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# FIRST LOADOUT WORK PLAN FOR THE WASTE PITS REMEDIAL ACTION PROJECT (WPRAP)

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

DECEMBER 1998

U.S. DEPARTMENT OF ENERGY
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## LIST OF ACRONYMS/ABBREVIATIONS

| | |
|---|---|
| AWWT | Advanced Wastewater Treatment |
| Bq | Becquerel |
| BSL | Biodenitrification Surge Lagoon |
| CDF | Commercial Disposal Facility |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| DOE | U. S. Department of Energy |
| DOT | U. S. Department of Transportation |
| FEMP | Fernald Environmental Management Project |
| FDF | Fluor Daniel Fernald |
| GCS | Gas Cleaning System |
| IEMP | Integrated Environmental Monitoring Plan |
| IT | IT Corporation |
| LSA | Low Specific Activity |
| MHB | Material Handling Building |
| NPDES | National Pollutant Discharge Elimination System |
| Ohio EPA | Ohio Environmental Protection Agency |
| ODNR | Ohio Department of Natural Resources |
| OSDF | On-Site Disposal Facility |
| OU1 | Operable Unit One |
| PCB | Polychlorinated Biphenols |
| PFD | Process Flow Diagram |
| PPE | Personal Protective Equipment |
| PSP | Project Specific Plan |
| RA | Remedial Action |
| RCRA | Resource Conservation and Recovery Act |
| RD | Remedial Design |
| RLB | Railcar Loadout Building |
| ROD | Record of Decision |
| SP6 | Soil Pile 6 (a.k.a. OU1 Contaminated Soil Stockpile/Mt. Di.) |
| SP7 | Soil Pile 7 |
| SWD | Surface Water Discharge |
| SWM | Stormwater Management Pond |
| SWPPP | Stormwater Pollution Prevention Plan |

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## LIST OF ACRONYMS/ABBREVIATIONS
**(Continued)**

| | |
|---|---|
| USEPA | United States Environmental Protection Agency |
| WAC | Waste Acceptance Criteria |
| WPRAP | Waste Pits Remedial Action Project |
| WTS | Wastewater Treatment System |

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# 1.0 INTRODUCTION AND PROJECT DESCRIPTION

This Work Plan (i.e., the Plan) addresses the activities which comprise the First Loadout of Operable Unit One (OU1) wastes. Specifically, this Plan has been developed to provide the details necessary to support implementation of the first phase of remedial action, whereby soils and soil-like materials from Soil Pile 6 (SP6) and Soil Pile 7 (SP7) are processed through a portion of the remediation facility, without the need for the dryers. The plan for disposal of SP6 and SP7 materials off-site, is consistent with various previous communications and commitments made with the EPAs. For example, in an April 11, 1996 letter to the EPAs on the OU1site preparation activities and materials management, it was stated that soils generated from the OU1 site preparation activities would be managed in SP6 in support of eventual treatment through the OU1 remediation facility. This concept was approved by the U. S. Environmental Protection Agency (USEPA) by letter of April 30, 1996. In addition, SP6 contains soils from the north railyard site preparation activities which the Ohio Environmental Protection Agency (Ohio EPA) and USEPA directed to be placed in SP6 for off-site disposal, by letters of July 8, 1996 and July 3, 1996, respectively. Finally, SP6 and SP7 contain soils and soil-like materials from Soils Characterization and Excavation Project excavation activities which were determined to exceed the On-Site Disposal Facility (OSDF) Waste Acceptance Criteria (WAC), and as such are destined for off-site disposal.

This Plan also demonstrates that the subject activities are consistent with, and meet the commitments of, the OU1 Record of Decision (ROD) and other approved OU1 documents (e.g., the Remedial Design (RD) Work Plan, the Remedial Action (RA) Work Plan, the Waste Pits Remedial Action Project (WPRAP) RD Documents Package). This Plan does not provide details relative to the management of railcars within the on-site railyard or the shipping activities, in that these activities will not differ between First Loadout and full operations; rather, these activities are covered in the Transportation and Disposal Plan for OU1.

## 1.1 INTRODUCTION

The Fernald Environmental Management Project (FEMP) is a 1,050 acre, government owned facility located approximately 18 miles northwest of the City of Cincinnati, Ohio. It is situated on the boundary between Hamilton and Butler Counties. The FEMP, which operated under the name of the Feed Materials Production Center, produced high purity uranium metal products for the United States Department of Energy (DOE) and its predecessor agencies from 1952 to 1989. Former uranium processing operations at the FEMP were limited to a fenced, 136 acre tract, closed to public access, known as the production area. In June 1991, the site was officially closed for production by an act of Congress. The Fernald site was included on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List in 1989. The current mission of the site is the safe environmental restoration of the site in accordance with all stated requirements.

OU1 is a well-defined, 37.7 acre area located in the northwest quadrant of the FEMP site. Large quantities of liquid and solid wastes that were generated by various chemical and metallurgical processing operations were stored or disposed in the six waste pits and the Clearwell, or the Burn Pit. These waste pits are located in a portion of the FEMP Waste Storage Area and are contained within the boundaries of OU1.

Implementation of the selected remedy for OU1 involves the excavation of waste materials from the pits, treatment and/or blending as necessary, and ultimately transporting the waste to an off-site Commercial Disposal Facility (CDF) for disposal. The general steps and activities associated with this process are: 1) Excavation of wastes from the pits (along with any residual contaminated soils from beneath the pits); 2) Preparation of the wastes (e.g., sorting, crushing, shredding); 3) Treatment by thermal drying (as necessary to remove free water and achieve optimum moisture content to meet the WAC of the disposal facility; and 4) Blending to achieve a uniform product, and loadout into railcars (or boxes, as applicable).

In addition to the waste materials and soils to be excavated from the waste pits, it is also logical for OU1 (a.k.a. WPRAP) to provide management of certain soils and soil-like materials generated by other FEMP projects. Specifically, there are various soils which have been, and are expected to be, generated by various FEMP projects, which, by their nature (i.e., levels of contamination), are destined for disposal at an off-site CDF. For the purpose of the activities under this Plan, the CDF which will be used is Envirocare of Utah, Inc. (Envirocare). In an effort to integrate remediation efforts across the site, so as to best utilize FEMP resources, OU1 has taken on the responsibility for managing these materials. (SP7, which is covered by this Plan is an example of these types of materials.) This integration is consistent with the FEMP proposal to focus site-wide remedial action efforts on common components as defined in an August 18, 1995 letter to the EPAs, which was supported by the Ohio EPA and the USEPA, in letters of September 8, 1995 and September 15, 1995, respectively.

In accordance with the approved WPRAP RD Documents Package, which was approved by USEPA on October 9, 1998 and Ohio EPA on November 18, 1998, IT Corporation (IT) has designed a facility capable of implementing the OU1 selected remedy. In addition, IT is in the process of constructing this remediation facility such that it is fully capable of processing all of the waste for which the WPRAP is responsible. The goal of these overall efforts is to initiate operations (i.e., the loading of waste into railcars) by March 1, 1999, and to complete remediation of OU1 by May 31, 2005, in accordance with the USEPA approved enforceable milestones established in the OU1 RA Work Plan.

## 1.2 PURPOSE

First Loadout represents the first phase of a sequenced approach to bringing the WPRAP remediation facility into full production. By phasing the project, operations can be initiated in manageable portions, affording WPRAP with the opportunity to practice operations in the newly constructed facilities and the railyard, before moving on to the more complex aspects of the remediation facility. Under First Loadout, use of SP6 and SP7 allows WPRAP to have operating personnel outfitted in lower levels of personal protective equipment (PPE) initially. In doing so, the operators can accustom themselves to their duties without the initial burden of working in a Thorium contamination area and then gradually work into the higher level PPE. Phasing up to this higher level of contamination, and to more complicated operations associated with the dryer, facilitates an emphasis on safety.

The activities identified in this Plan constitute WPRAP's plan for meeting the March 1, 1999 enforceable milestone, and to then provide for continued remediation of OU1, until such time as the remediation facility is fully operational. Specifically, this Plan defines the concept which has come to be known as First Loadout. This Plan shows how the activities which comprise First Loadout are consistent with the long-term remediation plans of WPRAP, as defined in various OU1 documents (e.g., the RD Documents Package). In other words, this Plan shows that First Loadout is a phase of the project, which does not alter the overall plans, facilities, etc., and which meets approved commitments. As important, however, this Plan identifies the activities which make up First Loadout, and shows how these activities also meet the requirements of the various OU1 remeidation documents.

## 1.3 PLAN ORGANIZATION

This Plan has been set up to address those facilities and activities which constitute First Loadout and, to the extent necessary, demonstrate/document consistency with the long-term remediation objectives for WPRAP. This Plan is comprised of eight sections; the sections and their contents are as follows:

Section 1.0 Introduction and Project Description - Describes the project, the purpose of this

Plan, and the work plan organization.

Section 2.0 First Loadout Concept - Provides a detailed listing of the activities and facilities which comprise First Loadout.

Section 3.0 Process Description - Provides a description of the processes which are a part of First Loadout.

Section 4.0 Environmental Controls/Monitoring - Provides details of the methods and means which will be utilized to control erosion and sedimentation, and suppress dust, as well as monitoring to be employed relative to these activities.

Section 5.0 Stormwater/Wastewater Management - Describes the methods and means which will be utilized to manage stormwater/wastewater generated during First Loadout.

Section 6.0 Sampling and Analysis - Describes the sampling and analysis activities which will be necessary to support First Loadout, including sampling for compliance with the Envirocare WAC.

Section 7.0 Off-Spec Material Management - Provides a description of how off-spec material (i.e., material which cannot readily be processed through the facility) will be managed.

Section 8.0 Achieving Full Operation - Provides a description of how First Loadout activities will fold into eventual full operations, and the impact on submittals to the EPAs.

# 2.0 FIRST LOADOUT CONCEPT

First Loadout is a concept which provides the means for initiating OU1 remediation activities within the scope of approved plans and facilities without impacting long-term OU1 remediation goals and commitments. Under First Loadout, available OU1 remediation facilities will be utilized to process waste until such time as the entire facility is operational.

In general terms, First Loadout consists of the processing of soils eligible for disposal at Envirocare, without initiating excavation of the waste pits or initiation of dryer operations. This strategy enables a phased approach to full operational capability, which ensures worker safety and process operational experience development. Under First Loadout, soils and soil-like materials generated through various FEMP remediation activities, which meet the Envirocare WAC, will be transferred from their current location into the Material Handling Building (MHB), wherein this material will be managed (as discussed in Section 3.2) and then transferred to the Railcar Loadout Building (RLB) where it will be staged and then loaded into railcars for off-site shipment and disposal.

To date, the soil and soil-like materials generated by various other FEMP remediation activities (which is destined for off-site disposal) have been placed in one of two locations. In support of the OU1 site preparation activities initiated in April 1996, various soils from the OU1 area were placed in SP6, which is also known as the OU1 Contaminated Soil Stockpile or Mt. Di. (see Figure 2-1). Soils found to exceed the OSDF WAC, from within the north railyard area, were also placed in SP6. Finally, a small quantity of material from other FEMP projects, which was found to exceed the OSDF WAC, was placed in SP6 prior to its closure. It is estimated that SP6 contains a total of 18,000 $yd^3$ of soil and soil-like material.

Subsequent to the closure of SP6, materials generated from other FEMP projects (which exceed the OSDF WAC) have been placed in SP7. As of the date of this Plan, SP7 (see Figure 2-1) contains approximately 13,000 $yd^3$ of material, and is still receiving such material.

As discussed in the RD Documents Package, the average production rate for the WPRAP remediation facility is planned to be about 400 tons per day, or about 4 railcars per day. Although it is expected that this production rate can be achieved during First Loadout, there is also a general expectation that during initial startup, the production rate may be less. Specifically, as facilities are brought into operations, and operators become accustomed to their activities, the production rate will reflect this phasing in of implementation. The

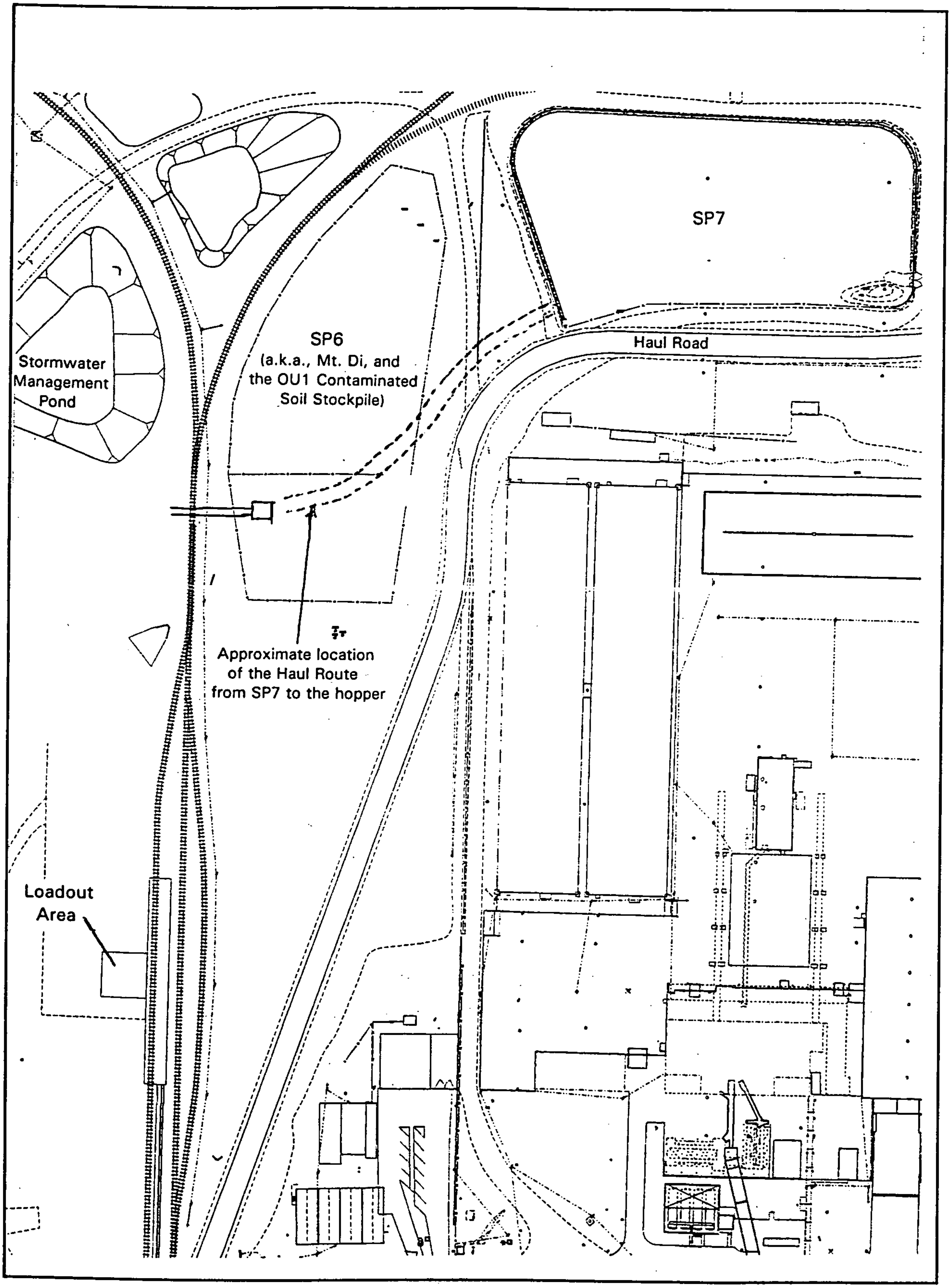


Figure 2-1 Location of SP6 and SP7

production rate should, as a minimum, not be less than half of the above average production rate, and should increase over time so as to ultimately ensure that all production is completed as necessary to meet the May 31, 2005 enforceable milestone for project completion.

The following sections provide an identification of the facilities which will be utilized in support of First Loadout, and a listing of the activities to be performed under First Loadout. A detailed description of the process which constitutes First Loadout is provided in Section 3.0. Details relative to activities which support these processes are provided in additional sections within this Plan, as discussed in Section 1.3.

## 2.1 FIRST LOADOUT FACILITIES

The activities which will be performed in support of First Loadout will be performed within a portion of the entire facility described in the RD Documents Package. Specifically, Figure 2-2 takes the overall site layout and shows which of the WPRAP remediation facility structures will be available and operational in support of First Loadout. As can be seen from Figure 2-2, First Loadout activities associated with the processing of the SP6/SP7 soils and soil-like materials, and any secondary waste from the process, will be focused in the MHB (including the conveyor and hopper from SP6 to the MHB) and the RLB.

It should be noted that, in keeping with efforts to bring the entire facility into operation, only a portion of the MHB will be used to support First Loadout. Specifically, a portion of the MHB will be cordoned off from that portion which will be used in support of First Loadout, to support activities associated with the startup of the dryer operations and other longer term operations (e.g., material screening, and crushing/shredding). As shown on Figure 2-2, the southwest corner of the MHB will not be used in support of First Loadout. Within this area, which is in and around the dryer feed and exit, activities centered on the completion of equipment installation, testing of equipment, startup of the equipment, and training associated with the equipment will continue concurrent with First Loadout.

As is shown in Figure 2-2, the support facilities associated with First Loadout fall into one of two categories: support facilities which are required or planned; and support facilities which are desired or partial. Those support facilities which are required or planned because of their need to support personnel activities, include the laundry, the respirator wash facility, the change out facility, and the break room. The desired or partial support facilities, which include the laboratory and the warehouse, are those which are not necessarily needed (i.e., other alternatives are available) or are needed only in part, should they be available at the time of

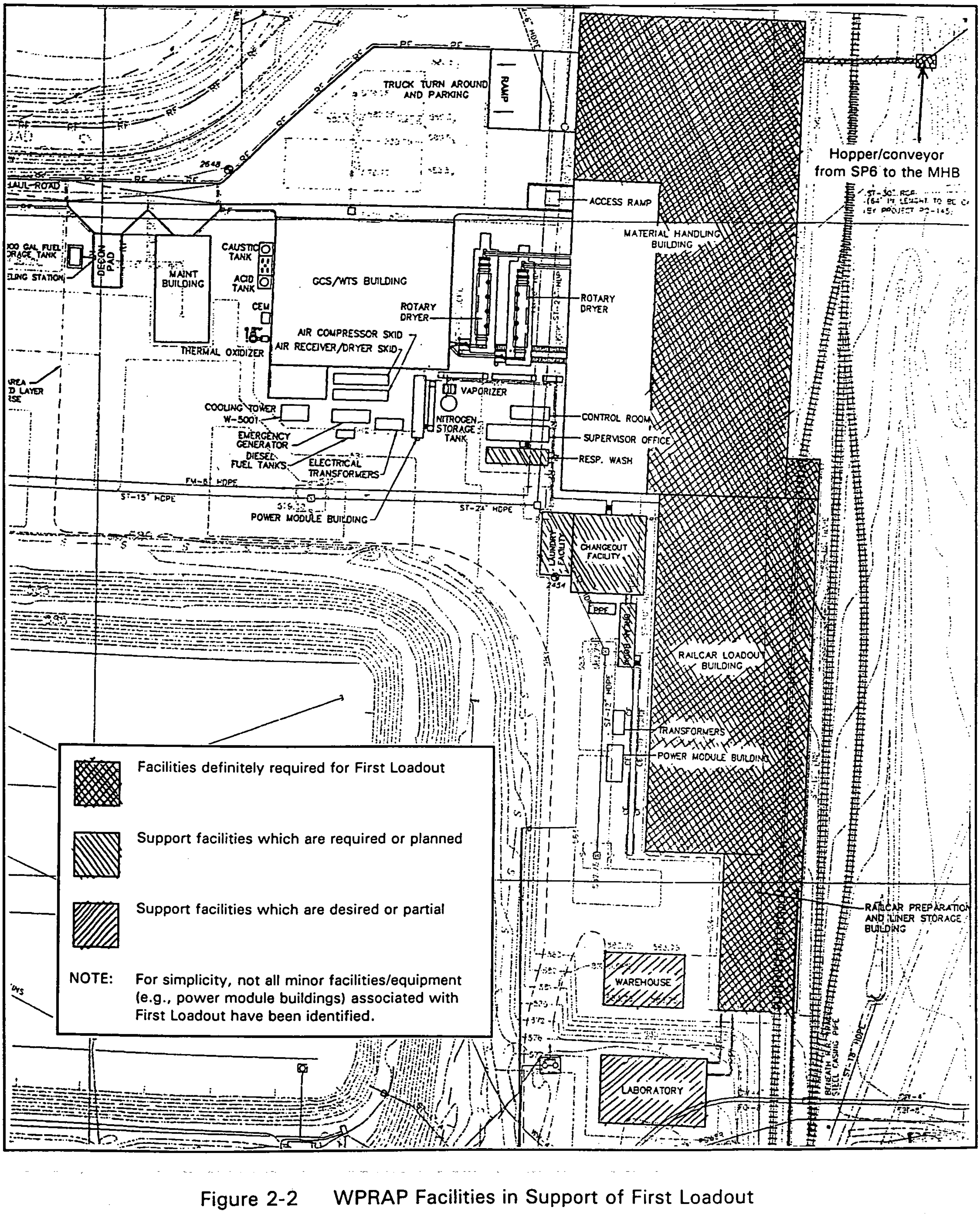


Figure 2-2 WPRAP Facilities in Support of First Loadout

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First Loadout.

