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Explanation of Significant Differences

Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10

At the Idaho National Engineering and Environmental Laboratory
Idaho Falls, Idaho

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January 2005

Prepared for the
U.S. Department of Energy
Idaho Operations Office

SIGNATURE SHEET

Signature sheet for the *Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10* at the Idaho National Engineering and Environmental Laboratory, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Environmental Quality

Richard B. Provencher, Assistant Manager
Idaho Completion Project
U.S. Department of Energy,
Idaho Operations Office

Date 12/17/2004

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Daniel D. Opalski, Director
Office of Environmental Cleanup
U.S. Environmental Protection Agency,
Region 10

1-5-05
Date

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Toni Hardesty, Director
Idaho Department of Environmental Quality

12/20/04
Date

CONTENTS

ACRONYMS v

1. INTRODUCTION 1

2. SUMMARY OF SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY 3

2.1 Site History 3

2.1.1 V-Tanks Sites 3
2.1.2 TSF-26 PM-2A Tanks 6
2.1.3 TSF-46 TAN-616 Soils, TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps 7
2.1.4 TSF-19 Caustic Tank 7

2.2 Contamination in Accordance with the 1999 Record of Decision 7

2.2.1 TSF-09/18 V-Tanks Sites 7
2.2.2 TSF-26 PM-2A Tanks 7
2.2.3 TSF-46 TAN-616 Soils, TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps 9
2.2.4 TSF-19 Caustic Tank 9

2.3 Selected Remedy in Accordance with the 1999 Record of Decision 9

2.3.1 V-Tanks Sites 9
2.3.2 TSF-26 PM-2A Tanks 11
2.3.3 TSF-46 TAN-616 Soils, TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps 12
2.3.4 TSF-19 Caustic Tank 12

3. DESCRIPTIONS AND BASIS OF THE SIGNIFICANT DIFFERENCES 12

3.1 V-Tanks Sites 12

3.1.1 OU 5-12 ARA 16 Waste and OU 1-07B Waste 14
3.1.2 V-Tanks NonCharacteristic Confirmation and Revised Treatment Approach 14
3.1.3 Revision to PCB Treatment Requirements 16
3.1.4 Clarification of Site Revegetation Requirements 17
3.1.5 Cost 17

3.2 TSF-26 PM-2A Tanks 17

3.2.1 Addition of Potential Treatment Location 17
3.2.2 Clarification of the Treatment Options 19
3.2.3 Clarification of the Site Revegetation Requirements 19
3.2.4 Cost 20

3.3 TSF-46 TAN-616 Soils, TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps 20

3.4 TSF-19 Caustic Tank 20

4. AGENCY COMMENTS 21

5. PUBLIC PARTICIPATION 21

6. AFFIRMATION OF THE STATUTORY DETERMINATIONS 21

7. REFERENCES 21

FIGURES

1. Location of areas and facilities at the INEEL Site 4

2. Location of individual facilities at TAN 5

3. Location of V-Tanks Sites TSF-09/18 and PM-2A Tanks Site TSF-26 6

4. Location of TSF-46, 47, and 48 new sites and TSF-19 Caustic Storage Tank 8

TABLES

1. Summary of changes for the TSF-09/18 V-Tanks 12

2. Summary of changes for the TSF-26 PM-2A Tanks 18

3. Summary of changes for the TSF-46, 47, and 48 New Sites 20

4. Summary of changes for the TSF-19 Caustic Tank 20

ACRONYMS

AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
BEHP	bis-2-ethyl-hexyl-phthlalate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
DEQ	Idaho Department of Environmental Quality
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FRG	final remediation goal
GAC	granular activated carbon
ICDF	INEEL CERCLA Disposal Facility
IET	Initial Engine Test
INEEL	Idaho National Engineering and Environmental Laboratory
LDR	land disposal restrictions
LOFT	Loss-of-Fluid Test
OU	operable unit
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
RCRA	Resource Conservation and Recovery Act
RD/RAWP	Remedial Design/Remedial Action Work Plan
ROD	Record of Decision
SMC	Specific Manufacturing Capability
SSSTF	Staging, Storage, Sizing, and Treatment Facility

TAN	Test Area North
TSCA	Toxic Substances Control Act
TSF	Technical Support Facility
UHC	underlying hazardous constituent
USC	United States Code
VOC	volatile organic compound
WAC	waste acceptance criteria
WAG	waste area group
WRRTF	Water Reactor Research Test Facility

Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10

1. INTRODUCTION

This Explanation of Significant Differences (ESD) applies to the remedial actions performed under the *Final Record of Decision for Test Area North, Operable Unit 1-10, Idaho National Engineering and Environmental Laboratory* (DOE-ID 1999) as amended by the *Explanation of Significant Differences for the Record of Decision for the Test Area North Operable Unit 1-10* (DOE-ID 2003) and the *Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A Tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10* (DOE-ID 2004a). The U.S. Department of Energy (DOE) Idaho Operations Office; U.S. Environmental Protection Agency (EPA), Region 10; and the Idaho Department of Health and Welfare—now identified as the Idaho Department of Environmental Quality (DEQ)—signed the Record of Decision (ROD) in December 1999, the 2003 ESD in April 2003, and the ROD Amendment/ESD in February 2004. The EPA and DEQ support the need for this ESD.

This ESD—prepared in accordance with Section 117(c) of the "Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA/Superfund)," (42 USC 9601 et seq.) and Section 300.435(c)(2)(i) of the "National Oil and Hazardous Substances Pollution Contingency Plan," (40 CFR 300)—documents significant changes to portions of the remedies selected in the following decision documents: 1999 ROD, modified in a 2003 ESD, and the 2004 ROD Amendment/ESD for sites at the Test Area North (TAN) Technical Support Facility (TSF). The sites and remedy changes addressed in this ESD include the following:

<u>TSF-09 and TSF-18 V-Tanks–</u>The change to the remedy selected for the V-Tanks includes:

- The V-Tanks will be sampled and analyzed after treatment of the waste with air sparging at ambient or elevated temperatures (up to and including boiling temperatures). Should this air sparging prove to be effective in complying with land disposal restrictions (LDR) treatment standards for all applicable organic constituents, then chemical oxidation as specified in the ROD Amendment/ESD will not be conducted. If sparging is not sufficient to meet the organic treatment standards, then chemical oxidation will be performed to comply with applicable or relevant and appropriate requirements (ARARs).

- Additional waste streams from a radionuclide tank at ARA-16 (OU 5-12) and from the TAN TSF-05 Injection Well (OU 1-07B) are to be treated along with the V-Tanks waste. The OU 5-12 and OU 1-07B waste along with the OU 1-10 waste can be treated as contiguous waste sites according to CERCLA Section 104(d)(4).

- Clarification is also provided on the confirmation of the V-Tanks waste as noncharacteristically hazardous.

- The results of a risk evaluation supporting a risk-based management approach have shown that treatment of polychlorinated biphenyl (PCBs) is not required in order to demonstrate that there is no unreasonable risk of injury to human health or the environment.

- In addition the V-Tanks site will not be revegetated as the area is within an active industrial area.

TSF-26 PM-2A Tanks–The change to the remedy selected for the PM-2A Tanks includes:

- Allowing treatment of the tank contents, as appropriate, at or adjacent to the point of generation at TAN (e.g. TAN-607) or at the Staging, Storage, Sizing, and Treatment Facility (SSSTF) located at the INEEL CERCLA Disposal Facility (ICDF).

- Clarification of the identified treatment options under consideration for treatment of the waste in the PM-2A tanks.

- Clarification of the applicable treatment standards. The PM-2A Tanks primarily received waste from the V-Tanks after the waste had been processed through the TAN-616 evaporator. Due to failure of the TAN-616 evaporator some wastes were transferred there without treatment. Therefore, the waste in the PM-2A Tanks must meet the same listed waste criteria as the V-Tanks. The OU 1-10 ROD Amendment/ESD requires that the waste in the PM-2A Tanks must be treated to meet the LDR treatment standards for all F001 listed constituents (40 CFR 268.40). Consistent with 40 CFR 268.9(b), the treatment standard for the listed waste code will apply in lieu of the treatment standard for the characteristic waste for any constituents specifically addressed as F001 constituents.

