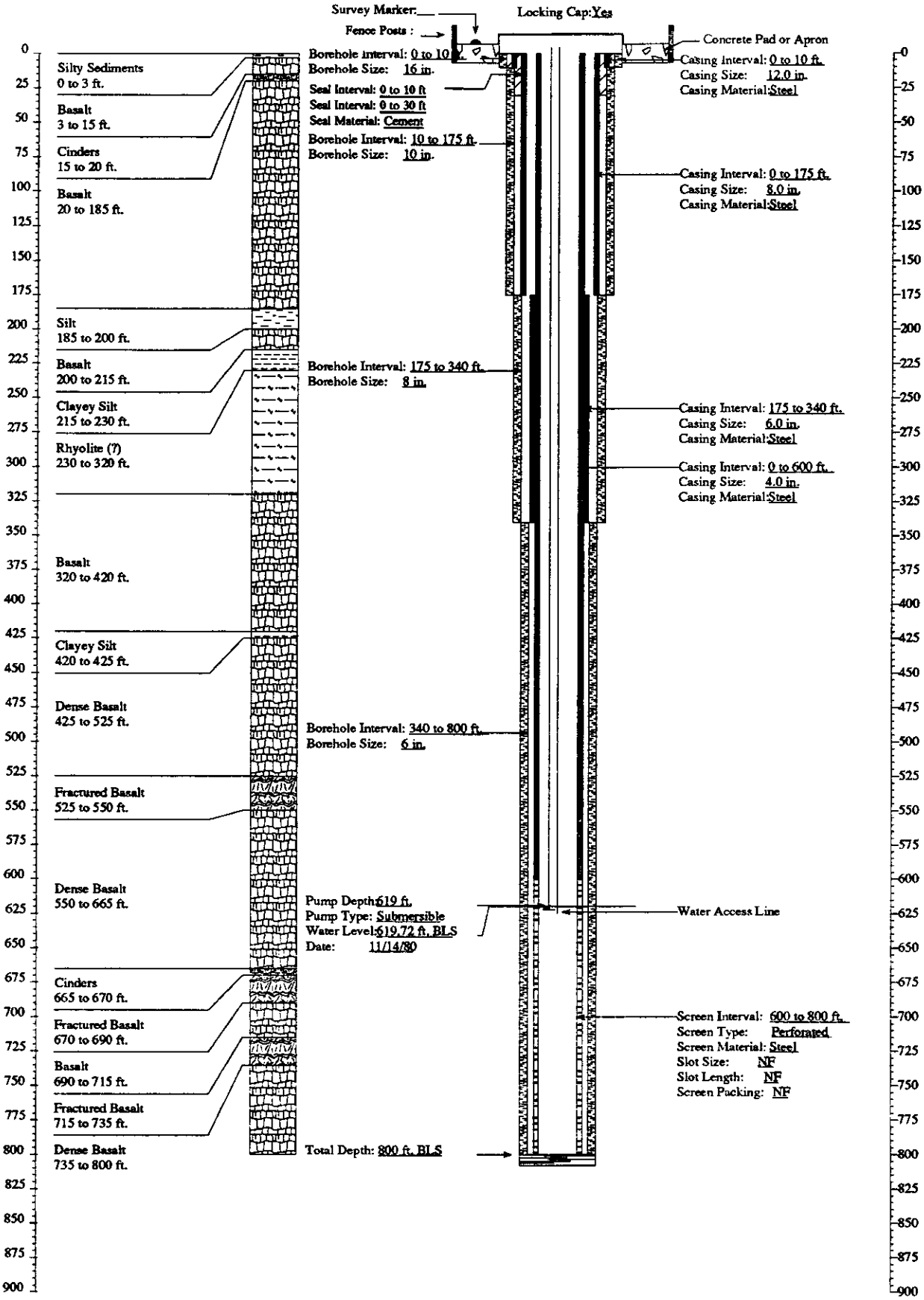
06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1980
Total Depth: 800

Easting: 265738.60
Northing: 651253.00
Longitude: 1130255.77
Latitude: 432701.20
Completion Depth: 800

Driller: Denning
Geologist: NF
Drilling Method: Air rotary
Drilling Fluid: NF
Land Surface: 5045

Water Level: 619.72
Water Level Date: 11/14/80
Water Level Access: Line



FITNESS-FOR-USE CHECKLIST FOR AQUIFER AND PERCHED GROUNDWATER MONITORING/OBSERVATION WELLS

LOCATION: SOUTH INEL Well Name/No. USGS-110

A. WELL USES

1) Year well was drilled: 1980

2) Current use for well:
( )DOE 5400.1 Monitoring
( )RCRA Monitoring (X)USGS Observation
( )CERCLA Characterization ( )No Documented Use
(X)Other: Proposed for future DOE 5400.1 and CERCLA monitoring.

