
**PROJECT SPECIFIC PLAN FOR
REAL-TIME SCAN OF PADDYS RUN CORRIDOR AND
ASSOCIATED DRAINAGE FEATURES**

SOIL AND DISPOSAL FACILITY PROJECT

**FERNALD CLOSURE PROJECT
FERNALD, OHIO**



AUGUST 2003

U.S. DEPARTMENT OF ENERGY

20300-PSP-0008

Revision 1

FINAL

000001

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LIST OF ACRONYMS AND ABBREVIATIONS

ALARA	as low as reasonably achievable
ASCOC	area-specific constituent of concern
ASL	analytical support level
ccpm	corrected counts per minute
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
ECDC	Engineering/Construction Document Control
FACTS	Fernald Analytical Computerized Tracking System
FAL	Field Activity Log
FCP	Fernald Closure Project
FRL	final remediation level
GPS	global positioning system
HPGe	high-purity germanium detector
LAN	Local Area Network
MDC	minimum detection concentration
mg/kg	milligrams per kilogram
OSDF	On-Site Disposal Facility
pCi/g	picoCuries per gram
ppm	parts per million
PSP	Project Specific Plan
PWID	Project Waste Identification Document
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RMS	Radiation Measurement System
RSS	Radiation Scanning System
RTIMP	Real-Time Instrumentation Measurement Program
RTRAK	Real-Time Radiation Tracking System
SDFP	Soil and Disposal Facility Project
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
TAL	Target Analyte List
TBD	to be determined
V/FCN	Variance/Field Change Notice
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This project specific plan (PSP) describes pre-design radiological scanning in the Fernald Closure Project's (FCP) stream corridors including Paddys Run, two adjacent oxbow areas, and the Storm Sewer Outfall Ditch and Pilot Plant Drainage Ditch corridor, both of which are tributaries to Paddys Run. The data collected under this plan will be used to: 1) identify and evaluate any patterns of radiological contamination and to perform initial excavation design, 2) provide preliminary estimates of sediment and soil that will need to be excavated to reach FRLs within these areas, and 3) identify any hotspot areas for radium-226, thorium-232 and total uranium that need further pre-design measurements using real-time detector systems, and 4) identify visible surface debris within the stream corridor to assess the need for removal and disposition. The results will also be utilized for precertification purposes in areas where real-time results indicate the absence of radiological hotspots in areas not impacted by flow from uncertified areas upstream.

These objectives will be accomplished through real-time scanning, as described in Section 2.0, and walk-downs within the stream corridor. Due to the dynamic deposition in the streambed, data collection in portions of the stream corridor may require some amount of reiterative scanning since some of the tributaries (e.g., Pilot Plant Drainage Ditch) bordering the FEMP property are not currently certified.

The scope of this PSP is limited to pre-design scanning activities within the stream corridors previously described from the northern FEMP boundary to the southern FEMP boundary, including the accessible adjacent areas. The Storm Sewer Outfall Ditch, as well as the tributary leading to the storm water retention basins (1,050 feet in length), and the Pilot Plant Drainage Ditch (and adjacent banks and terraces) is also included. The work scope includes scanning, confirmation measurements and, if necessary, hot spot delineation. Scanning is contingent upon water flow in the streambeds and safe accessibility with real-time scanning equipment.

1.2 BACKGROUND

Paddys Run stream traverses the western portion of the FCP property (Figure 1-1) and is approximately 10,500 feet in length. It receives storm water that flows from the Pilot Plant Drainage Ditch and the Storm Sewer Outfall Ditch. The Storm Sewer Outfall Ditch, a natural drainage feature, begins just south of the main parking lot and extends 3,600 feet to the confluence with Paddys Run. The Pilot Plant Drainage Ditch, also a natural drainage feature, is approximately 1,200 feet in length. Figure 1-2 illustrates the locations of stream and drainage ditches under investigation.

Within the boundaries of the FCP, Paddys Run has two adjacent oxbow areas. The southernmost oxbow area is highly vegetated and extends to the west along Area 8, Phase III (A8PIII). In 1962, a berm was created along the northern section of Paddys Run to mitigate erosion into the Waste Pits (refer to Figure 1-2). The northern oxbow area formed as a result of this berm and stream channel movement. In 1967, additional erosion mitigation along Paddys Run road resulted in straightening and diversion of the streambed. The southern oxbow area formed as a result of this southern streambed earthwork.

Paddys Run stream flow is highly variable, ranging from nearly dry conditions some summers up to 500 cfs. Historically, it has received drainage from all but the extreme northeastern corner of the site. Since the mid-1980s, drainage from the most contaminated areas of the site has been controlled by diverting it to lined storage basins, where the water is stored before treatment in the Advanced Waste Water Treatment Facility.

The Storm Sewer Outfall Ditch is the principal tributary on-site for Paddys Run. Uncontrolled run-off from the main parking lot and eastern areas of the site enters this drainage ditch at the extreme northeastern fork. The northwestern fork periodically receives contaminated run-off from the site's Storm Water Retention Basin during overflow events.

The on-site portion of Paddys Run's streambed primarily consists of gravel mixed with sand combined with transitory channel deposits, typical of coarse bed-load materials. The streambed is at significant depth relative to its banks, with bank heights ranging from 10 feet along the southwestern bank to more than 30 feet along the northeastern bank. The western bank is, in general, much lower than the eastern bank. The area immediately west of the stream represents an over bank flood plain. The width of average flow within the streambed is approximately 20 feet.

This stretch of Paddys Run is actively degrading with incisive meanders. High flow events can be accompanied by significant streambed reworking and bank erosion. As an example, between 1954 and 2000, the centerline of Paddys Run moved approximately 40 feet closer to the silos, cutting into the bank that borders the western edge of the silos area. The course of Paddys Run has also been modified by human intervention during the years Fernald was active. These include bank stabilization measures along the eastern bank in the vicinity of the silos to mitigate bank erosion, and rerouting of the streambed in two locations. Figures 1-3, 1-4 and 1-5 provide aerial photographs of Paddys Run for 1954, 1973, and 2000. Figure 1-3 (1973 photograph) also shows the locations of the two stream rerouting events. The reasons for

the rerouting are not known. However, the northern reroute was likely intended to control bank erosion along the northwestern edge of the silos area.

Historical soil sampling and analysis data from the Paddys Run oxbow areas is summarized in Appendix B, and soil sample locations are plotted in Figures 1-6 and 1-7. Several sample locations (see Table 1-1) have above-FRL historical radiological contamination at surface which are depicted in Figure 1-8 and 1-9. Further investigation of these locations with HPGe measurements is discussed in Section 2.2. Historical soil data from the Pilot Plant Drainage Ditch, primarily collected during the pre-design investigation of Area 2/Phase 2, indicated two of 25 surface samples was above the soil FRL for total uranium at 86.9 mg/kg and 119 mg/kg (refer to Figure 1-10). The A2/P2 pre-design work also included a total of 64 samples collected at depth along the ditch for total uranium, isotopic radium and isotopic thorium. The maximum total uranium concentration at depth was 174 mg/kg (1.5-2 feet depth); there were no isotopic radium and thorium results above the soil FRL.

TABLE 1-1
HISTORICAL RADIOLOGICAL SOIL SAMPLES IN
STREAM CORRIDORS ABOVE SOIL FRLs

Boring ID	Sample IDs	Radiological Isotope	Northing	Easting
WPS-A-14	075509/075500	Thorium-228	481152.42	1346513.65
WP-SS-21	123276	Thorium-228	481480.99	1346306.93
WP-SS-21	123276	Thorium-232	481480.99	1346306.93
WP-SS-21	123276	Uranium, Total	481480.99	1346306.93
WP-SS-22	123278	Radium-226	481681.00	1346319.94
WP-SS-22	123278	Radium-228	481681.00	1346319.94
WP-SS-22	123278	Thorium-228	481681.00	1346319.94
WP-SS-22	123278	Thorium-232	481681.00	1346319.94
WP-SS-22	123278	Uranium, Total	481681.00	1346319.94
WP-SS-23	123287	Radium-226	481901.99	1346538.94
WP-SS-23	123287	Radium-228	481901.99	1346538.94
WP-SS-23	123287	Thorium-228	481901.99	1346538.94
WP-SS-23	123287	Thorium-232	481901.99	1346538.94
WP-SS-23	123287	Uranium, Total	481901.99	1346538.94
500318/SS-35	121045/121050	Uranium, Total	479544.93	1346398.61

Note: Refer to Figure 1-7 and 1-8 for plotted locations and concentrations.

The Operable Unit 5 (OU5) Remedial Investigation/Feasibility Study (RI/FS) includes a 1986 Dames and Moore radiological survey of Paddys Run. The survey was conducted from the confluence of Paddys Run and the Great Miami River to the on-site railroad trestle bridge located north of the waste storage area and included a comprehensive radiological walkover survey of the stream bottom and banks. A survey was included in the RI/FS which indicated two areas with elevated gamma readings, one at the confluence of Paddys Run and the Storm Sewer Outfall Ditch and one south of the FCP (south of New Haven Road). Quantitative field frisker measurement values are not stated in the RI/FS.