Outside of the remediation facility itself, the remainder of the activities will be performed at SP6 and SP7 (see Figure 2-1).

## 2.2 FIRST LOADOUT ACTIVITIES

The activities which comprise First Loadout consist of the following (details of which are described in later sections of this Plan):

- SP6/SP7 Characterization in Support of Disposal at Envirocare
- Excavation of SP6/SP7
    - Excavation of the soil at SP6 and SP7;
    - Visual identification and physical segregation of off-spec materials found during excavation;
    - Transport of the soils to the hopper/conveyor located at SP6;
    - Transport of materials by truck to the MHB, if:
        - operational problems prohibit the use of the conveyor for an extended period of time;
        - the materials are oversized (from the standpoint of transport via the hopper/conveyor), but otherwise meet the Envirocare WAC;
    - Stockpiling/packaging of off-spec materials;
    - Maintenance of SP6/SP7 stormwater controls;
    - SP6/SP7 fugitive emission controls;
    - Segregation of active SP7 placement activities from soil removal activities;
    - Placement of soils into the grizzly/hopper;
    - Management of oversize materials rejected from the hopper;
    - Grading/seeding of the SP6 area (i.e., stabilization of the area pending final Area 6 soils remediation);
- Operation of Hopper/Conveyor
    - Segregation of larger materials by the hopper (via grizzly);
    - Removal of oversize materials rejected from the hopper;
    - Transfer of soils to the MHB via the conveyor;
- Material Handling Building Operations
    - Blending of soil, as necessary (i.e., to control moisture), within the MHB;
    - Maintenance of pile at conveyor discharge;
    - Visual identification and physical segregation of any additional off-spec

materials found during material management activities;
  - Stockpiling/packaging of off-spec materials;
  - Transport of soils from MHB to RLB using conventional earth-moving equipment;
  - Stormwater collection/management;
  - Fugitive dust controls within the MHB;
- Railcar Loadout Building Operations
  - Storage of soils within the RLB bins;
  - Sampling of the soils in the RLB bins (for moisture content);
  - Identification and segregation, if necessary, of off-spec materials;
  - Blending of soil within the bins, as necessary based on RLB bin sampling, to meet the Envirocare WAC;
  - Movement of railcars within the RLB to support loadout;
  - Removal of railcar lids;
  - Inspection of the fixed railcar liner;
  - Installation of disposable railcar liner;
  - Loadout of soils from the RLB storage bin into railcars;
  - Weighing of railcars;
  - Securing of disposable railcar liner;
  - Installation and securing of railcar lid;
  - Maintenance of lids, as necessary;
  - Radiological surveying of railcars (for release for transport);
  - Decontamination of railcars, as necessary, based on radiological surveys;
  - Development of material inventory paperwork (including database(s) and shipping documentation) associated with railcar shipment;
  - Stormwater collection/management;
  - Fugitive dust controls within the RLB;
- Support Activities
  - Respirator washing, as necessary;
  - Laundering of clothing, as necessary;
  - Analytical support (moisture parameters only);

# 3.0 PROCESS DESCRIPTION

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The description of activities which comprise First Loadout are presented in the following sections as a discussion of either the excavation of SP6/SP7 (Section 3.1), management within the MHB (Section 3.2), and/or management (including loadout) within the RLB (Section 3.3). These sections provide a description of the process to be followed within each of these areas. Although the following sections may touch upon activities associated with environmental controls, stormwater/ wastewater management, sampling and analysis (including the characterization of SP6/SP7), and the handling of off-spec materials, details relative to these topics are provided in Sections 4.0, 5.0, 6.0, and 7.0, respectively. Details relative to the remaining support activities identified in Section 2.2 will not be covered in this Plan, other than through the following discussions. In addition, Section 3.4 provides a discussion of operational contingencies.

## 3.1 EXCAVATION OF MATERIALS FROM SP6/SP7

The activities covered by this portion of First Loadout, and the approach to performing those activities, are basic, in that conventional earth moving equipment (e.g., trackhoes, bulldozers, front end loaders, etc.) will be used to excavate the materials from the stockpiles. The rate of excavation will vary depending on weather conditions, the production (i.e., loadout) rate, available MHB/RLB capacity, etc. On average, the rate of excavation/production will be about 400 tons/day. However, because excavation is weather dependent, the daily excavation rate will generally be higher than this average production rate, so as to ensure continued availability of soils for loadout. Once the material has been excavated, it will be transferred and placed into the hopper. The transfer of material from SP6 to the hopper will generally be performed using front end loaders (because of the relatively short distance between the hopper and the Stockpile areas).

Once authorization to operate is given to IT by Fluor Daniel Fernald (FDF), the plan is to start excavating materials from SP6 at the northeast corner and proceed to the southwest corner. In doing so, SP6 itself can be used to help manage erosion, since the stormwater flow in the area is generally to the southwest.

Excavation of SP6 will continue until the placed soils have been removed (i.e., until the original grade, as shown in Figure 3-1, has been reached). Additional excavation may be performed, as necessary, to adjust the final contours to assure proper drainage.

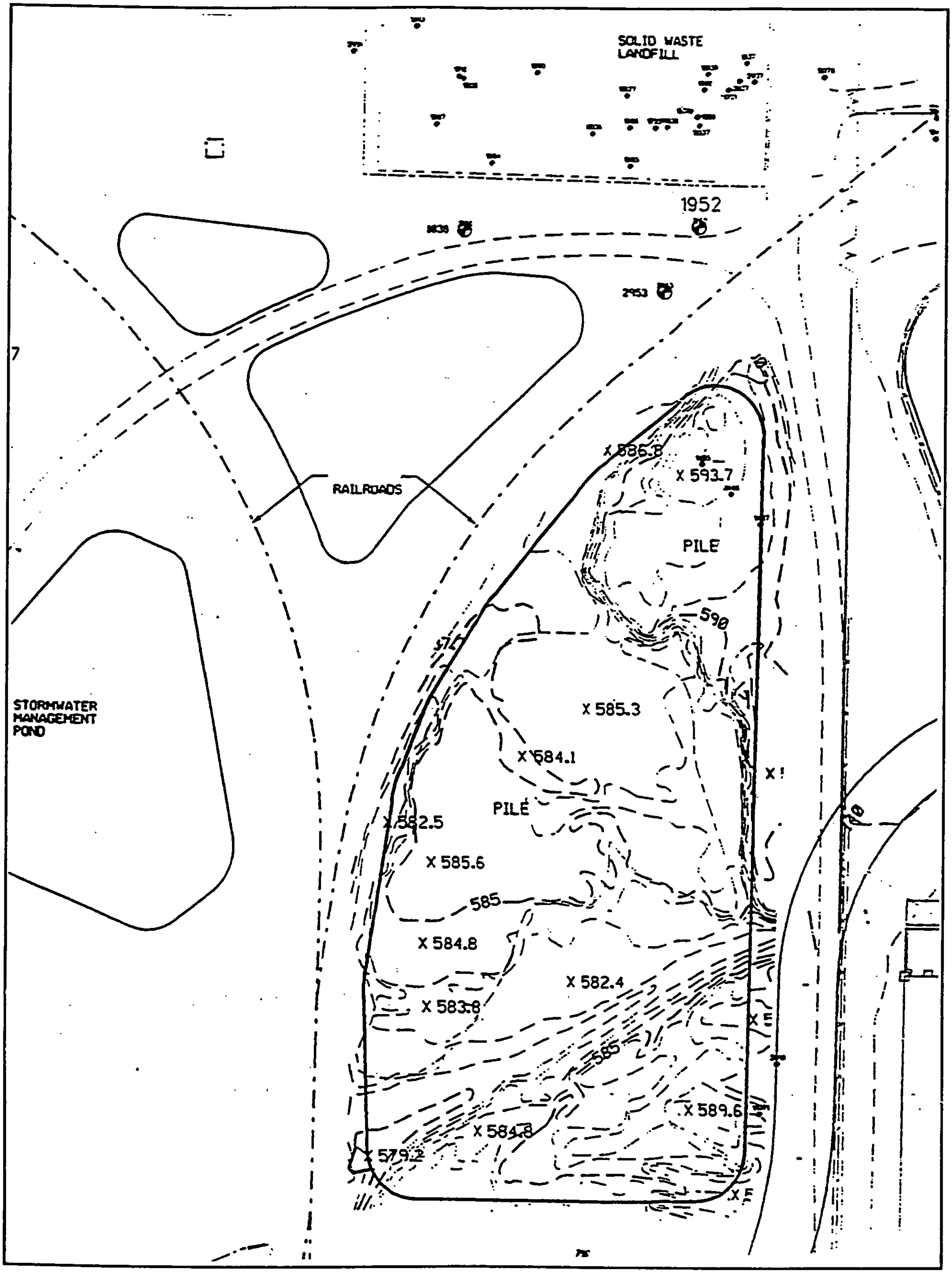


Figure 3-1 Original Contours of SP6 Area

Once all of the material is excavated from SP6, excavation activities will then move to SP7. Prior to initiating SP7 excavation activities, controls will be put in place to ensure that only those SP7 materials which have been characterized for disposal at Envirocare (pursuant to Section 6.1) are being excavated and transferred to the hopper. Such controls may consist of a rope or other barrier, with signs, prohibiting the placement of additional soils during these excavation activities.

The transfer of materials from SP7 to the hopper will be performed with either front end loaders or dump trucks. This transport will take place along a dedicated haul route (i.e., a defined/controlled corridor) from SP7 to the hopper (which will remain at its original location). Such a haul route (as is shown in Figure 2-1) will allow for better control of the spread of contamination, and will allow for the revegetation of the remainder of the SP6 area to take hold. Because of the short duration over which this haul route will be required, it is planned to construct it by simply compacting and grading the area. If necessary, gravel may be added to support traffic. Methods to be employed for the control of erosion along the haul route are discussed in Section 4.1.2. Measures to be implemented to control fugitive dust generation along this route are discussed in Section 4.2.1.

During excavation of both soil piles, care will be taken to minimize erosion, as discussed in Section 4.1. In addition, as discussed in Section 4.2.1 measures will be implemented, as necessary, to suppress fugitive dust generated through the subject activities.

The plan for transfer of materials through the hopper/conveyor, and into the MHB for processing, is based on the presumption (supported by process knowledge) that the material is soil or soil-like, and that the material will meet the Envirocare WAC. Accordingly, an integral part of the excavation/transfer/loading process will be to visually identify and physically segregate materials which do not meet this definition and manage them separately, as discussed in Section 7.0. Because the hopper will have a grizzly which will reject materials larger than approximately 3 - 4 inches in diameter, it is expected that most of the off-spec material (as discussed in Section 7.0) will be removed during this step of the process (i.e., will not make it into the MHB or RLB. If excavation in an area is hampered for a period of time due to activities necessary to manage this off-spec material, work may shift to another area.

The only site preparation work which will be necessary under this Plan (beyond that specifically discussed in the RD Package), to support the excavation, transfer, and loading activities, other than the haul route work discussed above, is the installation of silt fencing downgradient of SP6. The specifics of the silt fence installation are discussed in Section 4.1.1.

## 3.2 MATERIAL HANDLING BUILDING MATERIALS MANAGEMENT

Process Flow Diagram (PFD) D-15-10-001 contained in the RD Documents Package depicts the handling/preparation of excavated materials as it will take place within the MHB. To better represent the activities within the MHB which support First Loadout, this PFD has been marked up and is attached to this Plan (as Attachment A). In general, material management activities within the MHB, include receipt of excavated soils via the conveyor from SP6, segregation of off-spec materials, blending of soils for moisture (as necessary), and transfer of the soils to the RLB storage bins.

Soils excavated from SP6/SP7 will be transferred from the SP6 hopper to the MHB via a conveyor, which spans the rail tracks. As discussed in Sections 3.1and 7.1, the amount of material transferred on a daily basis will vary depending on weather conditions, the production rate, and available MHB/RLB storage, but may be higher than the 400 tons per day nominally identified as the production rate. This conveyor will bring the material over the eastern wall of the MHB and into the northern most storage bin along the eastern side of the MHB. This bin will serve as the receipt area for the soils.

Due to the nature of the materials being handled through this First Loadout activity, it is not anticipated that there will be a need to blend the materials to provide for a homogeneous product to meet the Envirocare WAC. This is especially true for the soils from SP6. Any blending would more than likely be for the purpose of achieving optimum moisture content, and would be performed in another storage bin (to be constructed using precast concrete traffic (Jersey) barriers), along the east wall of the MHB. In addition, it is not anticipated that the materials will contain an amount of water such that it will need to be drained, since such excessively wet material would preclude transfer through the conveyor from SP6. However, should this be the case, and should it not be possible or practical to blend this material with dryer soils, it could be transferred to one of the mixing bins in the northwest corner of the MHB, where the free water runoff would be collected in a sump and managed as discussed in Section 5.2.3.

Because the soil and soil-like material received from SP6/SP7 would have already gone through some segregation steps as discussed in Section 3.1, it is not anticipated that the material being managed within the MHB will contain any materials which do not meet the

Envirocare WAC. However, should any such materials be encountered as activities are being performed in the Material Handling Building, they will be segregated and managed, as discussed in Section 7.2.

Once it appears that the material will meet the Envirocare WAC, this material will be transferred to one of the storage piles in the RLB. Transfer of the materials will be performed using front end loaders.

The control of dust in support of the activities being performed within the MHB (for First Loadout) are discussed in Section 4.2.2. No other activities, such as shredding, mechanical screening, or mechanical size reduction, will be performed within the MHB, in support of First Loadout.

## 3.3 MATERIAL LOADOUT

PFD D-35-10-001 contained in the RD Documents Package depicts the transfer of materials from the MHB to the RLB. To better represent the activities within the RLB which support First Loadout, this PFD has been marked up and is attached to this Plan (as Attachment B). As discussed in Section 3.2, the material is transferred using conventional rubber-tired front end loaders. During storage bin filling, sampling of the material is undertaken as discussed in Section 6.1.2, to evaluate moisture content related requirements in support of the determination that the bin meets the WAC requirements for Envirocare. These bins have a storage capacity of approximately 600 tons, which should accommodate filling six railcars.

Should analysis indicate that a material in a storage bin does not meet the Envirocare WAC due to moisture content, the material will be removed from the bin and reblended (either in the RLB or MHB) with other materials to achieve the desired moisture levels. Because the material will be characterized in-situ for the other Envirocare WAC constituents (see Section 6.1.1), the material should not be reanalyzed for any other reason.

Railcar loading will be supervised from a position adjacent to the rail weigh scale. The Loadout Supervisor will be in radio or visual contact with the personnel involved in moving the railcars, lid removal, liner installation, material loading, liner sealing, lid replacement, and decontamination and survey activities. The loadout personnel will also be monitoring for dust generation and will have the ability to activate the dust suppression system if required (see Section 4.2.2). The supervisor will be responsible for completing the necessary documentation relating to the weight of each railcar and identifying from which storage bin each railcar is filled. A conventional front end loader will remove the material from the bin characterized to meet the WAC and evenly distribute it in the railcar until the maximum cargo weight is achieved. The maximum cargo weight is approximately 108 tons.

A fixed liner within the railcar is designed to prevent contamination of the railcar. In addition, the use of a disposable liner in each railcar, has been engineered into the process. These disposable liners facilitate unloading of the railcars at Envirocare, and are used to minimize contamination of the external railcar surfaces during the loading operations. These disposable liners will be stored in the lid/liner storage area and transferred to the liner installation area utilizing a pallet jack. The disposable liner will be placed in the railcar such that it will overlap the side of the railcar along the entire length of the railcar in the loading zone. The overhung liner will protect the railcar siding from contamination in the event of spillage during the loadout operation. Once the loadout is complete, the liner is folded over the material and into the railcar, and folded over.

### 3.3.1 Railcar Loadout and Lidding Operations

Four railcars at a time will be staged and positioned for loadout in the RLB utilizing a Trackmobile™. The railcars will initially enter the RLB at the northeast corner (through the rail decontamination area). Each car will in turn proceed through five operations necessary for completion of loadout. These operations are:

- Lid removal and inspection
- Railcar fixed liner inspection, and disposable liner installation
- Loadout and disposable liner closure
- Replacement and securing of the railcar lid
- Radiological survey, decontamination (if necessary), and release of the railcar to the railyard

The following is a step-by-step description of the operation in the RLB:

> [NOTE: For discussion purposes, the first car the enters the building is referred to as Car 4, with all cars that follow being referred to in a descending order because the last car to enter the building will be the first car to leave the building.]

**Step 1.** As the railcars pass through the decontamination area, the lids will be removed and visually inspected to assess their condition and to identify any damage.

- If the lid is in good condition (i.e., does not need repairs), it will be placed in a rack located within the decontamination area and stacked/stored until the lid replacement step, after railcar loadout is completed.

- If a lid requires repair, it will be placed back on Car 1. The railcars then move to the liner and lid repair area at the southern end of the building where damaged lids will be removed as needed for repair.

**Step 2.** After the lids are removed, the railcars will be visually inspected for the integrity of the fixed liner and/or for structural damage to the railcar. If necessary, and if possible, repairs will be made in the RLB. If repairs are extensive, however, the railcar will be removed from the RLB and another railcar will be brought in.

**Step 3.** The railcars will be moved to the liner installation and lid repair area. Once all of the lids are removed, either in the decontamination area or the liner installation and lid repair area, Car 1 is positioned in the lining area and the disposable liner is installed, with Cars 2, 3, and 4 awaiting lining.

**Step 4.** The railcars will advance so that Car 1 is awaiting loadout, Car 2 is having its disposable liner installed, and Cars 3 and 4 are awaiting lining.

**Step 5.** The railcars will advance so that Car 1 is positioned on the scale in front of the loadout pad and filled to the desired weight, while Car 2 is awaiting loadout. Car 3 is having its disposable liner installed, and Car 4 is awaiting lining. Following filling, the disposable liner in Car 1 will be folded inward to cover the waste material.

**Step 6.** The railcars will advance so that Car 1 is in the decontamination area where a lid will be placed back on the railcar, sealing the railcar, and the outside of the railcar will be radiologically surveyed, and decontaminated (if necessary). Car 2 is filled and weighed, Car 3 is awaiting loadout, and Car 4 is having its disposable liner installed.

**Step 7.** Car 1 will advance out of the decontamination area to the dedicated holding area to await final radiological survey results. Car 2 is lidded, radiologically surveyed and decontaminated (if necessary), Car 3 is filled and weighed, and Car 4 is awaiting loadout.

**Step 8.** The railcars will advance so that Car 2 awaits final radiological survey results in the holding area, Car 3 is lidded, radiologically surveyed, and decontaminated (if necessary), and Car 4 is filled and weighed.

