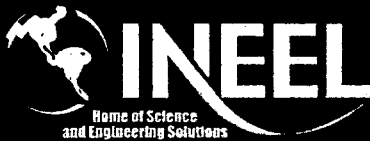


DOE/NE-ID-11135
Revision 0
May 2004



U.S. Department of Energy
Idaho Operations Office

***Scope of Work for Waste Area Group 10
Track 2 Investigations for CFA-10A,
Sites MISC-33, TRA-60, and TRA-63***



Idaho National Engineering and Environmental Laboratory

**DOE/NE-ID-11135
Revision 0
Project No. 23037**

**Scope of Work for Waste Area Group 10
Track 2 Investigations for CFA-10A, Sites MISC-33,
TRA-60, and TRA-63**

May 2004

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

ABSTRACT

This statement of work addresses the Track 2 field investigation of four Comprehensive Environmental Response, Compensation, and Liability Act sites included in Waste Area Group 10 at the Idaho National Engineering and Environmental Laboratory. Sites being investigated in this study consist of the experimental test drum in EOCR-01 leach pond (MISC-33), the soil-filled concrete ring adjacent to CFA-667 (CFA-10A), the TRA-605 warm waste pipeline (TRA-63), and the fenced area north of TRA-608 (TRA-60). This document summarizes previous studies and presents preliminary scoping recommendations and preliminary site conceptual models that illustrate the potential contaminant pathways to environmental receptors. Also presented are the preliminary data quality objectives for this Track 2 investigation, a list of deliverables, and the project schedule.

CONTENTS

ABSTRACT.....	iii
ACRONYMS.....	vii
1. INTRODUCTION.....	1
2. SITE HISTORY AND BACKGROUND.....	1
2.1 Experimental Test Drum in EOCR-01 Leach Pond (MISC-33).....	1
2.2 Soil-Filled Concrete Ring (CFA-10A).....	3
2.3 TRA-605 Warm Waste Pipeline (TRA-63).....	3
2.4 Fenced Area North of TRA-608 (TRA-60).....	3
3. PRELIMINARY SCOPING RECOMMENDATION.....	7
4. SCOPE FOR WAG 10 TRACK 2 INVESTIGATION.....	7
4.1 Experimental Test Drum in EOCR-01 Leach Pond (MISC-33).....	7
4.2 Soil-Filled Concrete Ring (CFA-10A).....	7
4.3 TRA-605 Warm Waste Pipeline (TRA-63).....	8
4.4 Fenced Area North of TRA-608 (TRA-60).....	8
5. CONCEPTUAL SITE MODELS.....	8
6. PRELIMINARY DATA QUALITY OBJECTIVES.....	8
7. DELIVERABLES AND SCHEDULE.....	8
8. REFERENCES.....	15

FIGURES

1. Experimental test drum in the EOCR-01 leach pond (MISC-33)	2
2. Soil-filled concrete ring adjacent to CFA-667 (CFA-10A)	4
3. TRA-605 warm waste pipeline (TRA-63)	5
4. Fenced area north of TRA-608 (TRA-60)	6
5. Conceptual site model for the experimental test drum in the EOCR-01 leach pond (MISC-33).....	11
6. Conceptual site model for the soil-filled concrete ring (CFA-10A)	12
7. Conceptual site model for the TRA-605 warm waste pipeline (TRA-63)	13
8. Conceptual site model for the fenced area north of TRA-608 (TRA-60)	14

TABLES

1. Preliminary data quality objectives	9
2. Track 2 deliverables and schedule	15

ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CLP	Contract Laboratory Program
COC	contaminant of concern
COPC	contaminant of potential concern
DQO	data quality objective
EOCR	Experimental Organic Cooled Reactor
FSP	field sampling plan
HQ	hazard quotient
INEEL	Idaho National Engineering and Environmental Laboratory
SOW	scope of work
SVOC	semivolatile organic compound
TAL	Target Analyte List
TPH	total petroleum hydrocarbon
TRA	Test Reactor Area
WAG	waste area group

Scope of Work for Waste Area Group 10 Track 2 Investigations for CFA-10A, Sites MISC-33, TRA-60, and TRA-63

1. INTRODUCTION

This scope of work (SOW) addresses four Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites within Waste Area Group (WAG) 10 at the Idaho National Engineering and Environmental Laboratory (INEEL). These sites consist of the following:

- The experimental test drum in the Experimental Organic Cooled Reactor (EOCR)-01 leach pond (MISC-33)
- The soil-filled concrete ring (Central Facilities Area [CFA]-10A)
- The Test Reactor Area (TRA)-605 warm waste pipeline (TRA-63)
- The fenced area north of TRA-608 (TRA-60).

These sites are being addressed under an INEEL Track 2 investigation. The purpose of the investigation is to provide additional data for input into the WAG 10 Operable Unit 10-08 remedial investigation/feasibility study. This SOW is written in accordance with *Track 2 Sites: Guidance for Assessing the Low Probability Hazard Sites at the INEL* (DOE-ID 1994).

2. SITE HISTORY AND BACKGROUND

The purpose of this section is to present the background and history of each site in this investigation, including the results and recommendations of the Track 1 investigations.

2.1 Experimental Test Drum in EOCR-01 Leach Pond (MISC-33)

MISC-33, located approximately 2.5 miles southeast of CFA, consists of a drum inside a stainless-steel cylinder and a metal/stainless-steel apparatus (Figure 1). The annulus between the drum and the stainless-steel cylinder contains soil. The drum itself contains ashes, thermocouples, graduated cylinders, beakers, stainless-steel blocks, pipettes, crucibles, and other items generated during a series of experiments conducted in the test drum. The tests, which were completed in May 1982, involved the explosive characterization of unleached ion exchange resins mixed with nitric acid. Based on the results of the experiments, it was concluded that the resin/nitric acid mixture posed no significant explosion risks (Scarpellino et al. 1984).

However, the drum contents may pose an unacceptable risk to human health and the environment from lead and nitroaromatics (Harris 2000). A radiological survey of surficial soils in the area was conducted in August 1991. The results of the survey indicated that only background radiological conditions exist at MISC-33. No other field-screening or laboratory data exist for MISC-33, and a Track 1 investigation has not been conducted at this site.