Only one non-radiological sample (061030), located east of the northern oxbow area, shows a detected result [20 parts per million (ppm)] greater than the soil FRL (15 ppm) for the pesticide compound dieldrin. This sample location will not be further investigated within this PSP since it lies outside of the oxbow area, but will be further evaluated under a separate PSP.

Sediment monitoring takes place on a yearly basis at selected locations along Paddys Run, including at a background location (north of S.R. 126), north of the Storm Sewer Outfall Ditch, from the Storm Sewer Outfall Ditch itself, and from south of the Storm Sewer Outfall Ditch under the current Integrated Environmental Monitoring Plan. Table 1-2 summarizes results from 1990 through 2002 for these four locations. Figure 1-11 shows the general locations for the recent rounds of sampling. For the 1990 to 2002 period, exceedances were primarily limited to the 1990 and 1992 samples for thorium-228, thorium-232 and radium 226 as compared to the sediment FRLs; one other exceedance in 1996 occurred for thorium-232.

TABLE 1-2
RANGE OF ENVIRONMENTAL SEDIMENT SAMPLING RESULTS (1990-2002)

Location	Radium-226 (pCi/g)	Thorium-232 (pCi/g)	Thorium-228 (pCi/g)	Total U (ppm)
Paddys Run Background	0.0 - 1.4	0.15 - 1.1	0.15 - 1.2	0.6 - 4.1
Paddys Run North of Storm Sewer Outfall Ditch	0.0 - 3.7	0.19 - 5.4	0.25 - 5.1	0.8 - 13
Storm Sewer Outfall Ditch	0.0 - 1.4	0.01 - 2.1	0.05 - 1.9	0.6 - 23
Paddys Run South of Storm Sewer Outfall Ditch	0.54 - 0.65	0.33 - 0.35	0.26 - 0.35	0.8 - 44

1.3 CONCEPTUAL MODEL

Any potential contamination in Paddys Run sediments could have come from a number of sources. These include discharge and/or seepage from the waste lagoons, contamination associated with silos activities, contamination associated with surficial discharge from the Storm Sewer Outfall Ditch and Pilot Plant Drainage Ditch (which received drainage from portions of the former production area until 1986 and 1996, respectively), contamination from disposal activities in the South Fields area, and/or random dumping/disposal events along the stream's eastern bank, between the Silos Area and the South Fields Area. Debris associated with Fernald activities has been retrieved from Paddys Run stream banks in the past. Based on site operations, contamination that could have been released into Paddys Run include the primary radionuclides of concern at the site: uranium, radium-226, radium-228, thorium-230 and thorium-232.

Given the episodic high flow rates associated with Paddys Run and the scoured and dynamic nature of the streambed, if contamination persists in measurable quantities it most likely would be either associated with buried debris in stream banks, or present as debris/depositional layers in stable sedimentation areas. Of particular concern are point bars associated with the southern oxbow of Paddys Run since these represent sediment deposits that would have been developing at the time contamination releases were taking place, that would have seen potential over bank deposition since abandonment, and that would have been unaffected by scouring.

1.4 KEY PERSONNEL

The team members responsible for coordination of work in accordance with this PSP are listed in Table 1-3.

**TABLE 1-3
KEY PERSONNEL**

Title	Primary	Alternate
DOE Contact	John Sattler	Don Pfister
Project Manager	Jyh-Dong Chiou	Rich Abitz
Characterization Manager	Frank Miller	Krista Flaugh
RTIMP Lead	Brian McDaniel	Dale Seiller
Field Sampling Lead	Tom Buhrlage	Jim Hey
Surveying Lead	Jim Schwing	Andy Clinton
WAO Contact	Linda Barlow	TBD
Laboratory Contact	Heather Medley	Amy Meyer
Data Validation Contact	Jim Chambers	Andy Sandfoss
Field Data Validation Contact	Dee Dee Edwards	Andy Sandfoss
Data Management Lead	Krista Flaugh	Frank Miller
Radiological Control Contact	Corey Fabricante	Mike Schneider
FACTS/SED Database Contact	Kym Lockard	Susan Marsh
Quality Assurance Contact	Reinhard Friske	Dick Scheper
Safety and Health Contact	Gregg Johnston	Jeff Middaugh or Pete Bolig

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2.0 PRE-DESIGN REAL-TIME CHARACTERIZATION

2.1 DATA COLLECTION STRATEGY

The first priority will be initial scanning in the two adjacent oxbow areas (Figure 2-1). Following the oxbow scanning, the Paddys Run stream corridor that traverses the uncertified areas, and the Pilot Plant Drainage Ditch and the Storm Sewer Outfall Ditch will be scanned to assess possible radiological contamination. Based on these scanning results, selected areas of the stream corridors may be identified for biased physical sampling (under a separate PSP). Particular attention will be paid to locations where stream activity is incising historical deposits, potentially exposing buried contamination. Examples of these locations are the heads of point bars.

The real-time scanning methods and approach will be consistent with the User Guidelines, Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectrometry at the Fernald Site (User's Manual). Field activities will be consistent with the Sitewide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ), and Data Quality Objectives (DQO) SL-054, Revision 1 (Appendix B).

The real-time scanning of the stream corridors and adjacent areas will potentially require the use of several Radiation Measurement System (RMS) platforms due to the varied terrain and surface conditions. Some portions of the stream and stream banks will not be accessible for real-time surveys because of terrain and/or vegetation cover as well as large areas of stream cobble. The real-time coverage will encompass the majority of stream bank areas and oxbow areas to the extent that the work can be accomplished safely and with minimal cutting or removal of stream bank vegetation (no mature trees will be removed). Some portion of the stream corridors will not be measurable with real-time equipment due to the presence of water, the amount of exposed stream channel rock in the field of view, and the density of trees/shrubs on the stream bank where removal would increase the rate of bank erosion. As necessary, some areas may be cleared of undergrowth vegetation in floodplains where the clearing will not destabilize the surface and result in erosion. If possible, the Excavation Monitoring System (EMS) will be utilized on steep bank slopes that are free of trees/shrubs but inaccessible with portable equipment. The relatively flat oxbows, the current and former floodplain and plateau areas may be scanned using HPGe detectors, Radiation Scanning System (RSS), Radiation Tracking System (RTRAK) and/or the Gator.

Real-time measurements within the stream corridor channels and bank slopes will likely be performed with high-purity germanium (HPGe) detectors in accessible areas where the surface consists of soil and/or sand with relatively minimal rock. NaI systems will be used in flat terrain where vegetation can be cut as necessary and when feasible. For NaI scanning, surface water and rock material will be avoided within the detector field of view (radius of 1.2 m). For HPGe measurements, surface water and rock will be avoided when possible, however, measurements may be taken adjacent to surface water or rock material if it is limited to the outer edge of the field of view. In accordance with the User's Manual, the following minimum distances (d) from the center of the detector to the edge of the obstruction (surface water or rock) will be maintained for each HPGe detector height (h): $h = 100$ cm, then $d > 3$ m; $h = 31$ cm, then $d > 1.25$ m; $h = 15$ cm, then $d > 0.5$ m. Removal of small amounts of surface cobble or other debris by raking or other means is permitted to help establish a measurement location where the central portion of the field of view is unobstructed. Where applicable, a correction factor may be applied to account for obstructions occupying >15 percent of the total field of view in accordance with section 4.9.6 of the User's Manual.

Based on results of the real-time measurements, HPGe detectors may be used at lower detector heights to evaluate/confirm concentrations of radium-226, thorium-232, and total uranium. A hot spot is suspected if measurement results exceed three times (3x) the soil FRL for uranium, radium-226 and thorium-232 using HPGe detectors. For NaI systems, a hot spot for radium-226 is suspected if measurements exceed seven times (7x) the FRL or three times (3x) the FRL for uranium and thorium-232. If the suspected hot spot is confirmed (3xFRL with HPGe), hot spot delineation will take place as described below. During the delineation process it may not be possible to comply with the minimum distances to obstructions that were specified in the paragraph above.

2.2 INITIAL PRE-DESIGN SCAN

Initial real-time pre-design scanning (referred to as Phase I) will consist of the maximum possible coverage of the stream corridors and adjacent areas using real-time, gamma sensitive, NaI detector systems (RTRAK/RSS/Gator) or HPGe detector systems to evaluate soil contamination patterns. When the HPGe detectors are used, measurements will be obtained at a detector height of 31 cm or 1 meter and a count time of 300 seconds (5 minutes). At the discretion of the Characterization Lead and/or RTIMP analysts, readings may be obtained at the 31-cm or 15-cm detector height if a smaller field of view is required (i.e., topographic constraints or avoiding standing water in tributary within the center of field of view, etc.).

Since the historical data in the adjacent oxbow areas show some above-FRL radiological constituents at the surface, HPGe measurements will be collected at all locations in the oxbow areas which are above-FRL (Figures 1-8 and 1-9). HPGe measurements at these locations will be collected at a detector height of 31 cm and a count time of 300 seconds (5 minutes). Based on the results of the HPGe measurements, further delineation may be necessary if 3xFRL is detected. All further characterization (i.e., physical sampling) of these areas will be documented in a Variance/Field Change Notice (V/FCN).