3) Constituents monitored currently: USGS Observation - ^3H, Cl^-, Na^+;

4) Water level monitored: (Yes X No _ Insufficient data _)

5) Is the well used for USGS observation: (Yes X No _)
(The sampling protocols for the USGS are "Techniques of Water Resources Investigation" and "National Handbook of Recommended Methods for Water-Data Acquisition".)

6) Is the well used or proposed for compliance/detection monitoring:
(Yes X No _) If yes, specify regulating program plan: INEL Groundwater Monitoring Plan - DOE 5400.1

7) Responsible organization/Contact person: USGS Observation - USGS / Larry Mann; DOE 5400.1 - EG&G (IRTS) / Jerry Sehlke; CERCLA - EG&G(WAG 10) / Robert Wadkins

B. WELL SHOULD COMPLY WITH INEL BEST MANAGEMENT PRACTICES (BMP) REGARDING SURFACE COMPLETION

Surface completion data is documented in "Idaho National Engineering Laboratory Well Catalog" (DOE/ID-10380). The elevation and coordinates of the measuring point and brass marker for appropriate INEL wells are being resurveyed as described in "INEL Well Inspection and Surveying Project" (EGG-WM-9890). The project started in the summer of 1992.

1) Well located by field inspection: (Yes X No _)
2) Protective posts: (Yes _ No X) or Fence posts: (Yes X No _)
3) Concrete pad/apron present: (Yes X No _)
4) Does the well contain a survey marker: (Yes X No _)
5) If no to 2, 3 or 4, is the well planned for upgrade: (Yes _ No _ N/A X)

6) Based on location of well, is existing or planned surface completion adequate: (Yes X No _)

C. WELL IS EVALUATED TO IDAHO DEPARTMENT OF WATER RESOURCES "WELL CONSTRUCTION STANDARDS-RULES and REGULATIONS" (1989)

1) Surface Completion

State of Idaho Reg. 3,2,1. The top of the casing shall be completely covered with a 1/4-inch, thick, solid, new or like-new steel plate welded in place, a threaded cap, or a watertight sanitary seal cover cap. State of Idaho Reg. 3,11. The well shall be equipped with an access port with a plug that will allow measurement of the depth to water.

a) Well capped and protected: (Yes X No _ Insufficient Data _)
b) Access to measure water levels: (Yes X No _ Insufficient Data _)

2) Casing

State of Idaho Reg. 3,3,2,1. Steel surface casing shall be installed to a minimum depth of 18 feet below land surface with a borehole size 2 inches greater than the O.D. of the casing.

a) If well is completed in surficial sediments, does the casing extend to a minimum depth of 18 feet: (Yes _ No _ N/A X)

b) If well is completed in alluvium, is borehole size at least 2 inches greater than the O.D. of casing: (Yes _ No _ N/A X
Borehole size _ Casing size _)

State of Idaho Reg. 3,3,4. Steel surface casing shall be installed into bedrock or to a depth of 18 feet, whichever is greater, with a borehole size 2 inches greater than the O.D. of the casing.

c) If well is completed in bedrock, does the casing extend to a minimum depth of 18 feet or bedrock, whichever is greater:
(Yes X No _ N/A _)

d) If well is completed in bedrock, is the borehole at least 2 inches greater than the largest diameter casing from ground surface to top of bedrock: (Yes X No _ Borehole size 16-inch Casing size 12-inch I.D.)

e) What is/are the type of casing(s), diameter(s), interval(s), joint type(s) and casing thickness(es):

State of Idaho Reg. 3,2,1. Casing shall extend at least 12 inches above land surface. Casing joints shall be welded or screw-couple joints which shall be water tight or by other means approved by the Director of Idaho Department of Water Resources. All permanent steel casing required to be installed in a well shall meet the minimum specifications listed below. State of Idaho Reg. 3,2,2. The specifications of any plastic casing to be used shall meet or exceed ASTM Standard F-480.