- Similar to the V-Tanks site, the TSF-26 site will not be revegetated as the area is within an active industrial area.

TSF-46 TAN-616 Soils–TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps--The change to the remedy selected for these new sites includes:

- The Agencies have agreed to remediate these three newly identified CERCLA sites (TSF-46, 47, and 48) that are adjacent to the V-Tanks and have similar contamination as the V-Tanks in conjunction with the V-Tanks site. These new sites will be remediated to the same RAOs and FRG as TSF-09/18.

TSF-19 Caustic Tank–The change to the remedy selected for the Caustic Tank includes:

- As a result of finding waste still present within the Caustic Tank, the tank and contents will be removed, the tank contents treated as necessary, and the tank and contents disposed at ICDF or other approved facility.

The remaining sites and remedies discussed in the previous decision documents are not affected by this ESD. This ESD will become part of the Idaho National Engineering and Environmental Laboratory (INEEL) administrative record. Significant sections of the INEEL administrative record are on the Internet at http://ar.inel.gov/ and are available to the public at the following locations:

INEEL Technical Library DOE Public Reading Room 1776 Science Center Drive Idaho Falls, ID 83415 (208) 526-1185	Albertson's Library Boise State University 1910 University Drive Boise, ID 83725 (208) 426-1625

2. SUMMARY OF SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

2.1 Site History

The INEEL, which is managed by the U.S. Department of Energy (DOE), is a government facility located 51 km (32 mi) west of Idaho Falls, Idaho. The INEEL Site occupies 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain. In 1949, the U.S. Atomic Energy Commission established the site as the National Reactor Testing Station. The purpose was to conduct nuclear energy research and related activities. In 1974, the National Reactor Testing Station was redesignated the Idaho National Engineering Laboratory; in 1997, it was renamed the Idaho National Engineering and Environmental Laboratory to reflect expansion of its mission to include a broader range of engineering and environmental management activities. The developed area within the INEEL Site is surrounded by a 13-km^2 (5-mi^2) buffer zone used for cattle and sheep grazing. The county land surrounding the INEEL Site is approximately 45% agricultural, 45% open land, and 10% urban. Sheep, cattle, hogs, and poultry are produced. In addition, potatoes, sugar beets, wheat, barley, oats, forage, and seed crops are cultivated. Most of the land surrounding the INEEL Site is owned by private individuals or the U.S. government.

The TAN facility is located in the northern portion of the INEEL Site (see Figure 1), and the nearest communities are Howe (west) and Mud Lake (east). The TAN TSF was constructed between 1954 and 1961 to support the Aircraft Nuclear Propulsion Program. The program's objectives were to develop and test designs for nuclear-powered aircraft engines. Upon termination of this research in 1961, TAN's facilities were converted to support a variety of other DOE research projects. From 1962 through 1986, the area supported reactor safety testing at the Loss-of-Fluid Test (LOFT) Facility, Initial Engine Test (IET) Facility, and the Water Reactor Research Test Facility (WRRTF) shown in Figure 2. Beginning in 1980, the area was used to conduct work with material from the 1979 Three-Mile Island reactor accident. Current activities include the manufacture of armor for military vehicles at the Specific Manufacturing Capability (SMC) Project, nuclear inspection, and storage operations.

2.1.1 V-Tanks Sites

The two V-Tank sites (TSF-09 and TSF-18) were evaluated together in the ROD (DOE-ID 1999) due to similarities. These two sites have similar attributes, are located in the same area (see Figure 3), were all used to manage the same waste, and are considered part of one tank system. Because of these similarities, all of the tanks, the tank contents, and associated piping are being managed as one primary waste stream from one system.

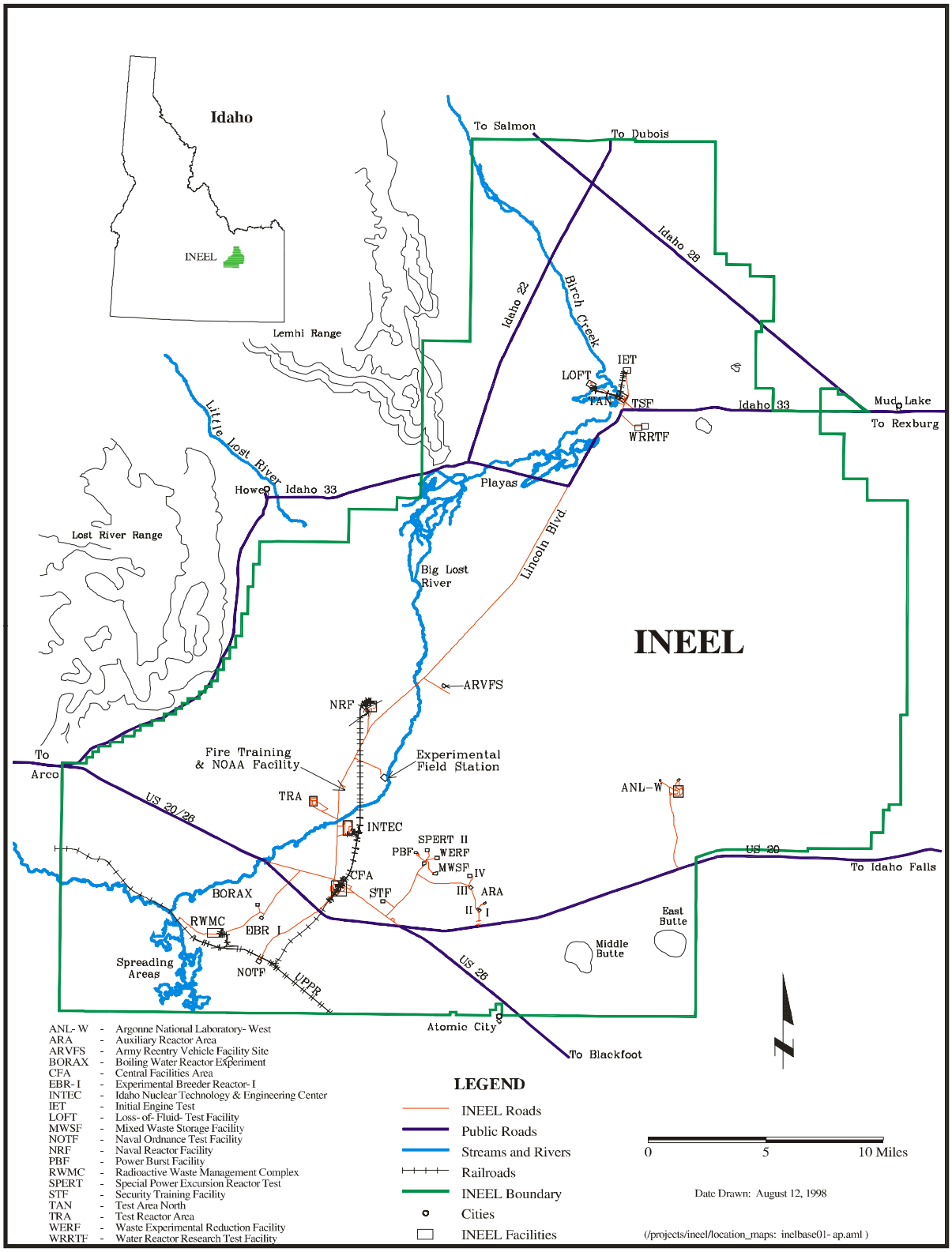

Figure 1. Location of areas and facilities at the INEEL Site.