**Step 9.** The railcars will advance so that Car 3 awaits final radiological survey results in the holding area, and Car 4 is lidded, radiologically surveyed, and decontaminated (as necessary).

**Step 10.** The railcars will advance so that Car 4 awaits final radiological survey results in the holding area.

**Step 11.** Once the railcars are radiologically surveyed for release to the railyard, they will be transferred out of the area and replaced with empty railcars. The full railcars are subsequently moved to the on-site railyard to await shipment off site.

In the event that a railcar fails the radiological surveying, the railcar will be returned to the decontamination area for additional cleaning. Each railcar will then be resurveyed to determine if it meets the radiological release requirements for transport to Envirocare. The FEMP believes that all railcars can be consistently decontaminated to the established radiological limits, even after multiple use, however, no railcar will be released from the site if the (DOT) limits for free release cannot be achieved.

### 3.3.2 Railcar Rejection at Envirocare

In the unlikely event that sampling at Envirocare determines that the contents of a railcar are not in compliance with their WAC, additional measures will be taken at Envirocare to attempt to render the material WAC compliant. Such measures include: confirmatory sampling and analysis; admixing with on-site materials to assure compliance; isolation of RCRA waste to apply treatment; etc. These measures to deal with non-compliant railcar contents at Envirocare, including specific actions and payments, will be dealt with on a case-by-case basis and are subject to various contractual relationships between and/or among DOE, FDF, IT and Envirocare, and will be undertaken to the extent necessary to assure the non-return of full railcars to the FEMP. Actions to deal with non-compliant railcars are dependent on a number of variables including the specific basis for non-compliance, contractual requirements and remedies between involved parties, specific methods and alternatives available to bring the materials into compliance, and costs. Such actions can include treatment at Envirocare, and/or disposal potentially at an increased cost. The ultimate disposition of the materials will be in compliance with all regulations, laws, and the requirements of Envirocare's license.

If all efforts to make the material WAC compliant (as discussed above) prove unsuccessful, the railcar will be returned to the FEMP, and the railcar will be unloaded in the load out area of the RLB. Unloading will be done with conventional earth-moving equipment during an off-shift. If this unloading results in the disposable liner being incapable of being reused (i.e., if it is ripped or torn), it will be folded into the railcar and a new liner will be installed over it. If the fixed liner is damaged during unloading, repairs will be undertaken either in the RLB or the on-site railyard. If the material was rejected because of radiological content or moisture, it will be reblended with other material until it satisfies the Envirocare WAC.

## 3.4 OPERATIONAL CONTINGENCIES

The biggest impact on the ability to process the soil and soil-like materials, is anticipated to be the impact to excavation due to inclement weather; in particular, periods of extensive rain. Not only are there safety considerations associated with the ability to continue work in this type of situation, to continue to work the soil in this weather would adversely impact moisture levels within the soil, thereby impacting the ability to meet the Envirocare WAC. Consequently, the plan is to excavate at a rate greater than the production (i.e., railcar loadout) rate. In doing so, there would be a reserve of soils within the MHB/RLB which could be drawn upon to continue loadout, while excavation activities have stopped.

This weather impact may not only be problematic during the weather event, but also after the event has stopped. Therefore, when inclement weather is anticipated, actions will also be taken to protect the excavation face, such as compacting/grading the area to direct stormwater away and/or covering the area if necessary. In this way, delays in restarting excavation activities will be minimized.

Once an excavation area has been impacted by adverse weather, there are ways to address this impacted soil. Wet soils can either be worked with dry soils, or excavation activities can be moved to an area of dryer soils. Snow is not anticipated to be a problem since it can be moved from the work area with the earth moving equipment. Frozen ground is not expected to be a problem, since the soils can still be excavated, and worked as necessary to accommodate feeding through the grizzly/hopper.

The other general factor which impacts the ability to process materials, both in the areas of excavation and in the facilities, is mechanical failure. In general, the plan is to have the capability to readily repair the equipment or bring in replacement equipment. However, work-arounds may need to be implemented under prolonged conditions. As an example, the option of hauling soils by truck into the MHB or RLB needs to be available should there be prolonged problems with the conveyor.

# 4.0 ENVIRONMENTAL CONTROLS/MONITORING

The purpose of this section is to detail the methods and means which will be utilized to control erosion and sedimentation, and suppress dust, relative to the activities which will be performed in support of First Loadout. These activities, and the locations where they will take place are described/discussed in Sections 2.0 and 3.0. This section addresses both short-term and long-term control measures. Section 5.0 addresses the methods and means which will be utilized to manage stormwater and wastewater during First Loadout. Stormwater/ wastewater sampling during First Loadout is discussed in Section 6.3.

## 4.1 EROSION AND SEDIMENT CONTROL

The methods and means of erosion control will be in compliance with the Ohio Department of Natural Resources (ODNR) "Rainwater and Land Development, Ohio's Standards for Stormwater Management, Land Development, and Urban Stream Protection," Second Edition, 1996 (ODNR Rainwater and Land Development Guidance), and shall be consistent with the existing FEMP Stormwater Pollution Prevention Plan (SWPPP).

### 4.1.1 SP6

For SP6, silt fences will be utilized around the Stockpile to prevent excessive erosion and/or sedimentation during the SP6 excavation period. Silt fence locations will be selected based upon the location of the excavation activities as they progress. At a minimum, silt fences will be positioned along the perimeter of open, disturbed areas which are under excavation. Silt fencing will be field located to follow contours to the extent possible and take advantage of existing vegetation. Silt fence installation and fabrication will be in accordance with Chapter 4 of the ODNR Rainwater and Land Development Guidance. In accordance with the ODNR Rainwater and Land Development Guidance, hay or straw bales will not be used for temporary erosion control.

The use of silt fencing will be complemented with the maintenance of a vegetative cover on undisturbed/unused portions of the Stockpile area, and effective management of any open work faces. Specifically, areas will only be opened for excavation as needed, thereby taking advantage of the natural vegetative cover to help control erosion. As areas are opened, they will be worked (i.e., compacted and contoured) to control erosion. In addition, within 45 days of the work being completed in an area, or if an area remains inactive for over 45 days, the area will be vegetated using a native mix of grasses and/or wild flowers, in accordance with the ODNR Rainwater and Land Development Guidance. As needed, plastic sheeting may be used as a temporary measure on open areas to minimize erosion. In addition, the working area (including haul paths) will be periodically scraped/cleaned to manage any possible spillage from the material hauling activities.

Once installed, silt fencing will be inspected once per week and within 24 hours of any storm event measuring greater than 0.5 inches of rain in a 24-hour period, pursuant to the FEMP SWPPP. These inspections will be documented as required in the FEMP SWPPP. Any required repairs noted during these inspections will be repaired immediately. In addition, any accumulated sediment will be removed when it is found to affect the performance of the silt fence. As silt fencing deteriorates or wears to a point of losing effectiveness it will be removed and replaced. Over the course of the excavation activities, silt fencing will be relocated and reused to the extent that it allows. Upon completion of the activities in this area, temporary erosion control structures, such as silt fencing, will be removed where no longer needed (e.g., where vegetation has been reestablished).

In conjunction with the above controls, the area directly around the hopper will be sloped, compacted, and graded, and additional silt fences installed, as necessary, to direct stormwater and control erosion of material deposited around the hopper. In addition, the hopper area will be administratively controlled to prevent the accumulation of materials, so as to bolster these erosion/sediment control efforts. Specifically, the general plan is to place material directly into the hopper as it is excavated. However, should it be necessary to place the material on the ground near the hopper (e.g., from a dump truck), the plan is that no material beyond that which could be expected to be transferred through the conveyor that day would be placed near the hopper. In other words, material would not be staged near the hopper from day to day.

### 4.1.2 SP7

As material is excavated from SP7, erosion and sediment control practices will continue to be maintained as they are currently defined, with stormwater collected and transferred for treatment through the FEMP stormwater management system. Specifically, areas will only be opened for excavation as needed, thereby taking advantage of any natural vegetative cover to help control erosion. As areas are opened, they will be worked (i.e., compacted and contoured) to control erosion. Within 45 days of the work being completed in an area, or if an area remains inactive for over 45 days, the area will be vegetated in accordance with the ODNR Rainwater and Land Development Guidance or a crusting agent applied.

In terms of the haul route from SP7 to the hopper, it will be compacted and graded, and maintained, so as to facilitate erosion control. To minimize spillage onto the haul route during transport from SP7 to the hopper, the bucket of the front end loader will not be overfilled. In addition, the haul route will be periodically scraped/cleaned, as necessary, to clean up any possible spillage from the front end loaders or dump trucks.

### 4.1.3 Plant Facilities Area

It should be kept in mind that the plant facilities area will be in a state of flux during some portion of the period of First Loadout. Specifically, although construction will have been completed in some areas, it will be active in others. Prior to the completion of construction activities, the plant facilities area will be graded to promote proper drainage of stormwater into the existing stormwater collection system, in accordance with the approved Pre-Operational Environmental Control Plan, which was a part of the approved RD Package. As construction is completed (i.e., when areas are no longer being disturbed), the area will be vegetated in accordance with the ODNR Rainwater and Land Development Guidance. In addition, silt fencing which was installed at the plant facilities area during the pre-operations phase of the project will be maintained until sufficient vegetative cover is provided to protect against erosion. After construction is complete in the plant facilities area, and the vegetative cover has taken hold, erosion and sediment control is not expected to require frequent corrective actions.

## 4.2 DUST CONTROL

Overall, dust control measures will be implemented, as necessary, to mitigate dusting conditions, and to comply with the FEMP Sitewide Dust Control Policy.

### 4.2.1 SP6/SP7

The nature of the subject activities is such that opportunities will be present for the generation of dust. To minimize dust generation, the excavation will be organized and implemented such that open/disturbed areas are minimized. By not disturbing areas until it is necessary, the existing vegetation will serve to minimize the likelihood of dust generation. Then, by reestablishing a vegetative cover as soon as is practical following excavation (as discussed in Section 4.1), and/or by using temporary covers, as necessary, this benefit will again be realized.

Once an area is disturbed, thereby increasing the likelihood that dust will be generated, it will be necessary to manage/minimize the amount of dust generated. The primary method to be used for dust suppression will be water sprays. The water spray will be delivered by conventional means such as water trucks, portable pumps, sprinklers, and spray nozzles. Water will be applied to excavations in progress, access roads, and work areas (e.g., hopper loading operations), as necessary to control dust. Water will be applied judiciously to avoid runoff, ponding, or the generation of mud, and also so as not to adversely impact the moisture content relative to meeting the Envirocare WAC. The application of water will be dependent on the ambient conditions, being more frequent during warm weather and under breezy conditions when dryout would occur more rapidly. During the winter season, dust suppression will require extra care to control dust, so as not to create a freezing or ice hazard in work areas. If necessary, non-toxic surfactants (or crusting agents) may be used for dust control in lieu of water spray (e.g., due to ambient conditions).

Minimization of dust generation along the haul route between SP7 and the hopper will focus on both the transport vehicles and maintenance of the haul route, and will be consistent with the FEMP Sitewide Dust Control Policy. Because of the relatively short distance between SP7 and the hopper, it is not expected that the materials being transported will have an opportunity to become airborne, there are no plans to cover the material during transport. Instead, fugitive dust generation during transport will be minimized, as necessary, through the application of water sprays before and/or during loading. For the haul route, vehicle traffic will be limited to only those vehicles necessary, vehicle speeds will be limited, and water trucks will be used, as necessary, to control fugitive dust.

### 4.2.2 Plant Facilities Area

It should be kept in mind that the plant facilities area will be in a state of flux during some portion of the period of First Loadout. Specifically, although construction will have been completed in some areas, it will be active in others. Prior to the completion of construction activities in an area, therefore, the control of fugitive dust will be in accordance with the approved Pre-Operational Environmental Control Plan, which was a part of the approved RD Package.

Once construction is complete, the plant area will be comprised of new gravel and concrete access roads, buildings, and vegetated work areas. Those areas which are disturbed during the plant facilities construction, but will not be utilized for buildings, roads, or other work requirements will be revegetated in order to minimize erosion and dust generation. Dust control on the concrete and gravel roads will be maintained using water spray delivered by water trucks, portable pumps, sprinklers, and spray nozzles.

Dust suppression within the MHB and the RLB will be accomplished via a water spray from portable hoses and nozzles. Water will be applied as necessary to the floors of the buildings to ensure that dust generation does not occur. Multiple handling of dry material will be minimized to the extent practical. Relative to the conveyor itself, it will be enclosed, and equipped with water spray suppression systems to control airborne dust at the outfeed.

### 4.2.3 Dust Monitoring

Monitoring for dust will be performed visually in accordance with the FEMP Sitewide Dust Control Policy. It will be the responsibility of each worker to observe his/her work area for the potential and actual generation of dust. This will be reported to the supervisor or team leader, who will then arrange for immediate wetting of the area or implementation of other measures to eliminate the dust. If necessary, the work area will be minimized or work stopped until the dust can be controlled.

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# 5.0 STORMWATER/WASTEWATER MANAGEMENT

Because of the nature of the materials being handled under First Loadout, and the activities which constitute First Loadout, it is not expected that a significant amount of stormwater and/or wastewater will be generated during First Loadout. The following sections, however, discuss what will be done to manage that stormwater/wastewater which will be generated.

## 5.1 CATEGORIES OF STORMWATER/WASTEWATER

The water generated during First Loadout is only a small portion of that expected to be generated during full facility operations (see Section 2.8 of the Description of Operation and Process in the RD Documents Package), and can be categorized as either nonprocess wastewater or noncontact stormwater based on its source. There will be no process wastewater or contact stormwater generated as a result of activities being performed in support of First Loadout.

To facilitate discussion of these site water categories, the following definitions are provided for use (with a specific focus on only those sources which will be in place during First Loadout):

- **Noncontact Stormwater.** Stormwater that does not contact any raw waste or surfaces potentially contaminated by raw waste. Examples include roof drains, stormwater that lands on SP6, and stormwater that falls on the ground outside the plant facility buildings and is diverted to the Stormwater Management (SWM) Pond or to existing drainage swales.

- **Nonprocess Wastewater.** Water streams to be discharged to the Clearwell, before being transferred to the Biodenitrification Surge Lagoon (BSL) for treatment by the FDF Advanced Wastewater Treatment (AWWT) Facility. Examples include laboratory wastewater, laundry wastewater, personnel decontamination shower wastewater, respirator wash water, drainage water and excess dust suppression spray collected in the sumps in the buildings, and decontamination water.

It should be kept in mind that the remainder of the plant facilities area will be in a state of flux during some portion of the period of First Loadout. Specifically, although construction will have been completed in some areas, it will be active in others. Stormwater management within those areas not associated with First Loadout will continue in accordance with the approved Pre-Operational Environmental Control Plan, which was a part of the approved RD Package.

## 5.2 STORMWATER/WASTEWATER MANAGEMENT

### 5.2.1 SP6

Presently, all of the stormwater which falls within the limits of the area around SP6 drains to the south where it feeds into an existing ditch along the north side of Second Street. This water eventually flows to an existing 30-inch drain that discharges to the Pilot Plant Drainage Ditch, and is ultimately discharged to Paddys Run through National Pollutant Discharge Elimination System (NPDES) Outfall 4005. In support of the subject activities, no change to this stormwater flow pattern is planned.

As discussed in Section 4.1.1, there are various controls which will be put in place to minimize the potential for erosion/sedimentation. With these controls, and the contaminant levels associated with the subject soils, it is not expected that stormwater which flows from the area of SP6 will be adversely impacted. This expectation of minimal stormwater contamination is evidenced by the levels of uranium found during the time period when SP6 was open for material placement (see Figure 5-1). In other words, there is no perceived value seen to collecting and treating this stormwater prior to discharge (see Section 6.3).

### 5.2.2 SP7

As for SP7, the stormwater which falls in and around this area is and will continue to be collected through the existing FEMP stormwater collection system.

As discussed in Section 4.1.2, there are various controls which will be put in place to minimize the potential for erosion/sedimentation along the haul route between SP7 and the hopper. With these controls, it is expected that stormwater falling on the haul route will be effectively directed so as to minimize the spread of contamination, with the expectation that this stormwater will have no adverse impacts.

### 5.2.3 Material Handling Building/Railcar Loadout Building

The MHB will contain three collection sumps. Water from the material being handled in the mixing pits will collect in a sump to the south of these pits. The trench from the mixing pits to the sump will include a weir to minimize accumulation of solids in the sump. Water draining from material stock piles in the storage bins along the east wall of the building will

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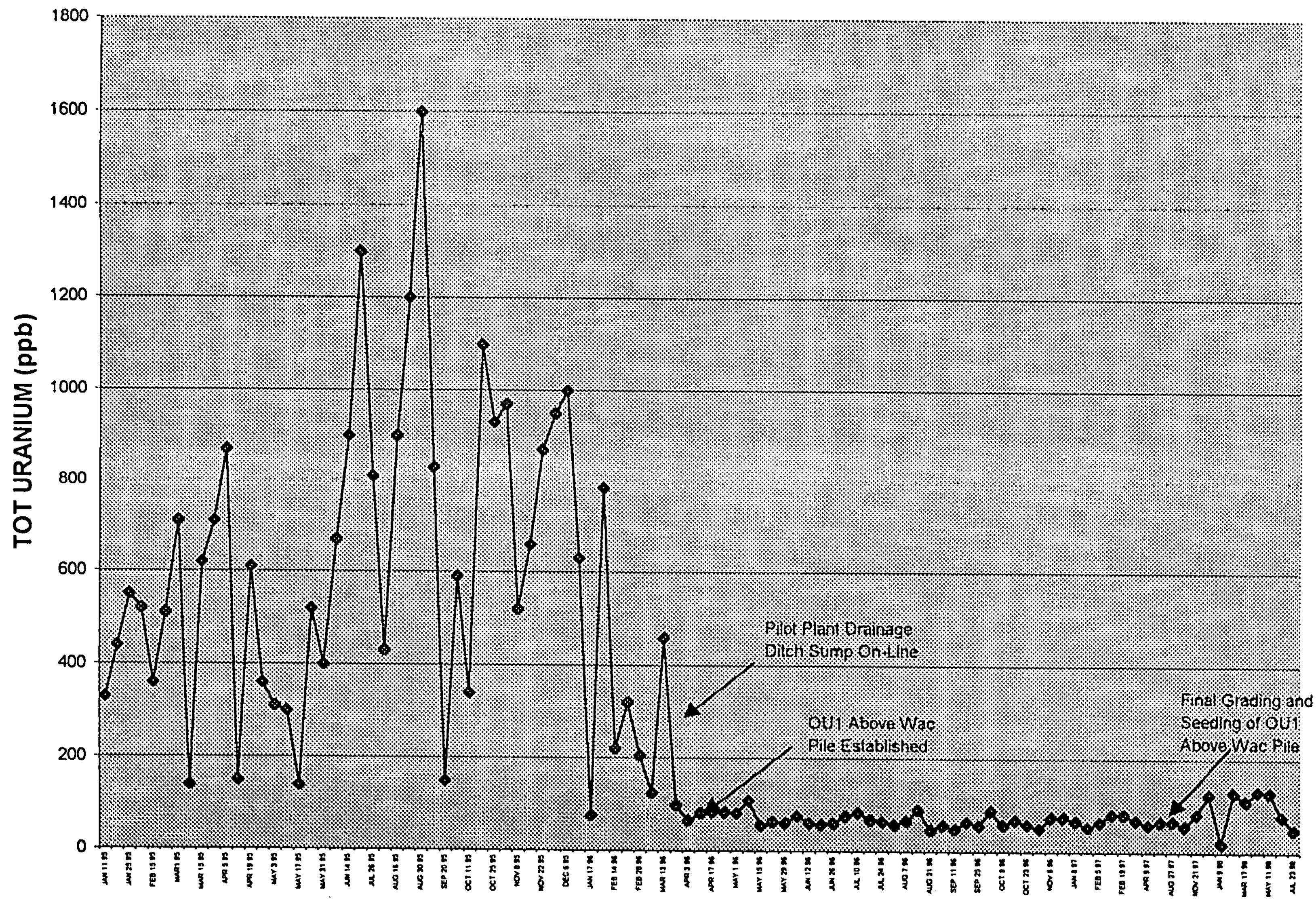


Figure 5-1 SWD-03 Uranium History

be collected by an open trench behind the storage bins. This trench will be sloped to a sump in the center of the trench. The connection between the trench and the sump will include a weir to minimize the accumulation of solids in the sump. A third sump will be located in the southwest portion of the building near the future location of the filter press. The floor in this area will be sloped to drain free water to the collection sump. Each collection sump will contain a single sump pump and will transfer water to the MHB Collection Tank. The average flow rate from the three sumps in the MHB is not expected to be greater than 228 gpd average.