For NaI systems, the spectral acquisition time will be set to 4 seconds, and data will be collected with a detector speed of 1 mile per hour. Adjacent passes will be conducted with approximately a 0.4-meter overlap, which corresponds to a separation of the centerline of the passes by 2 meters. The onboard Global Positioning System (GPS) will be used to obtain positioning information (i.e., northings and eastings) for each spectrum acquired in locations where a reliable GPS signal can be maintained.

The data obtained from NaI system measurements will be used to determine patterns of total gamma activity and the presence of potential hot spots in Paddys Run oxbow areas and other areas where appropriate. A 2-point moving average of consecutive mobile sodium iodide (NaI) measurements will be mapped to determine if potential total uranium, radium-226 and/or thorium-232 hot spots are present. After reviewing the mapped data, the Characterization Lead or designee will determine the HPGe locations for either confirmation/delineation measurements or highest RMS total gamma activity measurements.

2.3 BIASED LOCATIONS NEAR DEBRIS

The stream corridors will be walked down to determine biased real-time measurement locations for visible debris. Debris will be initially surveyed using a beta/gamma frisker followed by HPGe measurements. The HPGe measurement height will be 31 cm over the debris. Field locations will be selected as deemed necessary to assist in determining the extent of contamination, if any. The debris locations will be marked, identified and surveyed for later removal. If debris exceeds the health and safety trigger levels, 5,000 disintegrations per minute (dpm) for fixed beta/gamma contamination or 1,000 dpm for smearable contamination, these locations will be documented as such and prioritized for later removal. This activity will be performed under a separate work plan, RWP and other health and safety permits as needed, including a PWID applicable to the debris. HPGe measurements on soil/sediment underlying the debris locations will be performed under the PSP for General Characterization for Sitewide Soil Remediation (20300-PSP-011) as an excavation control activity.

2.4 CONFIRMATION MEASUREMENTS WITH HPGE

All confirmation measurements will be taken using HPGe detectors. These measurements will be obtained to confirm potential hot spots identified by NaI (i.e., 2-point moving average results above 3xFRL for uranium and thorium-232 or above 7xFRL for radium-226) and any HPGe potential hot spots (results above 3xFRL for the COCs), as identified during the initial real-time scanning.

All NaI hot spot confirmation measurements will be obtained at a 31 cm detector height with a spectral acquisition time will be set to 5 minutes. Again, the RTIMP analyst will have the flexibility to reduce HPGe detector height to avoid obstructions in the center of the detector field of view. All HPGe hot spot confirmation measurement locations will be surveyed and marked, as identified in Section 2.9.

2.5 HOT SPOT DELINEATION

If a hot spot is confirmed (i.e., HPGe result above 3xFRL), the delineation approach will be determined by project management after considering all surrounding real-time results. Hot spot pre- and post-excavation real-time measurements will include elevation and coordinates. Details of the hot spot delineation will be documented in a V/FCN. This information and data will also be forwarded to WAO (via Data Group Form FS-F-5157) for waste tracking. If excavation is necessary, a PWID would be developed or identified for proper handling and tracking of the excavated soil or material; this removal work would be performed under a separate work plan document (e.g., construction traveler).

2.6 SURFACE SOIL MOISTURE MEASUREMENTS

Surface moisture measurements will be collected to determine soil moisture content and used to correct the real-time data so it is comparable to a lab analysis (where data is reported on a dry weight basis). Moisture measurements will be collected using the Zeltex[®] moisture meter. Surface moisture measurements will be obtained at a minimum of four per acre where the mobile RMS detectors were used for the real-time scan. If the moisture measurements show less than 10 percent variability, the 1 acre will be scanned as one RMS run. Only one moisture value can be applied to each RMS run. If more than a 10 percent variability is shown between the four measurements, the run area will be reduced in size to ensure only the area with less than 10 percent variability in moisture is included in the run. When the HPGe is used, one surface moisture measurement will be obtained per HPGe reading. All surface moisture measurements will be conducted within 8 hours of collecting the real-time measurements and before ambient weather conditions change. If surface soil conditions are unsuitable for moisture measurements, a default moisture value may be used. Refer to Section 3.8 of the User's Manual for more information on these measurements.

2.7 BACKGROUND RADON MONITORING

Background radon monitoring will be utilized during the collection of real-time measurements to obtain background radon information if radium contamination above 7x FRL for NaI systems or 3x FRL for HPGe systems is suspected from based on initial scans and measurements under this PSP. In this case, a background monitor will be established and the suspect area will be reevaluated by repeat scans and/or measurements. The background monitor will be operational from the time that data collection begins until after the final measurement is completed. The monitor will be placed in one location for the day, where it will be set at 31 cm. The radon monitor must also be placed at approximately the same elevation as the real-time measurement. The background radon data will be used per Section 5.3 of the User's Manual to correct the radium-226 data.

2.8 PHYSICAL SAMPLES

Physical samples may be taken under this PSP in areas that are inaccessible to both the NaI systems and the HPGe detectors and/or for delineation purposes. The Characterization Lead or designee will document the sampling approach and other essential information in a V/FCN. If collected, physical samples will follow the quality objectives identified in DQO SL-048.

2.9 REAL-TIME MEASUREMENT IDENTIFICATION

All measurements will be assigned a unique identification for data tracking purposes. All data files will include the area in the file names. All measurements will contain some or all of the following designators.

Real-Time Measurements/Scans:

1. Prefix designating the location: Paddys Run = PR
NOX = northern oxbow area along the Waste Pits
SOX = southern oxbow area along A8PI and A8PIII
Pilot Plant Drainage Ditch = PPD
Storm Sewer Outfall Ditch = SSD
2. Phase: P1 = Phase One (*all NaI scans will be coded as P1*)
P2 = Phase Two confirmation
P2HS = hot spot delineation
P3 = hot spot removal verification
Note: Add "-SM" to this text for Special Material if applicable.
3. NaI or HPGe used: NaI: RSS1, RSS2, RSS3, EMS, GATOR, or RTRAK
HPGe: If using tripod, do not include an identifier.
If using EMS, designate as "EMS".

- 4a. NaI batch number : Sequential numbering of NaI analytical runs/batches.
(if applicable):
- 4b. HPGe Measurement Number : Designates the sequential numbering of HPGe
(if applicable) measurements. The first measurement taken is 1 and any
subsequent measurements are numbered sequentially
(2, 3, 4, etc.).
5. Quality control designator: D = duplicate measurement
(if applicable) Note: One duplicate HPGe measurement
will be collected per 20 measurements.

For example:

SOX-P1-SM-4

PR-P1-RSS3-0999

Where:

SOX = Southern Oxbow Area
P1 = Phase One
SM = Special Material
4 = the fourth gamma reading obtained

Where: PR = Paddys Run
P1= Phase One
RSS3 – NaI platform
0999 = NaI batch number

HPGe Background Radon Monitor :

1. Area (see above areas)
2. Radon (RN)
3. Next sequential number of the background radon measurements collected for a specific area.
For example: PPD-RN-3

2.10 REAL-TIME DATA MAPPING

As the RTIMP measurements are acquired, the data will be electronically loaded into mapping software through manual file transfer or Ethernet. A set of maps and/or data summaries will be given to the Characterization Lead or designee. Maps will be generated indicating COC radionuclide concentrations at geographic locations (northing and easting). The maps will depict the following:

Surface Scan Coverage Maps (Phase I)

- Total Activity Map (single spectra coverage) - to potentially determine certification unit (CU) boundaries for selected below-FRL areas
- Constituents of Concern (COCs) Concentration Maps – total uranium, radium-226 and thorium-232 (2-point running average to determine potential hot spots exceeding 7xFRL for radium-226 and 3xFRL for total uranium and thorium-232) . HPGe data plot will include HPGe locations and measurement results including <3xFRL and >3XFRL for COCs.

HPGe Confirmation/Delineation Maps (Phase II)

- HPGe Location Map (map showing field of view and number for each HPGe measurement)

Hot Spot Post Removal Maps (Phase III)

- HPGe Location Map (map showing field of view and number for each HPGe measurement)

3.0 QUALITY ASSURANCE REQUIREMENTS

3.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS AND DATA VALIDATION

The Data Quality Objective SL-054, Revision 2 (Appendix A), field quality control requirements will be followed for real-time scanning. This DQO addresses both Phase 1 and 2 measurements

If any methods are used that are not in accordance with the SCQ, the Project Manager and Characterization Manager must determine if the qualitative data from the real-time measurements or samples will be beneficial to pre-design or precertification decision making. If the data will be beneficial, the Project Manager and Characterization Manager will ensure that:

- The PSP is revised through a V/FCN to include references confirming that the new method is sufficient to support data needs, and
- Variations from the SCQ methodology are documented in the PSP or V/FCN.