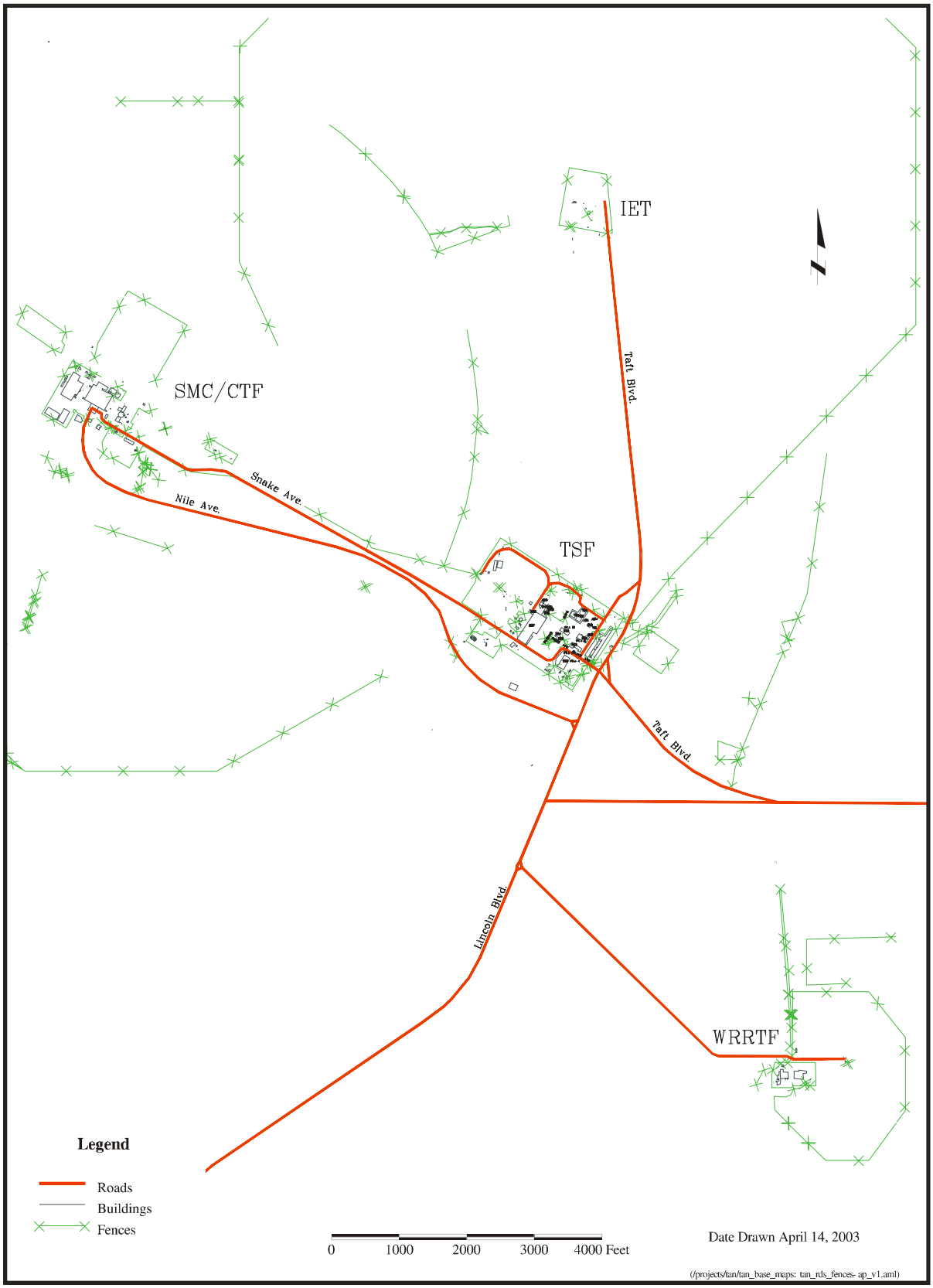

Figure 2. Location of individual facilities at TAN.

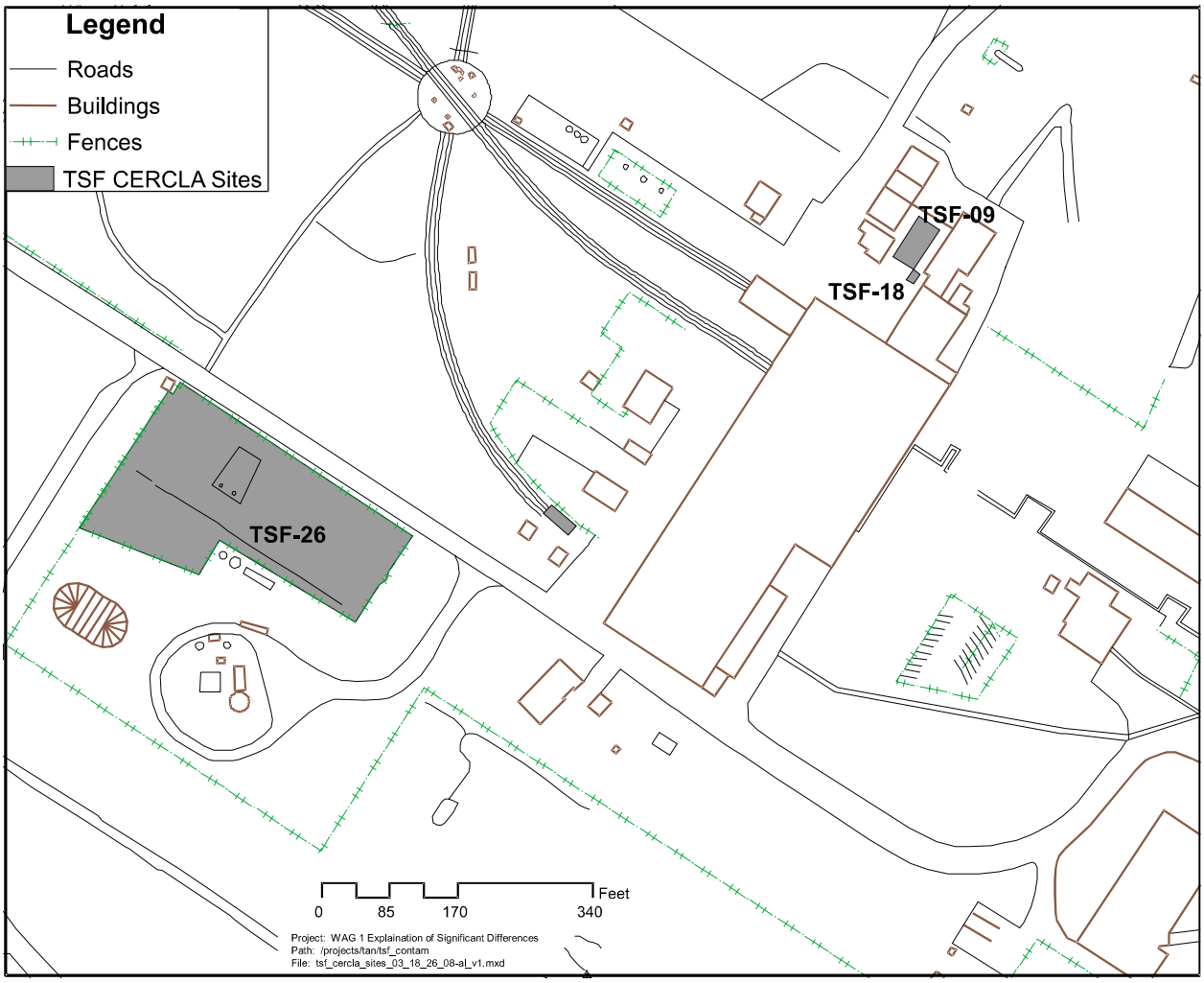

Figure 3. Location of V-Tanks Sites TSF-09/18 and PM-2A Tanks Site TSF-26.

Site TSF-09 includes three abandoned 37,850-L (10,000-gal) underground storage tanks (Tanks V-1, V-2, and V-3), associated ancillary piping, the contents of the tanks, and surrounding contaminated soil. Site TSF-18 includes an abandoned 1,514-L (400-gal) underground storage tank (Tank V-9), the tank contents, a sand filter, associated piping ancillary to the tank and sand filter, and surrounding contaminated soil. The sand filter, associated piping, and part of the surrounding contaminated soils have already been removed.