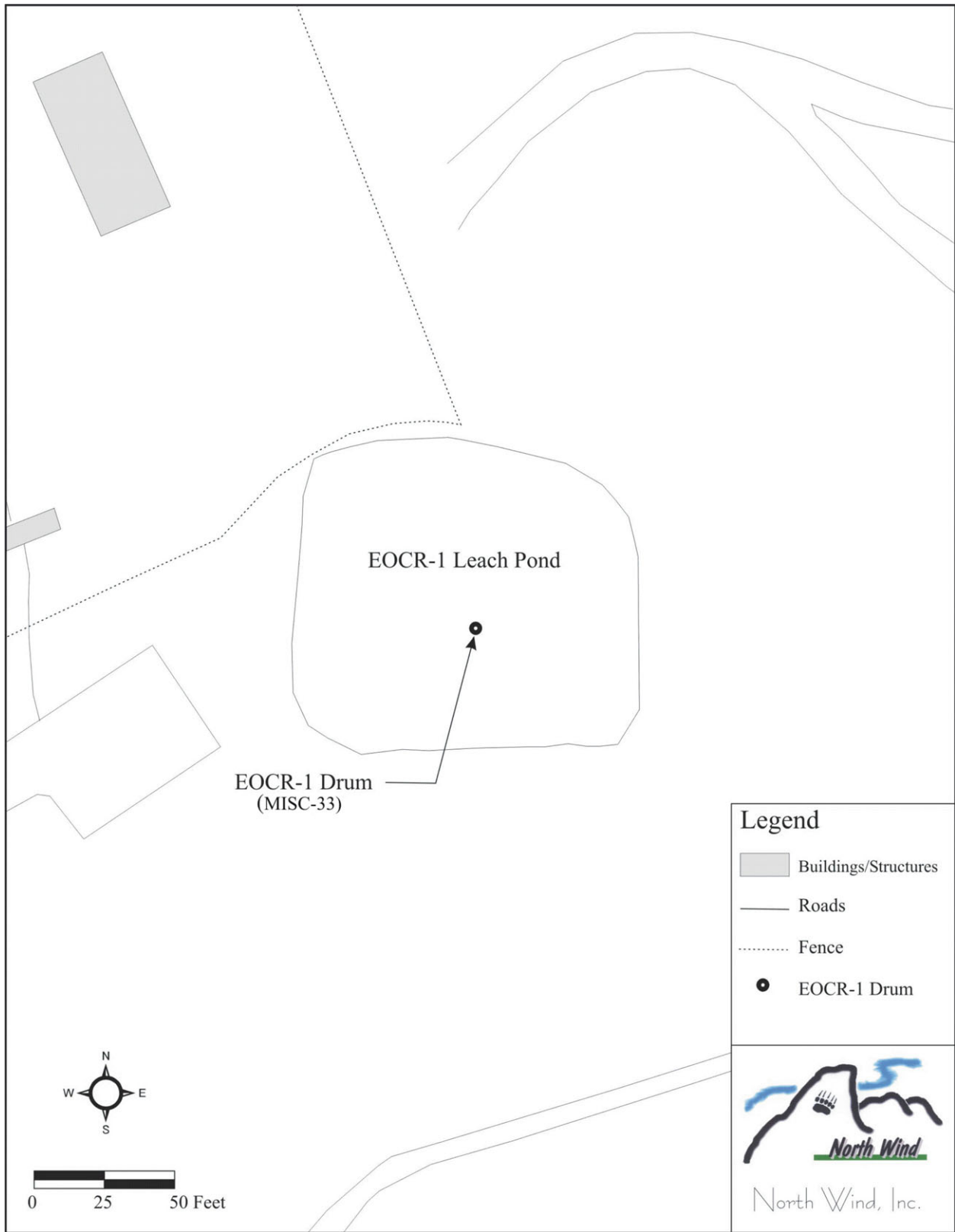


Figure 1. Experimental test drum in the EOCR-01 leach pond (MISC-33).

2.2 Soil-Filled Concrete Ring (CFA-10A)

CFA-10A consists of a soil-filled concrete ring discovered during remediation of Site CFA-10, which was an area of lead-contaminated soil outside of building CFA-667 (Figure 2). The concrete ring is about 4 ft in diameter. Its past use is unknown, but it may have been the upper portion of a dry well used to receive runoff from the driveway on the east side of CFA-667 (Landis 2002). A Track 1 investigation has not been conducted at this site.

The only known contaminant of concern (COC) at CFA-10A is lead, which was identified during previous remediation efforts.

2.3 TRA-605 Warm Waste Pipeline (TRA-63)

During the initial excavation at the TRA-605 Warm Waste Pipeline Replacement Project in October 2001, radiation control technicians (using handheld detectors) discovered contaminated soil exhibiting 30,000 disintegrations per minute at about 60 in. below ground surface. Upon further excavation, a breach was found in the 4-in. Duriron warm wastewater pipeline at about 72 in. below ground surface. Figure 3 illustrates the general layout of TRA-63. The pipe was found to have a shear offset of about 1/2 in., with the offset constituting approximately 13% of the cross-sectional area of the pipe.^a Workers observed that the edges of the sheared pipe appeared corroded, suggesting that the pipe had been damaged for some time.

Before the pipeline was repaired, contaminated water was seen issuing from the breach in the pipeline and from the surrounding formation. Approximately 3 gal of contaminated water had filled the excavation before the 4-in. Duriron warm wastewater pipeline was repaired. A radiological survey of the soil in the immediate vicinity of this pipeline confirmed the presence of contamination at 300,000 disintegrations per minute. During this effort, approximately 4 yd³ of contaminated soils was removed from the vicinity of the pipeline and disposed of as radioactively contaminated soil. After the 30-in. TRA-605 Warm Waste Pipeline Replacement Project was completed, the area was backfilled with clean fill material.

No additional site characterization has occurred since the pipeline was repaired in October 2001. However, evidence (documented in the Track 1 investigation) suggests that radioactive wastewater was released into the soils beneath the warm waste line. Therefore, a Track 2 investigation will address further characterization of the extent of soil contamination at this site.