Permanent Steel Casing Minimum Specifications

Nominal Size (inches)	Outside Diameter (inches)	Nominal Wall Thickness (inches)
1 1/2	1.900	.145
2	2.375	.154
2 1/2	2.875	.203
3	3.500	.216
3 1/2	4.000	.226
4	4.500	.237
5	5.500	.244
6 or greater		.250

Casing Type	Casing Diameter (inches)	Casing Interval (feet)	Type of Casing Joints	Stick-up of Casing Above Ground (inches)	Casing Thickness (inches)	Compliance W/ State Regs. on Casing Thickness
Carbon Steel (surface casing)	12 I.D.	0 - 5	N.F.	2	N.F.	N.F.
Carbon Steel	8 (I.D. or O.D.?)	0 - 350	N.F.	10	N.F.	N.F.
Carbon Steel (1)	6 (I.D. or O.D.?)	0 - 780	N.F.	26	N.F.	N.F.

(1) Casing perforated from 580 to 780 feet bls.

3) Seal

State of Idaho Reg. 3,3,1 and 3,3,2,1. The annular space between surface casing and borehole shall be filled with cement grout, puddling clay or bentonite grout from ground surface to 18 feet or top of bedrock, whichever is greater, to prevent the possible downward movement of contaminated surface waters. If well is completed in alluvium and greater than 18 feet in total depth, a seal to 18 feet is required.

Annular Seal Material	Interval (feet)	Mixture/Volumes	Material Approved by State of Idaho Regs.
Cement Grout	0 - 5 (12-inch casing seal)	N.F.	Yes
Cement Grout	0 - 25 (8-inch casing seal)	N.F.	Yes

a) Does the surface seal extend at a minimum from ground surface to 18 feet below land surface (if the well is completed in the alluvium) or to the top of bedrock (if the well is completed in bedrock): (Yes X No Uncertain/Not documented _)

b) If the seal is documented, how was it emplaced (provide intervals if there was more than one grouting event): N/A _ Uncertain/not documented X Explanation for seal emplacement _

State of Idaho Reg. 3,3,1. The casing seal shall prevent the downward movement of groundwater from zones that have been cased out of the well due to quality or other reasons.

c) Is the well located in proximity to surface water bodies such as percolation ponds, influent streams and spreading areas or other sources that may contribute to perched groundwater above the sampling interval near the well: (Yes _ No X) Explanation No surface water bodies are located in the area.

d) Is there evidence of saturated formations above the sampling interval from drilling logs, geophysical logs (USGS Open-File Report 90-366) or other indicators: (Yes _ No X Insufficient data _) Explanation (Qualify data/specify perched intervals if applicable) No evidence was found for perched groundwater near the well.

e) Is the casing sealed adequately to prevent groundwater movement within the annular space: No, the well contains no seal below 25 feet bls. However, no surface water or perched groundwater occurs near the well.

4) Gravel Pack. Does the well contain a gravel pack: (Yes _ No X) If yes, is there a packer or adequate seal to prevent the migration of surface water or perched groundwater into the gravel pack: (Yes _ No _ N/A X) Explanation

D. IS THE WELL USED FOR RCRA MONITORING (Yes _ No X) OR IS THE WELL TO BE EVALUATED TO RCRA GUIDANCE AS A BEST MANAGEMENT PRACTICE (Yes X No _). (If no, proceed to section E)

The State of Idaho Well Construction Regulations and INEL Best Management Practices that overlap with RCRA guidelines and regulations will not be duplicated in this section.

1) Were the drill rig, equipment, casing and screen steam cleaned before drilling and installation: (Yes _ No _ No documentation X)

2) Were drilling additives used: (Yes _ No X Uncertain/No documentation _) Drilling Method Air Rotary

3) Are the casing (that portion which is within the sampling interval), the screen, the pump and the pump discharge pipe constructed of nonreactive material which does not affect/interfere with chemical, physical, biological or radiological constituents of interests: (Yes _ No X)

Material

Casing Carbon Steel
Screen Perforated Carbon Steel
Pump Grundfos Submersible
Discharge Pipe 1-inch Galvanized Steel
Water Level Access Pipe 1-inch PVC
Explanation EGG-ER-8496 documents that no significant difference (95% level) existed between the metals concentrations from wells constructed of carbon steel and stainless steel at the RWMC. Although galvanized steel may corrode under acidic conditions, the groundwater is not acidic at the INEL. However, PVC is not preferred in compliance/detection monitoring due to its absorbing/leaching characteristics.