2.1.2 TSF-26 PM-2A Tanks

The TSF-26 area included the two PM-2A Tanks and surrounding area (see Figure 3). Remediation of the surrounding area was completed in September 2004. The two underground tanks were excavated and moved into the TAN-607A high bay for temporary storage in June 2004. These two tanks (Tanks V-13 and V-14) are each 55 ft long and 12.5 ft in diameter. Each tank has a capacity of 50,000 gal. Each tank contains approximately two feet of sludge and diatomaceous earth (approximately 5000 gal or 45,000 lb each). Waste from the V-Tanks (discussed above) was routinely moved to the PM-2A Tanks by pipeline or tanker truck until the early 1970s. Most of the waste from the V-Tanks was processed through an evaporator before transport to the PM-2A Tanks. Normal industrial means were

used to empty the PM-2A tanks. Diatomaceous earth was then added to absorb any of the remaining free liquids and/or sludge.

2.1.3 TSF-46 TAN-616 Soils, TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps

TSF-46, 47, and 48 (see Figure 4) were identified in conjunction with the removal of buildings TAN-615 and 616. Contamination at these sites is presumed to be a result of the waste handling activities associated with these two building. TSF-46 consists of the soils surrounding and between the former location of building TAN-616. TSF-47 consists of the soils surrounding a broken pipe adjacent to the former location of TAN-615. TSF-48 consists of the soils beneath the sump location in the former building TAN-615. These three sites are adjacent to the TSF-09/18 site.

2.1.4 TSF-19 Caustic Tank

TSF-19 (see Figure 4) is located within the new site identified as TSF-46. This caustic tank was a feed tank for providing caustic to neutralize the waste in the V-Tanks. The unit ceased operation when the V-Tanks ceased operation in the late 1970s. Initial investigations in the 1990s indicated that the tank was empty. The OU 1-10 ROD in 1999 identified TSF-19 as a No Action site.

2.2 Contamination in Accordance with the 1999 Record of Decision

The nature and extent of contamination, as defined in the OU 1-10 ROD (DOE-ID 1999), are summarized in the following subsections.

2.2.1 TSF-09/18 V-Tanks Sites

The V-Tanks contents are contaminated with radionuclides, heavy metals, and organic compounds including PCBs. The V-Tanks contents are managed under CERCLA as both an F001 listed RCRA mixed low-level waste and a TSCA PCB remediation waste above 50 mg/kg of total PCBs. The soil surrounding the tanks was contaminated by waste spilled during tank-transfer operations. Contamination has been detected throughout the area. The primary contaminant of concern (COC) for soils at the V-Tanks sites is Cs-137. The contents of these tanks are being remediated since the contents represent a principal threat under CERCLA.

2.2.2 TSF-26 PM-2A Tanks

As the PM-2A Tanks received waste from the V-Tanks, primarily after evaporation, the PM-2A Tanks contents are also contaminated with radionuclides, heavy metals, and organic compounds. As a result of receiving waste from the V-Tanks, the PM-2A Tanks contents are also F001 listed RCRA mixed low-level waste. The PM-2A Tanks are also managed as PCB remediation waste with a PCB concentration less than 50 mg/kg. The tank contents will be disposed in a CERCLA equivalent chemical waste landfill as specified in 40 CFR 761.75 (i.e. ICDF) or other approved facility. The soil around the PM-2A Tanks was contaminated from waste spills. The primary COC for soils at the PM-2A tanks site is also Cs-137. The contents of these tanks are being remediated since the contents represent a principal threat under CERCLA.

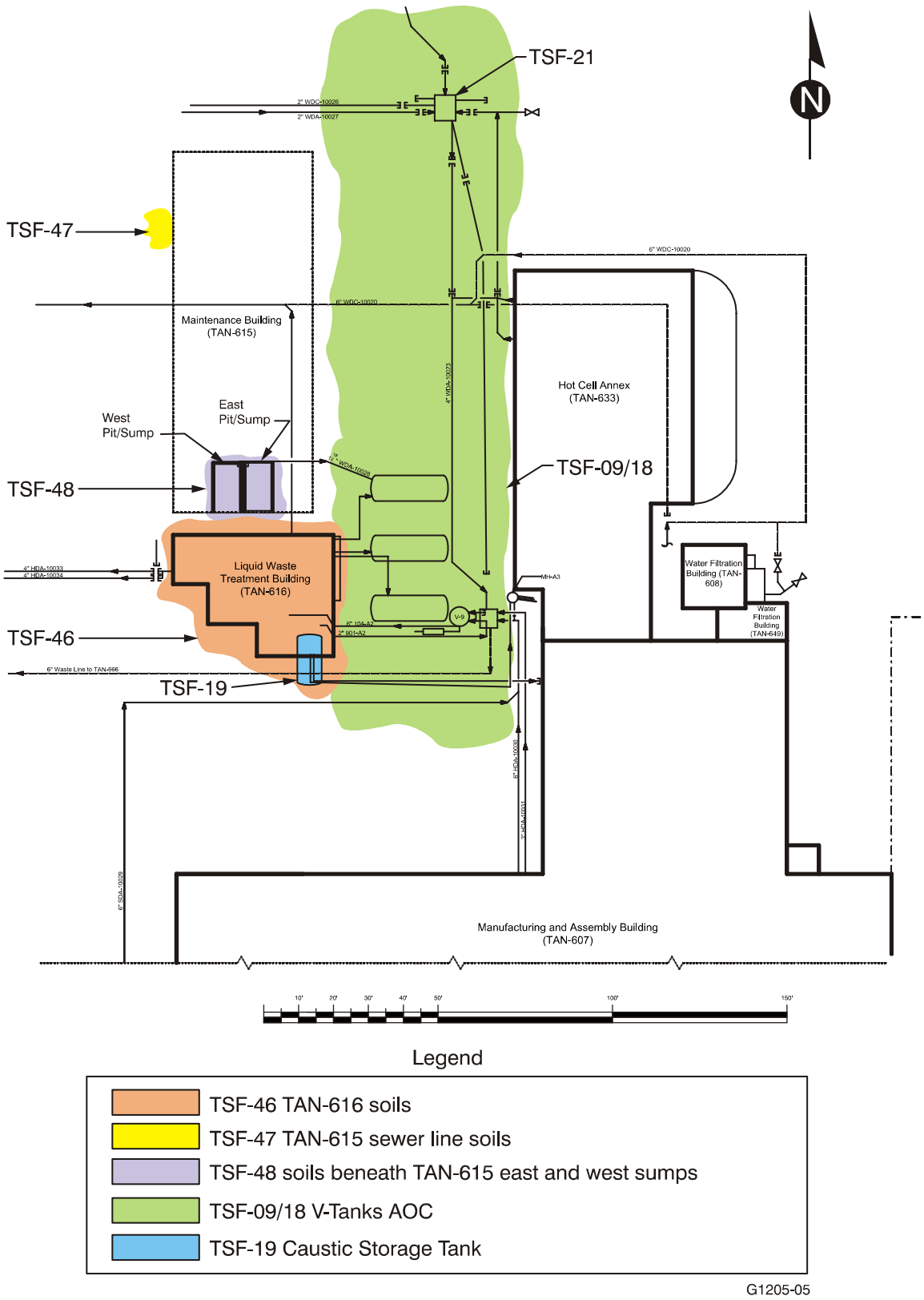

Figure 4. Location of TSF-46, 47, and 48 new sites and TSF-19 Caustic Storage Tank.

2.2.3 TSF-46 TAN-616 Soils, TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps

The new sites TSF-46, 47, and 48 are primarily contaminated with the same materials as the TSF-09/18 sites. The primary COC of concern in these soils is Cs-137. Other contaminants that may be present include other radionuclides, heavy metals, and volatile organic compounds.

2.2.4 TSF-19 Caustic Tank

The TSF-19 caustic tank provided a source of caustic for neutralization of the waste in the V-Tanks system. The tank is located within the TSF-46 area of contamination and as such has become contaminated with the same contaminants. The residual tank contents have minimal contamination. The primary COC at TSF-19 is Cs-137.

2.3 Selected Remedy in Accordance with the 1999 Record of Decision

The selected remedy, as defined in the Operable Unit (OU) 1-10 ROD Amendment/ESD (DOE-ID 2004a), is summarized in the following subsections.

