Appendix E

Selected Remedy Cost Estimates

Appendix E

Cost Estimates

Table E-1 presents the cost estimate for the WAG 1 OU 1-10 Remedial Design/Remedial Action Work Plan development/finalization and the remedial actions as described in Chapter 5 of this Work Plan. The estimated costs are provided at a summary level and include only the costs associated with the remedial action at the OU 1-10 Group 1 sites. [Costs associated with the V-Tanks (TSF-09, -18), PM-2A Phase II tank content removal (TSF-26), Burn Pits (TSF-03, WRRTF-01), remedial action report, site maintenance, institutional controls, and five year reviews will be included in the OU 1-10 Group 2 RD/RAWP.]

The costs in Table E-1 include both direct and indirect costs. Direct costs include estimated dollars for equipment, construction, and operation activities to conduct the planned selected remedial activities. Indirect costs include estimated dollars for activities to support the remedial action, such as construction management, project management, and management reserve. Although the cost estimates are projected to be within ± 10%, actual costs may vary based on subcontracting strategies and potential overtime required to perform the work due to weather constraints.

The estimates for each site are based on specific activities. Detailed cost estimates can be found in the INEEL FY 2000 WAG 1 control account and the INEEL WAG 1 Detailed Work Plan for FY 2001. It needs to be noted that, based on agency comments to this primary document, the PM-2A Phase I contaminated soil removal may not occur until the ICDF is open and operational.

A-1. GENERAL DESCRIPTIONS OF REMEDIAL ACTIONS

The following sections are brief descriptions of the remedial actions at the Soil Contamination Area South of the Turntable, the PM-2A Phase I Contaminated Soil Removal site, the Limited Action for the Disposal Pond, and the Fuel Leak Site (WRRTF-13).

A-1.1 Soil Contamination Area South of the Turn Table (TSF-06, Area B)

Three phases of work will be conducted at TSF-06, Area B, consisting of:

Phase I

This phase has already been completed and included surveying and sampling the overburden material for Cs-137. At identified areas, materials exhibiting Cs-137 concentrations greater than 23.3 pCi/g were excavated and placed into soil bags, which are currently being stored temporarily at the RPSSA until final disposal can occur at the RWMC. The remaining overburden material was scraped north of the site and will remain in the area to be used as backfill material once the FRG has been achieved.

Phase II

This phase of the remedial action will identify areas exhibiting Cs-137 concentrations greater than 23.3 pCi/g in the native soil. Once these areas have been identified, contaminated soil will be excavated, sampled for a NLCI determination, placed into soil bags, and temporarily

stored at the RPSSA until final disposal can occur at the RWMC. Once the site has achieved the remedial action goals, clean backfill material will be brought in and a temporary road will be constructed.

Phase III

The final phase will entail removing the existing road, and surveying and sampling the soil underneath the asphalt to determine if there are any areas exhibiting Cs-137 contamination greater than the FRG. Such soil will then be excavated, sampled for a NLCI determination, placed into soil bags, and temporarily stored at the RPSSA until final disposal can occur at the RWMC. Snake Avenue will be replaced and institutional controls will be maintained at this site until the Cs-137 contamination decays to unrestricted land use concentrations (expected to be within 100-yr, but will be based on confirmation sample results).

A-1.2 PM-2A Phase I Contaminated Soil Removal

The remedial action at this site is to remediate soil contaminated with Cs-137 greater than the FRG of 23.3 pCi/g. Past removal actions at PM-2 left three soil stockpiles and one wooden box remaining at the site. These stockpiles and wooden box were sampled for a NLCI determination, excavated, placed into soil bags, and are currently being stored temporarily at the RPSSA until final disposal can occur at the RWMC. The remaining site was then surveyed and sampled to identify areas where Cs-137 concentrations are above 23.3 pCi/g.

Based on the Post-ROD sampling activities, it has been agreed to by the Agencies that a 4 to 6-inch layer of clean fill material should be placed over this site to mitigate the spread of Cs-137 contamination due to wind. It has also been agreed to by the Agencies that this remedial action will be delayed until the ICDF is open and operational. Once the ICDF is open, contaminated soil will be excavated to a maximum depth of 3 m (10 ft) below the surrounding surface or to below the FRG, whichever is less. The cost estimate presented in this section assumes that an average depth of 0.3 m (1 ft) from the entire site will be excavated and disposed.

A-1.3 Limited Action for the Disposal Pond (TSF-07)

This limited action will be to maintain institutional controls. Such activities include repairing the existing RADCON fence that surrounds the TSF-07 site and placing signs around the perimeter of the site.