The RLB contains three collection sumps. Water from railcar decontamination and excess water from dust suppression spraying will be collected by these sumps. Each sump will contain a dedicated sump pump. The sump pumps will transfer the water to the MHB Collection Tank. The average flow rate from the RLB is not expected to be greater than 1,200 gpd.

Wastewater from collection sumps in the MHB and RLB will be pumped to the MHB Collection Tank. The tank will be an above ground storage tank with an open top, located along the wall in the MHB. The tank will have a horizontal centrifugal pump mounted outside the tank, and the level in the tank will be monitored. The discharge pump will transfer water from the tank to the Clearwell. MHB and RLB wastewater may alternatively be transferred by portable tank to the BSL.

### 5.2.4 Other Areas

The following sections provide an identification of the other nonprocess wastewater and noncontact stormwater sources that will originate during First Loadout, as well as discussion about how these sources will be managed.

#### 5.2.4.1 Nonprocess Wastewater

As discussed in Section 2.1, various support facilities are planned/desired in support of First Loadout. Even if these facilities are used, however, wastewater flows will be less than those expected during full operations. The following sections describe the method by which the water will be collected and transferred, and the expected flow rate during full operations (for a point of reference).

**Laundry Water** Wastewater from the washing machines in the laundry facility will flow by gravity from the laundry facility to the Grey Water Collection Sump as needed. During full operations, the laundry facility will generate approximately 750 gpd average over a seven-day week.

**Respirator Wash Water** Wastewater from the respirator wash facility will flow by gravity from the respirator wash facility to the Grey Water Collection Sump. During full operations, the respirator wash facility will generate approximately 100 gpd average over a seven-day week.

**Laboratory Wastewater** Wastewater generated in the on-site laboratory will be pumped to the Grey Water Collection Sump. This wastewater is generated as a result of analytical activities. During full operations, the average flow rate from the laboratory is not expected to be greater than 100 gpd.

Wastewater from the laundry facility, laboratory, and respirator wash facility will be transferred to the Grey Water Collection Sump, which will be discharged to the Clearwell for eventual discharge to the BSL.

#### 5.2.4.2 Noncontact Stormwater

Stormwater collected from certain areas within IT's work area in OU1 is not expected to contact contaminated materials. These areas include:

- The ground west and south of the RLB, including the area around the warehouse and the laboratory

- The access road that runs along the north and east sides of the BSL

- The roofs of the MHB, the RLB, the Railcar Prep and Liner Storage Building, and the Gas Cleaning System (GCS)/Wastewater Treatment System (WTS) Building.

Stormwater from these areas is not expected to be contaminated. Stormwater from the area identified in the first bullet will flow to Paddys Run, through the Pilot Plan Drainage Ditch and NPDES Outfall 4005. Stormwater from the area identified in the second and third bullets will be directed to the SWM Pond. Roof drains from the MHB and the RLB will be directed into the SWM Pond. Roof runoff from other WPRAP buildings and structures may be directed to the collection basins or to other surface drainage features.

Stormwater collected in the SWM Pond will be transferred to the Clearwell or directly to the BSL. Water collected in the SWM Pond may alternatively be used for dust suppression, or Waste Pit 5 or Waste Pit 6 water cap management.

In the event of a 25-year, 24-hour storm event, the water in the SWM Pond naturally overflows to a series of smaller ponds north of the SWM Pond and eventually to drainage swales along the north boundary of OU1 to Paddys Run.

# 6.0 SAMPLING AND ANALYSIS

The purpose of this section is to address the sampling and analysis which will be performed specifically in support of First Loadout. As discussed in Section 6.1, the plan for the characterization of SP6 and SP7 to determine compliance with the Envirocare WAC will be a combination of in-situ sampling as well as some minimal sampling in the bins of the RLB. Section 6.2 describes the approach to be utilized to demonstrate that the materials in SP6 and SP7 meet the definition of U. S. Department of Transportation (DOT) Low Specific Activity (LSA-I) material. Finally, Section 6.3 provides discussion relative to the approach for sampling of stormwater/wastewater under First Loadout.

## 6.1 SP6/SP7 CHARACTERIZATION FOR ENVIROCARE

The plan for characterization of the soil and soil-like material in SP6 and SP7, involves a two step process, wherein a majority of the sampling is performed in-situ, with the only sampling in the bin being in support of ascertaining compliance with Envirocare requirements which are impacted by the moisture content of the material. The specifics relative to these sampling efforts and the associated analyses are discussed in the following sections.

### 6.1.1 In-Situ Characterization

As discussed above, a majority of the sampling of the SP6 and SP7 materials, will be performed in-situ. The basis for this sampling approach, and the planned sampling and analysis program are contained in the Project Specific Plan (PSP) included as Attachment C.

### 6.1.2 Railcar Loadout Building Sampling

As stated above, and as presented in the PSP, included as Attachment C, the plan for sampling and analysis is to perform as much sampling as possible of SP6 and SP7, in situ. The exception to this, is sampling of the material relative to requirements which are affected by the moisture content of the material. Because the sampling program detailed in Attachment C is being performed prior to excavation of the soil and soil-like materials from SP6 and SP7, and because these materials will continue to be susceptible to impacts from the weather (i.e, rain and/or dry conditions) for a couple of months, ascertaining compliance with moisture related requirements, as a part of this in-situ program, is not practical. Accordingly, sampling of the materials for determining compliance with the Envirocare requirements for moisture content, for optimum moisture for compaction, and for free liquids, will be performed in the RLB bins.

The specifics of this sampling and analysis program are contained in the PSP included as Attachment C of the Plan.

## 6.2 LSA 1 DETERMINATION

Determining the appropriate DOT hazard class of SP6/SP7 material (i.e., whether it will require shipment as nonradioactive or LSA-1) can be accomplished in one of the following ways:

1) Determining if the material meets the DOT definition for radioactive materials, which is defined in 49 CFR 173.403, as "...material having a specific activity greater than 70 Bq per gram (0.002microcurie per gram)."

2) If determined to be a DOT radioactive material, determining through analytical data (i.e., from the in-situ sampling performed pursuant to Section 6.1.1) that the material meets the definition of LSA-1 waste, as defined in 49 CFR 173.403, by performing the following calculation:

$$\sum_{i=1}^{n} (a_i/A_{2i}) < 10^{-6}$$

Where $a_i$ is the activity of the i radioisotope and $A_{2i}$ is the DOT $A_2$ value of the i isotope.

Since it can be shown that the activities of minor isotopes are of no consequence in the calculation of LSA-1, the above calculation will be made for the following isotopes:

U234, U235, U238
Th228 (Ac228), Th230, Th232 (Ac228)
Ra226, Ra228 (Ac228)
Ac228
Cs137

Based on the relatively low levels of radioactivity in SP6 and SP7, it is anticipated that this material will be well below the LSA-1 criteria. The final calculations, however, will be based on the sampling and analysis data collected under the program discussed in Section 6.1.1.

## 6.3 STORMWATER/WASTEWATER

As can be seen from the discussion in Section 5.0, the quality and quantity of stormwater and wastewater generated during the period of First Loadout is not expected to be significant. As such, it is expected that this stormwater/wastewater will not adversely impact the FEMP's current stormwater/wastewater management activities. Accordingly, there is no plan to perform specific sampling of the stormwater and wastewater generated during First Loadout, as discussed below.

Because of the nature of the soils and soil-like materials (i.e., the types of contaminants and their expected levels), which will form the qualitative basis of the wastewater discharges to the BSL, it is not expected that this wastewater will adversely impact AWWT operations, including the ability to comply with the NPDES permit. Therefore, no sampling of this wastewater is planned prior to discharge.

As discussed in Section 5.2.1, and shown in Figure 5-1, it is not expected that the stormwater which comes from the SP6 area will be adversely impacted by the excavation and associated material management activities. As such, there is no specific sampling planned of the stormwater being generated from this area. It should be noted, however, that this stormwater eventually discharges to an existing 30-inch storm drain that discharges to the Pilot Plant Drainage Ditch, and that the discharge from this drain is sampled under the Integrated Environmental Monitoring Plan (IEMP) as sampling point SWD-03. SWD-03 is currently sampled monthly for total uranium. The continued sampling of the stormwater at this point, pursuant to the IEMP should provide information necessary to quantify any impacts from the subject stormwater discharges.

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# 7.0 OFF-SPEC MATERIALS MANAGEMENT

Under First Loadout, it is important to note that the facilities and equipment to be utilized are directed toward processing material consisting of soil and/or soil-like material which meets the Envirocare WAC. Accordingly, even if a material could be handled during full scale operations (e.g., thorium contaminated waste, oversized debris, etc.), this same material will not be suitable for processing during First Loadout. Therefore, this off-spec material must be managed (e.g., stored) until the facilities are available, at which time it will be transferred to the remediation facilities.

Although highly unlikely, it is also possible that material which will never be able to be processed through the remediation facility for disposal at Envirocare may be encountered during the First Loadout materials management activities. These off-spec materials will be handled in a manner similar to those Non-Typical wastes encountered during operations, in that they will be turned over to FDF for management (see Section 7.3).

## 7.1 SP6/SP7

As stated in Section 3.1, the focus of the soil transfer activities under First Loadout, relates to the transfer to the remediation facilities, via the hopper/conveyor, of soil and soil-like material which meets the Envirocare WAC from a radiological and chemical constituent basis. Accordingly, a necessary part of this Plan, and the subject of this section, is to address the measures to be taken to segregate out materials which do not fit these criteria (e.g., larger debris, radiological hot spots), and then to manage those materials.

Through the excavation, transfer, and loading of the soils (into the hopper), operators will be trained to spot materials which do not fit the above profile. Through this "trained eye" training, the plan is to be observant of the material being handled, and if these non-conforming materials are found, to set them aside. Any off-spec materials will be placed in a pile, away from the working face, until such time as the remediation facility can accept such material. When the remediation facility is ready to accept this material, it will be placed in containers, trucks, etc. and transferred to the remediation facility, where it will be managed and loaded into railcars consistent with similar materials found through the waste pit excavations (as discussed in the RD and RA Documents Packages). If the off-spec material can never be processed through the WPRAP remediation facility (i.e., it is Non-Typical waste), it will be set aside for management by FDF, as discussed in Section 7.3.

In addition to these segregation activities, the hopper itself will contain a grizzly for the purpose of knocking out materials larger than approximately 3 - 4 inches in diameter. Periodically, this material will be removed from the point where it is discharged from the hopper. To the extent that this material can be size reduced with existing earth moving equipment (i.e., if it contained large clumps of dirt), this will be done, and the material will be fed once again into the hopper. Any material which cannot be easily size reduced, will be placed aside and managed as discussed above.

## 7.2 MATERIAL HANDLING BUILDING

As stated in Section 3.2, due to the segregation activities which will have taken place during excavation, it is not anticipated that the material being managed within the MHB will contain any non-spec materials. However, as is the plan for the excavation activities (see Section 7.1), operators within the MHB will maintain an awareness of the material as it is being handled, and based on training as to what material is acceptable for processing, will segregate any off-spec materials found. If this off-spec material can eventually be processed through the remediation facility, it will be placed in an area of the MHB away from the general working area, until such time as the facility can process the material. If the off-spec material can never be processed through the remediation facility (i.e., it is Non-Typical waste), it will be set aside for management by FDF, as discussed in Section 7.3.

## 7.3 NON-TYPICAL WASTE

If materials are encountered during the excavation and/or processing activities discussed in Sections 3.0, 7.1 and 7.2, which in their present form will not meet the Envirocare WAC (e.g., pyrophoric materials, small explosive devices, compressed gas cylinders, transformers, unopened intact drums, large debris, polychlorinated biphenol (PCB) wastes, etc.), such Non-Typical materials will be segregated for assessment. The assessment will involve a determination as to whether the material can be treated or size-reduced to meet the Envirocare WAC. If this material can eventually be processed through the remediation facility, it will be placed aside, away from the general working area, until such time as the facility can process the material. Non-Typical materials which cannot be processed to meet the Envirocare WAC will be segregated according to guidance provided by FDF and placed in containers for transfer to FDF for further handling and disposition. It should be noted that soil and soil-like materials were used for the construction of SP6 and SP7, and therefore, the only type of Non-Typical material that is expected to be encountered in these stockpiles is over-sized debris.

# 8.0 ACHIEVING FULL OPERATION

As discussed in Section 1.0, First Loadout represents a phase of the OU1 remediation process, which allows for WPRAP to meet the March 1, 1999 enforceable milestone of initiation of operations, while continuing to bring the remediation facility into full operational status (i.e., completing construction and start up activities for the remainder of the facilities). The purpose of this section is to provide details relative to the plan for achieving full operational status, with the goal of completing the remediation of OU1 in accordance with the enforceable milestone date of May 31, 2005.

## 8.1 PHASING OF REMEDIATION

With the implementation of First Loadout, WPRAP is adopting a phased approach to fulfilling the requirements of the OU1 ROD, the RA Work Plan, and the RD Documents Package. While providing for a means of meeting the March 1, 1999 milestone without the benefit of all of the facilities being completed, this phased approach also allows operations to progress in a manner wherein new challenges can be addressed with potentially less problems than if the facility were to rely on full operations from the beginning. In other words, this phased approach provides for a way for WPRAP to ease into full operations. The intent of this phasing is to provide for a seamless progression through remediation (i.e., to fulfill the CERCLA requirement for substantial, continuous physical on-site remedial action).

The initial phase (i.e., First Loadout) allows operations personnel to begin working to procedures which they will be using during full operations, while working with a material which will be less problematic than actual waste pit materials. The next phase of the project involves bringing the facility into full operation, with the intent of processing waste pit materials. Full operation means that excavation of the waste pits will be under way and that the dryers, the gas cleaning system, and the wastewater treatment system will be operational. Full operation of the system may involve excavation and processing of dry pit materials without use of the dryer. Dryer use will depend on field observations and measurements to ascertain whether thermal drying is required or whether admixing of wet and dry soils/waste can achieve the desired moisture content. It is expected that all facilities, including the dryer, will become fully operational by August 15, 1999.

## 8.2 IMPACT ON APPROVED ACTIVITIES/PLANS

As stated in previous sections, the phasing of WPRAP activities is consistent with, and meets the commitments of, the OU1 ROD and other approved OU1 documents (e.g., the RD Work

Plan, the RA Work Plan, and the RD Documents Package). Specifically, through phasing of the project, there is no change in the facilities to be constructed, and similarly, there is no change to the activities to be performed in support of the remediation. As such, there generally appears to be no impact on the approved activities and plans, and no need to therefore modify existing approved documents. The one exception to this, however, is the impact of these activities on the Excavation Plan. Because the soil and soil-like materials to be processed through First Loadout are shown to be spread throughout many of the excavation phases identified in the Excavation Plan, there will be some impact to this approved Plan. However, until it is known how much of this material will be processed through First Loadout, the exact impact on this Plan cannot be ascertained. When the quantity to be processed is known, the excavation phasing will be reassessed, and, as necessary, the Excavation Plan will be revised to reflect any needed modifications. If revised, the Excavation Plan, or portions thereof (i.e., change pages) will be submitted to the EPAs for review and approval.

# ATTACHMENT A

## Mark-Up of PFD D-15-10-001 to Reflect First Loadout Activities

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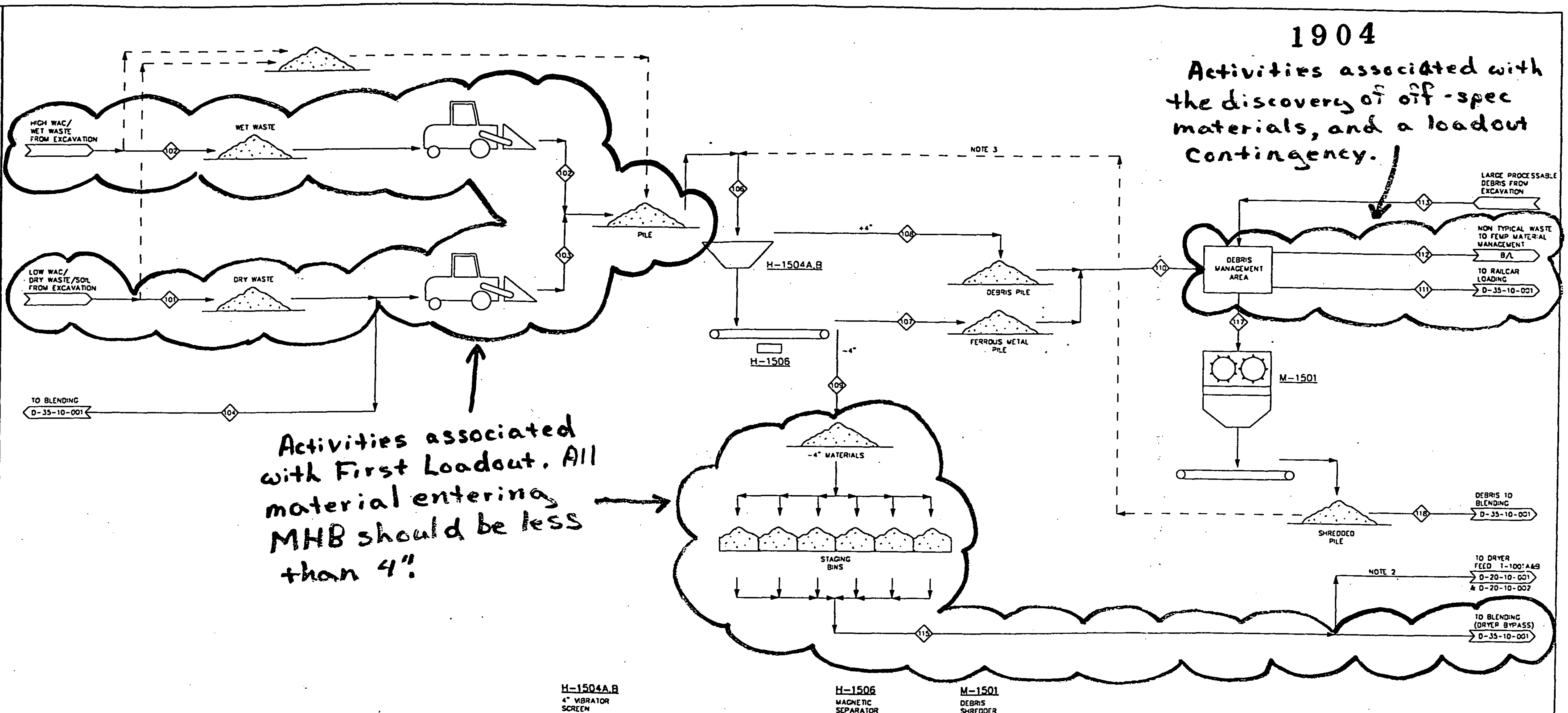
DRAWING NUMBER D-15-10-001




000053

| STREAM NO. / COMPONENT | | 101 (NOTE 1) LOW WAC WASTE FROM EXCAVATION | 102 (NOTE 1) HIGH WAC WASTE FROM EXCAVATION | 103 WASTE TO SIZE REDUCTION | 104 WASTE TO BLENDING | 106 WASTE TO SCREEN | 107 FERROUS METAL | 108 OVERSIZE | 109 SCREEND MATERIAL | 110 DEBRIS | 111 DEBRIS TO LOADER | 112 DEBRIS TO FDF | 113 LARGE DEBRIS FROM EXCAVATION | 115 SOLIDS TO DRYER | 117 MATERIAL TO SHREDDER | 118 DEBRIS TO BLENDING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVERAGE CONDITION | | | | | | | | | | | | | | | | |
| $H_2O$ | LB/HR | | | | | | | | | | | | | 18,400 | | |
| SOIL/PARTICULATE | LB/HR | | | | | | | | | | | | | 25,300 | | |
| ORGANICS | LB/HR | | | | | | | | | | | | | 2,300 | | |
| TOTAL MASS FLOW | LB/HR | | | | | | | | | | | | | 46,000 | | |
| VOLUMETRIC FLOW | ACFM (GPM) [YD²] | | | | | | | | | | | | | | | |
| TEMPERATURE | °F | AMB | AMB | AMB | AMB | AMB | AMB | AMB | AMB | AMB | AMB | AMB | AMB | 60 | | |
| PRESSURE | IN. W.C. (PSI) | | | | | | | | | | | | | ATM | | |
| ENTHALPY | MM BTU/HR | | | | | | | | | | | | | | | |

NOTES:
1. QUANTITY VARIES BY PHASE - SEE EXCAVATION PLAN.
2. STREAM 115 FEEDS TWO THERMAL DRYER UNITS (TDU) EQUALLY DISTRIBUTED AS STREAM 116 ON D-20-10-001 AND D-20-10-002.
3. ALTERNATE PATH FOR WET MATERIALS.