2.3.1 V-Tanks Sites

The remedy identified in the ROD Amendment/ESD (DOE-ID 2004a) was ex situ treatment of the tank contents and disposal. The major components of the V-Tanks remedy, as described in the ROD Amendment/ESD are:

1. Conducting further sampling and/or analysis of the V-Tanks contents to support refinement of the Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.) characteristic evaluation to determine whether treatment is required for underlying hazardous constituents. The results of this step will be subject to review and concurrence by the Agencies.

2. Consolidating and/or blending of the tank contents to the extent practical to facilitate management of the waste as one homogenous waste stream. If laboratory studies on sludge treatment demonstrate a clear benefit, some of the liquid excess from the treatment process may be decanted and treated separately from the remainder of the waste.

3. Continued temporary use of Tank V-9 for storage until the contents of that tank are removed for transfer to another V-Tank. Continued temporary use of Tanks V-1, V-2, and V-3 without secondary containment for storage of waste prior to treatment, blending waste prior to treatment, and/or providing an accumulation location for treated waste prior to stabilization.

4. Chemically oxidizing/reducing the volatile organic compounds (VOCs) in the V-Tanks contents as necessary to meet applicable RCRA LDR F001 treatment standards in accordance with ARARs as well as the ICDF or other approved disposal facility waste acceptance criteria (WAC).

    a. Chemical oxidation/reduction of PCBs will be performed as necessary to demonstrate no unreasonable risk to human health and the environment, as part of a PCB risk-based management strategy developed under 40 CFR 761.61(c).

b. Chemical oxidation/reduction will be required for specific underlying hazardous constituents (UHCs) (e.g., bis-2-ethyl-hexyl-phthlalate [BEHP]) if the waste is confirmed to exhibit a RCRA characteristic.

c. Laboratory studies will be conducted to optimize the choice of specific oxidant(s)/reductant(s) (e.g., peroxide) and to optimize the treatment process.

d. The treatment process selected may be multistage and will be conducted ex situ at the V-Tanks site or in adjacent areas (e.g., TAN-607), as necessary to facilitate remediation.

5. Performing additional treatment (e.g., solidification, stabilization) of the V-Tanks contents as necessary to meet ICDF or other approved disposal facility WAC.

6. Disposing of the treated tank contents at the ICDF or other approved facility.

7. Removing and disposing of the V-Tanks and associated piping at the ICDF or other approved facility.

8. Shipping treatment system off-gas residues and other secondary wastes to the ICDF or an approved treatment facility as necessary based on characterization of the wastes.

9. Excavating contaminated soil:

   a. Excavating contaminated soil that exceeds the final remediation goal (FRG) to a maximum of 3 m (10 ft) below ground surface (bgs).

   b. Excavating additional soil below 3 m (10 ft) bgs to the extent necessary to remove the V-Tanks and associated piping.

10. Disposing of the contaminated soil at an approved soil repository.

11. Performing post-remediation soil sampling to verify FRGs are met and to analyze for additional contaminants if excavation indicates a release of the V-Tanks contents:

   a. For contaminated soil less than 3 m (10 ft) bgs, perform post-remediation sampling to verify FRGs are met.

   b. For contaminated soil more than 3 m (10 ft) bgs, perform post-remediation sampling to determine the need for institutional controls.

   c. For contaminated soil beneath the V-Tanks and piping where there is evidence of a release (either a leak from a V-Tank or the associated piping), perform post-remediation soil sampling at the bottom of the excavation to analyze for V-Tanks contaminants to provide information for a risk analysis that supports a potential revision to the FRGs and a determination of the need for further actions. This determination could lead to application of institutional controls, further remediation, or no action.

   d. For contaminated soil beneath the V-Tanks and piping where there is no evidence of a release from either the V-Tanks or the associated piping, perform post-remediation soil sampling to determine the appropriate institutional controls, if any, for this site.

12. Filling the excavated area with clean soil (soil that meets remedial action objectives) and then contouring and grading to the surrounding elevation.

13. Establishing and maintaining institutional controls consisting of signs, access controls, and land-use restrictions, depending on the results of post-remediation sampling. Institutional controls will be required if residual contamination precludes unrestricted land use after completion of remedial action.

14. Further characterizing the surrounding contaminated soil and further defining the corresponding area of contamination (AOC).

15. Adding ARARs for managing PCB remediation waste.

2.3.2 TSF-26 PM-2A Tanks

The selected remedy in the ROD Amendment/ESD (DOE-ID 2004a) for the TSF-26 PM-2A Tanks (excluding soil remedy elements that are not affected) was tank removal with waste remaining in the tanks, treatment as necessary, and disposal at ICDF or other approved facility. The major components of the PM-2A Tanks remedy (excluding soil remedy elements), as described in the ROD Amendment/ESD were:

1. Tanks will be removed with waste still inside.

2. The waste in the tanks will be treated as necessary to meet LDRs and disposal facility WAC. Confirmation sampling will be conducted to verify that no further treatment is necessary prior to disposal.

    a. Treat PM-2A Tanks contents to meet F001 LDR standard for all F001 constituents including trichloroethylene; tetrachloroethylene; methylene chloride; 1,1,1-trichloroethane; carbon tetrachloride; 1,1,2-trichloro-1,2,2-trifluoroethane; and trichloromonofluoromethane.

    b. Treatment is expected to be thermal desorption or chemical oxidation/reduction.

    c. Treatment will take place at or adjacent to the PM-2A Tanks site (e.g., TAN-607) as necessary to facilitate remediation.

    d. Treatment studies may be conducted as necessary to select and refine the most appropriate treatment option to support remediation.

    e. After treatment, the tank contents will be re-sampled to confirm compliance with LDRs and the applicable disposal facility WAC.

    f. Solidification or stabilization agents will be added as necessary to meet additional waste disposal facility WAC such as the requirement for no free liquids.

    g. Tanks and treated contents will be transported to the ICDF or other approved facility for disposal.

    h. After placement in the disposal facility, the void space within the tanks will be filled, as necessary or desirable, as part of disposal facility operations.

2.3.3 TSF-46 TAN-616 Soils, TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps

The new sites, TSF-46, 47, and 48 were identified only after the signing of the OU 1-10 ROD in 1999. As such, the remediation of these sites is not addressed in that document.

2.3.4 TSF-19 Caustic Tank

The OU 1-10 ROD signed in 1999 determined that TSF-19 was a No Action site based upon the evaluation that the tank was empty and that no contamination was present.

3. DESCRIPTIONS AND BASIS OF THE SIGNIFICANT DIFFERENCES

3.1 V-Tanks Sites

For the V-Tanks, this ESD identifies changes regarding the implementation of the remedy selected in the ROD Amendment/ESD (DOE-ID 2004a). These changes include additional waste to be treated, confirmation of the characteristic determination, revision to the treatment approach, revision to the PCB treatment requirements, clarification of the site revegetation requirements, and a rough order of magnitude cost estimate for the changed remedy (see Table 1).

Table 1. Summary of changes for the TSF-09/18 V-Tanks.

Remedial Action Element	Original/Amended Remedy	Remedy Change
Additional waste treatment	Not included.	Wastes similar to the V-Tanks waste from the ARA-16 and OU 1-07B sites will be managed and treated as part of the V-Tanks contents. This adds the requirement to meet F005 treatment standards for toluene from the ARA-16 waste.
Characteristic determination	1. Further sampling and/or analysis of the V-Tanks contents to support refinement of the RCRA characteristic evaluation to determine whether treatment is required for underlying hazardous constituents. The results of this step will be subject to review and concurrence by the Agencies.	1. Previous sampling efforts have determined that the V-tanks contents are not RCRA characteristic. Confirmation sampling of the consolidated V-Tanks waste will be conducted after treatment has removed interferences necessary to confirm that the waste is not characteristically hazardous.
Treatment approach	4. Chemically oxidizing or reducing the VOCs in the V-Tanks contents as necessary to meet applicable RCRA LDR F001 treatment standards in accordance with ARARs as well as ICDF or other approved disposal facility WAC.	4. Air sparging at ambient or elevated temperatures (up to and including boiling temperatures) of V-Tanks contents, chemical oxidation/reduction as necessary, and solidification/ stabilization to meet RCRA LDR treatment standards as well as ICDF or other approved disposal facility WAC.