4) Is the screen factory fabricated: (Yes _ No X No screen _) Type Perforated casing

5) Is the monitoring interval adequate to detect the contaminants of concern, i.e. "floaters", "sinkers" or dissolved constituents: (Yes X No _) Explanation Since the water table occurs within the monitored zone, the well is designed to detect both "floaters" and dissolved constituents.

6) Is the monitoring interval greater than 30 feet in length: (Yes X No _) or does the well monitor more than one type of lithology: (Yes X No _) Monitoring interval(s) Water table (approximately 569 feet bls) to 780 feet bls. The monitoring interval of about 210 feet is excessive and crosses several different lithologies.

7) Is a filter pack present: (Yes _ No X) If yes, is the filter pack comprised of chemically inert material: (Yes _ No _ Uncertain _ N/A X) Does it extend no more than 2 feet above screen: (Yes _ No _ N/AX)

8) Has the well been developed to ensure turbid free groundwater samples, i.e. <5 NTUs: (Yes _ No _ Not Documented X) and to restore the natural hydraulic conductivity of the formation, i.e. stabilization of parameters: (Yes _ No _ Not Documented X) Well development type and duration N.F.

9) Is the pump intake location documented: (Yes X No _) Depth 612 feet

10) Does the pump type collect representative groundwater samples: (Yes X No _ Not Documented _) Type Grundfos Submersible Explanation EGG-WM-9787 documents that gas piston pumps, submersible pumps and bailers produced nearly equal results for selected organic volatiles at TAN.

E. THE PRIMARY SOURCE OF INFORMATION FOR THIS CHECKLIST IS IDAHO NATIONAL ENGINEERING LABORATORY COMPREHENSIVE WELL SURVEY OR AS REFERENCED. OTHER SOURCES: EGG-ER-8496, EGG-WM-9787

N.F. - Not Found/No Documentation
N/A - Not Applicable

F. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: USGS Observation, Proposed for DOE 5400.1 and CERCLA/State Regulations and INEL Best Management Practices

( ) Well complies with applicable regulations and is acceptable for intended use.
(X) Well complies with applicable regulations except for minor construction details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
( ) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well is located near the south-central border of the INEL. The well is adequately sealed at the surface and complies with state regulations except for the following minor deficiencies: the casing thicknesses and joint types were not documented and the 12-inch casing extends 2 inches above ground instead of the required 12 inches. Although the casings are not sealed below a depth of 25 feet, no evidence was found of perched water near the well.

Remediation: None

G. WELL FITNESS DETERMINATION

Intended Use/Applicable Regulations: Proposed for DOE 5400.1 and CERCLA/ RCRA Guidelines

( ) Well complies with applicable regulations and is acceptable for intended use.
( ) Well complies with applicable regulation except for minor details and is acceptable for intended use.
( ) Well does not meet applicable regulations, a variance should be obtained. If variance not obtained, remediation is required to comply with the regulations.
( ) Well does not meet applicable regulations and intended use, remediation is required.
(X) Well does not meet applicable regulations and should not be used for this purpose.
( ) Insufficient/uncertain data is available to evaluate compliance to the regulations.
( ) Abandonment, well is unneeded or cannot be remediated.

Deficiencies: The well complies with state regulations as stated in Section F. The well does not comply with RCRA guidelines for the following reasons: (1) the 6 and 8-inch casings are not sealed in the borehole above the monitoring interval, which may affect the integrity of the groundwater samples and (2) the monitoring interval of about 210 feet is excessive for compliance/detection use and may result in the dilution of contaminant concentrations. This interval also includes 5-foot thick sediment and cinder beds and extremely variable permeabilities in the basalt. The following minor deficiencies also were noted: (1) the well development and decontamination procedures were not documented and (2) the use of PVC in the well (water level measuring pipe) is not preferred due to its absorbing/leaching characteristics.

Remediation: None

GEOLOGIC LOG

Well Name USGS-110

Source: USGS Generalized Lithologic Log

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Interval (feet below surface)

Begin	End	Description
0	3	Silty Sediment
3	25	Basalt
25	55	Basalt and Cinders
55	360	Basalt
360	410	Fractured Basalt
410	470	Basalt
470	480	Silty Clay
480	570	Dense Basalt
570	585	Fractured Basalt
585	590	Silty Sediment
590	610	Basalt
610	635	Fractured Basalt
635	640	Cinders
640	690	Fractured Basalt
690	745	Dense Basalt
745	765	Fractured Basalt
765	780	Dense Basalt