A-1.4 Fuel Leak Site (WRRTF-13)

As identified in the Final OU 1-10 Comprehensive ROD, the scope of work required that a RBCA analysis be conducted to determine whether remedial action is warranted. Based on Post-ROD sampling data, a RBCA analysis was performed, as presented in Appendix F of this document. Based on this analysis, no remedial action will be required at this site. The cost presented in Table E-1 only reflects the cost associated with the sampling and RBCA analysis.

A.2 GENERAL PROJECT ASSUMPTIONS

- Remedial action activities will be performed during fair weather conditions during the April through October time frame. No freeze protection or special winterization will be required.
- INEEL Site Stabilization wages will apply; no overtime or shift differential has been considered.
- Onsite disposal of excavated soils is expected to involve the Radioactive Waste Management Complex (RWMC), and the INEEL CERCLA Disposal Facility (ICDF).
- Sample data from the Post-ROD sampling activities were used to determine excavation volumes.
- General and Administration and Procurement Fees have been included on all subcontract work at a rate of 32% General and Administrative (G&A) and 3% Procurement Fee, compounded for a total of 36%.
- The duration of the operations/surveillance and monitoring activities at TSF-06, Area B, TSF-26, and TSF-07 is assumed to be 100 years, commencing in FY 2000.

A.3 SITE SPECIFIC REMEDIAL ACTION ASSUMPTIONS

Soil Contamination Area South of the Turntable (TSF-06, Area B)

- It is estimated that 810 m^3 (1050 yd^3) of contaminated soil will be excavated and disposed from this site:
    - 270 m^3 (350 yd^3) from TSF-06 overburden
    - 270 m^3 (350 yd^3) from TSF-06 native
    - 270 m^3 (350 yd^3) from TSF-06 road bed.
- The area of Snake Avenue asphalt that will be removed is 152 m x 9 m for a total area of 1,368 m^3 (15,000 sf). The depth of asphalt is 0.33 ft (4 inches) for a total of 190 $yd^3$of material.
- Asphalt will not be required to be placed in bags.
- 270 m^3 (350 yd^3) of backfill will be required
- All borrow material for backfill will be available within a 20 mile radius at no cost other than those for transport.
- Backfill will not need to meet any specifications other than those for the TSF-06 road bed.
- All contaminated material will be soil bagged. Based on total of 810 m^3 (1050 yd^3) of contaminated soil and capacity of 4.2 m^3 (5.5 yd^3) per bag, 190 bags will be required.

- Bags will be placed at their final disposal location within 6 months from filling.
- The RWMC is considered to be acceptable for disposal of the TSF-06 waste.
- The number of roll-offs required for removal of Snake Avenue asphalt is 6.
- The ICDF will be able to accept waste in early FY-01 for staging.
- The ICDF will be available to accept waste from TSF-06.
- There will be no weather delays.
- All equipment other than paving equipment is available onsite.
- Soil screening/monitoring will be performed to 20 pCi/g for Cs-137 to ensure the FRG of 23.3 pCi/g is met.
- Scope for weed control is not included in this estimate.
- Sampling for NLCI at TSF-06 overburden and native soil will be conducted in FY-00.
- The TAN Facility will approve a road outage for Snake Avenue for a period from April through October, 2001.
- Pre-Final inspection will be concurrent for TSF-06
- A Final Inspection Report will be submitted to the Agencies after the pre-final inspection checklist has been finalized.

Contaminated Soils at the PM-2A Tanks (TSF-26)

- It is estimated that 1260 m^3 (1650 yd^3) of contaminated soil will be excavated and disposed:
    - 115 m^3 (150 yd^3) from the PM-2A soil stockpiles/wooden box
    - 1145 m^3 (1500 yd^3) from TSF-26 native.
- 75 m^3 (100 yd^3) of backfill will be required.
- All borrow material for backfill will be available within a 20 mile radius at no cost other than cost for transport
- Backfill will not need to meet any specifications.
- All contaminated material will be soil bagged. Given a total of 1260 m^3 (1650 yd^3) of contaminated soil and capacity of 4.2 m^3 (5.5 yd^3) per bag, 300 bags will be required for the work to be performed in FY 01.
- Bags will be placed at their final disposal location within 6 months from filling.

- The ICDF is considered to be acceptable for onsite disposal of TSF-26 waste.
- Roll-offs will not be required to send soil to the ICDF.
- ICDF will accept soil in end dumps or dump trucks.
- The ICDF will be available to accept waste from TSF-26.
- There will be no weather delays.
- Soil screening/monitoring will be performed to 20 pCi/g for Cs-137 to ensure the FRG of 23.3 pCi/g is met.
- Scope for weed control is not included in this estimate.
- Pre-Final inspection will be concurrent for TSF-26 and TSF-06.
- A Final Inspection Report will be submitted to the Agencies after the pre-final inspection checklist has been finalized.