Table 1. (continued).

Remedial Action Element	Original/Amended Remedy	Remedy Change
PCB Treatment	4. a) Chemical oxidation/reduction of PCBs will be performed as necessary to demonstrate no unreasonable risk to human health and the environment, as part of a PCB risk-based management strategy developed under 40 CFR 761.61(c).	4. a) A PCB risk-based evaluation under 40 CFR 761.61(c) demonstrates that the PCB concentration in the V-Tanks (average concentration < 18 mg/kg, regulated at 294 mg/kg) does not require treatment in order to demonstrate no unreasonable risk of injury to health and the environment when disposed at the CERCLA approved (RCRA and TSCA equivalent) INEEL CERCLA Disposal Facility.
Treatment of UHCs if waste is RCRA characteristic	4. b) Chemical oxidation or reduction will be required for specific UHCs (e.g., BEHP) if the waste is confirmed to exhibit a RCRA characteristic.	4. b) No change.
Laboratory studies	4. c) Laboratory studies will be conducted to optimize the choice of specific oxidant(s) or reductant(s) (e.g., peroxide) and to optimize the treatment process.	4. c) No change.
Treatment process	4. d) The treatment process selected may be multistage and will be conducted ex situ at the V-Tanks site or in adjacent areas (e.g., TAN-607), as necessary to facilitate remediation.	4. d) No change.
Secondary Wastes	8.) Shipping treatment system off-gas residues and other secondary wastes to the ICDF or an approved treatment facility as necessary based on characterization of the wastes.	8.) Secondary wastes will be treated as necessary to meet LDR treatment standards and disposal facility WAC for disposal at the ICDF or other approved facility. The GAC beds which captured the volatilized organic compound will be shipped off-INEEL for appropriate treatment and disposal. Some secondary wastes including minor volumes of returned laboratory samples may be aggregated or consolidated to the extent practical in order to determine appropriate management, application of treatment standards, and disposal requirements.
Revegetation	Revegetation not specified in ROD or ROD Amendment/ESD.	Remediation area will be managed as part of TAN industrial complex. Revegetation will not be performed. Noxious weed growth will be monitored as part of Operations and Maintenance Plan and controlled by the Long-Term Stewardship Program.

Table 1. (continued).

Remedial Action Element	Original/Amended Remedy	Remedy Change
Cost	$32.6 M	$20.0 M is sparging successful $22.5 M if chemical oxidation also required

3.1.1 OU 5-12 ARA 16 Waste and OU 1-07B Waste

A WAG 5 ESD (DOE-ID 2004b) has been prepared documenting the selection of the V-Tanks treatment process as the appropriate treatment approach for the OU 5-12 ARA-16 waste. This waste is very similar to the V-Tanks waste and the V-Tanks treatment process will have no difficulty in meeting the additional F005 treatment standard applicable for toluene from the ARA-16 waste. Upon transport to the V-Tanks AOC, the ARA-16 waste will be managed according to the treatment approach selected for the V-Tanks. The OU 1-07B waste was generated as a result of surge and stress tests associated with the remediation of TSF-05 injection well within the TAN area. These tests produced approximately three liters of sludge retrieved from the bottom of the injection well. The primary waste stream injected into this well were the condensates remaining after the evaporation of the V-Tanks waste. This waste is contaminated with the same hazardous and radioactive constituents as the V-Tanks waste and is amenable to the same treatment approach as the V-Tanks waste.

Section 104(d)(4) of CERCLA (42 USC § 9601 et seq.) allows that where two or more noncontiguous facilities are reasonably related on the basis of geography or on the basis of a threat or potential threat to public health, welfare, or the environment, the U.S. president may—in his discretion—treat these related facilities as one for purposes of CERCLA Section 104(d)(4). The preamble to 40 CFR 300 (55 FR 46) further explains that when noncontiguous facilities (i.e., separate operable units) are reasonably close to one another and/or waste types at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without having to obtain a permit. The TAN treatment facility is designated in the ROD Amendment/ESD (DOE-ID 2004a) for the treatment of mixed low-level waste from tanks such as the waste found at OU 5-12 and OU 1-07B. Therefore, the treatment process at TAN and the waste addressed by this ESD in this section are considered to represent a single site for response purposes under this ESD.

3.1.2 V-Tanks Noncharacteristic Confirmation and Revised Treatment Approach

The remedy selected in the ROD Amendment/ESD (DOE-ID 2004a) specified that further sampling would be conducted to confirm the determination that the waste was not characteristic. Confirmation of that determination was complicated by interferences (high concentrations of halogenated organic compounds and oils) associated with the analysis of 11 minor contaminants. Process knowledge and an in-depth review of sampling data have concluded that those last 11 minor contaminants were not present in concentrations sufficient to exceed the characteristic levels. Further sampling will be conducted to confirm that determination. These interferences will be removed through either sparging at ambient or elevated temperatures (up to and including boiling temperatures) to remove high concentrations of volatile organic compounds and/or chemical oxidation to reduce the concentration of oils. Removing these interferences will allow confirmation of the characteristic determination.

The remedy selected in the ROD Amendment/ESD (DOE-ID 2004a) specified chemical oxidation/reduction and solidification/stabilization as necessary to meet treatment standards. Sparging at ambient or elevated temperatures (up to and including boiling temperatures) of the waste was initially added to reduce the corrosion potential from the destruction of high levels of halogenated organic

compounds. There were two primary factors that contributed to the conclusion that air sparging alone might be sufficient and that chemical oxidation might not be necessary to meet the treatment standards.

The first factor was that the results of post-ROD laboratory testing indicated it was possible that the LDR F001 and F005 treatment standards could be met through sparging alone at ambient or elevated temperatures (up to and including boiling temperatures). The second factor was that results of an extensive data review concluded that the V-Tanks waste was not characteristically hazardous. This obviated the need for the conservative assumption that the V-Tanks waste was characteristically hazardous and therefore the treatment of underlying hazardous constituents would not be required. This data review determined that the only applicable treatment standards were F001 and F005. Further sampling will be conducted to confirm this determination. Presuming the waste is confirmed to be noncharacteristic and that the F001 and F005 standards can be met by sparging, there are no regulatory or risk-driven reasons for implementing the chemical oxidation/reduction step.

The short-term effectiveness, including protection of workers, the surrounding communities, and the environment for this remedy change, has been documented in the applicable Remedial Design/Remedial Action Work Plan (RD/RAWP). Numerous CERCLA sites around the country have used various forms of heated air stripping, hot air sparging, or steam injection to remove volatile organic compounds from waste. Six-phase heating of groundwater and soils has been used at several Superfund sites to bring the groundwater to boiling conditions in order to support removal of VOCs. These remediation efforts typically either destroy the VOCs or capture them on granular activated carbon (GAC) for potential treatment at another location. While sparging of the V-Tanks waste at ambient or boiling conditions is not expected to emit significant concentrations of PCBs (boiling point of Aroclor 1260 is typically reported as being between 730 and 780 degrees Fahrenheit), any PCBs that are volatilized will be captured on the GAC bed. Both EPA RCRA and CERCLA programs have approved thermal desorption processes that use heat to volatilize PCBs and then capture those PCBs on a GAC bed. The GAC beds installed on the V-Tanks treatment system will prevent release of volatilized PCBs to the environment.

The sulfur-impregnated GAC beds specified in the applicable RD/RAWP are specifically designed to capture mercury emissions as well as organic compounds. These GAC beds contain a color indicator strip that will indicate when build up has occurred and it is time to change the GAC bed. This is one part of the control system that will prevent a release of these contaminants that could expose either the workers or the environment. The off-gas system to be utilized for air sparging is the same system as that designed and approved for the chemical oxidation system that also was planned to operate at boiling conditions.

Radionuclides are also present in the waste. Due to the low volatility of most of the radionculides at operating temperature (up to and including boiling), entrainment is the more likely contributor to the potential for radionculides in the off-gas. The scrubber system consists of a venturi scrubber followed by a packed bed designed to remove particulates (e.g., radionuclides). Each part, venturi and packed bed, are both expected to have good particulate removal. The HEPA filters have pressure differential indicators and will be periodically monitored.