3.2 APPLICABLE PROCEDURES, MANUALS AND DOCUMENTS

To assure consistency and data integrity, field activities in support of this PSP will follow the requirements and responsibilities outlined in controlled procedures and manufacturer operational manuals. Applicable procedures and manuals may include the following:

- RTIMP-M-003, Real-Time Instrumentation Measurement Program Operations Manual
- User Guidelines, Measurement Strategies, and Operational Factors for Deployment of *In-Situ* Gamma Spectroscopy at the Fernald Site (User's Manual)
- EP-0003, Unexpected Discovery of Cultural Resources
- EQT-04, Photoionization Detector
- EQT-06, Geoprobe® Model 5400 Operation and Maintenance Manual
- RM-0021, Safety Performance Requirements Manual
- SMPL-01, Solids Sampling
- SMPL-21, Collection of Field Quality Control Samples
- Sitewide Excavation Plan (SEP)
- OSDF Impacted Materials Placement Plan
- OSDF WAC Attainment Plan
- Sitewide CERCLA Quality (SCQ) Assurance Project Plan
- In-Situ Gamma Spectroscopy Addendum to the SCQ Assurance Project Plan
- RTRAK Applicability Study
- RTIMP Quality Assurance Plan.

000018

3.3 PROJECT REQUIREMENTS FOR INDEPENDENT ASSESSMENTS

Project management has ultimate responsibility for the quality of the work processes and the results of the sampling activities covered by this PSP. The Quality Assurance (QA) organization may conduct independent assessments of the work process and operations to assure the quality of performance. Assessment will encompass technical and procedural requirements of this PSP and the SCQ. Independent assessments will be performed by conducting a surveillance. Surveillances will be planned and documented according to Section 12.3 of the SCQ.

3.4 IMPLEMENTATION OF FIELD CHANGES

Before implementation changes, the Field Lead will be informed of the proposed changes. Once the Field Lead has obtained written or verbal approval (electronic mail is acceptable), the changes may be implemented. Changes to the PSP will be noted in the applicable field logs and on a V/FCN. QA must receive the completed V/FCN, which includes the signatures of the Characterization Manager, Field Lead, Project Manager, WAO, QA, within seven working days of implementation of the change.

4.0 SAFETY AND HEALTH

A safety briefing will be conducted prior to the initiation of field activities and on a daily basis thereafter.

The Field Sampling Leads and team members will jointly assess the safety of performing real-time measurement activities in the field locations covered under this PSP. This will include the slopes of working surfaces, vegetation, and general terrain hazards that may cause slips, trips and falls. Due to the heavy vegetation in the stream corridor work area, the following precautions will be taken:

- Apply insect repellent as needed.
- Gather pant leg at ankle and tape to prevent entry of insects.
- Check skin and head for ticks after finishing work.
- If contact with poison ivy or other poisonous plants is made, thorough washing of body and change or washing of clothing is required.
- Report any bites or injuries to Fluor Fernald Medical.

This PSP is not considered a work authorization document per SH-0021, Work Permits. All personnel performing measurements and physical sampling related to this project will be briefed to the following work control documents where applicable: the Contractor Safe Work Plan or Traveler Package, Fluor Fernald work permits, RWP, penetration permits, Safety Performance Requirements Manual and Environmental Services procedures (i.e., RTIMP-M-003). These work control documents will define required personal protective equipment (PPE) and safe work zones. Work control documents must be reviewed by RTIMP and field sampling personnel to ensure that the intended work is within the scope of these documents (i.e., ensure work to be performed is addressed in the permit). These safety and technical briefings will be documented. Personnel who are not documented as having completed these briefings will not participate in the execution of field activities. All personnel entering a Construction Area will obtain a pre-entry briefing on current activities or hazards that may affect their work. Additionally, prior to entry into an excavation, the Competent Person for Trenching and Excavation shall be contacted to assure that the daily inspection has been completed and the excavation is safe to enter.

All emergencies shall be reported immediately to the Site Communications Center at 648-6511 (if using a cellular phone), or using a radio and contacting "CONTROL" on Channel 2.

5.0 DATA MANAGEMENT

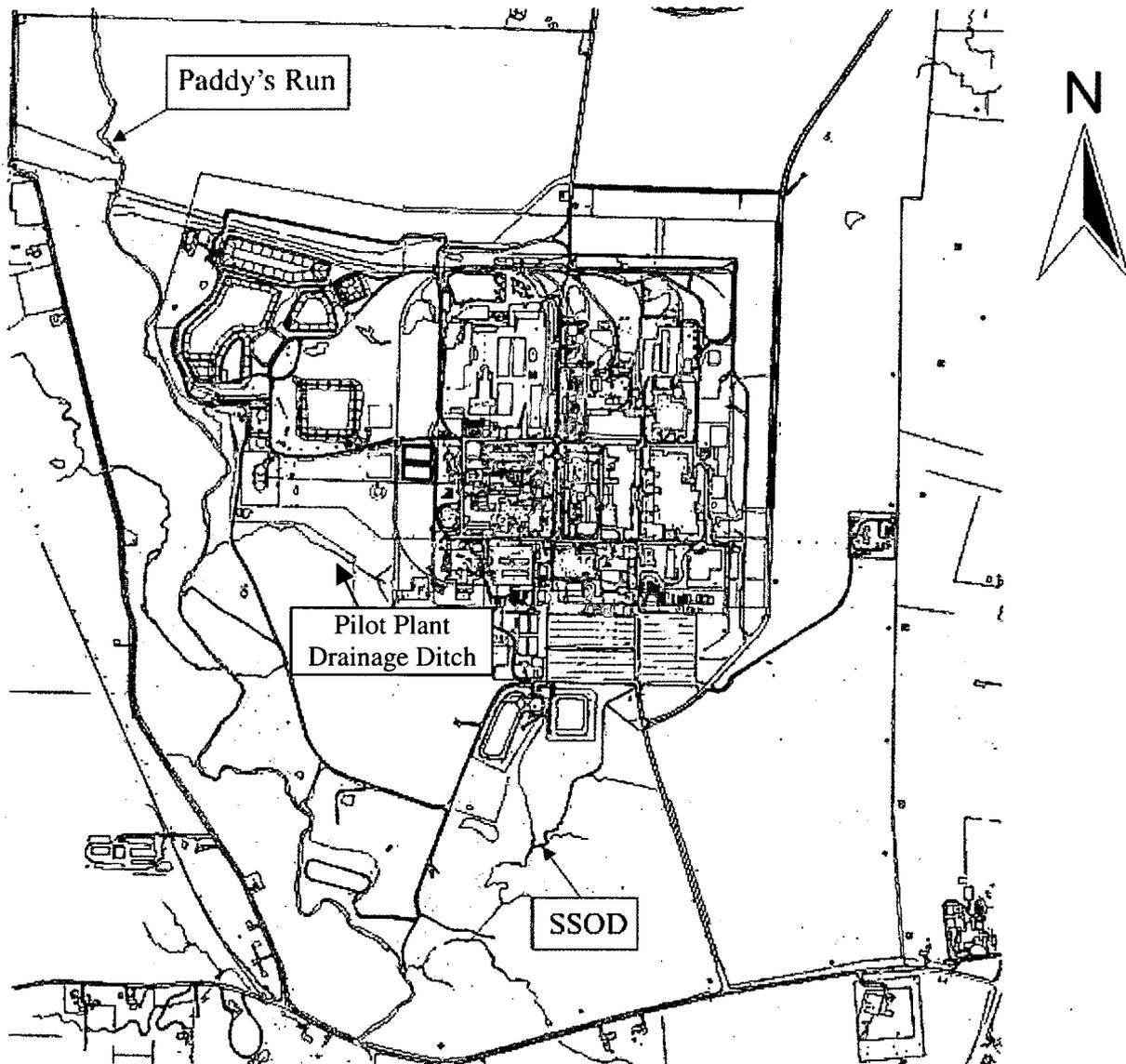
The RTIMP group will provide hard copy maps and/or summary reports to the Characterization Lead and Data Management Lead or designees. All real-time data will be collected and reported at a minimum ASL A and require no data validation. All physical samples measurements will be collected and reported at ASL B and will require 10 percent data validation. As applicable, NaI or HPGe Data Verification Checklists will be completed in accordance with procedure RTIMP M-003 for all in-situ measurements. Field documentation, such as the Zeltex® PercentMoisture Worksheet, will undergo an internal review by the RTIMP.

Electronically recorded data from the GPS, HPGe, and NaI systems will be downloaded on a daily basis to disks, or to the Local Area Network (LAN) using the Ethernet connection. The Characterization Lead or designee will be informed by the RTIMP Lead or designee when RTIMP measurements do not meet data quality control checklist criteria. The Characterization Lead or designee will determine whether additional scanning, confirmation, or delineation measurements are required. Details of hot spot delineations will be documented in a V/FCN. This information and data will also be forwarded to WAO (via Data Group Form FS-F-5157) for WAC documentation.

Once the electronic data have been placed on the LAN and SED, the RTIMP Lead or designee will perform an evaluation prior to placement on the Soil and Disposal Facility Project (SDFP) web site. The evaluation may involve a comparison check between the electronic data, hard copy maps and summary reports for accuracy and completeness. The evaluation will be documented on a Data Verification checklist .

Copies of field documentation shall be generated and provided to the Characterization Lead or Data Management Lead upon request and maintained in SDFP project files until dispositioned to Engineering/Construction Document Control (ECDC). RTIMP will maintain all the real-time files and survey data will be maintained by the Survey Lead or designee. All records associated with this PSP will reference the PSP number and eventually be forwarded to ECDC to be placed in the project file.