2.4 Fenced Area North of TRA-608 (TRA-60)

The TRA-60 area (Figure 4) was used from 1952 to 1999 for support operations related to the TRA demineralizer process. The structures within the fenced area include two acid tanks (TRA-731D and -731E), two caustic tanks (TRA-731B and -731C), a pumphouse (TRA-631), a regenerant effluent neutralization tank (TRA-708C), a brine pit (TRA-731A [CERCLA Site TRA-20]), an east-west trench, and a north-south trench (CERCLA Site TRA-40). The piping and contaminated debris in the north-south trench were removed under NEW-TRA-006 of the Voluntary Consent Order (IDEQ 2000) during the spring of 2000. The brine pit (TRA-20) and the north-south trench (TRA-40) were determined to be “no further action” sites in the Operable Unit 2-13 comprehensive record of decision signed in December 1997.^b

a. *Track 1 Decision Documentation Package for TRA-605 Warm Waste Line (Draft)*, DOE/NE-ID-11139, Rev. B, Department of Energy Idaho Operations Office, February 2004.

b. *Draft Track 1 Decision Document Packages for OU 2-14 Sites TRA-56, TRA-57, TRA-58, TRA-59, and TRA-60*, EM-ER-245-00, Department of Energy Idaho Operations Office, November 2000.



Figure 2. Soil-filled concrete ring adjacent to CFA-667 (CFA-10A).

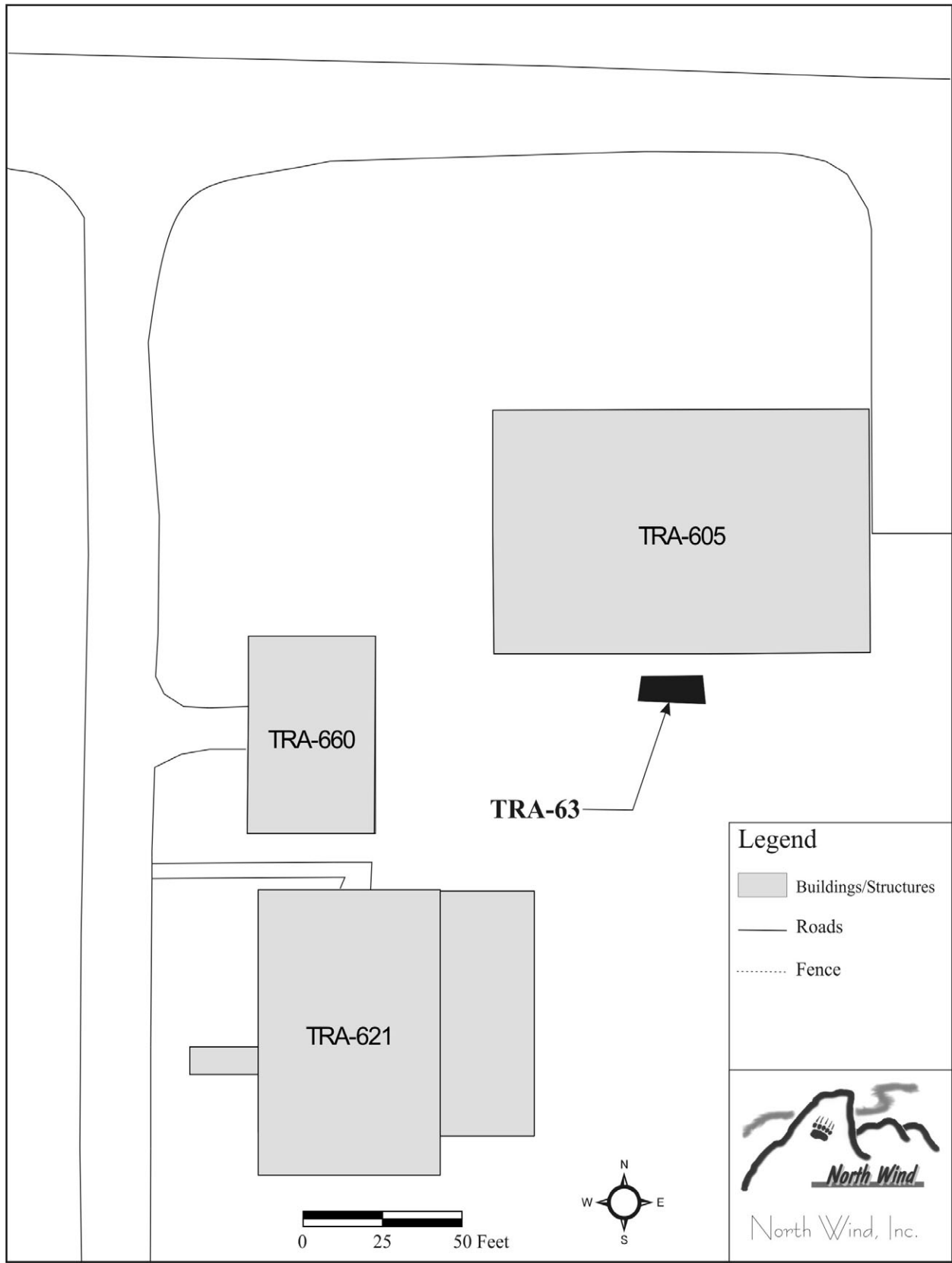


Figure 3. TRA-605 warm waste pipeline (TRA-63).