Industrial hygiene personnel will be responsible for monitoring exposure to workers. Periodically monitoring will be performed in the vicinity of the treatment process, workers will wear personal monitoring instruments, and the stack emissions will be measured to ensure that workers are not unduly exposed to the hazardous constituents.

The most significant ARARs controlling the operation of the V-Tanks treatment process are those applying restrictions to air emissions and those preventing a release of the waste from the treatment

system. Air emissions will be controlled to acceptable levels through the use of scrubbers, GAC beds, and HEPA filters. Accidental releases from the treatment system will be controlled through the use of secondary containment systems for both the storage tanks and transfer lines.

Sparging, proven to be effective in the removal of VOCs, is a preferred or equivalent treatment approach to chemical oxidation:

1. At least equivalent, but potentially more protective of human health and environment as products of incomplete destruction will not be formed and no hazardous chemicals will be used

2. Modified remedy also meets ARARs

3. More implementable (due to simplicity)

4. Higher short-term effectiveness since treatment is simpler and will be implemented more expeditiously

5. Equivalent long-term effectiveness and permanence

6. Equivalent reduction of toxicity, mobility and volume (While sparging will not treat the SVOCs, and mobility will not be altered, the volume of waste disposed will be reduced by approximately 50%)

7. Lower cost - $2.5 M cost savings if sparging successful

8. Equivalent state acceptance since sparging meets ARARs and is achieved in a more timely manner.

If either the waste does not meet the F001 and F005 treatment standard after sparging at ambient or elevated temperatures (up to and including boiling temperatures) or the waste is shown to be characteristically hazardous, then implementation of the chemical oxidation process has been retained as part of the remedy and will be required. In either case, the waste will be solidified/stabilized as appropriate for disposal at ICDF or other approved disposal facility.

Secondary wastes will be treated as necessary to meet LDR treatment standards and disposal facility WAC for disposal at the ICDF or other approved facility. The GAC beds which captured the volatilized organic compounds will be shipped off-INEEL for appropriate treatment and disposal. Some secondary wastes including minor volumes of returned laboratory samples may be aggregated or consolidated to the extent practical in order to determine appropriate management, application of treatment standards, and disposal requirements.

3.1.3 Revision to PCB Treatment Requirements

The remedy selected in the ROD Amendment/ESD (DOE-ID 2004a) specified chemical oxidation/reduction of PCBs was to be performed as necessary to demonstrate no unreasonable risk to human health and the environment as part of a PCB risk-based management strategy developed under 40 CFR 761.61(c). The ARAR 40 CFR 761.61(c) provides for the sampling, cleanup, treatment, and disposal of PCB remediation waste in a manner other than as described in 761.61(a) or (b) provided EPA finds that the revised remedy will not pose unreasonable risk of injury to health or the environment. EPA's evaluation of this method considers the planned treatment for the V-Tanks waste as well as the final disposition of the treated waste at the ICDF. The designated disposal facility's (ICDF) waste acceptance criteria documents that the ICDF is capable of accepting nonliquid wastes with up to 380,000 kg of Aroclor 1260 (a PCB) while demonstrating no unreasonable risk of injury to human health and the environment (DOE-ID 2004c). The total mass (including minor quantities of additional waste

streams to be added to the V-Tanks waste) of PCBs is projected to be less than 1.10 kg. Although the V-Tanks waste is regulated as a PCB remediation waste at 294 mg/kg due to its multiphasic nature, the average concentration of the entire waste stream prior to treatment is less than 18 mg/kg. This information has been compiled in Revision 1 to EDF-3077, "Risk-Based Approach for Management of PCB Remediation Waste from the V-Tanks," prepared in conjunction with this ESD. This document will be placed in the Administrative Record for OU 1-10. Signature by EPA of this ESD confirms the EPA finding of no unreasonable risk of injury to health or the environment under 40 CFR 761.61(c).

3.1.4 Clarification of Site Revegetation Requirements

The TSF-09/18 CERCLA site where the V-Tanks are located is within the active industrial area that surrounds TAN-607. As such, this site and the surrounding area are and will continue to be subject to heavy industrial traffic. Therefore, revegetation of this limited area has been determined to be unnecessary. However, control of noxious weeds is still required. The site-wide Operation and Maintenance Plan will be modified to require these sites to be inspected to ensure noxious weed growth is controlled. Noxious weed control will be conducted under the Long-Term Stewardship program.

3.1.5 Cost

The changes to the V-Tanks remedy as addressed in this ESD along with project cost savings as a result of obtaining government furnished design and equipment results in a reduction in the total estimated cost of approximately $10.1 to $12.6M. The total estimated cost for the modified remedy described in the February 2004 ROD Amendment/ESD was $32.6 M. The rough order of magnitude total estimated cost for the remedy as addressed in this ESD is approximately $22.5M if chemical oxidation treatment is required. If air sparging at ambient temperature is successful and chemical oxidation is not required, then the total estimated cost would be $20.0M.

3.2 TSF-26 PM-2A Tanks

For the TSF-26 PM-2A Tanks, this ESD identifies changes necessary to clarify and facilitate the completion of the selected remedy. These changes include addition of a potential treatment location, clarification of treatment standards, clarification of the identified treatment options under consideration for treatment of the waste in the PM-2A tanks, clarification of the revegetation requirements, and an updated rough order of magnitude cost estimate. (see Table 2).

3.2.1 Addition of Potential Treatment Location

The remedy as modified in the ROD Amendment/ESD specified treatment at or adjacent to the PM-2A Tanks site (e.g. TAN-607). A review of the potential treatment approaches has determined that treatment may be more practical at or adjacent to the treatment area (SSSTF) of the planned disposal facility (ICDF). The plan for the previously considered treatment location within the TAN-607 High Bay may interfere with the potential continued use of the TAN-607 building complex in support of new missions at the INEEL. If approval of treatment at the existing ICDF treatment facility can be confirmed by the ICDF management and the Agencies, then treatment will be conducted there. If not, treatment at TAN will be necessary. Selection of the final treatment location (either at or adjacent to the point of generation or at or adjacent to the SSSTF at ICDF) will be made in consultation with the CERCLA OU 1-10 program managers and documented in the applicable RD/RAWP.

Table 2. Summary of changes for the TSF-26 PM-2A Tanks.

Remedial Action Element	Original/Changed Remedy	Remedy Change
Treatment requirements	2. The waste in the tanks will be treated as necessary to meet LDRs and disposal facility WAC. Confirmation sampling will be conducted to verify that no further treatment is necessary prior to disposal.	No change to overall approach except as described below.
	2. a) Treat PM-2A Tanks contents to meet F001 LDR standard for all F001 constituents.	2. a) Clarification – Treat PM-2A Tanks contents to meet F001 LDR standard for all F001 constituents. Consistent with 40 CFR 268.9(b), the treatment standard for the listed waste code will apply in lieu of the treatment standard for the characteristic waste for any constituents specifically addressed as F001 constituents.
	2. b) Treatment is expected to be thermal desorption or chemical oxidation/reduction.	2. b) Treatment options include chemical oxidation or various approaches that volatilize VOCs and then capture those VOCs in the off-gas. These approaches include thermal desorption, hot air drying, ambient or heated air sparging, steam sparging, high temperature grouting, and similar VOC removal approaches.
	2. c) Treatment will take place at or adjacent to the PM-2A Tanks site (e.g., TAN-607) as necessary to facilitate remediation.	2. c) Addition – Treatment will take place at or adjacent to the PM-2A Tanks site (e.g., TAN-607) or at the SSSTF treatment facility at ICDF, as necessary to facilitate remediation.
	2. e) After treatment, the tank contents will be re-sampled to confirm compliance with LDRs and the applicable disposal facility WAC.	2. e) One PM-2A Tank (V-13) has been determined to be LDR compliant and ready for disposal. No further sampling is necessary. The other PM-2A Tank (V-14) requires treatment to meet LDR standards and allow disposal. Compliance with concentration-based treatment standards for tank V-14 after treatment will be confirmed by further sampling.
Revegetation	Revegetation not specified in ROD or ROD Amendment/ESD.	Remediation area will be managed as part of TAN industrial complex. Revegetation will not be performed. Noxious weed growth will be monitored as part of Operations and Maintenance Plan and controlled by the Long-Term Stewardship Program.
Cost	$5.3 M	$7.0 M

CERCLA Section 104(d)(4) allows that where two or more noncontiguous facilities reasonably related on the basis of geography or on the basis of the threat or potential threat to public health, welfare, or the environment, the President may, in his discretion, treat these related facilities as one for purposes of this Section. The preamble to the NCP (55 FR 46) further explains that when noncontiguous facilities (e.g., separate operable units) are reasonably close to one another and/or wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without having to obtain a permit. The WAG 3-13 ROD identified the ICDF, which contains the Staging, Storage, Sizing, and Treatment Facility (SSSTF), as reasonably close and/or are compatible for selected treatment or disposal of CERCLA waste from throughout the INEEL, including the waste from the CERCLA cleanup at TAN. Therefore, the ICDF and TAN are considered to be a single site for response purposes under this ESD.