FIGURE 1-1 LOCATION OF STREAM CORRIDORS



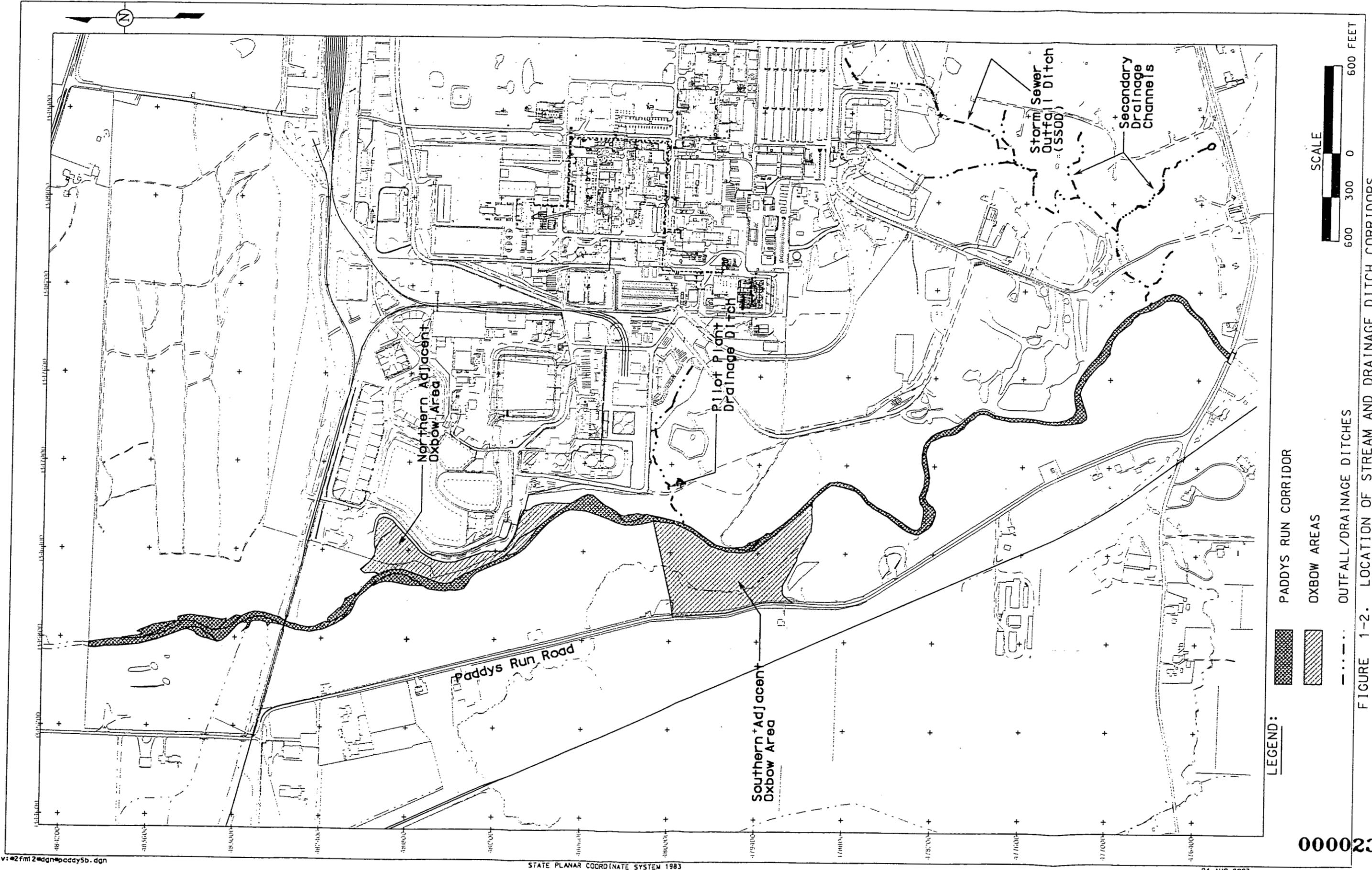


FIGURE 1-2. LOCATION OF STREAM AND DRAINAGE DITCH CORRIDORS

FIGURE 1-3 1973 AERIAL PHOTOGRAPH OF PADDYS RUN