Disposal Pond (TSF-07)

- The main portion of the pond is approximately 630-ft by 100-ft by 10-ft deep. The overflow pond is located along the north side of the pond and is approximately 430-ft by 80-ft. The perimeter around the disposal pond is estimated to have a total length of 2500-linear feet.
- The repair and maintenance of the existing RADCON fence on the perimeter of the pond will not involve entry into the contaminated area.

Fuel Leak Site (WRRTF-13)

- Remedial action is not required, based upon the results of the Risk-Based Corrective Action analysis, presented in Appendix F of this RD/RAWP.
- No Institutional Controls will be required at this site based on the RBCA analysis.

A.4 CONTINGENCY GUIDELINE IMPLEMENTATION

No costs for maintaining conformance with standard Environmental Restoration Program Procedures, for contingency, or for management reserve, have been included in this estimate.

A.5 OTHER COMMENTS/CONCERNS SPECIFIC TO THIS ESTIMATE

Unit costs used in this cost estimate are comparable to costs derived from similar construction activities completed at the INEEL, such as those conducted at the Central Facilities Area (CFA) and Test Reactor Area (TRA).

Table E-1. Summary Level Cost Estimate for OU 1-10 Group 1 Sites

		Fiscal Year (FY)-2000
FFA/CO Management and Oversight		
	WAG 1 - Management	$ 299,200
OU 1-10 Group 1 RD/RAWP		
	Development/Finalization	$ 154,100
OU 1-10 Post-ROD Sampling		
	Prepare and Finalize Post-ROD SAP	$ 22,900
	TSF-06	
	TSF-06, Overburden	$ 62,933
	TSF-06, Native Soil	$ 71,967
	PM-2A	
	PM-2A Stockpiles NLCID	$ 81,300
	PM-2A Native Soil	$ 179,067
	PM-2A Debris	$ 11,200
	WRRTF-13	
	WRRTF-13 sampling	$ 186,333
OU 1-10 Group 1 Remedial Action		
	TSF-06	
	TSF-06 Overburden	$ 165,710
	TSF-06 Native	$ 689,610
	TSF-06 Road Removal	$ 141,227
	TSF-06 Hot Spot removal under Road	$ 156,810
	TSF-06 Road Replacement	$ 124,327
	TSF-06 Soil Disposal	$ 23,217
	TSF-26	
	TSF-26 Placement of Clean Fill Material	$ 26,977
	TSF-26 Soil Removal	$ 241,400
	TSF-26 Backfilling and Grading to Surrounding Grade	$ 66,124
	Disposal	$ 18,000
	WRRTF-13	
	No Remedial Action Required	$ -
	TSF-07	
	Repair of Existing Fence	$ 5,780
	Final Inspection Report for OU 1-10 Group 1 Sites	$ 39,500
Total OU 1-10 Group 1 Sites Estimated Cost		**$ 2,767,681**

Appendix F

WRRTF-13 Post-ROD Sampling Data and RBCA Analysis

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WRRTF-13 Post-ROD Sampling and RBCA Analysis

Post-Record of Decision (ROD) sampling at WRRTF-13 began February 28, 2000 and concluded March 2, 2000. The sample locations and sampling approach are given in the post-ROD field sampling plan (DOE/ID-10710, Revision 0, February 2000).

Seven borehole locations were selected based on site history to bias the samples toward areas of highest contamination. Borehole 1 was placed at the former location of tank TAN-738, which was known to have leaked, Borehole 2 was placed adjacent to tanks TAN-738 and –739. Boreholes 3 through 6 were placed along transfer piping that was known to have leaked. Finally, Borehole 7 was placed at the former location of tank TAN-787. Figure F-1 shows the borehole locations at the WRRTF-13 site.

A minimum of four samples were taken from each borehole, three of the samples taken were determined from taking photoionization detector (PID) or flame ionization detector (FID) readings to determine the highest hydrocarbon concentrations. The three samples from each borehole with the highest PID or FID readings were sent to the laboratory for analysis. In addition, a composite sample was taken from each borehole and analyzed. Further details of the sampling procedures and nature and extent of contamination are presented in the post-ROD field sampling plan (DOE/ID-10710, Revision 0, February 2000).

A Risk Based Corrective Action (RBCA) analysis was performed on the data received from the analytical laboratory. The maximum concentration of each detected contaminant from all the samples collected were compared to the State of Idaho RBCA Tier 0 and Tier 1 screening concentrations. The maximum concentrations from this site exceeded both the Tier 0 and Tier 1 RBCA screening concentrations. To complete the RBCA analysis a Tier 2 evaluation was done using the RBCA Software (State of Idaho RBCA Tier 2 Software Ver 1.0 July 1997). Input data to the RBCA software included: maximum concentrations, current land use is occupational, future land use will be residential, no surficial contaminated soil (which precluded calculating resident child risks due to soil ingestion), and identifying that the groundwater class is 2 since this flow rate is closer to the Snake River Plain Aquifer flow rate. The output for this evaluation is provided in Appendix F. As presented on page F1-1, the cumulative risk at this site for the residential scenario is 1.17E-08 and the cumulative Hazard Index (HI) is 0.96. The cumulative risk for an industrial scenario is 2.65E-09 and the cumulative HI is 0.42. The Subsurface Soil Indoor Inhalation exposure pathway is the main contributor to the cumulative HI. The results of the RBCA Tier 2 analysis are below the Tier 2 evaluation criteria of 1E-05 cumulative risk and a HI of 1.