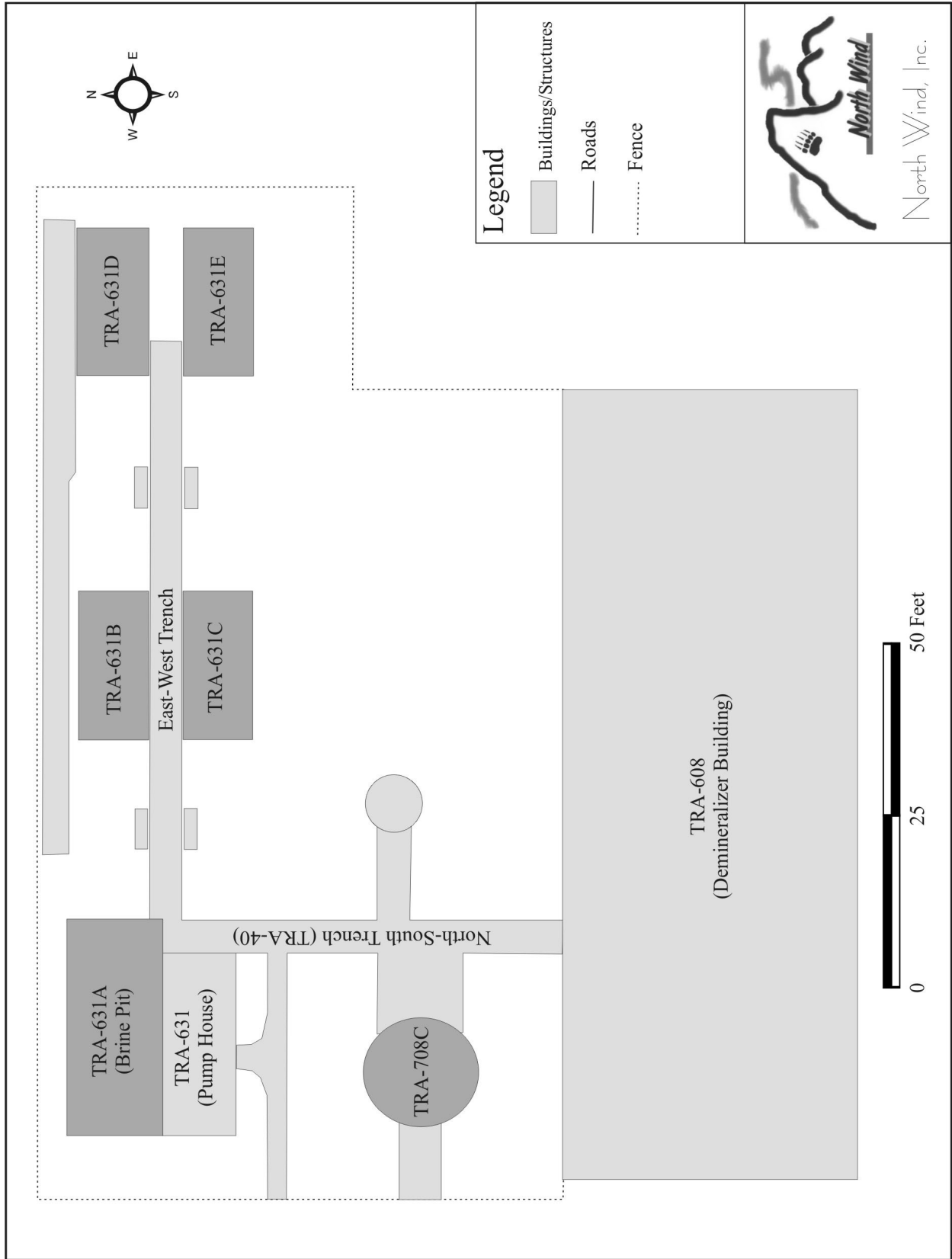


Figure 4. Fenced area north of TRA-608 (TRA-60).

TRA-708C, an elementary neutralization unit for the TRA-608 demineralizer process, leaked on November 3 and 4, 1996. The regenerant effluent was primarily composed of sulfuric acid and sodium hydroxide, and the releases at TRA-708C were classified as corrosive-characteristics hazardous waste. Furthermore, the commercial-grade sulfuric acid was found to be contaminated with mercury and lead. The total volume of the release at TRA-708C was estimated to be 1,500 gal.

Several rounds of soil sampling were conducted at TRA-60 from 1999 to 2001. The sampling efforts focused on the area around the base of TRA-708C, the area along the north-south trench (TRA-40), the area along and beneath the east-west trench (north of TRA-608), and random locations throughout TRA-60. Several areas within TRA-60 were identified as having unacceptable concentrations of lead and mercury in the soil. Elevated concentrations of lead were found in soils at the base of TRA-708C and along the north side of the east-west trench. In addition, elevated levels of mercury were detected in soils in the north-south trench near the base of TRA-708C and along the north side of TRA-608.

Based on the findings of the Track 1 investigation conducted in 2001, the COCs within the fenced area north of TRA-608 are lead and mercury. The Track 1 investigation recommends further investigation, including additional sampling, to better determine the risks associated with the contaminants in the area and to evaluate all potential pathways from the site. Further evaluation is also needed in order to develop any necessary remedial alternatives for cleanup of the contaminated area.

3. PRELIMINARY SCOPING RECOMMENDATION

Currently, no preliminary scoping recommendation has been made by the Agencies (i.e., the Department of Energy, the Environmental Protection Agency, and the Idaho Department of Environmental Quality). The information used to develop the preliminary scope for this investigation was derived from various sources, including Track 1 investigations, findings, and recommendations; field sampling plans (FSPs); and other historical documentation.

4. SCOPE FOR WAG 10 TRACK 2 INVESTIGATION

The following subsections summarize the preliminary scope of investigation at each site being addressed under this Track 2 investigation. A detailed discussion of the overall sampling approach at each Track 2 site will be presented in the FSP.

4.1 Experimental Test Drum in EOCR-01 Leach Pond (MISC-33)

The soil material, debris, and ash within the experimental test drum will be sampled during this Track 2 investigation. In addition, the soil within the annulus between the drum and the stainless-steel cylinder will be sampled. It is anticipated that only two samples will be collected and analyzed for lead and nitroaromatics. The details for this sampling effort will be defined by the project data quality objectives (DQOs), which are discussed in the FSP.

4.2 Soil-Filled Concrete Ring (CFA-10A)

Because of the absence of any information about the presence of contaminants at CFA-10A, five to 10 soil samples will be collected within and around the soil-filled concrete ring at a maximum depth of 10 ft to evaluate whether contaminated soils exist at CFA-10A. The samples will be analyzed for semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPHs), metals, and radioactive contamination (i.e., alpha, beta, and gamma radiation). This information will be used to determine whether soils within the concrete ring pose a threat to human health or the environment. Details of this sampling effort will be defined by the project DQOs, which are discussed in the FSP.