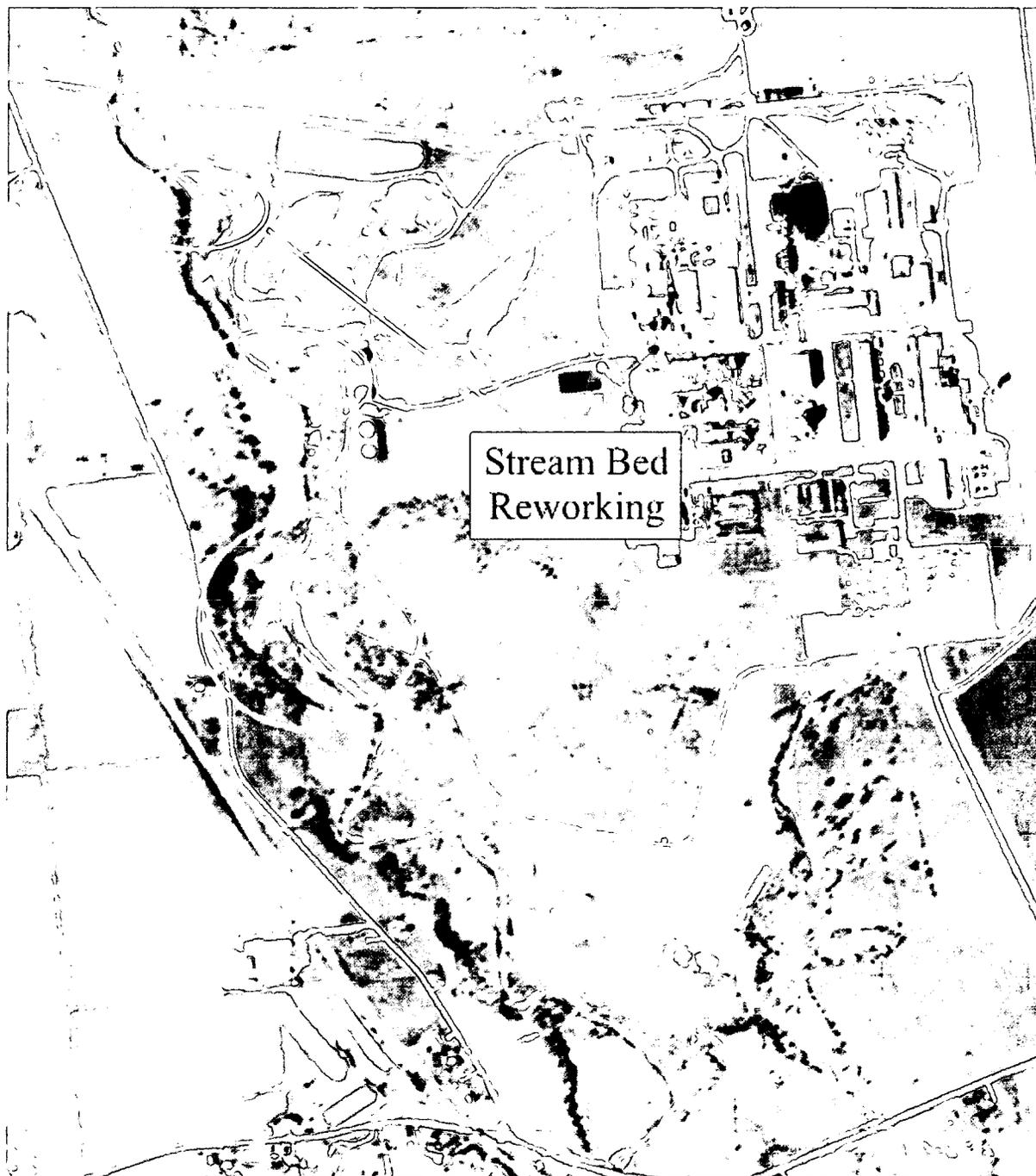


FIGURE 1-4 1954 AERIAL PHOTOGRAPH OF PADDYS RUN

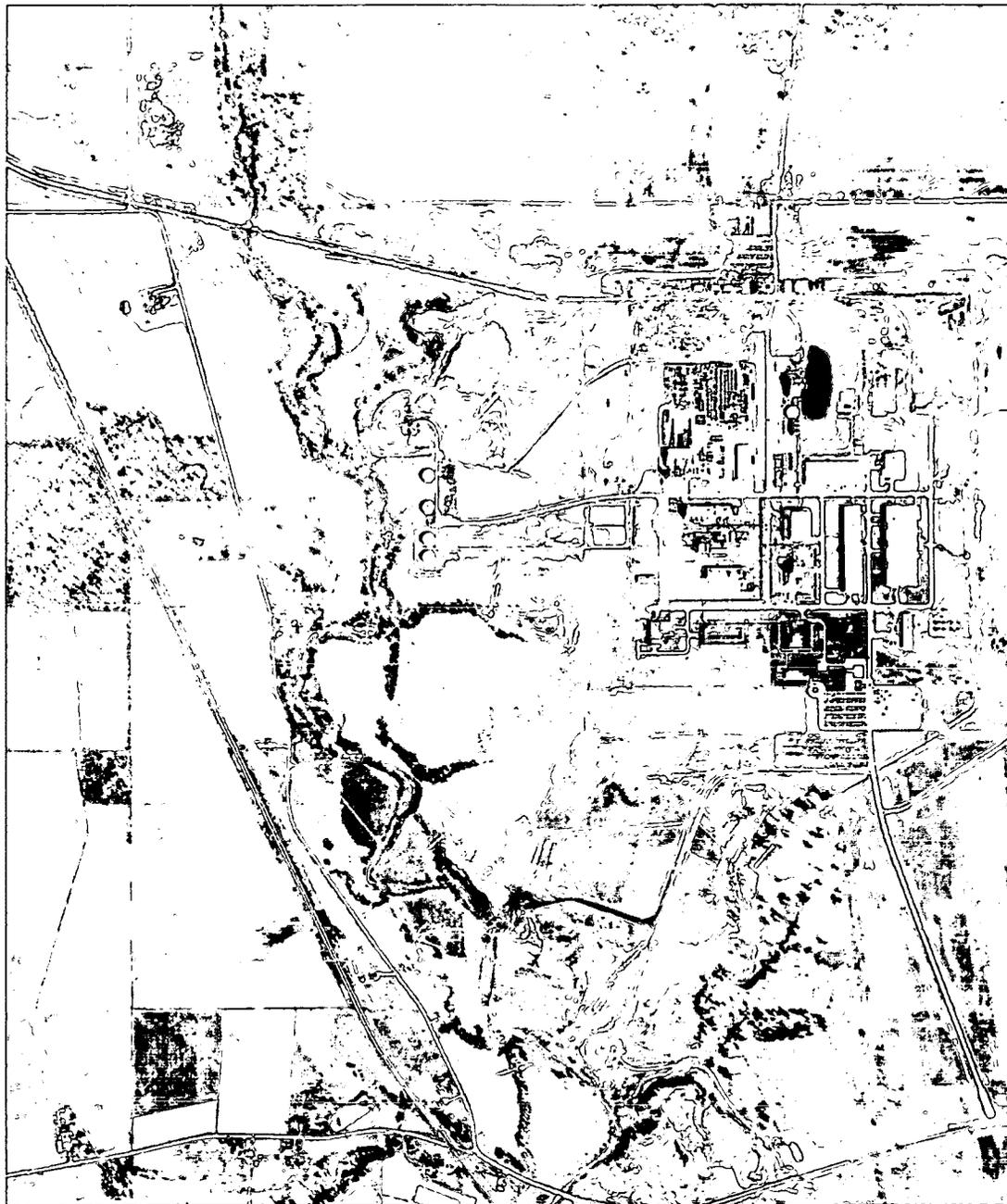
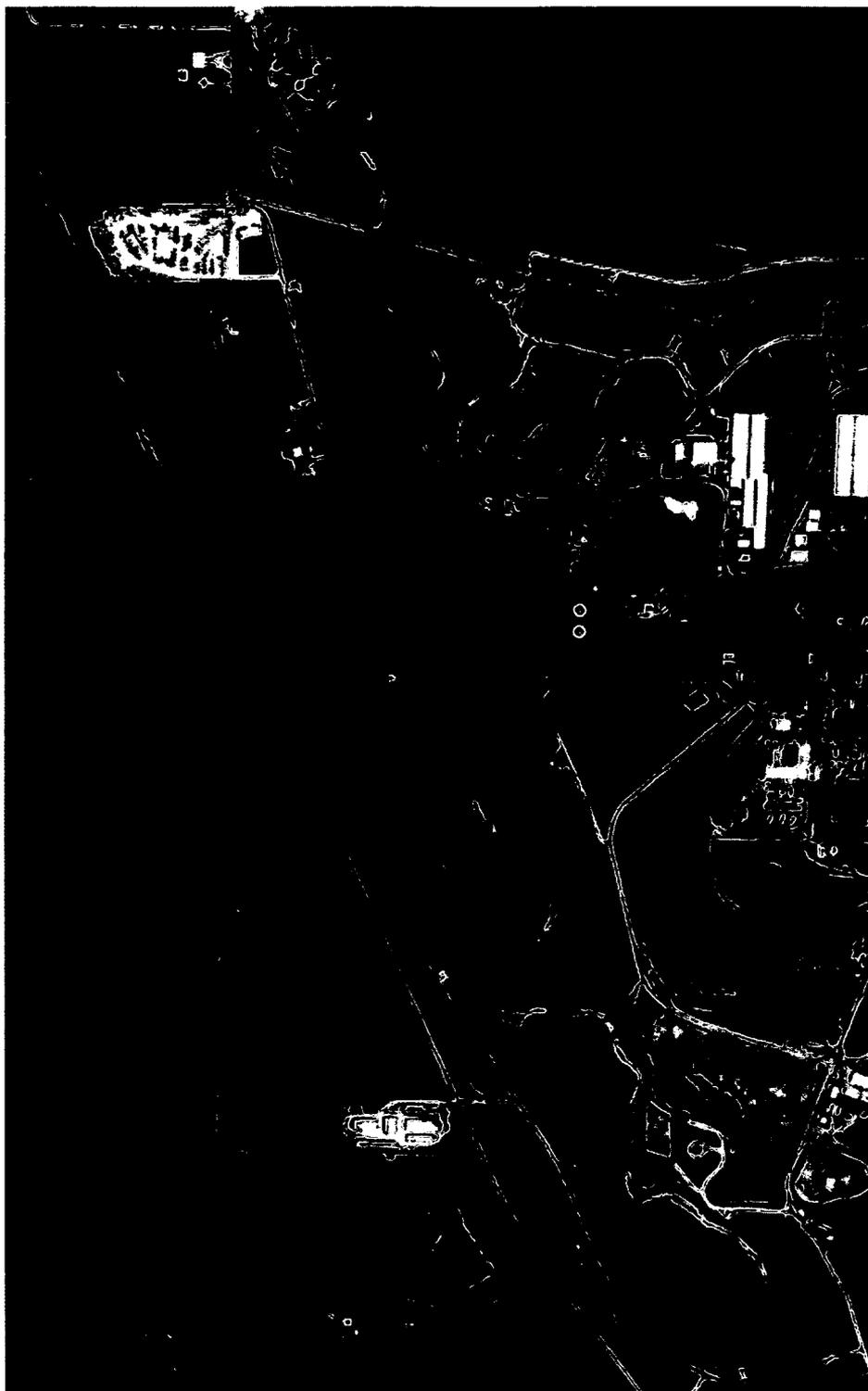