**FOR INFORMATION ONLY**
**NOT FOR CONSTRUCTION**

| REV | DATE | BY | CHK'D | APPR'D | DESCRIPTION |
|---|---|---|---|---|---|
| 0 | 8/25/98 | JWH | JAN | CHH | FINAL RD PACKAGE |

FLUOR DANIEL FERNALD
WASTE PITS REMEDIAL ACTION PROJECT (WPRAP) FERNALD, OHIO FDF SUBCONTRACT NO. 98SC000001

PROJECT NAME: WASTE PITS REMEDIAL ACTION PROJECT (WPRAP)

TITLE: AREA 15 PROCESS FLOW DIAGRAM MATERIAL HANDLING

INTERNATIONAL TECHNOLOGY CORPORATION
... Creating a Safer Tomorrow

| | | | | |
|---|---|---|---|---|
| DESIGNED BY | DOP | CHECKED BY | JAN | REVISION |
| DRAWN BY | JWH | APPROVED BY | CHH | |
| DATE | 12/31/97 | DWG. SCALE | NONE | 0 |
| IT PROJECT NO. | 773481 | DRAWING NO. | D-15-10-001 | |

1904

# ATTACHMENT B

## Mark-Up of PFD D-35-10-001 to Reflect First Loadout Activities

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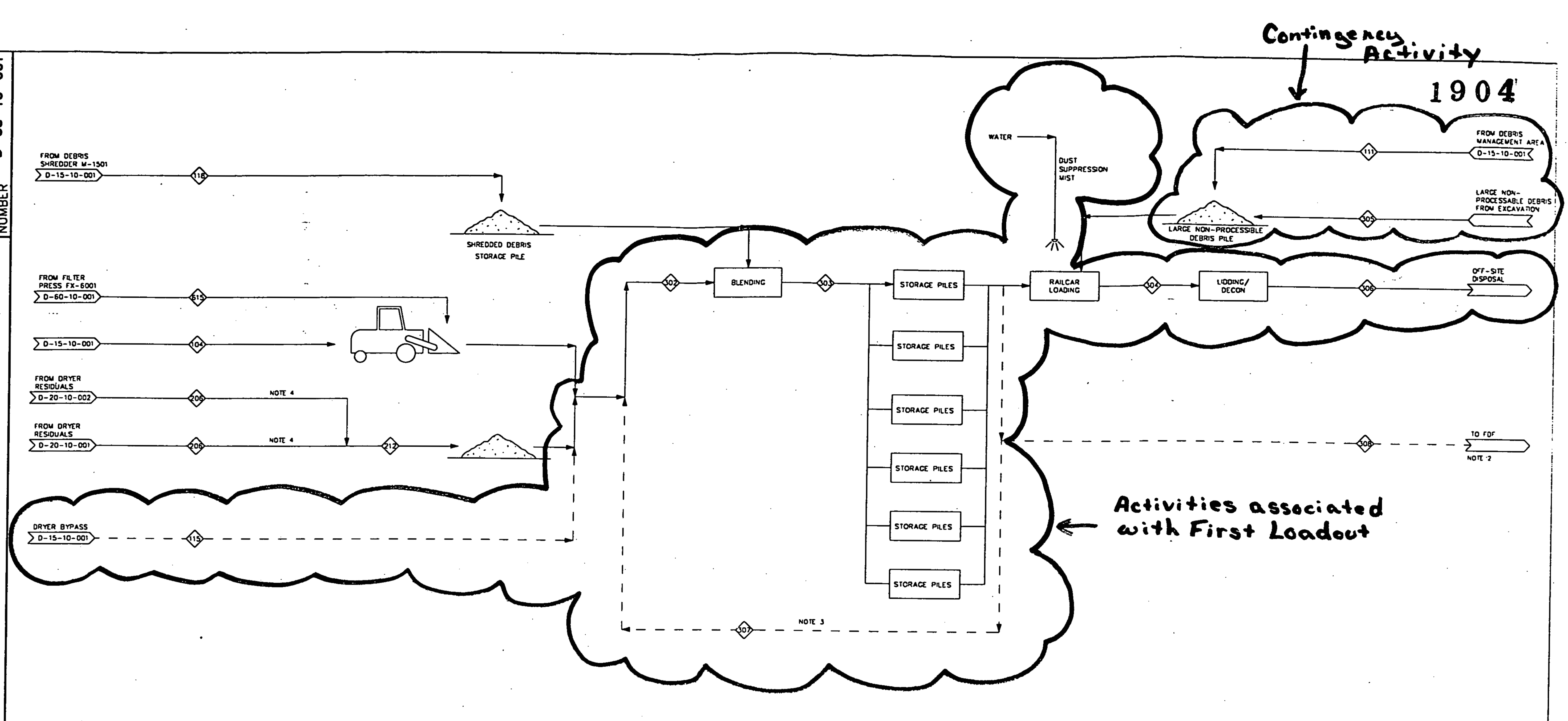
DRAWING NUMBER D-35-10-001




000056

| STREAM NO. / COMPONENT | 104 (NOTE 1) | 111 (NOTE 1) | 115 | 118 | 212 | 302 | 303 | 304 | 305 | 306 | 615 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-DRIED WASTE FOR BLENDING | LARGE NON-PRESSABLE WASTE FROM WASTE PROCESSING | DRYER BYPASS MATERIAL | SHREDDED MATERIAL | DRIED WASTE | WASTE TO BLENDING | BLENDED WASTE | RAILCAR LOADOUT | NON-PROCESSABLE WASTE FROM EXCAVATION | WASTE TO PCDF | FILTER CAKE |
| AVERAGE CONDITION | | | | | | | | | | | |
| $H_2O$ LB/HR | | | | | 2,894 | | | | | | 1,592 |
| SOIL/PARTICULATE LB/HR | | | | | 23,784 | | | | | | 1,592 |
| ORGANICS LB/HR | | | | | 2,264 | | | | | | 1.5 |
| TOTAL MASS FLOW LB/HR | | | | | 28,940 | | | | | | 3,185 |
| VOLUMETRIC FLOW ACFM (GPM) | | | | | | | | | | | |
| TEMPERATURE °F | AMB | | AMB | | 175 | | | | | | 135 |
| PRESSURE IN. W.C. (PSI) | | | | | | | | | | | |
| ENTHALPY MM BTU/HR | | | | | | | | | | | |
| CARS/DAY AVG/MAX | | | | | | | | 6/8 | | 6/8 | |

NOTES:

1. VARIES WITH PHASE - SEE EXCAVATION PLAN.
2. IN THE UNLIKELY EVENT THAT SAMPLING AND ANALYSIS INDICATES RCRA CHARACTERISTIC WASTE IT WILL BE TURNED OVER TO FDF.
3. IN THE UNLIKELY EVENT THAT SAMPLING AND ANALYSIS INDICATES WASTE IN A STORAGE BIN DOES NOT MEET CDF WAC FOR MOISTURE OR RADIONUCLIDES IT WILL BE REBLENDED.
4. STREAM 206 FROM EACH DRYER ARE COMBINED AS STREAM 212.

**FOR INFORMATION ONLY**
**NOT FOR CONSTRUCTION**

| REV | DATE | BY | CHK'D | APR'VD | DESCRIPTION |
|---|---|---|---|---|---|
| 0 | 8/25/98 | JWH | JAN | CHH | FINAL RD PACKAGE |

FLUOR DANIEL FERNALD
WASTE PITS REMEDIAL ACTION PROJECT (WPRAP) FERNALD, OHIO FDF SUBCONTRACT NO. 98SC000001

PROJECT NAME: WASTE PITS REMEDIAL ACTION PROJECT (WPRAP)

TITLE: AREA 35 PROCESS FLOW DIAGRAM RAILCAR LOADING/LIDDING

INTERNATIONAL TECHNOLOGY CORPORATION
... Creating a Safer Tomorrow

| | | | | |
|---|---|---|---|---|
| DESIGNED BY | | CHECKED BY | JAN | REVISION |
| DRAWN BY | JWH | APPROVED BY | CHH | |
| DATE | 12/31/97 | DWG. SCALE | NONE | 0 |
| IT PROJECT NO | 773481 | DRAWING NO. | D-35-10-001 | |

1904

# ATTACHMENT C

## Project Specific Plan (PSP) for the Sampling and Analysis of SP6 and SP7

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1904

# PROJECT SPECIFIC PLAN FOR SAMPLING AND ANALYSIS OF FIRST WASTE LOADOUT MATERIALS FOR OPERABLE UNIT 1

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

DECEMBER 1998

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

60500-PSP-0002
REV. 0
FINAL

1904

# PROJECT SPECIFIC PLAN FOR SAMPLING AND ANALYSIS OF FIRST WASTE LOADOUT MATERIALS FOR OPERABLE UNIT 1

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

DECEMBER 1998

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

FINAL

000060

# PROJECT SPECIFIC PLAN FOR SAMPLING AND ANALYSIS OF FIRST WASTE LOADOUT MATERIALS FOR OPERABLE UNIT 1

**Project Number: 60500-PSP-0002**
**Revision: 0**
**Prepared by: Fluor Daniel Fernald**
**Prepared for: U.S. Department of Energy**

**Fernald Field Office**
**Contract DE-AC05-92OR21972**

APPROVAL:

12-23-98

Susan Lorenz, Manager — Date
Waste Acceptance Organization

12/23/98

Vicky L. Zimmerman, Sampling and Data Lead — Date
Waste Acceptance Organization

Tom Buhrlage for Mike Frank — 12/23/98

Mike Frank, Manager — Date
Soil and Miscellaneous Media Projects

12-23-98

Reinhard Friske, Quality Assurance — Date

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**
**Fluor Daniel Fernald**
**P.O. Box 538704**
**Cincinnati, Ohio 45253-8704**

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# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ASL | Analytical Support Level |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| COC | Constituent of Concern |
| FDF | Fluor Daniel Fernald, Inc. |
| FEMP | Fernald Environmental Management Project |
| HPGe | High Purity Germanium detection system |
| mg/kg | milligrams per kilogram |
| OEPA | Ohio Environmental Protection Agency |
| OSDF | On-Site Disposal Facility |
| PPE | personal protection equipment |
| ppm | parts per million |
| PSP | Project Specific Plan |
| QA/QC | quality assurance/quality control |
| RWP | Radiation Work Permit |
| SCQ | Sitewide CERCLA Quality Assurance Project Plan |
| SED | Sitewide Environmental Database |
| SEP | Sitewide Excavation Plan |
| VR/FCN | Variance Request/Field Change Notice |
| WAC | waste acceptance criteria |
| WAO | Waste Acceptance Organization |
| WPRAP | Waste Pits Remedial Action Project |

# 1.0 INTRODUCTION

## 1.1 BACKGROUND

This Project Specific Plan (PSP) describes the sampling and analysis activities for characterizing materials designated as "first waste loadout" materials under the Fernald Environmental Management Project's (FEMP's) step-wise approach for shipping Operable Unit 1 waste materials offsite for disposal. This PSP is a stand-alone component of the First Waste Loadout Work Plan, which has been prepared for the Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (OEPA) to describe the first waste loadout concept and its accompanying remedial action facilities and activities.

The PSP is also intended to serve as the Department of Energy's (DOE's) contract-required Sampling and Analysis Plan (SAP) for first waste loadout, as specified in DOE's June 30, 1998 contract with Envirocare of Utah. By contract, this SAP is to be submitted to Envirocare for their review, to ensure that mutually agreeable approaches and procedures for material characterization are being implemented. The plan is to be updated when necessary so that it remains current at all times.

As part of the first waste loadout concept, material from two FEMP soil stockpiles (soil stockpiles 6 [SP-6] and 7 [SP-7]) will be utilized to accomplish first loadout material excavation, railcar loading, shipment, and off-site disposal at the Envirocare commercial disposal facility. Stockpile SP-6, also known in certain FEMP documents as the "Mt. Di" stockpile, will be excavated first, followed by SP-7 several months later once the SP-6 pile has been depleted and successfully shipped offsite.

The PSP describes the in-situ sampling and analysis strategy deemed necessary to characterize the first loadout materials for acceptance by the Envirocare facility, as part of an overall waste acceptance criteria (WAC) attainment demonstration process. The plan also describes the post-excavation characterization activities for the physical properties of the material (e.g., gradation, moisture content, specific gravity, proctor density) that will be performed on a batch-by-batch basis before the excavated materials are loaded into the railcars.

The characterization strategy contained in the PSP is generally applicable to materials from both SP-6 and SP-7. However, because SP-7 is currently an active stockpile and continues to receive materials from FEMP soil remediation activities on an ongoing basis, the designation of final sampling locations for SP-7 will be deferred until the pile nears its excavation date; current-condition topographic surveys have been performed; and the administrative actions necessary to cordon off appropriate portions the pile for characterization and loadout are in place.

As discussed in Section 1.5, a summary letter and map for SP-7 (similar to what is included for SP-6 in this PSP) will be submitted to EPA and OEPA to update current conditions and plans for SP-7, and to document the final number of sampling locations chosen for the in-situ characterization effort. The letter for SP-7 will adopt the remaining portions of this PSP by reference, as necessary.

## 1.2 PROJECT-SPECIFIC-PLAN OBJECTIVES

There are three primary objectives associated with the sampling and analysis activities for SP-6 and SP-7, as described in this PSP:

1. To satisfy the expectations of the Operable Unit 1 Record of Decision (ROD) for additional Resource Conservation and Recovery Act (RCRA) characterization of materials, as appropriate, that are destined for offsite disposal

2. To satisfy Envirocare's requirements for waste generators to adequately profile and characterize their waste materials prior to shipment to the Envirocare facility

3. To satisfy a managerial need for key "risk-management" sampling, where such sampling is considered appropriate, to further reduce the possibility or ramifications of material rejection upon its arrival at the Envirocare facility.

Each of these three objectives has been considered in the development of the sampling strategy behind this PSP and the selection of an appropriate suite of analytical parameters and sample collection frequency to accomplish first loadout material characterization.

The sampling strategy contained in this PSP considers Envirocare's revised license requirements for WAC compliance, as contained in the October, 1998 Envirocare facility license renewal. As a result of this revised license, waste generators must now meet WAC obligations on a container-by-container (e.g., railcar by railcar) basis; previously, the WAC levels were applied over an entire waste conveyance. This revised requirement has been considered in the selection of an appropriate sampling frequency for first loadout.

Users of this plan should be aware that the analytical parameters and sampling frequency selected for this first waste loadout PSP are generally applicable to the first loadout materials only. The sampling and analysis determination for these materials reflects the varied history of the stockpiles, the level of available sitewide soil characterization information to help guide the effort, and the overall conservative nature of the first loadout program as a means to help establish a successful "track record" of shipments to the Envirocare facility over time. Follow-up phases of the program, that address the Operable Unit 1 waste pit materials themselves, will employ sampling strategies and approaches reflective of those materials and the accompanying level of existing information to guide the program. A follow-up SAP revision to address these later project phases will be prepared accordingly.

### 1.2.1 Envirocare's Waste Characterization Expectations of the Waste Generator

In order to fulfill Objective Number 2 above, Envirocare requires that the waste generator perform sufficient sampling to adequately profile and verify the acceptance status of the waste. In general, these requirements can be summarized as follows:

- Obtain sufficient samples to adequately determine a range and weighted average of the radiological activity of the waste
- Provide results of analyses of the waste to determine: soil pH, paint filter liquids status, reactive cyanide and sulfide status, and RCRA Toxicity Characteristic Leaching Potential (TCLP) status for 32 RCRA organics, 8 RCRA metals, and zinc
- Provide information concerning the flash point and oxidizing potential of the waste
- Provide information on the physical description and characteristics of the waste (gradation, specific gravity, moisture content, and proctor density)
- Provide information on the overall debris content of the waste
- Provide information on the polychlorinated biphenyl (PCB) content of the waste
- Provide representative preshipment samples to Envirocare to establish working ranges for Envirocare's 10 general indicator parameters that are analyzed by Envirocare on arrival of the waste at the facility.

Table 1-1 summarizes all of the WAC constituents for the Envirocare facility for low-level radioactive waste.

1.2.2 Envirocare's Oversight Sampling of Rail Shipments

In addition to the sampling conducted by the waste generator, Envirocare conducts an oversight sampling program for waste materials shipped to the facility. This oversight sampling is conducted independently from the waste generator's sampling. In general, this oversight program for railcar shipments, as it affects the formulation of this PSP, is summarized in the following subsections.

1.2.2.1 Oversight Sampling Parameters

- Radiological Prameters: Gamma scan, plus non-gamma analysis for specific constituents identified by the generator on the Waste Profile form
- Immediate Chemical Screening Parameters: the 10 general indicator parameters, including a PID "sniffer" scan on arrival of the waste at the Envirocare facility; these indicator parameters are the same parameters for which acceptance ranges are established through the preshipment samples
- Deferred Chemical Screening Parameters: TCLP metals plus zinc
- RCRA TCLP organic compounds, if the PID "sniffer" scan exceeds the range established through the preshipment samples
- A visual comparison of the waste materials against the profile.

1.2.2.2 Oversight Sampling Frequencies

The following oversight sampling frequencies reflect the minimum frequencies for railcar shipments conducted by Envirocare as part of their State of Utah operating license. While these represent minimum frequencies, Envirocare can elect to conduct additional sampling whenever deemed appropriate. For each railcar that is selected for sampling, Envirocare generally obtains six random "grab" samples composited into one sample from which all the subsequent analyses are performed. The minimum frequencies are as follows:

- Radiological Parameters: first 10 railcars, plus every fifth railcar over the balance of the waste stream
- Immediate Chemical Screening Parameters: First 10 railcars, plus every tenth railcar over the balance of the waste stream
- Deferred Chemical Screening Parameters (TCLP metals plus zinc): Every tenth railcar, over the balance of the waste stream

- TCLP organic compounds: conducted whenever indicated by the PID scan conducted as part of the Immediate Screening Parameters. Exceedance of the preshipment range for the PID scan will generally trigger the need for Envirocare to conduct a TCLP organic compound analysis for any particular waste.

In summary, Envirocare's oversight sampling program for WAC attainment potentially serves as useful guidance for establishing sampling frequencies and analytical parameters for consideration in this PSP, particularly to frame the level of "risk management" sampling that is considered appropriate for satisfying Objective Number 3 above.

## 1.3 MATERIAL CHARACTERIZATION STRATEGY FOR FIRST LOADOUT

This section summarizes the sampling and analysis strategy (selection of analytes and sampling frequency) for the characterization of stockpile SP-6. As discussed in Section 1.5, stockpile SP-7 will follow a similar overall strategy once the pile is deemed available for characterization.