4.3 TRA-605 Warm Waste Pipeline (TRA-63)

Although the break in the warm wastewater pipeline near TRA-605 was repaired in 2001 and both ends of the pipeline were capped in the summer of 2002, the line itself may still contain radioactively contaminated resin that could be released to the environment. Further evaluation is needed to determine the extent of the contamination and whether remedial actions are required.

Limited soil sampling will be conducted in the immediate vicinity of the break in the warm wastewater pipeline. The sampling array will be designed to sufficiently determine the vertical and horizontal extent of radionuclide-contaminated soil in the area surrounding the break in the warm wastewater pipeline. Soil samples collected from multiple depths at each borehole will be screened in the field for radioactivity. Samples exhibiting the highest levels of radioactivity will be submitted for laboratory analysis (i.e., alpha, beta, gamma, tritium, and selected isotopes listed in Table 1). It is anticipated that a minimum of five soil borings (sampled at 5-ft intervals) will be required for this investigation. Details of this sampling effort will be defined by the project DQOs, which are discussed in the FSP.

4.4 Fenced Area North of TRA-608 (TRA-60)

Based on the analytical results of previous sampling efforts, lead contamination within TRA-60 soil poses a potential risk to human health and the environment. The sample results indicate that lead is present in soil near the base of TRA-708C at levels that exceed the Environmental Protection Agency preliminary remediation goal (or maximum acceptance level) of 400 mg/kg. The sample results also indicate the presence of mercury at low levels that pose a potential risk to the environment.

The scope of the Track 2 investigation at TRA-60 is focused on further characterizing the nature and extent of lead and mercury soil contamination. Approximately 10 to 15 soil borings will be identified to fill in data gaps within TRA-60 area. These borings will be advanced to a maximum depth of 10 ft and sampled at 2-ft intervals. The information gathered in this investigation will be combined with past sampling information in order to evaluate the risk associated with the levels of lead and mercury contamination in soils at TRA-60 and to evaluate remedial action alternatives. Details of this sampling effort will be defined by the project DQOs, which are discussed in the FSP.

5. CONCEPTUAL SITE MODELS

The conceptual site models for each site are shown in Figures 5 through 8. The models for these sites were created using the Track 2 investigation format.

6. PRELIMINARY DATA QUALITY OBJECTIVES

Preliminary DQOs, which are summarized in Table 1, have been developed after a review of the information and data available for each of the four sites and will be further developed in the FSP.

7. DELIVERABLES AND SCHEDULE

Table 2 shows the deliverables for this Track 2 investigation.

Table 1. Preliminary data quality objectives.

Data Quality Objective Elements	Experimental Test Drum (MISC-33; EOCR-1)	Soil-Filled Concrete Ring (CFA-10A)	TRA-605 Warm Waste Pipeline (TRA-63)	Fenced Area North of TRA-608 (TRA-60)
Track 2 Objectives	<p>Determine the presence or absence of COPCs at this site.</p> <p>Determine the concentrations of nitroaromatics and lead at the site.</p>	<p>Determine the presence or absence of COPCs at this site.</p> <p>Perform sampling in and around the soil-filled concrete ring to determine COPCs.</p> <p>Determine the depth of potential contamination associated with the soil-filled concrete ring.</p> <p>Determine the source of the waste associated with the soil-filled concrete ring if COCs are found above background levels.</p>	<p>Determine the concentrations of potential COCs at the site.</p> <p>Perform sampling sufficient to determine the overall nature and extent of soil contamination at this site.</p> <p>Completely delineate the three-dimensional footprint of the TRA-63 site.</p> <p>Determine the quantity of radiologically contaminated soil at the site.</p>	<p>Determine the concentrations of lead and mercury at the site.</p> <p>Perform sampling sufficient to determine the overall nature and extent of soil contamination at this site.</p> <p>Perform sampling sufficient to assess all exposure pathways and determine if unacceptable risk exists.</p>
Prioritized Data Uses	<p>Evaluate the risk to human health and the environment from nitroaromatics and lead at this site.</p> <p>Evaluate the risk level from nitroaromatic and lead contaminant concentrations.</p> <p>Determine proper disposal options.</p>	<p>Evaluate potential exposure pathways associated with this site.</p> <p>Evaluate the risk level from potential contaminants at this site.</p> <p>Select a remedial action alternative for possible cleanup of the contaminated area.</p>	<p>Evaluate whether radiologically contaminated soil remaining at TRA-63 poses an unacceptable risk to human health and/or the environment.</p> <p>Evaluate the risk to determine the appropriate controls needed at the site for the protection of human health and/or the environment.</p> <p>Select a remedial action alternative for possible cleanup of the contaminated area.</p>	<p>Evaluate the risk to human health and the environment from lead and mercury at this site.</p> <p>Evaluate all potential exposure pathways from this site.</p> <p>Evaluate the risk to determine the appropriate controls needed at the site for the protection of human health and/or the environment.</p> <p>Select a remedial action alternative for possible cleanup of the contaminated area.</p>

Table 1. (continued).