FIGURE 1-5 2000 AERIAL PHOTOGRAPH FOR PADDYS RUN



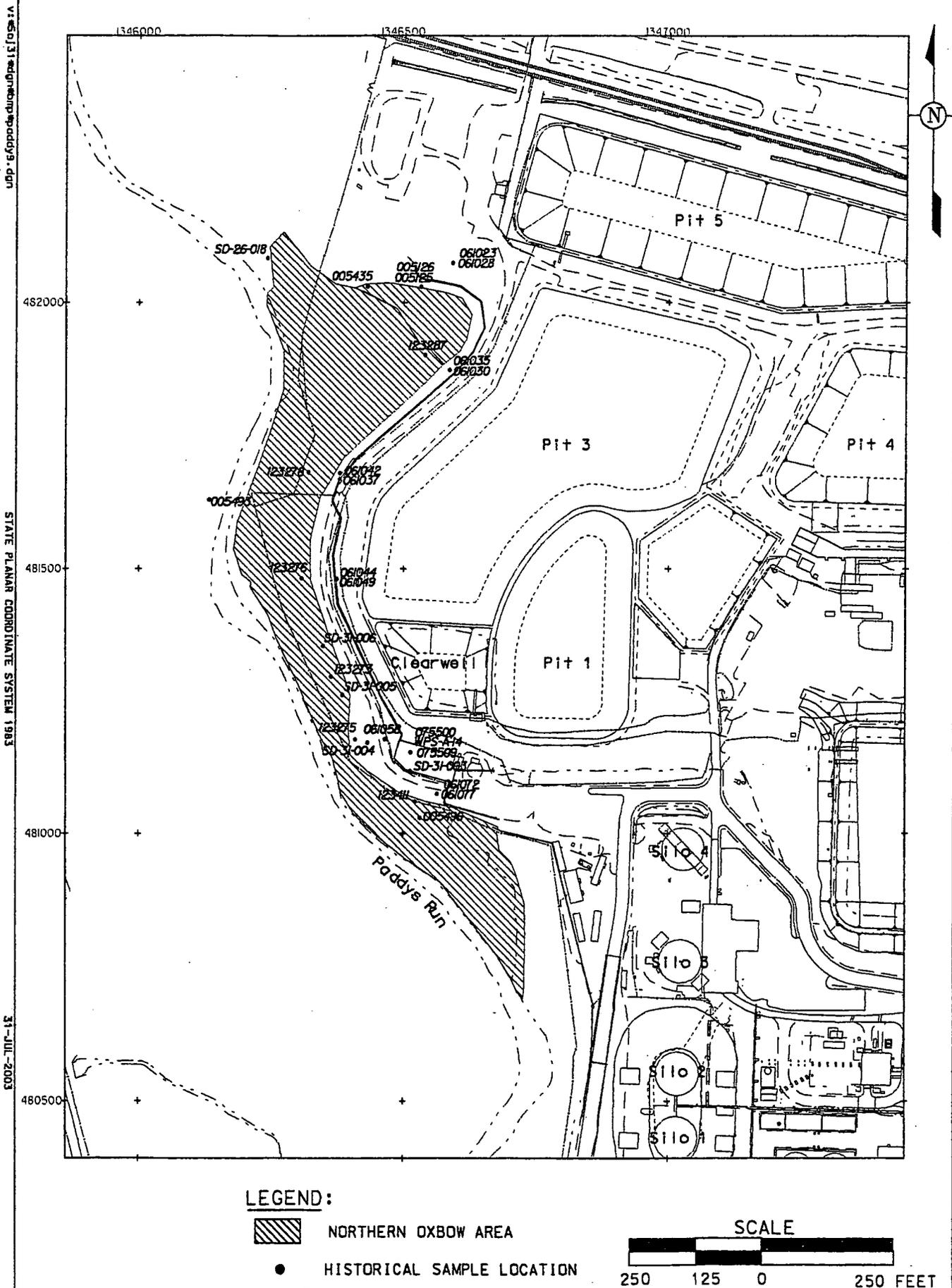


FIGURE 1-6. HISTORICAL SAMPLE LOCATIONS WITHIN THE NORTHERN OXBOW

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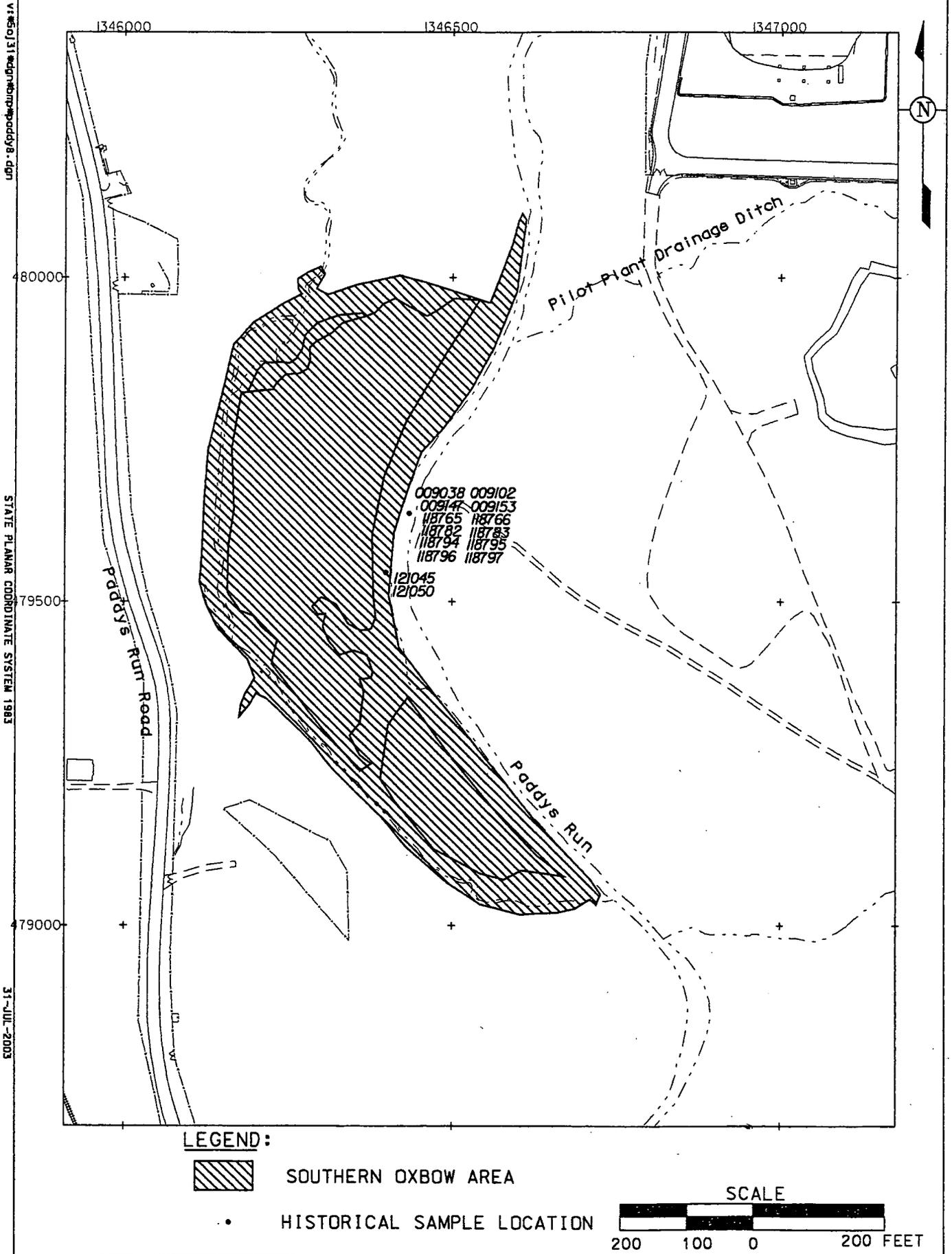


FIGURE 1-7. HISTORICAL SAMPLE LOCATIONS WITHIN THE SOUTHERN OXBOW

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V:\60131\rdg\rdg\m\paddy7.dgn