The overall intent is to characterize stockpile SP-6 in-situ for its radiological and chemical properties and at the time of material loadout (i.e., following excavation) for the key physical properties (material gradation, proctor density, and moisture content). The FEMP's Geoprobe sampling system or hand augering will be used to obtain samples within the pile. Debris will be generally be segregated as needed for later shipment, to focus on soil for the initiation of first loadout.

### 1.3.1 Selection of an Appropriate Sampling Frequency

The sampling frequency for the first loadout effort is focused primarily on satisfying Objective Number 3 (i.e., risk-management sampling) discussed earlier. (By definition, the conservative managerial approach adopted for Objective Number 3 for first loadout will adequately satisfy Objectives 1 and 2.) The FEMP has elected to use Envirocare's most intensive oversight railcar sampling frequency (first 10 cars and every fifth car thereafter) to conservatively guide the sampling frequency for first loadout. Using this frequency guideline and the nominal capacity of the railcars (100 tons; 74 cubic yards), it is then possible to identify the desired number of in-situ samples from the pile. For a 20,000 cubic yard pile, this yields approximately 65 to 70 individual samples. The FEMP has adopted 68 samples for planning.

1.3.2 Selection of Appropriate Analytical Parameters

The FEMP has selected a graded approach to the identification of appropriate analytes for first loadout material characterization, based on a conservative adoption of Envirocare's oversight program analytes and a general knowledge of sitewide soil radiological contaminant concentrations as indicated from the FEMP's comprehensive sitewide Remedial Investigation studies. The graded approach is summarized below:

Radiological Parameters:

- Conduct full gamma scans for 100 percent of the samples (68 samples)
- For 20 percent of the samples (14 samples), conduct alpha spectroscopy analysis for the FEMP's principal radiological constituents that will not be picked up by the gamma scans (uranium isotopes, thorium isotopes, and radium-226)
- For 10 percent of the samples (7 samples), conduct ICP-MS analyses to verify the natural or depleted uranium-235 status of the total uranium levels present in the samples
- For the FEMP's remaining minor radiological constituents that are occasionally detected at low concentrations in previous sampling at the facility and which are not picked up by the gamma scans the FEMP plans to adopt the maximum values observed in the FEMP's sitewide environmental database for reporting on the Envirocare Waste Profile form. Depending on the outcome of the gamma scans, this could include the following minor isotopes: Cesium-137, lead-210, neptunium-237, plutonium-238, plutonium-241, polonium-210, potassium-40, radium-228, ruthenium-106, strontium-90, and technetium-99. Generally, the maximum values for these minor isotopes are at least two orders of magnitude below the corresponding Envirocare WAC limit contained in the October, 1998 license revision. Therefore, conservatively adopting the maximum values for the minor constituents, where necessary for preparation of the Envirocare Waste Profile form, should not present any significant material acceptance conflicts.

During the conduct of the field program, the soil boring cores obtained from the Geoprobe system or hand augering will be screened with a beta-gamma (Geiger-Mueller) detector to search for vertical stratification of the radiological levels in the core. If a vertical stratification condition is identified in any particular core, biased sampling will be conducted to accommodate the highest relative activity from the core. This approach will help assure that the in-situ characterization effort adequately bounds the range of radiological levels that may exist within the pile. The details of the biased sampling program are provided later in this PSP.

Chemical Parameters:

- For 100 percent of the samples (68 samples), conduct analysis for the Deferred Chemical Screening parameters (the eight TCLP metals, plus zinc)
- For 10 percent of the samples (7 samples), selected at random, conduct analysis for the 32 TCLP organic constituents
- For 100 percent of the samples (68 samples), conduct headspace PID scans; if the headspace PID scans yield positive results for one or more sampling intervals for a particular sample location, the sample interval exhibiting the highest result will also be selected and submitted for TCLP organic analysis. The final number of samples submitted for TCLP organic analysis will therefore result from the photoionization detector results encountered in the field. If no positive photoionization readings are encountered, the minimum number of samples for TCLP organic analysis will be the 7 samples selected randomly.
- Submit one sample for total PCB analysis
- Submit one sample for reactive cyanide/sulfide analysis
- Submit one sample for a paint filter test (this sample will be used to document the absence of free liquids for the Envirocare Waste Profile form; additional post-excavation paint filter tests will be performed by IT Corporation as part of the batch-by-batch physical characterization of the materials [see Section 1.4]).
- Conduct soil pH measurements on 100 percent of the samples (68 samples). These values will be used later to help guide the selection of followup of preshipment samples for submission to Envirocare; the preshipment sample locations will be selected once initial useful information results (soil pH and photoionization detector scans, and visual observations) have been accumulated for the entire pile.

### 1.3.3 Selection of Appropriate Laboratories

Envirocare expects that at least one sample from the waste generator's RCRA-related material characterization efforts will be sent for analysis to a Utah-certified analytical laboratory. The FEMP will comply with this expectation through the following approach. All radiological analyses will be conducted onsite through the FEMP laboratory. The RCRA TCLP organic analysis, reactive cyanide, reactive sulfide, paint filter test, and PCB analysis will all be conducted by an offsite Utah-certified laboratory. The FEMP onsite laboratory will conduct all TCLP inorganic and soil pH measurements, with the exception of one sample each for TCLP inorganics and pH, which will be performed by the offsite Utah-certified laboratory. This approach meets the expecation for at least one first-loadout sample to be analyzed by a Utah-certified laboratory for RCRA properties.

## 1.4 POST-EXCAVATION MATERIAL PHYSICAL CHARACTERIZATION

Following excavation, the first loadout materials will be characterized for various physical properties prior to the loadout of material into railcars. This section describes the physical measurements to be performed by IT Corporation at the time of loadout under their respective operations procedures.

The following physical properties of the first loadout materials will be evaluated at the time of loadout:

- Specific gravity
- Moisture content
- Free liquids (Paint Filter Liquids Test)
- Proctor density
- Debris content (soil to debris ratio).

Specific gravity, moisture content, and presence of free liquids will be evaluated from composite samples that are collected from each storage bin as they are being filled with material. The grab samples for the composites will be collected at the rate of approximately 1 pound for each hour of bin filling. This should result in approximately 7 pounds of sample for each bin of material. A separate 23 kilogram (approximately 50 pounds) grab sample will be collected from the bin for proctor density.

Each storage bin represents a batch of approximately 600 tons of material; nominally, the physical properties will be determined at a rate of approximately one for each set of six railcars (each railcar holds approximately 100 tons of material).

The overall debris content will be evaluated for each bin as it is filled to verify that Envirocare's expectations regarding minimum soil to debris ratios (generally 9 parts soil to 1 part debris) are being met on a batch basis. IT Corporation's operational procedures will describe the process to follow on a batch basis if materials are found during first loadout, not to possess the desired physical properties.

## 1.5 FOLLOW-UP REQUIREMENTS FOR STOCKPILE SP-7

As stated in Section 1.1, the strategies and approaches described in this PSP are generally applicable to materials from both SP-6 and SP-7. However, the final number of samples for SP-7 cannot be determined until such time that this active pile is no longer receiving new waste materials from FEMP soil excavation activities. Once it is determined that materials from SP-7 are to be loaded out (as SP-6 loadout nears completion), a follow-up letter and stockpile map will be produced that describes the final number of samples and analytes to be implemented for the in-situ characterization of SP-7. The letter will be expected to adopt the remaining portions of this PSP as appropriate.

Alternatively, if it is determined (based on the status and progress of post-first loadout remedial action activities) that SP-7 can be excavated and loaded out concurrently with the waste pit materials, then the characterization of SP-7 will be accomplished following excavation (i.e., at the bins) in a manner consistent with what is approved for the pit materials. Under this scenario, the SP-7 materials will be mixed with the pit materials as appropriate to achieve blended compositions desired at loadout. Under this alternative, the in-situ characterization would not be necessary. This scenario will be discussed with EPA and OEPA and documented in the appropriate Remedial Action deliverables for the waste pit excavation and loadout.

## 1.6 STRATEGY FOR SELECTION OF PRESHIPMENT SAMPLES

Following the completion of the Geoprobe field program for SP-6 and the review of initial field results, a decision will be made concerning the desired locations within the stockpile for the selection of pre-shipment samples for delivery to Envirocare. The Geoprobe system will be utilized as appropriate to collect these followup samples. This additional sampling will be conducted via issuance of a variance to this PSP.

Five two-pound preshipment samples are required by Envirocare. The strategy for collecting these samples will involve consideration of:

- visual observations of material types in the field
- field PID scans
- analytical results received from the laboratories.

In general, the objective will be to obtain a series of five samples that bracket the widest range of conditions available in SP-6 for the general indicator parameters shown in Table 1-1. The variance will list the preshipment sample locations and depths in the pile based on consideration of the three items noted above.

If a decision is made to sample stockpile SP-7 via the in-situ approach in the future, additional pre-shipment samples may also be collected, if deemed appropriate to update the first loadout Waste Profile.

## 1.7 KEY PERSONNEL

Key personnel responsible for conducting work in accordance with this PSP are listed in Table 1-2.

**TABLE 1-1**
**ENVIROCARE FACILITY WAC CONSTITUENT LIST**

| Constituents | | |
|---|---|---|
| **Radiological:** | | **TCLP Organics:** |
| Americium-241 | Plutonium-241 | 1,4-dichlorobenzene |
| Americium-243 | Plutonium-242 | 2,4,5-trichlorophenol |
| Antimony-124 | Polonium-210 | 2,4,6-trichlorophenol |
| Antimony-125 | Potassium-40 | 2,4-dinitrotoluene |
| Barium-133 | Promethium-147 | Cresol |
| Beryllium-7 | Radium-226 | Hexachlorobenzene |
| Bismuth-207 | Radium-228 | Hexachlorobutadiene |
| Cadmium-109 | Rubidium-83 | Hexachloroethane |
| Calcium-45 | Ruthenium-106 | m-Cresol |
| Carbon-14 | Samarium-151 | Nitrobenzene |
| Cerium-139 | Scandium-46 | o-Cresol |
| Cerium-141 | Selenium-75 | p-Cresol |
| Cerium-144 | Silver-108m | Pentachlorophenol |
| Cesium-134 | Silver-110m | 1,1-dichlorethylene |
| Cesium-135 | Sodium-22 | 1,2-dichlorethane |
| Cesium-137 | Strontium-85 | Chlordane |
| Chromium-51 | Strontium-89 | Endrin |
| Cobalt-56 | Strontium-90 | Heptachlor |
| Cobalt-57 | Sulfur-35 | Heptachlor epoxide |
| Cobalt-58 | Tantalum-182 | Lindane |
| Cobalt-60 | Technetium-99 | Methoxychlor |
| Copper-67 | Thallium-204 | Toxaphene |
| Curium-242 | Thorium-230 | Benzene |
| Curium-243 | Thorium-232 | Carbon tetrachloride |
| Curium-244 | Tin-113 | Chlorobenzene |
| Europium-152 | Uranium-233 | Chloroform |
| Europium-154 | Uranium-234 | Methyl ethyl ketone |
| Europium-155 | Uranium-235 | Pyridine |
| Gadolinium-153 | Uranium-236 | Tetrachloroethylene |
| Germanium-68 | Uranium-238 | Trichloroethylene |
| Gold-195 | Uranium-depleted | Vinyl chloride |
| Hafnium-181 | Uranium-natural | 2,4,5-TP (Silvex) |
| Hydrogen-3 (Tritium) | Yttrium-88 | 2,4-D |
| Iodine-125 | Yttrium-91 | |
| Iodine-129 | Zinc-65 | **TSCA Constituents:** |
| Iridium-192 | Zirconium-95 | PCBs |
| Iron-55 | | |
| Iron-59 | **TCLP Inorganics:** | **General Indicators:** |
| Lead-210 | Arsenic | Solid/Soil pH |
| Manganese-54 | Barium | Paint Filter Liquids Test |
| Mercury-203 | Cadmium | Oxidizer/Reducer Test |
| Neptunium-237 | Chromium | Cyanide/Sulfide Test |
| Nickel-59 | Copper | Photoionizer "Sniffer" Test |
| Nickel-63 | Lead | Pyrophoricity |
| Niobium-94 | Mercury | Shock Sensitivity |
| Plutonium-238 | Selenium | Air Reactive |
| Plutonium-239 | Silver | Water Reactive |
| Plutonium-240 | Zinc | |

TABLE 1-2
KEY PERSONNEL FOR SAMPLING AND ANALYSIS OF SP-6

| TITLE | PRIMARY |
|---|---|
| WAO Manager | Sue Lorenz |
| Survey Lead | Jim Schwing |
| WAO Sampling and Data Lead | Vicky Zimmerman |
| SCEP Field Sampling Manager | Mike Frank |
| WPRAP Representative | Diane Zdlar-Bush |
| WPRAP Safety and Health Lead | Mike Davis |
| Quality Assurance Representative | Reinhard Friske |
| Sample Management Office Analytical Program Manager | Bill Westerman |

# 2.0 SAMPLING AND ANALYSIS

Sampling and analysis will be conducted in accordance with Section 2.0 and the Sitewide Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Quality Assurance Plan (SCQ).

## 2.1 STOCKPILE DESCRIPTION

SP-6 is located east of the waste pit area, south of the Solid Waste Landfill, and east of the Haul Road (see Figure 2-1). Volume of material in SP-6 is approximately 15,500 cubic yards ($yd^3$), based on a survey performed on November 20, 1998. This survey assumed the stockpile was built on level topography; a swale existed beneath SP-6 prior to construction of the stockpile and was filled with rubble and debris. Therefore, as a conservative estimate, SP-6 is estimated to contain 20,000 $yd^3$. The footprint of the pile is shown in Figure 2-2.

Construction of SP-6 began in August 1996; soil and soil-like materials in this stockpile were generated from site preparation activities for the new railyard, as well as soil removed from the Paddys Run stabilization project, Haul Road, the On-Site Disposal Facility leachate conveyance system, and the construction activities associated with installation of an eight trailer complex east of the waste pits.

In it's current state, the SP-6 footprint is moderately rectangular in shape and covered in vegetation. Although localized excavation in the southwestern area of SP-6 was recently conducted, Geoprobe access to SP-6 is not expected to be a problem; should access become an issue, sample collection will be accomplished using hand augers.

## 2.2 ANALYTICAL REQUIREMENTS

As discussed in Sections 1.3.1 and 1.3.2, the number and type of analyses specified under this PSP are designed around a conservative approach of managing risks associated with the off-site shipment of SP-6 and fulfilling the waste profiling and characterization requirements of the Envirocare facility. Analyses will be performed by the FEMP's on-site laboratory and by a commercial (Utah certified) laboratory as described below and in Table 2.1.

On-Site Laboratory Analysis:

Radiological (gamma spectrometry) - 68 samples
Radiological (alpha spectrometry) - 14 samples
TCLP inorganics - 67 samples
Enrichment determination (uranium-235) - 7 samples
Soil pH - 68 samples

Off-Site Laboratory Analysis:

TCLP organics - minimum of 7, maximum of 24 samples (dependent upon PID readings)

TCLP inorganics - 1 sample

Polychlorinated biphenyls - 1 sample

Reactive cyanide and sulfide - 1 sample

Paint Filter Liquid Test - 1 sample

Soil pH - 1 sample

Trip blank (for TCLP organics) - 1 for every 20 samples (minimum of 1) or 1 per sample collection/shipment batch (maximum of 8 trip blanks).

## 2.3 SELECTION OF SAMPLE LOCATIONS

Sample locations were selected by overlaying a grid onto the SP-6 footprint and randomly selecting a boring location within each grid block. The grid pattern selected yields a total of 17 grid blocks with 17 corresponding boring locations (see Figure 2-2). Each of the borings will be advanced to the bottom of the pile yielding a cross-sectional core from which four discrete depth intervals have been randomly selected for sampling. This strategy provides a total of 68 randomly selected sample intervals distributed spatially in three dimension within the pile. The random sample depth intervals and corresponding analytical requirements are presented in Table 2-1. The depth intervals are expressed as a fraction of the total pile depth at each boring location. In addition to the randomly selected samples, biased sampling locations will be selected based on radiological and organic field screening methods as described in Section 2.4.1.

## 2.4 SAMPLE COLLECTION METHODS

Soil samples will be collected by Geoprobe or by hand augering; these methods are described in Sections 2.4.2 and 2.4.3 below. All soil sampling will be conducted at an Analytical Support Level

(ASL) B. The OEPA may collect split samples; if this option is exercised, OEPA will collect soil from the intervals not analyzed by DOE. OEPA will be responsible for transportation and submittal of their samples to an off-site laboratory for analyses.

Soil samples will be collected at 1.5-foot intervals to obtain sufficient volume for analyses. One soil quality control (QC) sample will be collected for matrix spike/matrix spike duplicate analysis; to ensure sufficient sample volume, the QC sample interval length will be determined in the field.

If refusal is encountered in any random sample point or interval, the boring may be relocated within a 3-foot radius without a written variance. If a sample location lies within 10 feet of the slope edge of the stockpile (or anywhere safe configuration of the Geoprobe is not possible), the sample location may be relocated up slope within the grid to obtain Geoprobe accessibility.

### 2.4.1 Biased Sample Collection

Each of the 17 soil cores will be surveyed along it's entire length with a beta-gamma detector (Geiger-Mueller) for relative radioactivity with the results recorded as average counts for each 1.5 foot interval of the core. If screening indicates no measurements exceed background [corrected counts per minute], or the highest relative reading is contained within one of the four preselected sample intervals, then no biased sample will be collected. However, if the highest screening result is detected outside a preselected sample interval, then a sample for gamma spectrometry analysis will be collected from the interval exhibiting the highest activity and randomly substituted only for one of the four predetermined gamma spectrometry samples. The selection of the predetermined sample interval to be eliminated will be based on the substitution table provided in Appendix C.

Samples requiring TCLP organic analysis will be based on the following:

- Seven sample intervals have been preselected at random for TCLP organics and are identified in Table 2-1.
- Additionally, all preselected sample intervals (4 per boring) will be screened with a PID to determine relative volatile organic presence. If PID readings are present then the sample interval exhibiting the highest PID reading will be submitted for TCLP organics (in addition to preselected TCLP organics sample interval if one is identified in the boring). The biased sample exhibiting the highest PID reading will be submitted

for TCLP organics analysis only. If all PID readings are the same in all four sample intervals, no additional sample will be submitted for analysis.

Methods for PID screening of samples will be the same for either Geoprobe or hand auger collection. Containerized soil samples will be surveyed with a PID calibrated to isobutylene for the presence of volatile organic compounds. The procedure for performing this headspace analysis is outlined in the FDF photoionization detector procedure (EQT-04); EQT-04 mirrors the requirements of Envirocare's PID procedure (EC- 0800). A brief summary of the PID headspace analysis is given below; for specific procedures, refer to EQT-04.

After the soil sample is collected, it will be placed into a sample container, the container opening covered with aluminum foil, and the container lid sealed with a screw-on lid. The container will be placed in an area where the temperature is greater than 60° F for 5 to 10 minutes. The container lid will be removed, the PID tip inserted through the aluminum foil, and a PID measurement collected for 10 seconds. The sample measurement will be recorded on the Field Activity Log (Form FS-F-3682).

2.4.2 Geoprobe

Samples will be collected using the Geoprobe Model 5400 in accordance with procedure EQT-06, Geoprobe Model 5400-Operation and Maintenance or using manual methods as specified in procedure SMPL-01, Solids Sampling. The Geoprobe sampling system will be used for sample locations that will support the safe operation of the Geoprobe vehicle (primarily on the top of SP-0006); where this is not possible, manual methods will be used. At each sampling location, the surface vegetation within a 6-inch radius of the sample point will be removed using a stainless steel trowel or by hand with clean nitrile gloves while taking care to minimize the removal of any soil.

If refusal or resistance is encountered during the soil borings, up to two additional borings within a 3-foot radius of the original point may be attempted in order to collect the specified samples. All encounters with subsurface debris will be noted in the field log.

A macro-core or dual tube sampler will be used if the soil sample is collected with the Geoprobe. Multiple cores may be collected at each sampling location to obtain sufficient sample volume for analysis if complete sample recovery is not obtained; however, both the original sample location and any additional core samples collected for volume requirements must be collected at the same depth intervals. Additional cores may be added within the limits discussed above without a written varience. Any debris contained in a sample interval will be segregated from the sample and the debris returned to SP-6 or, if the boring is completed, back down the borehole. Excess soil sample will be handled in the same manner.