Data Quality Objective Elements	Experimental Test Drum (MISC-33; EOCR-1)	Soil-Filled Concrete Ring (CFA-10A)	TRA-605 Warm Waste Pipeline (TRA-63)	Fenced Area North of TRA-608 (TRA-60)
Contaminants of Concern	Nitroaromatics, lead	Unknown	Alpha, beta, gamma, tritium	Lead, mercury
Level of Concern	Metals: >background; excess cancer risk >10 ⁻⁴ ; HQ >1 Nitroaromatics: excess cancer risk >10 ⁻⁴ ; HQ >1	Metals and radionuclides: >background; excess cancer risk >10 ⁻⁴ ; HQ >1 SVOCs and TPH: excess cancer risk >10 ⁻⁴ ; HQ >1	Radionuclides: >background; excess cancer risk >10 ⁻⁴ ; HQ >1	Metals: >background; excess cancer risk >10 ⁻⁴ ; HQ >1
Critical Samples	Critical samples will be defined in the FSP.	Critical samples will be defined in the FSP.	Critical samples will be defined in the FSP.	Critical samples will be defined in the FSP.
Sample Collection	Sample collection methods will be defined in the FSP.	Sample collection methods will be defined in the FSP.	Sample collection methods will be defined in the FSP.	Sample collection methods will be defined in the FSP.
Sample Analysis	CLP TAL metals, nitroaromatics	Alpha, beta, gamma, SVOCs, TPH, metals	Alpha, beta, gamma, tritium, and other selected isotopes ^a	CLP TAL metals
Field Screening	N/A	N/A	N/A	N/A
Data Validation Levels	Level A	Level A	Level A	Level A
Data Completeness	Soil samples: 90% Critical samples: 100%	Soil samples: 90% Critical samples: 100%	Soil samples: 90% Critical samples: 100%	Soil samples: 90% Critical samples: 100%

a. Other isotopes include Tc-99, Sr-90, Am-241, Ni-59, Ni-63, Pu-isotopes, U-isotopes, and Th-isotopes.
 CLP = Contract Laboratory Program
 COPC = contaminants of potential concern
 HQ = hazard quotient
 N/A = not applicable
 SVOC = semivolatile organic compound
 TAL = Target Analyte List
 TPH = total petroleum hydrocarbon

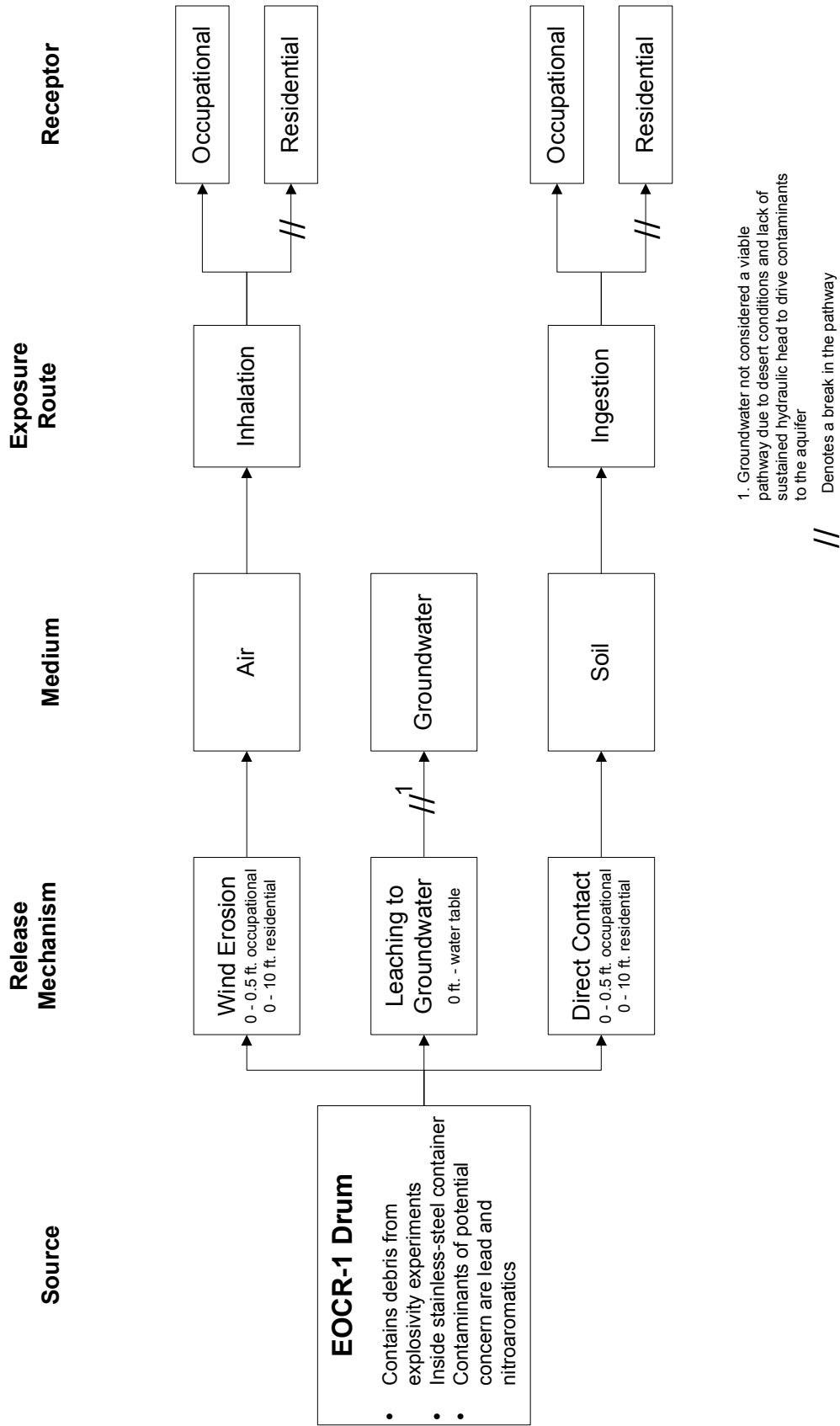


Figure 5. Conceptual site model for the experimental test drum in the EOCR-01 leach pond (MISC-33).