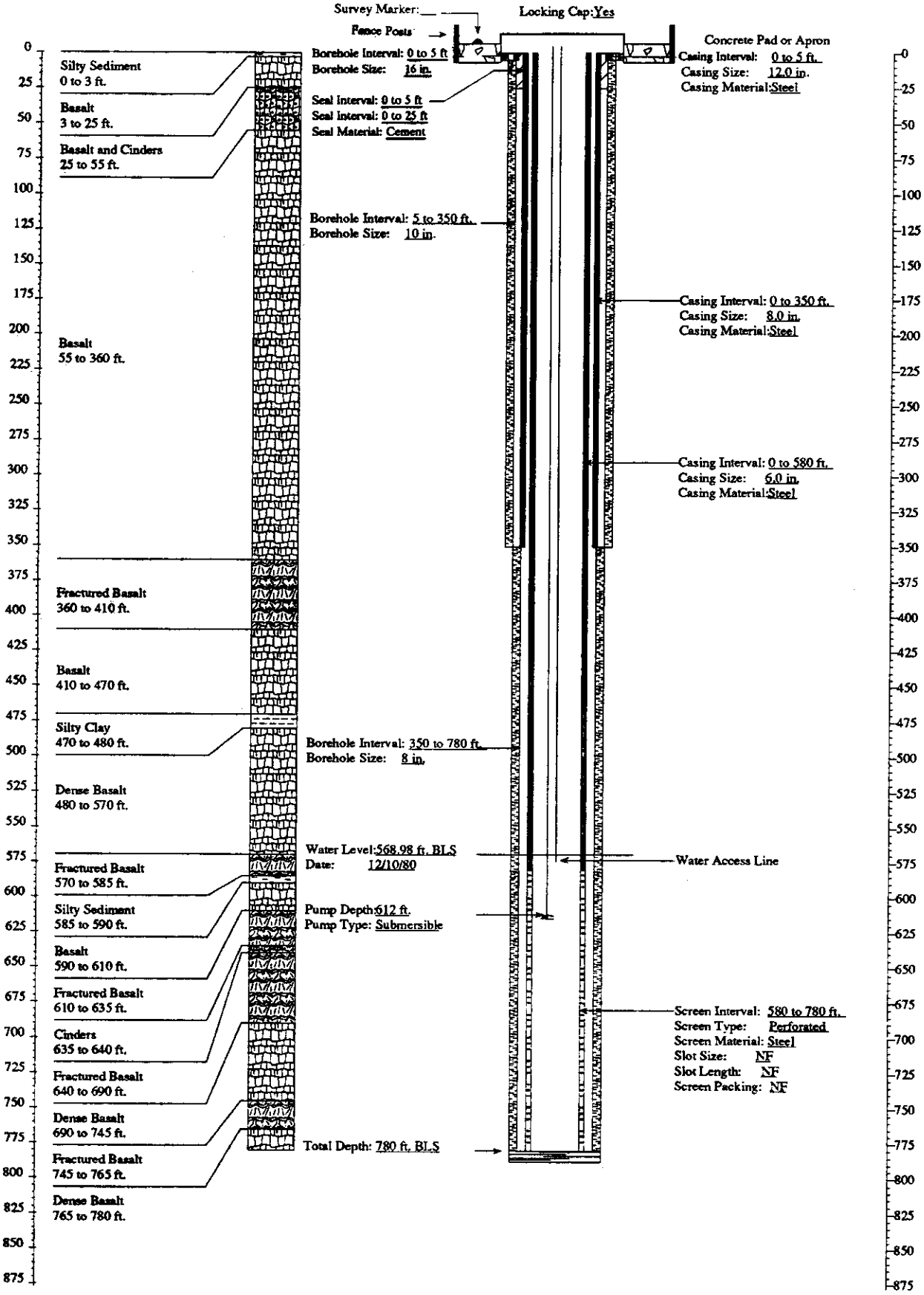
COMPILED BY/ORGANIZATION: J.M. Sabel / GAI Date August 24, 1992

WellName: USGS-110

06/18/1993

Facility: SOUTH
Well Type: Observation Well
Well Status: Active
Year Drilled: 1980
Total Depth: 780

Easting: 321870.50
Northing: 652315.50
Longitude: 1125014.99
Latitude: 432716.87
Completion Depth: 780

Driller: Denning
Geologist: NF
Drilling Method: NF
Drilling Fluid: NF
Land Surface: 5001.70

Water Level: 568.98
Water Level Date: 12/10/80
Water Level Access: Line