The Geoprobe soil core(s) will be laid on clean plastic and the appropriate sample increments will be separated from the core to obtain the necessary samples. Any debris (e.g., wood, concrete, metal, stones) contained in a sample interval will be excluded from the sample. For manual sampling locations, the soil cuttings collected from the target sample interval will be placed in a clean tray prior to transfer to the sample container. Sample volume and analysis information is summarized in Table 2-1.

### 2.4.3 Hand Augering

If Geoprobe accessibility is not possible, soil samples will be collected using a 3-inch diameter hand auger in accordance with SMPL-01. The hand auger will be advanced in approximately 6-inch increments down to the target depth intervals. Multiple holes at one sampling location (not to exceed 1 foot apart) may have to be augered to obtain sufficient volume for analysis; as with Geoprobe sampling, both the original sample location and any additional hand auger samples collected for volume requirements must be collected at the same depth intervals. Additional cores may be added within the limits discussed above without a written variance.

## 2.5 SAMPLE IDENTIFICATION

All soil samples collected for laboratory analysis will be assigned a unique sampling identifier (customer number), as listed in Table 2-2. The sample numbering system will consist of the following schematic:

SP6-x-y-z

where

| | | |
|---|---|---|
| SP6 | = | sampling area (SP-6) |
| x | = | sample point location (1, 2, 3, etc.) |
| y | = | depth interval (1 = 0-1.5 ft, 2 = 1.5-3 ft, etc) |
| z | = | analytical suite designators: R = radiological, TM = TCLP metals, TV = TCLP volatiles, P = PCBs, AB = gross alpha/beta screen, or TB = trip blank |

The following is an example of sample identification:

SP6-3-4-TM SP-6 area, sample point 3, depth interval 4 (4.5-6 ft), analyzed for TCLP metals.

## 2.6 EQUIPMENT DECONTAMINATION

Sampling equipment will be decontaminated before transport to the sampling site. Additionally, equipment that comes into contact with sample media at the target sample interval must be decontaminated. The decontamination of equipment that comes into contact with the sample will include the core sampler cutting shoe and other sample collection tools. All decontamination will be a Level II decontamination as specified in SMPL-01, Solids Sampling. The core barrel portion of the core sampler will be wiped down between sample intervals and locations to remove visible soil or material. Decontamination of the core barrel will not be necessary because the core barrel will not come into contact with the sample when using a liner insert. If a hand auger is used to collect the soil samples, the auger bucket will be decontaminated between borings or a clean bucket will be used.

## 2.7 SAMPLE HANDLING AND SHIPPING

Samples will be processed in accordance with SMPL-01 to ensure samples are properly documented and custody/sample integrity are maintained. All samples will be transported from the field to the Sample Processing Laboratory within the FEMP on-site lab for analysis or subsequent shipment to an off-site lab for analysis.

## 2.8 DISPOSITION OF WASTE REQUIREMENTS

During completion of sampling activities, field personnel may generate small amounts of unused soil, waters, contact waste, and residual sample media. Field generation of decontamination waters will be minimized by decontaminating equipment at a facility that discharges to the Advance Wastewater Treatment Facility, when possible. Contact-waste generation (i.e., disposable gloves) will be minimized by limiting contact with sample media. Any excess soils (including debris or samples) will be returned to SP-6 or, if the boring is completed, back down the borehole.

## TABLE 2-1

## SAMPLING AND ANALYSIS REQUIREMENTS

| Analyte | TAL | Preservative | ASL | Hold Time[a] | Container |
|---|---|---|---|---|---|
| Radiological | A, C, F | None | B | 6 months | 250 mL glass or plastic |
| TCLP Inorganics[b] + Zinc[B] | B | Cool, 4° C | B | 180/180 days | 60 mL glass with Teflon-lined lid |
| TCLP Organics[b] (VOCs) | D | Cool, 4° C | B | 14/14 days | 60 mL glass with Teflon-lined closure |
| TCLP Organics (BNA, Herbicide/Pesticide) | D | Cool, 4° C | B | 14/14 days | 120 mL/500 mL glass with Teflon-lined closure |
| Polychlorinated biphenyls[b] | E | Cool, 4° C | B | 14/40 days | 120 mL widemouth amber glass with Teflon liner |
| Reactive cyanide and sulfide[b] | G | Cool, 4° C | B | Upon lab receipt | 120 mL amber glass |
| pH[b] | H | Cool, 4° C | B | Upon lab receipt | 120 mL glass or plastic |
| Paint Filter Liquids Test[b] | I | None | B | None | 120 mL glass or plastic |
| Gross alpha/beta screen[b] | J | None | | 6 months | 120 mL glass or plastic |

[a]For holding times listed as xx/yy days, the first number is the allowed holding time for extraction or preparation of the sample for analysis and the second number is the allowed holding time for analysis of the extract.
[b]Analysis methods as defined in SW846 and Envirocare guidelines.

TABLE 2-2

SP-6 SAMPLE IDENTIFICATION AND LOCATIONS

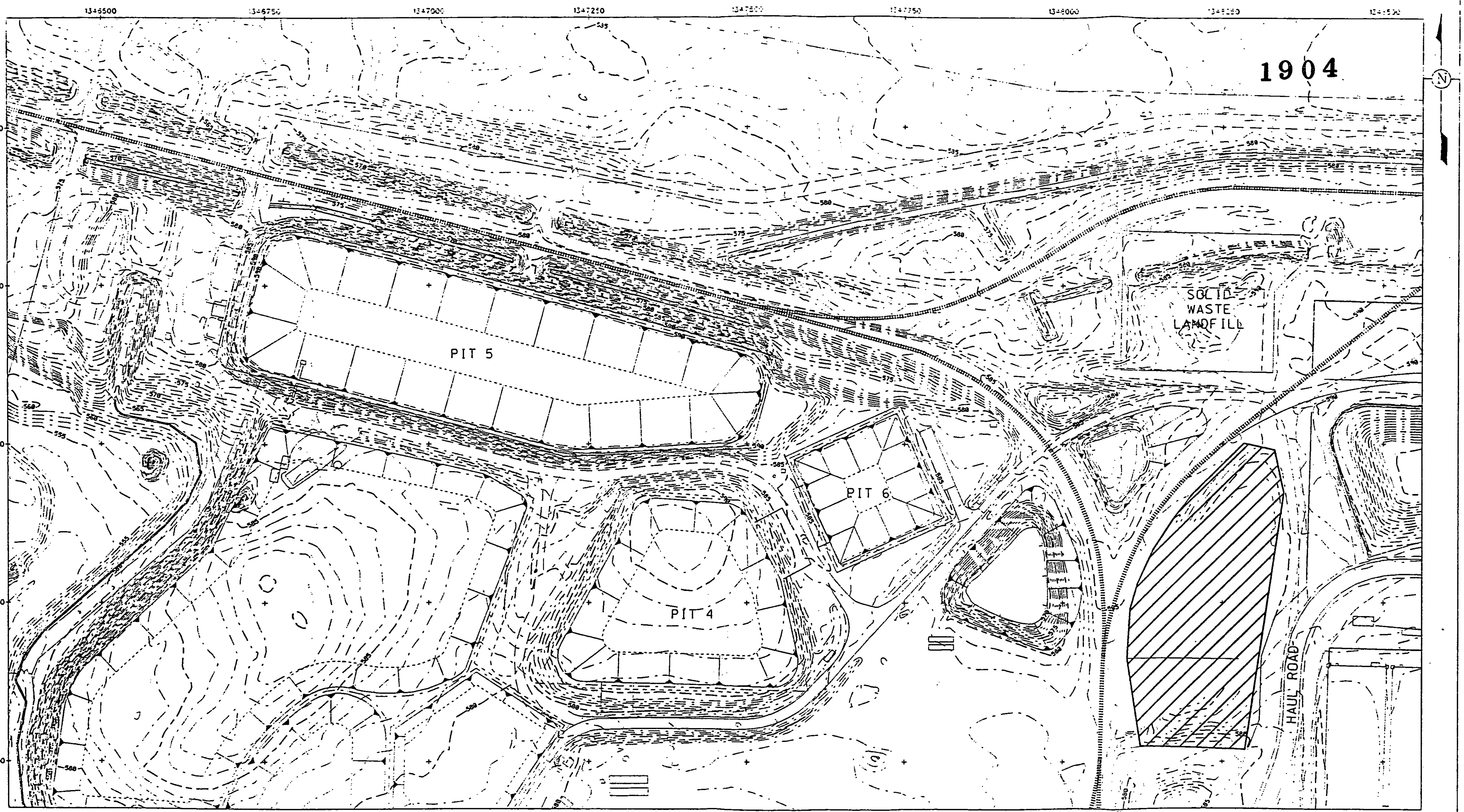
| Sample Identification | Northing | Easting | Interval No. | TAL | Sample Depth (ft) |
|---|---|---|---|---|---|
| SP6-1A[a] | 481565.120 | 1348141.810 | 1 | A,B,C,D*,F | 0-1 |
| | | | 2 | A,B | 1-2 |
| | | | 3 | A,B | 2-3 |
| | | | 4 | A,B | 3-4 |
| SP6-2A | 4851570.270 | 1348173.920 | 1 | A,B | 0.5-2 |
| | | | 2 | A,B | 2-3.5 |
| | | | 3 | A,B | 3.5-5 |
| | | | 4 | A,B | 5-6.5 |
| SP6-3 | 481579.010 | 1348253.740 | 1 | A,B | 0-1.5 |
| | | | 2 | A,B,C | 1.5-3 |
| | | | 3 | A,B | 3-4.5 |
| | | | 4 | A,B | 4.5-6 |
| SP6-4A | 481666.780 | 1348149.800 | 1 | A,B | 0-1.5 |
| | | | 2 | A,B | 1.5-3 |
| | | | 3 | A,B,C,D*,F | 3-4.5 |
| | | | 4 | A,B | 4.5-6 |
| SP6-5 | 481630.810 | 1348218.650 | 1 | A,B | 1-2.5 |
| | | | 2 | A,B | 2.5-4 |
| | | | 3 | A,B,C,D*,F | 4-5.5 |
| | | | 4 | A,B | 5.5-7 |
| SP6-6 | 481656.910 | 1348251.510 | 1 | A,B,C | 1.5-3 |
| | | | 2 | A,B | 3-4.5 |
| | | | 3 | A,B | 4.5-6 |
| | | | 4 | A,B | 6-7.5 |
| SP6-7 | 481724.600 | 1348151.230 | 1 | A,B | 0.5-2 |
| | | | 2 | A,B* | 2-3.5 |
| | | | 3 | A,B | 3.5-5 |
| | | | 4 | A,B | 5-6.5 |
| SP6-8 | 481693.510 | 1348200.790 | 1 | A,B | 0-1.5 |
| | | | 2 | A,B,E* | 3-4.5 |
| | | | 3 | A,B,C,D*,F | 4.5-6 |
| | | | 4 | A,B | 7.5-9 |
| SP6-9[a] | 481670.040 | 1348293.400 | 1 | A,B | 1-2 |
| | | | 2 | A,B,C | 2-3 |
| | | | 3 | A,B | 3-4 |
| | | | 4 | A,B | 4.5-5.5 |
| SP6-10A | 481771.680 | 1348174.110 | 1 | A,B | 2-3.5 |
| | | | 2 | A,B | 4.5-6 |
| | | | 3 | A,B,C | 6.5-8 |
| | | | 4 | A,B | 8.5-10 |

**TABLE 2-2**
**(Continued)**

| Sample Identification | Northing | Easting | Interval No. | TAL | Sample Depth (ft) |
|---|---|---|---|---|---|
| SP6-11 | 481769.290 | 1348240.470 | 1 | A,B | 1.5-3 |
| | | | 2 | A,B | 4-5.5 |
| | | | 3 | A,B | 5.5-7 |
| | | | 4 | A,B,C | 7-8.5 |
| SP6-12[a] | 481819.100 | 1348299.450 | 1 | A,B | 0-1 |
| | | | 2 | A,B,C | 2-3 |
| | | | 3 | A,B | 3-4 |
| | | | 4 | A,B | 4-5 |
| SP6-13A[a] | 481845.130 | 1348188.320 | 1 | A,B | 0.5-1.5 |
| | | | 2 | A,B | 1.5-2.5 |
| | | | 3 | A,B | 2.5-3.5 |
| SP6-13B[b] | TBD[b] | TBD[b] | 1 | A,B,C,D*,F | 0-1.5 |
| SP6-14A | 481853.310 | 1348231.590 | 1 | A,B | 0-1.5 |
| | | | 2 | A,B | 3-4.5 |
| | | | 3 | A,B | 6-7.5 |
| | | | 4 | A,B,C | 9-10.5 |
| SP6-15 | 481864.380 | 1348293.520 | 1 | A,B | 0-1.5 |
| | | | 2 | A,B,C,D*,F | 1.5-3 |
| | | | 3 | A,B | 3-4.5 |
| | | | 4 | A,B | 4.5-6 |
| SP6-16A | 481918.740 | 1348267.390 | 1 | A,B | 0-1.5 |
| | | | 2 | A,B | 1.5-3 |
| | | | 3 | A,B,C,D*,F | 3-4.5 |
| | | | 4 | A,B | 4.5-6 |
| SP6-17A[a] | 481920.100 | 1348285.810 | 1 | A,B | 0-1 |
| | | | 2 | A,B | 1-2 |
| | | | 3 | A,B,G*,H* | 2-3.5 |
| | | | 4 | A,B | 3.5-4.5 |

[a]Samples will be collected with hand auger
[b]To be field located adjacent to SP6-13A
*Gross alpha/beta screen for off-site analyses

**1904**




LEGEND:

SP-006

**000086**

SCALE

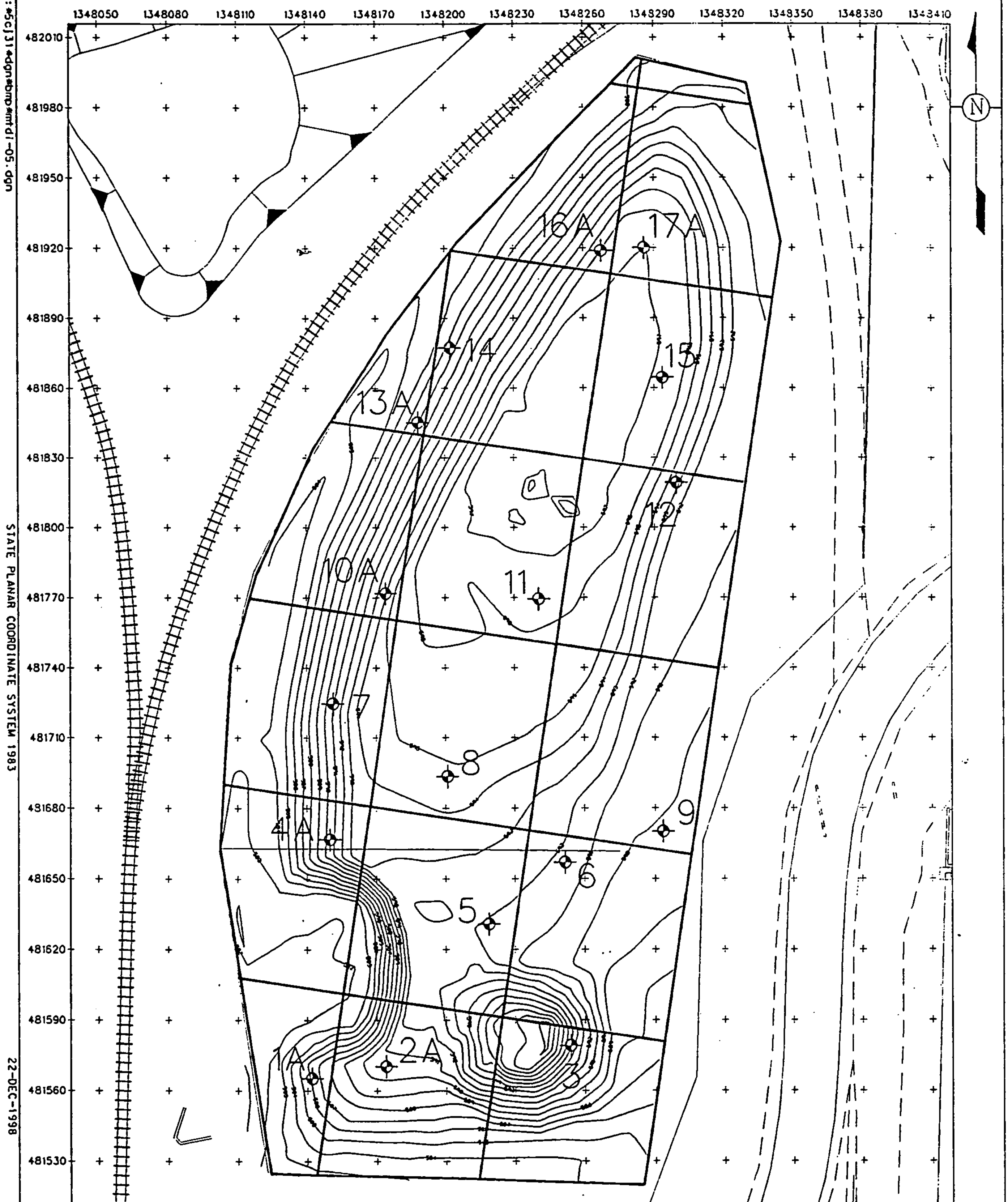
150 75 0 150 FEET

DRAFT

v:\5cj31\dgn\bmp\mfdi-01.dgn STATE PLANAR COORDINATE SYSTEM 1983 22-DEC-1998

FIGURE 2-1. SP-6 LOCATION MAP

1904




000087

LEGEND:

2 SAMPLE POINT

SCALE

60 30 0 60 FEET

DRAFT

FIGURE 2-2. SP-6 SAMPLE POINT LOCATION MAP

# 3.0 QUALITY ASSURANCE REQUIREMENTS

The data collection will be performed in accordance with the requirements in the latest revision of the SCQ and the SCQ Addendum. The applicable DQO for this plan is DQO SL-048.

## 3.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS, AND DATA VALIDATION

The only field quality control (QC) samples for this sampling effort will be trip blanks at the frequency outlined in the SCQ (at a minimum, 1 per sample batch or 1 per sampling day). No duplicate soil samples will be collected due to low volume of soil recovery.

All sampling and laboratory analyses will be performed at ASL B with 10% validation, in accordance with DQO-048. The validation will be conducted on the entire first release of sample analyses.

## 3.2 SURVEILLANCE

WAO has the ultimate responsibility for the quality of the work processes and the results of the monitoring activities covered by this plan. The Quality Assurance (QA) representative will conduct independent assessments of the work process and operations by conducting surveillances. The assessments will encompass technical and procedural requirements of this plan and the SCQ. Surveillances will be implemented by monitoring/observing ongoing project activities and work areas to verify conformance to specified requirements. Surveillances will be planned and documented according to the SCQ.

## 3.3 IMPLEMENTATION OF FIELD CHANGES

If field conditions require changes or variances, verbal approval must be obtained from the WAO Data Lead, the Field Sampling Manager, and the QA representative before the changes can be implemented (electronic mail is acceptable). Changes to the PSP will be noted in the applicable field activity logs and on a Variance Request/Field Change Notice (VR/FCN) form. QA must receive the completed VR/FCN (which includes the signatures of the WAO Data Lead, Field Sampling Manager, and the QA representative) within 10 working days of the granting of the verbal approval.

# 4.0 HEALTH AND SAFETY

All work performed on this project will be performed in accordance to applicable project procedures, RM-0020 (Radiological Control Requirements Manual), RM-0021 (Safety Performance Requirements Manual), FDF work permit, radiological work permit (RWP), and other applicable permits. Concurrence with all applicable safety permits is required by all personnel in the performance of their assigned duties. All personnel will also be briefed on any applicable safe work plans and abide by the requirements therein.