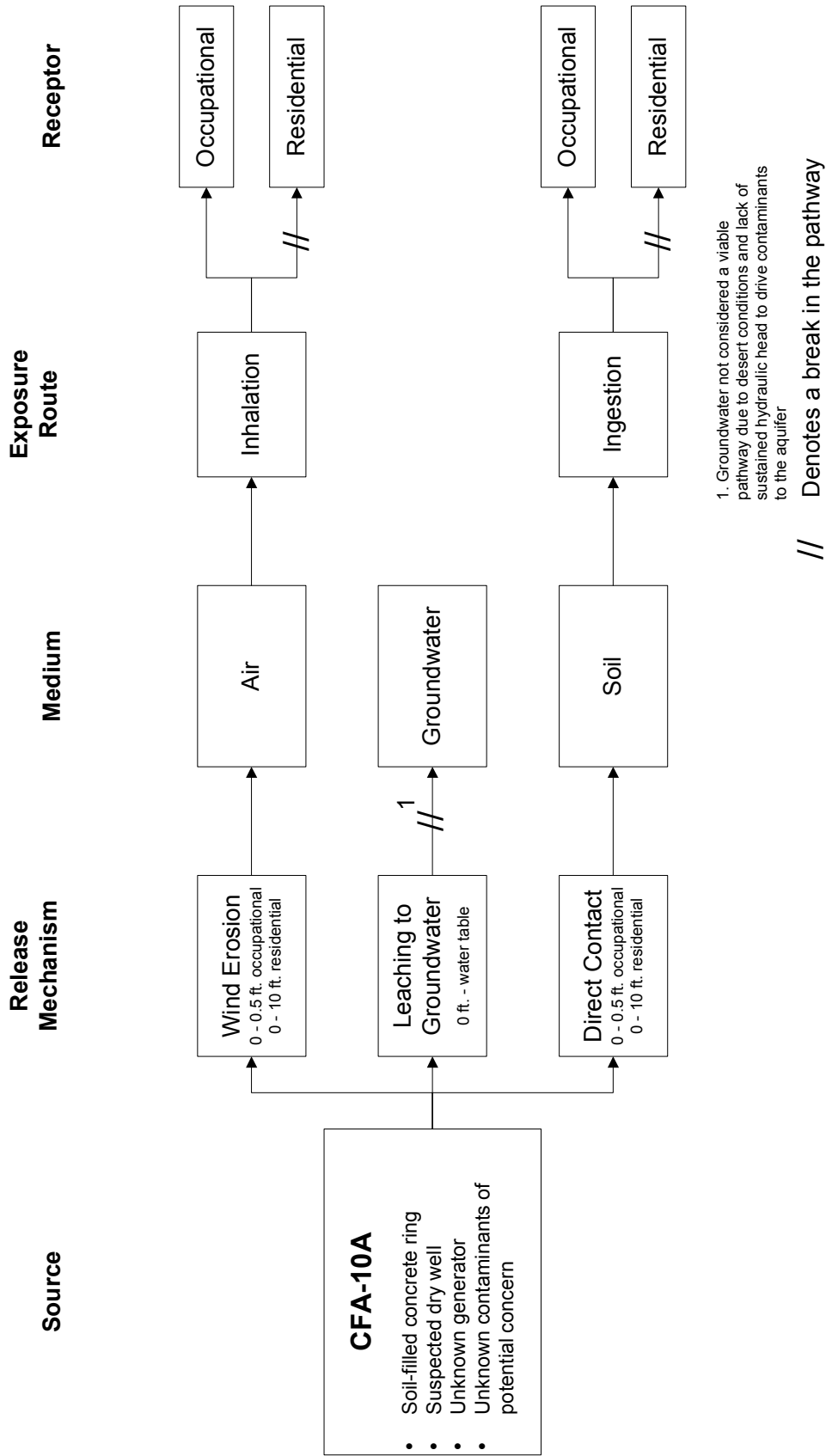


Figure 6. Conceptual site model for the soil-filled concrete ring (CFA-10A).