Based on the results of the RBCA analysis, no further excavation is necessary at the Fuel Leak site (WRRTF-13). Post-ROD sampling has determined that the site poses an acceptable risk to both occupational and residential occupation scenarios.

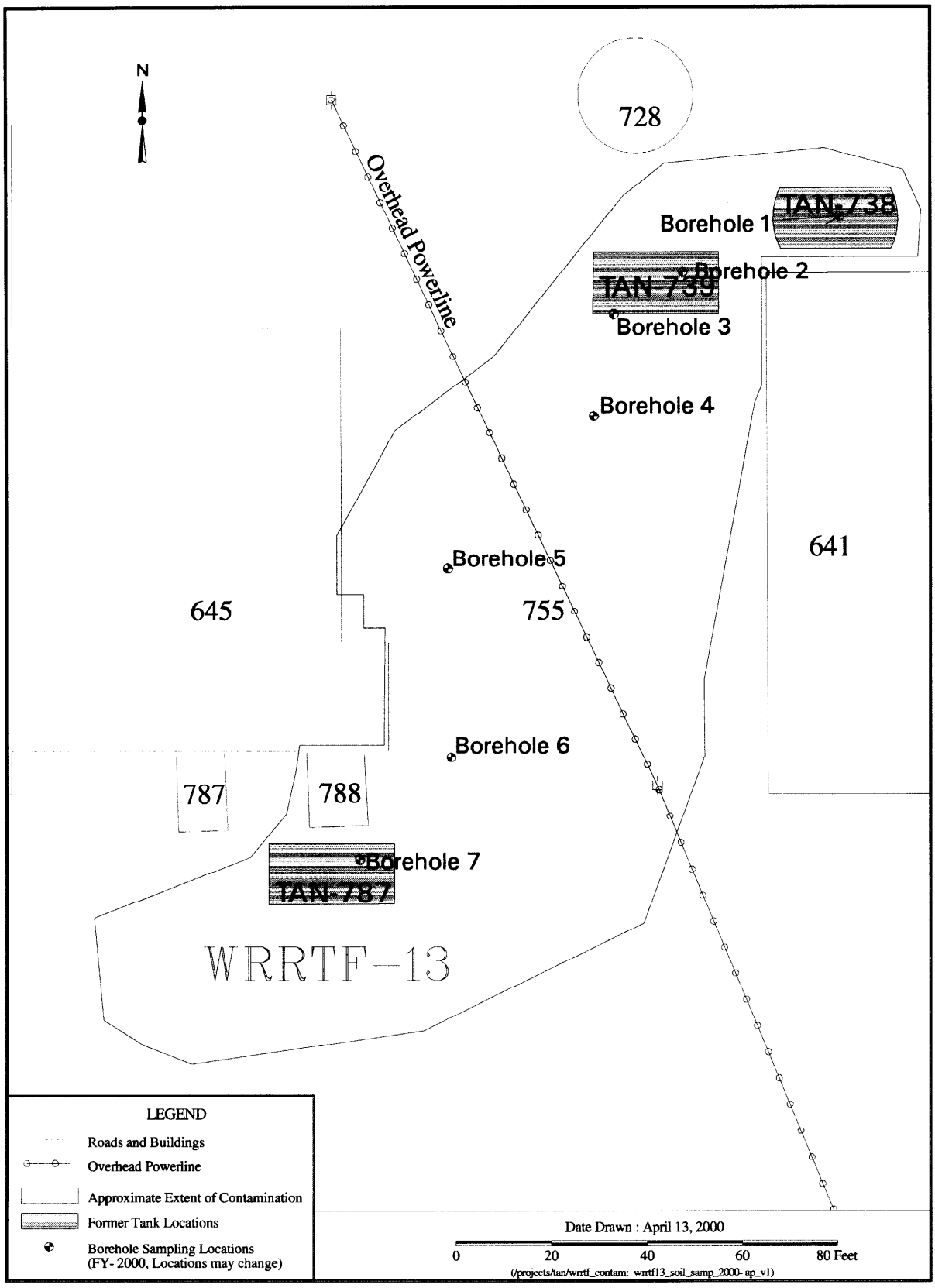

Figure F-1. Sampling locations at the Fuel Leak site (WRRTF-13).