3.2.2 Clarification of the Treatment Options

Options under evaluation for the treatment of the PM-2A tanks contents waste (as necessary) include chemical oxidation or various approaches that volatilize VOCs and then capture those VOCs in the off-gas. These approaches include thermal desorption, hot air drying, ambient air sparging, steam sparging, high temperature grouts, and similar VOC removal approaches. Treatment study plans will be prepared to assist in the determination of the appropriate technology for this waste. The first approach being studied is air sparging at ambient (or elevated) temperatures. The grouting approach calls for the demonstration of the effectiveness of VOC volatilization as a result of the exothermic reaction due to the heat of hydration from the addition of high curing temperature grout materials. In both of these cases, the volatilized PCE would be collected on granular activated carbon (GAC) filter. This GAC filter will be analyzed, treated as necessary, and disposed as a separate waste stream. Selection of the final treatment approach shall be addressed in an appropriate Remedial Design/Remedial Action Work Plan. Other approaches to treatment of this waste falling within the general description of chemical oxidation or VOC volatilization may be the subject of additional studies if the above mentioned studies determine those treatment options as evaluated are not effective in meeting treatment standards.

The remedy as modified in the ROD Amendment/ESD requires that the PM-2A Tanks waste meet the F001 LDR treatment standards for all F001 constituents. F001 constituents include trichloroethylene; tetrachloroethylene; methylene chloride; 1,1,1-trichloroethane; carbon tetrachloride; 1,1,2-trichloro-1,2,2-trifluoroethane; and trichloromonofluoromethane. Consistent with 40 CFR 268.9(b), those constituents specifically addressed as F001 constituents will not trigger LDR characteristic requirements for that same constituent.

One of the TSF-26 PM-2A tanks (V-13) has been determined to be in compliance with LDR treatment standards. Dependent upon acceptance of the tank for disposal by the ICDF, no further treatment or sampling of this tank is anticipated. After placement in the landfill cell, the disposal facility is expected to fill the void spaces within the tank with a grout-like material to prevent future subsidence issues at the landfill.

The other TSF-26 PM-2A Tank (V-14) has been demonstrated to exceed the LDR F001 treatment standard for a single volatile organic compound (tetrachloroethylene [PCE]). The F001 treatment standard for PCE requires that the concentration of the final waste be reduced to less than 6 mg/kg.

3.2.3 Clarification of the Site Revegetation Requirements

The TSF-26 CERCLA site where the PM-2A Tanks were located is within the active industrial area that surrounds TAN-607. As such, this site and the surrounding area are and will continue to be

subject to heavy industrial traffic. Therefore, revegetation of this limited area has been determined to be unnecessary. However, control of noxious weeds is still required. The site-wide Operation and Maintenance Plan will be modified to require these sites to be inspected to ensure noxious weed growth is controlled. Noxious weed control will be conducted under the Long-Term Stewardship program.

3.2.4 Cost

The changes to the PM-2A Tanks remedy as addressed in this ESD, and the confirmation that Tank V-14 does require treatment, results in an increase in the total estimated cost of approximately $1.7 M. The rough order of magnitude total estimated cost for the modified PM-2A Tanks remedy described in the February 2004 ROD Amendment/ESD was $5.3 M. The rough order of magnitude total estimated cost for the remedy as addressed in this ESD is approximately $7.0 M. In the original 1999 ROD and the February 2004 ROD Amendment/ESD the estimated cost for the PM-2A Tanks remedy did not include treatment of the tank contents. The majority of the identified cost increase is related to the additional cost for treating Tank V-14.

3.3 TSF-46 TAN-616 Soils, TSF-47 TAN-615 Sewer Line Soils, and TSF-48 Soils Beneath TAN-615 East and West Sumps

The Agencies have agreed to remediate these three new CERCLA sites (TSF-46, 47, and 48) in conjunction with the remediation of the V-Tanks site. These sites are adjacent to the V-Tanks and have contamination similar to the V-Tanks. These new sites will be remediated to the same RAOs and FRGs as the TSF-09/18 V-Tanks soils. (see Table 3)

Table 3. Summary of changes for the TSF-46, 47, and 48 New Sites.

Remedial Action Element	Original/Changed Remedy	Remedy Change
Soil Remediation	Previously not addressed	Remove and dispose of soils as necessary to meet RAOs and FRGs consistent with the remedy for the adjacent TSF-09/18 site.

3.4 TSF-19 Caustic Tank

Further investigation as part of the removal of TAN-616 and the TSF-46 new site revealed that the TSF-19 caustic tank was not empty and that some radioactive contamination was present. A recent video inspection of the inside of the tank revealed a significant heel still present. As a result of finding waste still present within TSF-19, the status of the tank and surrounding soils will be changed from No Action to remediation required in conjunction and consistent with the TSF-46 site that surrounds the TSF-19 caustic tank. The tank and contents will be removed, treated as necessary, and shipped to ICDF or another approved disposal facility. The surrounding soils will are addressed as part of TSF-46. (see Table 4)

Table 4. Summary of changes for the TSF-19 Caustic Tank.

Remedial Action Element	Original/Changed Remedy	Remedy Change
Tank Remediation	No Action	Remove tank and contents. Dispose at ICDF or other appropriate facility. Soils are addressed as part of TSF-46.

4. AGENCY COMMENTS

The EPA and the DEQ have reviewed this ESD and support the changes to the selected remedies for the identified OU 1-10 sites.

5. PUBLIC PARTICIPATION

The DOE will publish a notice of availability and a brief description of this ESD in the local newspaper (the Idaho Falls *Post Register*) and six other Idaho newspapers to meet the requirements of 40 CFR 300.435(c)(2)(i). The INEEL Community Relations Office may be contacted at (208) 526-4700 or (800) 708-2680. There will be no formal comment period. If requested by stakeholder groups, specific review sessions will be provided.

6. AFFIRMATION OF THE STATUTORY DETERMINATIONS

The DOE, EPA, and DEQ believe, after reviewing the proposed changes to the selected remedy, that the remedy remains protective of human health and the environment, complies with federal and state requirements identified in the ROD as applicable or relevant and appropriate to the remedial action at the time of the final ROD, and is cost-effective. In addition, permanent solutions and alternative treatment technologies are included in the revised remedy to the maximum practicable extent.

7. REFERENCES

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40 CFR 268.40, 2004, "Applicability of Treatment Standards," *Code of Federal Regulations*, Office of the Federal Register, March 29, 2004.

40 CFR 300, 2004, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, Office of the Federal Register, October 4, 2004.

40 CFR 300.435 (c)(2)(i), 2004, "Remedial Design/Remedial Action, Operation and Maintenance," *Code of Federal Regulations*, Office of the Federal Register, September 30, 2004.

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15 USC 2601 et seq., 1976, "Toxic Substances Control Act," as amended.

42 USC 6901 et seq., 1976, "Resource Conservation and Recovery Act of 1976," as amended.

42 USC 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA/Superfund)," *United States Code*, December 11, 1980.

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DOE-ID, 2004c, *Waste Acceptance Criteria for ICDF Landfill*, DOE/ID-10865, Rev. 7, U.S. Department of Energy Idaho Operations Office, August 2004.

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