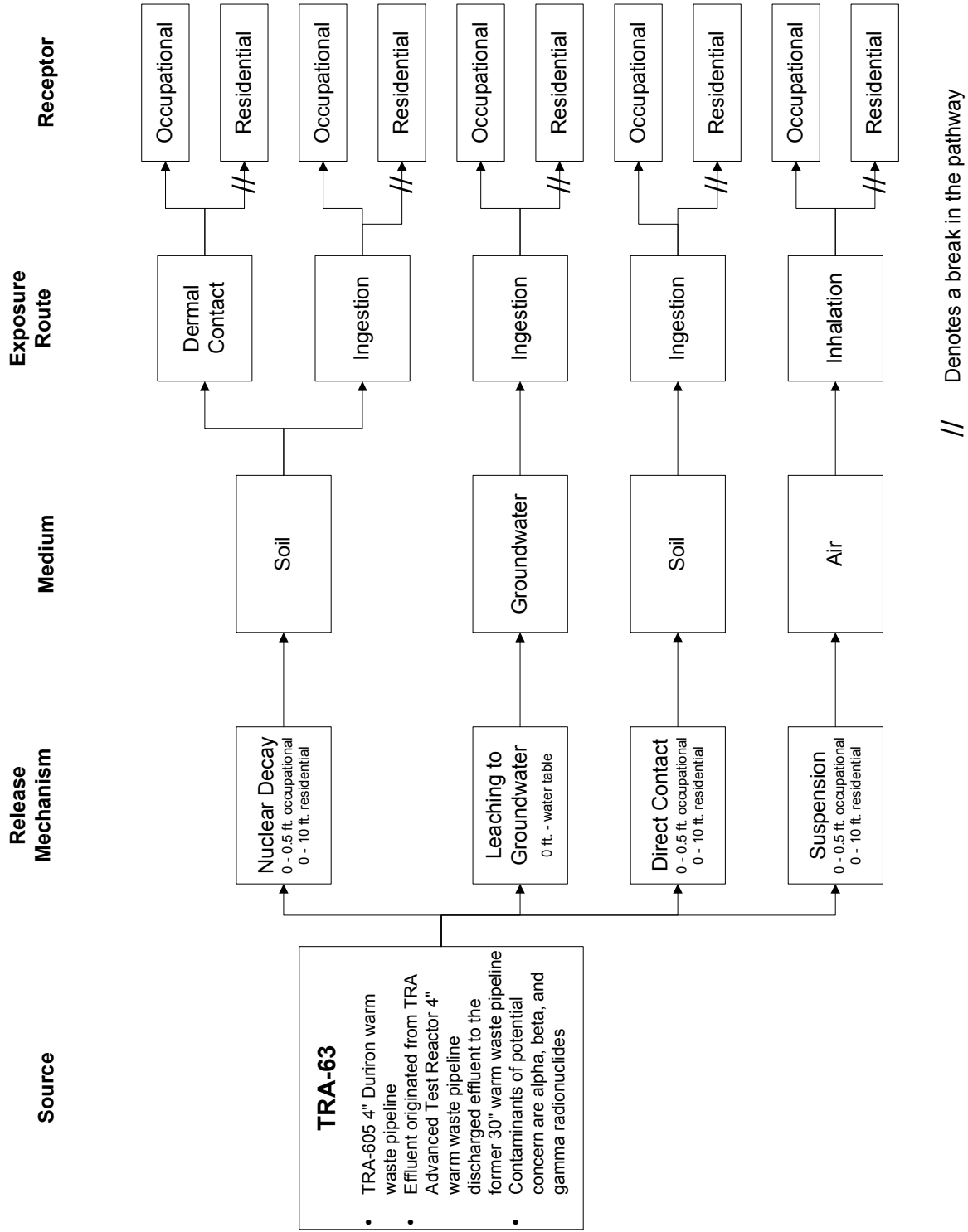
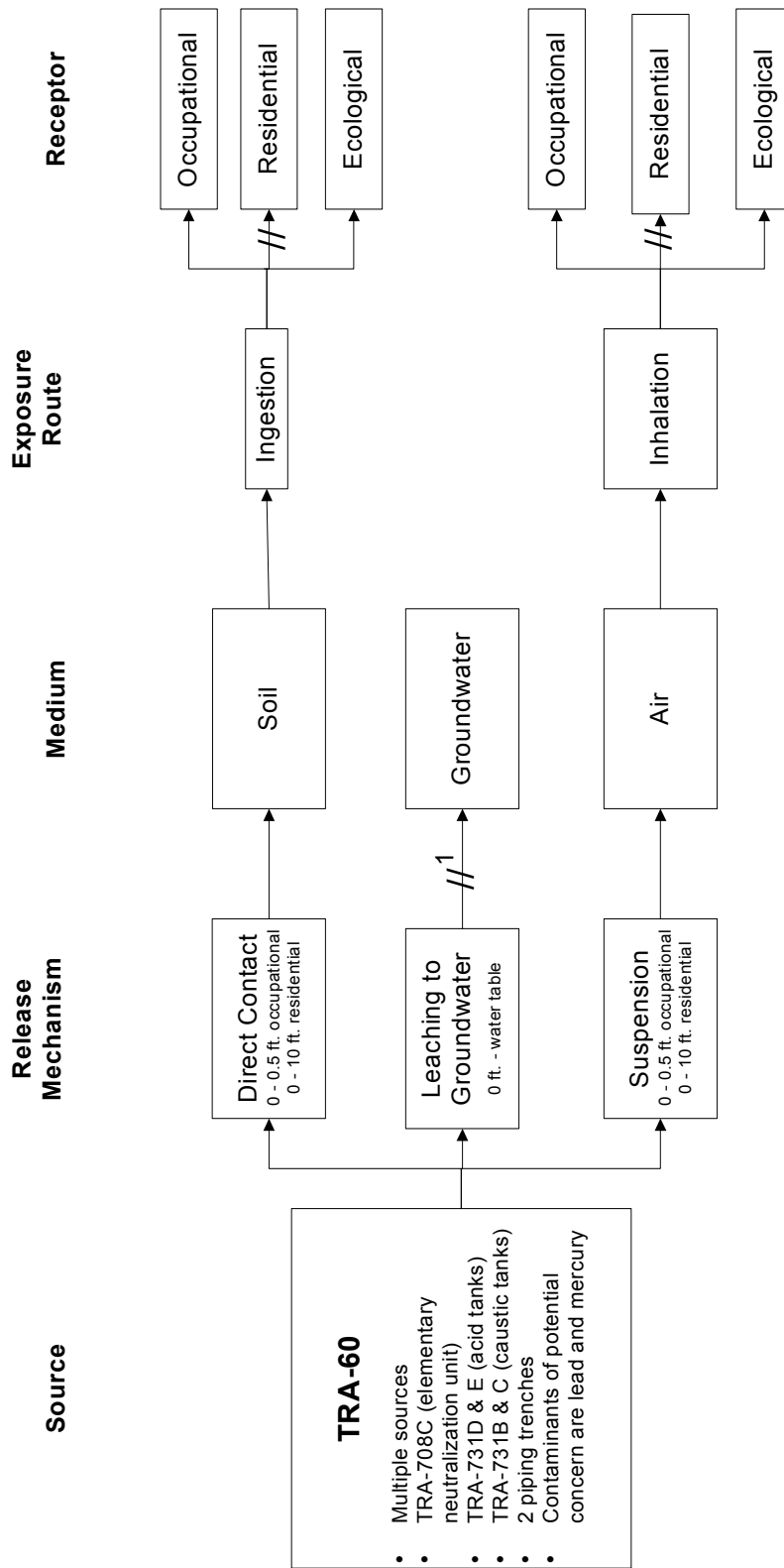


Figure 7. Conceptual site model for the TRA-605 warm waste pipeline (TRA-63).



1. Groundwater not considered a viable pathway due to desert conditions and lack of sustained hydraulic head to drive contaminants to the aquifer

// Denotes a break in the pathway

Figure 8. Conceptual site model for the fenced area north of TRA-608 (TRA-60).

Table 2. Track 2 deliverables and schedule.

Deliverable	Date
Submit draft SOW to Agencies	02/13/04
Resolve Agencies' comments on draft SOW	03/08/04
Submit final SOW to Agencies	03/09/04
Submit draft FSP to Agencies	03/26/04
Resolve Agencies' comments on draft FSP	04/30/04
Submit final FSP to Agencies	05/03/04
Finalize health and safety plan	03/05/04
Commence Track 2 field investigation	05/04/04
Finish Track 2 field investigation	06/01/04
Submit draft summary report to Agencies	12/14/04
Resolve Agencies' comments on draft summary report	02/01/05
Submit final summary report to Agencies	02/02/05

8. REFERENCES

- DOE-ID, 1994, *Track 2 Sites: Guidance for Assessing Low Probability Hazard Sites at the INEL*, DOE/ID-10389, Rev. 6, U.S. Department of Energy Idaho Operations Office, January 1994.
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