All personnel involved in the collection of soil samples will be briefed on this PSP and the briefing will be documented. Personnel who do not receive a briefing on these requirements will not participate in the execution of soil sampling activities related to the completion of assigned project responsibilities.

**All emergencies shall be reported immediately by dialing 911 (648-6511 on cellular phones) or radio "CONTROL".**

# 5.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed following completion of the field activities. As specified in Section 5.1 of the SCQ, daily activities will be recorded on the Field Activity Log, with sufficient detail to be able to reconstruct a particular situation without reliance on memory. Sample Collection Logs will be completed according to Procedure ADM-02, Field Prerequisites.

Electronically recorded data from the Geodimeter and GPS will be downloaded to disks on a daily basis, or as the project requires. Technicians will review the data for completeness and accuracy and then download it onto the local area network (LAN). Once on the LAN, an evaluation of the data will be performed. Once complete, the data will be sent to the loader where it will be loaded onto the ORACLE system and an error log will be generated. The data will then be made available to users through both the Graphical Information System and Microsoft Access software. The Survey Lead will retain all downloaded data on disk for future reference and archive.

Field documentation, such as the Field Activity Log, Chain of Custody forms, and the Sample Collection Log will undergo an internal quality assurance/quality control (QA/QC) review by the sampling technicians. Copies will then be generated and delivered to Data Management, who will perform an evaluation of the data. From this point, the paper-generated data will be sent to data entry personnel for input into the ORACLE system. Field logs may be completed in the field and maintained in loose-leaf form. Copies of all field documentation will also be provided to the WAO Sampling and Data Lead on a daily basis.

The sample technicians will forward the original field documentation for submission to FEMP QA personnel who will perform an additional review. Copies will then be generated and delivered to data entry personnel for input into the Sitewide Environmental Database (SED). The WAO Sampling and Data Lead will identify the data packages required for data validation.

The list of planned sample points will be entered into the Soils Master List in the ORACLE system by the Data Manager. This table serves as the starting point for tracking sample data electronically. As sample points are surveyed, actual northings and eastings will be transmitted through an electronic file to be entered into the SED. The Data Manager will maintain records into the Soils Master List so as to accurately reflect the sampling.

## 6.0 APPLICABLE DOCUMENTS, METHODS, AND STANDARDS

Soil sample collection activities for SP-6 as described in this plan shall follow the requirements outlined in the following documents, procedures, and standard methods:

- SMPL-01 Solids Sampling
- SMPL-21 Collection of Field Quality Control Samples
- EQT-06 Geoprobe Model 5400 - Operation, Maintenance, and Calibration
- Sitewide CERCLA Quality Assurance Project Plan (SCQ)
- RM-0020 Radiological Control Requirements Manual

# APPENDIX A
# DATA QUALITY OBJECTIVE SL-048

Control Number DQO-0038

1904

# Fernald Environmental Management Project

## Data Quality Objectives

**Title:** Delineating the Extent of Constituents of Concern in Pre-design Investigation and Remediation Sampling

**Number:** SL-048

**Revision:** 1

**Final Draft:** October 3, 1997

**Contact Name:** Eric Kroger

CONTROLLED COPY

Approval: William D. Kelley
William D. Kelley
DQO Coordinator
Date: 10-3-97

Approval: [signature]
for Joan White
Project Lead
Date: 10/03/97

| Rev. # | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Effective Date: | 9/19/97 | | | | | | |

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# DATA QUALITY OBJECTIVES

## Delineating the Extent of Constituents of Concern in Pre-design Investigation and Remediation Sampling

Members of Data Quality Objectives (DQO) Scoping Team

The members of the DQO team include a project lead, a project engineer, a field lead, a statistician, a lead chemist, a sampling supervisor, and a data management lead.

Conceptual Model of the Site

Media is considered contaminated if the concentration of a constituent of concern (COC) exceeds the final remediation levels (FRLs). The extent of specific media contamination was estimated and published in the Operable Unit 5 Feasibility Study (FS). These estimates were based on kriging analysis of available data for media collected during the Remedial Investigation (RI) effort and other FEMP environmental characterization studies. Maps outlining contaminated media boundaries were generated for the Operable Unit 5 FS by overlaying the results of the kriging analysis data with isoconcentration maps of the other constituents of concern (COCs), as presented in the Operable Unit 5 RI report, and further modified by spatial analysis of maps reflecting the most current media characterization data. A sequential remediation plan has been presented that subdivides the FEMP into seven construction areas. During the course of remediation, areas of specific media may require additional characterization so remediation can be carried out as thoroughly and efficiently as possible. As a result, additional sampling may be necessary to accurately delineate a volume of specific media as exceeding a target level, such as the FRL or the Waste Attainment Criterion (WAC). Each individual Project-Specific Plan (PSP) will identify and describe the particular media to be sampled.

### 1.0 Statement of Problem

If the extent (depth and/or area) of the media COC contamination is unknown, then it must be defined with respect to the appropriate target level (FRL, WAC, or other specified media concentration).

### 2.0 Identify the Decision

Delineate the horizontal and/or vertical extent of media COC contamination in an area with respect to the appropriate target level.

### 3.0 Inputs That Affect the Decision

Informational Inputs - Historical data, process history knowledge, the modeled extent of COC contamination, and the origins of contamination will be required to establish a sampling plan to delineate the extent of COC contamination. The desired precision of the delineation must be weighed against the cost of collecting and analyzing additional samples in order to determine the optimal sampling density. The project-

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specific plan will identify the optimal sampling density.

Action Levels - COCs must be delineated with respect to a specific action level, such as FRLs and On-Site Disposal Facility (OSDF) WAC concentrations. Specific media FRLs are established in the OU2 and OU5 RODs, and the WAC concentrations are published in the OU5 ROD. Media COCs may also require delineation with respect to other action levels that act as remediation drivers, such as Benchmark Toxicity Values (BTVs) and As Low As Reasonably Achievable (ALARA) levels.

## 4.0 The Boundaries of the Situation

Temporal Boundaries - Sampling must be completed within a time frame sufficient to meet the remediation schedule. Time frames must allow for the scheduling of sampling and analytical activities, the collection of samples, analysis of samples and the processing of analytical data when received.

Scale of Decision Making - The decision made based upon the data collected in this investigation will be the extent of COC contamination at or above the appropriate action level. This delineation will result in media contaminant concentration information being incorporated into engineering design, and the attainment of established remediation goals.

Parameters of Interest - The parameters of interest are the COCs that have been determined to require additional delineation before remediation design can be finalized with the optimal degree of accuracy.

## 5.0 Decision Rule

If existing data provide an unacceptable level of uncertainty in the COC delineation model, then additional sampling will take place to decrease the model uncertainty. When deciding what additional data is needed, the costs of additional sampling and analysis must be weighed against the benefit of reduced uncertainty in the delineation model, which will eventually be used for assigning excavation, or for other purposes.

## 6.0 Limits on Decision Errors

In order to be useful, data must be collected with sufficient areal and depth coverage, and at sufficient density to ensure an accurate delineation of COC concentrations. Analytical sensitivity and reproducibility must be sufficient to differentiate the COC concentrations below their respective target levels.

### Types of Decision Errors and Consequences

Decision Error 1 - This decision error occurs when the decision maker determines that the extent of media contaminated with COCs above action levels is not as extensive as it actually is. This error can result in a reme:·:ation design that fails to incorporate media contaminated with COC(s) above the a::tion level(s). This could result in the re-mobilization of excavation equipment anc :elays in the remediation schedule. Also, this could result in media contaminatea :ove action levels remaining after remediation is considered complete, pos:r: a potential threat to human health and the environment.

Decision Error 2 - This decision error occurs when the decision maker determines that the extent of media contaminated above COC action levels is more extensive than it actually is. This error could result in more excavation than necessary, and this excess volume of materials being transferred to the OSDF, or an off-site disposal facility if contamination levels exceed the OSDF WAC.

True State of Nature for the Decision Errors - The true state of nature for Decision Error 1 is that the maximum extent of contamination above the FRL is more extensive than was determined. The true state of nature for Decision Error 2 is that the maximum extent of contamination above the FRL is not as extensive as was determined. Decision Error 1 is the more severe error.

## 7.0 Optimizing Design for Useable Data

### 7.1 Sample Collection

A sampling and analytical testing program will delineate the extent of COC contamination in a given area with respect to the action level of interest. Existing data, process knowledge, modeled concentration data, and the origins of contamination will be considered when determining the lateral and vertical extent of sample collection. The cost of collecting and analyzing additional samples, will be weighed against the benefit of reduced uncertainty in the delineation model. This will determine the sampling density. Individual PSPs will identify the locations and depths to be sampled, the sampling density necessary to obtain the desired accuracy of the delineation, and if samples will be analyzed by the on-site or off-site laboratory. The PSP will also identify the sampling increments to be selectively analyzed for concentrations of the COC(s) of interest, along with field work requirements. Analytical requirements will be listed in the PSP. The chosen analytical methodologies are able to achieve a detection limit capable of resolving the COC action level. For real-time methodologies, the field data will be used to bias the physical sampling necessary for COC delineation.

### 7.2 COC Delineation

The media COC delineation will use all data collected unc:: the PSP, and if deemed appropriate by the Project Lead, may also include existing data obtained from physical samples, and if applicable, information obtained through real-time screening. The delineation may be accomplished through modeling (e.g. kriging) of the COC concentration data with a confidence limit specific to project needs that will reduce the potential for Decision Error 1. A very conservative approach to delineation may be utilized, where the boundaries of the contaminated media are extended to the first known vertical and horizontal sample locations that reveal concentrations below the desired action level.

7.3 QC Considerations

Laboratory work will follow the requirements specified in the SCQ. If analysis is to be carried out by an off-site laboratory, it will be a Fluor Daniel Fernald approved full service laboratory. Laboratory quality control measures include a media prep blank, a laboratory control sample (LCS), matrix duplicates and matrix spike.

Typical Field QC samples are not required for ASL B analysis. However the PSPs may specify appropriate field QC samples for the media type with respect to the ASL in accordance with the SCQ, such as field blanks, trip blanks, and container blanks. All field QC samples will be analyzed at the associated field sample ASL. The frequency of field QC sampling is as follows: Duplicate samples will be taken at a minimum of one per 20 samples. Rinsates will be performed at a minimum of one per 20 on all field equipment that is re-used. Trip blanks will be taken at a minimum of one per shipping container when analyzing for volatile organic compounds (VOCs). For VOCs, container blanks will be taken at a minimum of one per Area and Phase per container type (i.e. stainless steel core liner/plastic core liner/Geoprobe tube) when using uncertified containers. Field blanks are not necessary for soil metal analysis, as it is unlikely in ambient field conditions to have metals cross contamination, however, the probability of cross contamination with liquid samples and semi-volatile organic compounds is much higher, therefore for liquid samples and samples that will be analyzed for semi-volatile organic compounds (SVOCs) field blanks will be taken at a minimum of one per 20 samples. ASL and validation requirements are as follows:

- Real-time data will be analyzed to ASL A, and no field QC samples are required.

- If physical samples are analyzed for Pre-design Investigations and/or Pre-certification delineations; 100% of the data will be analyzed per ASL B requirements. 90% of the data will require only a Certificate of Analysis, the other 10% will require the Certificate of Analysis and all associated QA/QC results, and will be validated to ASL B.

- If samples are analyzed for WAC Attainment and/or RCRA Characteristic Areas Delineation, 100% of the data will be analyzed and reported to ASL B. The ASL B package will include a Certificate of Analysis along with all associated QA/QC results. In addition, 10% of the data will be validated to ASL B.

- If delineation data are also to be used for Certification, all data will be analyzed and reported to ASL D, and 10% will be validated to ASL D. In addition, the data must meet the data quality objectives specified in the Certification DQO.

All data will undergo an evaluation by the Project Team, including a comparison for consistency with historical data. Deviations from QC considerations resulting from evaluating inputs to the decision from Section 3, must be justified in the PSP such that the objectives of the decision rule in Section 5 are met.

7.4 Independent Assessment

Independent assessment shall be performed by the FEMP QA organization by conducting surveillances. Surveillances will be planned and documented in accordance with Section 12.3 of the SCQ.

7.5 Data Management

Upon receipt from the laboratory, all results will be entered into the SED as qualified data using standard data entry protocol. The required ASL B data will undergo analytical validation by the FEMP validation team. A minimum of ten percent (10%) of field data will be validated by the FEMP QA validation team. The Project Manager will be responsible to determine data usability as it pertains to supporting the DQO decision of determining delineation of media COC's.

7.6 Applicable Procedures

Sample collection will be described in the PSP with a listing of applicable procedures. Typical related plans and procedures are the following:

- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ).
- SMPL-01, *Solids Sampling*
- SMPL-21, *Collection of Field Quality Control Samples*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance*
- EQT-23, *Operation of ADCAM Series Analyzers with Gamma Sensitive Detectors*
- EQT-30, *Operation of Radiation Tracking Vehicle Sodium Iodide Detection System*

# Data Quality Objectives
## Delineating the Extent of Media Constituents of Concern

1A. Task/Description: Delineating the extent of contamination above the FRLs

1.B. Project Phase: (Put an X in the appropriate selection.)

RI ☐ FS ☐ RD ☒ RA ☐ RvA ☐ OTHER ☐

1.C. DQO No.: SL-048, Rev. 1 DQO Reference No.:____________

---

2. Media Characterization: (Put an X in the appropriate selection.)

Air ☐ Biological ☐ Groundwater ☒ Sediment ☒ Soil ☒

Waste ☒ Wastewater ☐ Surface water ☐ Other (specify) ____

---

3. Data Use with Analytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable Data Use.)

Site Characterization
A ☒ B ☒ C ☐ D ☒ E ☐

Risk Assessment
A ☐ B ☐ C ☐ D ☐ E ☐

Evaluation of Alternatives
A ☐ B ☐ C ☐ D ☐ E ☐

Engineering Design
A ☒ B ☒ C ☐ D ☒ E ☐

Monitoring during remediation
A ☒ B ☒ C ☐ D ☒ E ☐

Other
A ☐ B ☐ C ☐ D ☐ E ☐

---

4.A. Drivers: Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and the OU2 and/or OU5 Record of Decision (ROD).

4.B. Objective: Delineate the extent of media contaminated with a COC (or COCs) with respect to the action level(s) of interest.

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5. Site Information (Description):

---

6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

1. pH [X] •
   Temperature [X] •
   Specific Conductance [X] •
   Dissolved Oxygen [X] •
   Technetium-99 [X] •

2. Uranium [X] •
   Full Radiological [X] •
   Metals [X] •
   Cyanide [ ]
   Silica [ ]

3. BTX [ ]
   TPH [ ]
   Oil/Grease [ ]

4. Cations [ ]
   Anions [ ]
   TOC [ ]
   TCLP [X] •
   CEC [ ]

5. VOA [X] •
   BNA [X] •
   Pesticides [X] •
   PCB [X] •
   COD [ ]

6. Other (specify)

*If constituent is identified for delineation in the individual PSP.

6.B. Equipment Selection and SCQ Reference:

| Equipment Selection | Refer to SCQ Section |
|---|---|
| ASL A X RTRAK / HPGe / XRF | SCQ Section: Not Applicable |
| ASL B X | SCQ Section: App. G Tables G-1&G-3 |
| ASL C | SCQ Section: |
| ASL D X | SCQ Section: App. G Tables G-1&G-3 |
| ASL E | SCQ Section: |

7.A. Sampling Methods: (Put an X in the appropriate selection.)

Biased [X] Composite [ ] Environmental [X] Grab [X] Grid [X]

Intrusive [X] Non-Intrusive [ ] Phased [ ] Source [ ]

DQO Number: SL-048, Rev. 1

7.B. Sample Work Plan Reference: This DQO is being ~~written prior to the~~ PSPs.

Background samples: OU5 RI

7.C. Sample Collection Reference:

Sample Collection Reference: SMPL-01, EQT-06

---

8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

| | | | |
|---|---|---|---|
| Trip Blanks | [X]* | Container Blanks | [X]++ |
| Field Blanks | [X]+ | Duplicate Samples | [X] |
| Equipment Rinsate Samples | [X] | Split Samples | [X]** |
| Preservative Blanks | [ ] | Performance Evaluation Samples | [ ] |
| Other (specify) | | | |

*For volatile organics only
** Split samples will be collected where required by EPA or OEPA.
+ Taken at the discretion of the Project Manager (if warranted by field conditions)
++ One per Area and Phase per container type (i.e. stainless steel core liner/ plastic core liner/Geoprobe tube).

8.B. Laboratory Quality Control Samples:

| | | | |
|---|---|---|---|
| Method Blank | [X] | Matrix Duplicate/Replicate | [X] |
| Matrix Spike | [X] | Surrogate Spikes | [ ] |
| Tracer Spike | [ ] | | |

Other (specify) Per SCQ

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

# APPENDIX B
# TARGET ANALYTE LISTS

TAL A

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GAMMA SPECTROMETRY SCAN (300 grams)

30-minute count time identification of all peaks using multiple library searches

TAL B
TCLP INORGANICS AND pH (150 grams/150 grams) 1904

Arsenic
Barium
Beryllium
Cadmium
Chromium
Lead
Selenium
Silver
Zinc

pH

TAL C

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ALPHA SPECTROMETRY (5 grams)

Isotopic uranium
Isotopic thorium
Radium-226

TCLP ORGANICS (60 grams/120 grams/500 grams)

Endrin
Lindane
Methoxychlor
Toxaphene
2,4-D
2,4,5-TP (Silvex)
Benzene
Carbon tetrachloride
Chlordane
Chlorobenzene
Chloroform
o-Cresol
m-Cresol
p-Cresol
Cresol
1,4-Dichlorobenzene
1,2-Dichloroethane
1,1-Dichloroethylene
2,4-Dinitrotoluene
Heptachlor (and its epoxide)
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Methyl ethyl ketone
Nitrobenzene
Pentachlorophenol
Pyridine
Tetrachloroethylene
Trichloroethylene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
Vinyl chloride

TAL E

Polychlorinated biphenyls (200 grams)

Aroclor 1016
Aroclor 1221
Aroclor 1232
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260

TAL F

ICP/MS (5 grams)

Uranium-235 (wt %)

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TAL G

Reactive cyanide and sulfide (150 grams)

TAL H

Paint Filter Liquids Test (200 grams)

TAL I

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Gross alpha/beta screen (10 grams)

# APPENDIX C
# SAMPLE INTERVAL SUBSTITUTION LIST

## TABLE C-1

## RANDOM ORDER FOR ELIMINATION AND SUBSTITUTION OF SOIL INTERVALS

| Boring Number | 1st Depth Interval | 2nd Depth Interval | 3rd Depth Interval | 4th Depth Interval |
|---|---|---|---|---|
| | Rank Order of Intervals to be Eliminated in Event of Above Background Radiological Reading | | | |
| SP6-1 | 1 | 2 | 4 | 3 |
| SP6-2 | 3 | 2 | 4 | 1 |
| SP6-3 | 1 | 4 | 2 | 3 |
| SP6-4 | 2 | 3 | 1 | 4 |
| SP6-5 | 3 | 2 | 4 | 1 |
| SP6-6 | 2 | 1 | 3 | 4 |
| SP6-7 | 1 | 3 | 4 | 2 |
| SP6-8 | 2 | 4 | 3 | 1 |
| SP6-9 | 3 | 2 | 4 | 1 |
| SP6-10 | 4 | 2 | 1 | 3 |
| SP6-11 | 1 | 3 | 2 | 4 |
| SP6-12 | 4 | 2 | 1 | 3 |
| SP6-13 | 2 | 3 | 4 | 1 |
| SP6-14 | 4 | 3 | 2 | 1 |
| SP6-15 | 4 | 3 | 1 | 2 |
| SP6-16 | 2 | 3 | 1 | 4 |
| SP6-17 | 2 | 1 | 4 | 3 |

Note: The PSP requires that samples exhibiting above-background radiological readings be selected for radiological analysis. In this event, a predetermined interval in the PSP (Table 2-2) will be eliminated (per the rank order above) and substituted with the interval that exhibits radiological contamination.