STATE PLANAR COORDINATE SYSTEM 1983

31-JUL-2003

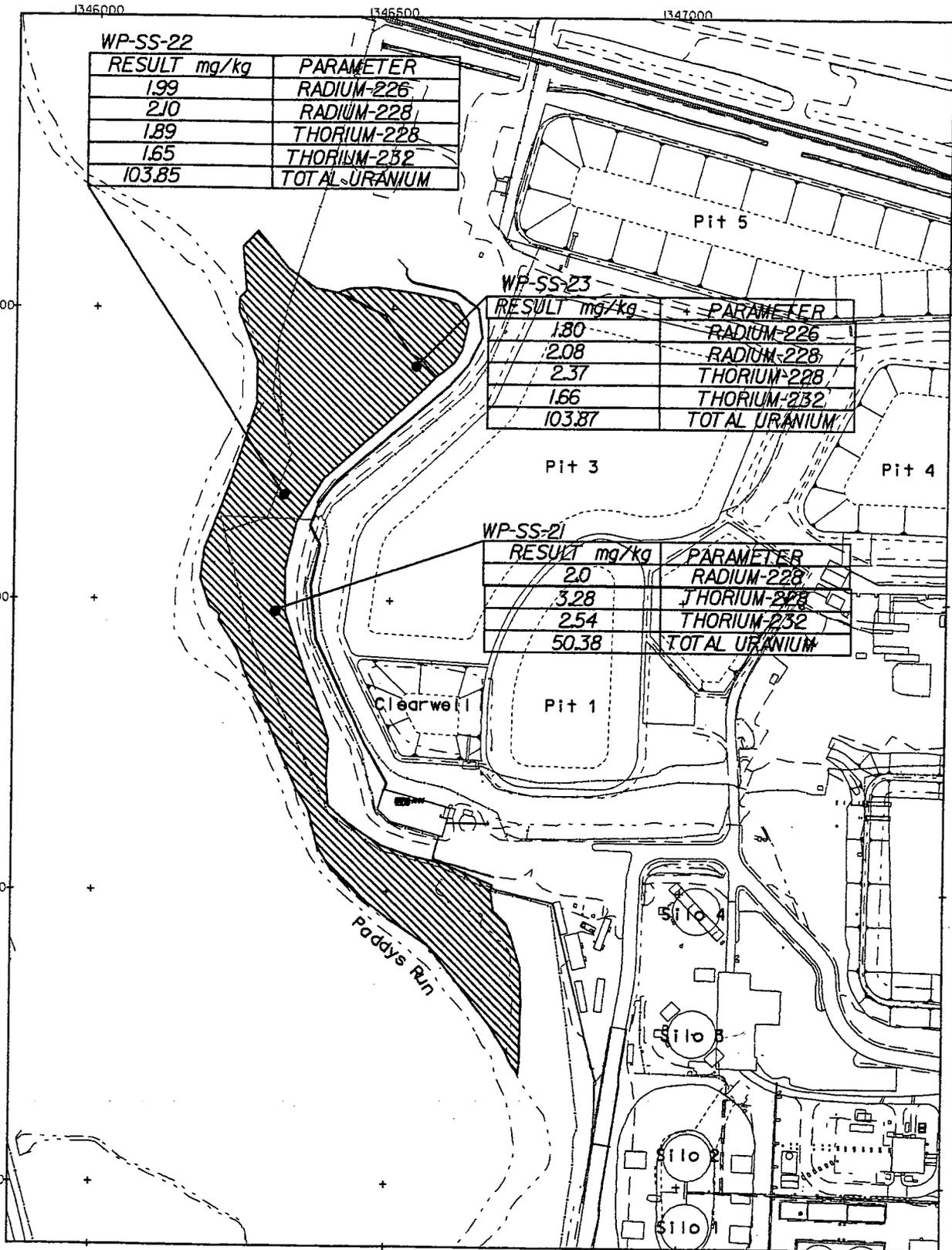
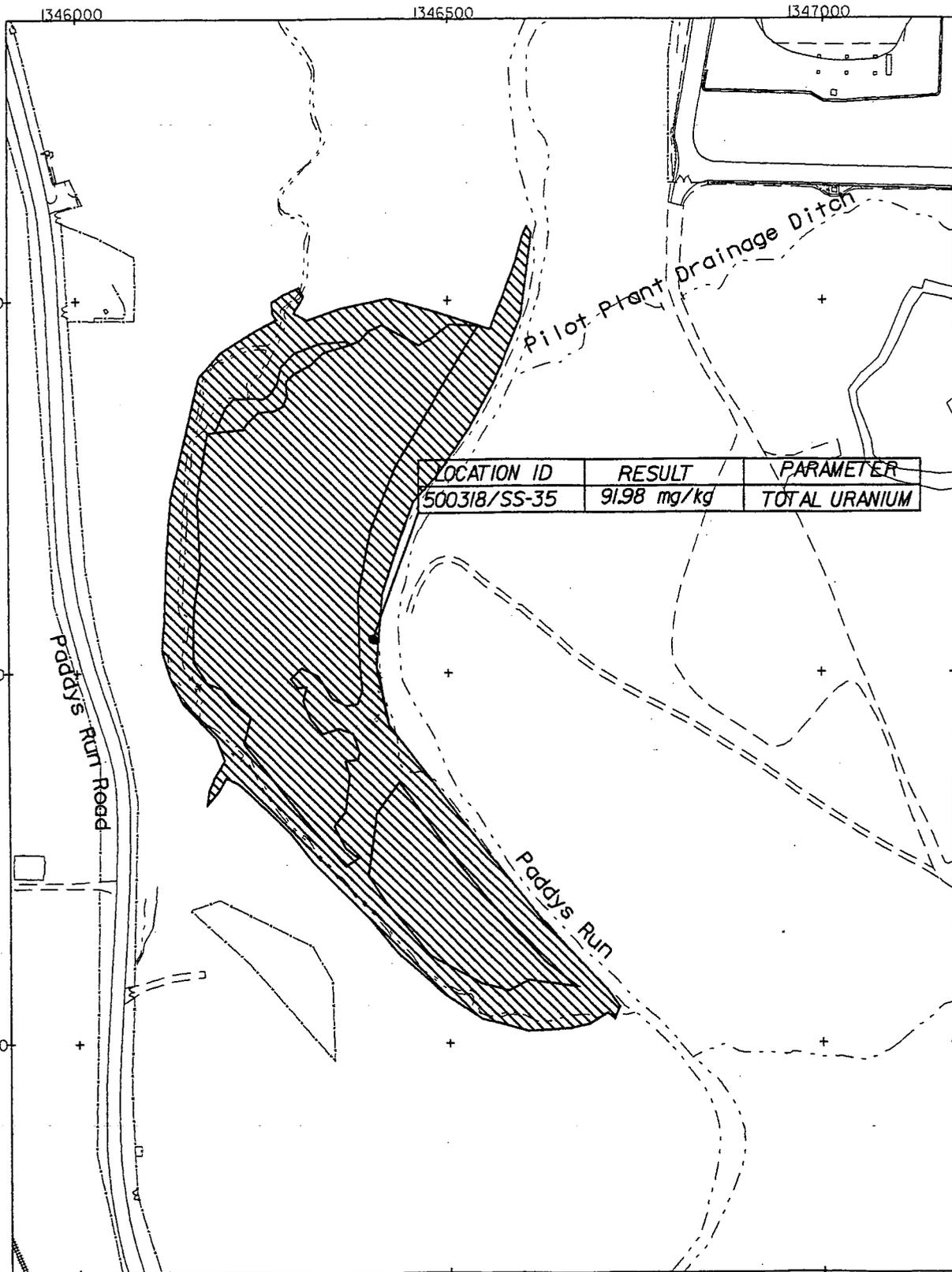


FIGURE 1-8. ABOVE FRL SOIL LOCATIONS IN NORTHERN OXBOW AREA

v:\5047\31\wq\wq\paddy6.dgn

STATE PLANNING COORDINATE SYSTEM 1983

31-JUL-2003



LOCATION ID	RESULT	PARAMETER
500318/SS-35	91.98 mg/kg	TOTAL URANIUM

LEGEND:

-  SOUTHERN OXBOW AREA
-  ABOVE FRL SOIL SAMPLE LOCATION

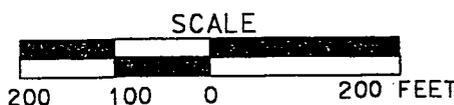
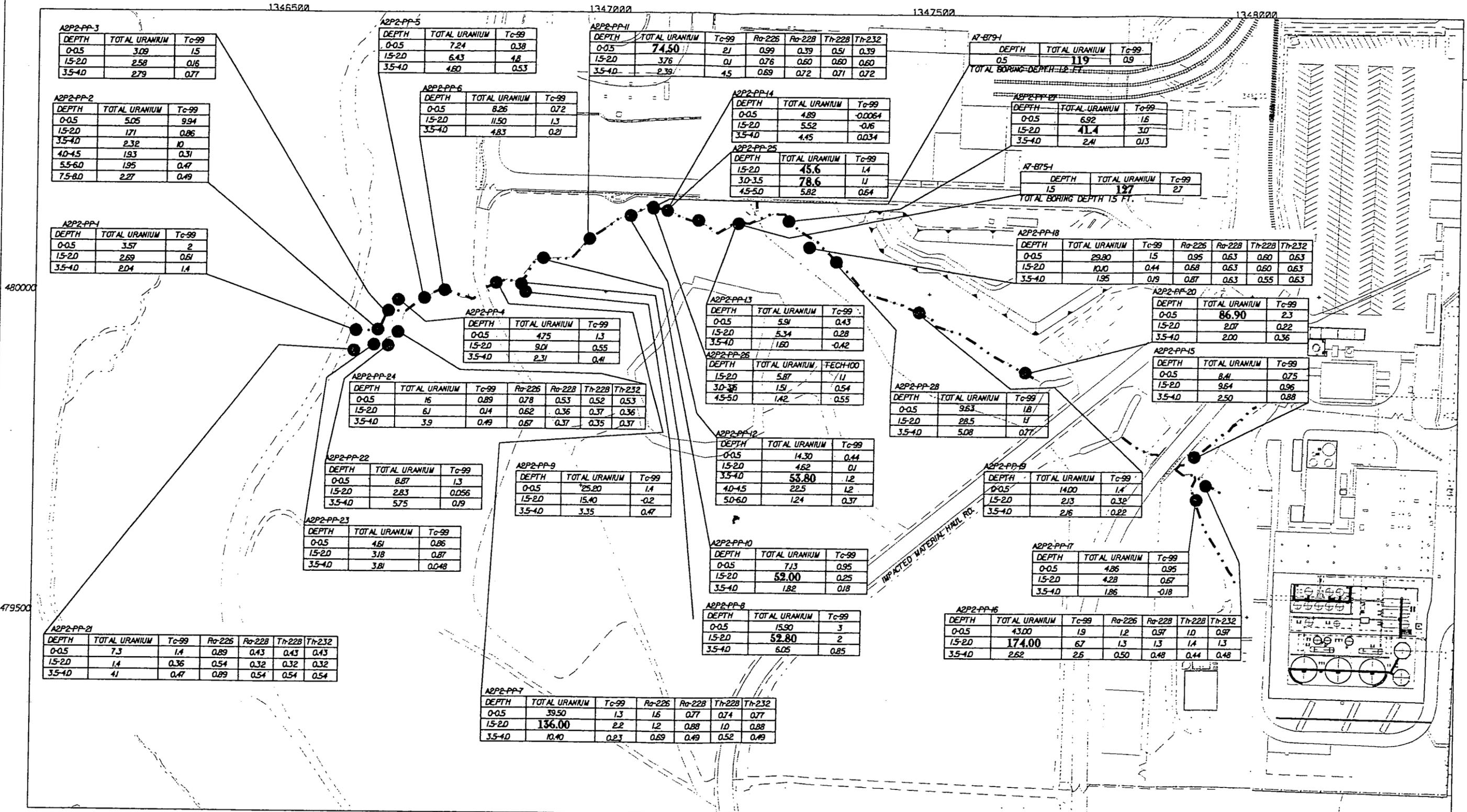


FIGURE 1-9. ABOVE FRL SOIL LOCATION IN SOUTHERN OXBOW AREA

000030



LEGEND:

TOTAL URANIUM - ppm
 Tc-99, Ra-226, Ra-228,
 Th-228, Th-232 - pCi/g

000031

SCALE

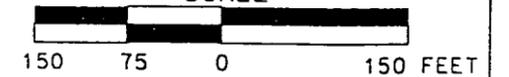
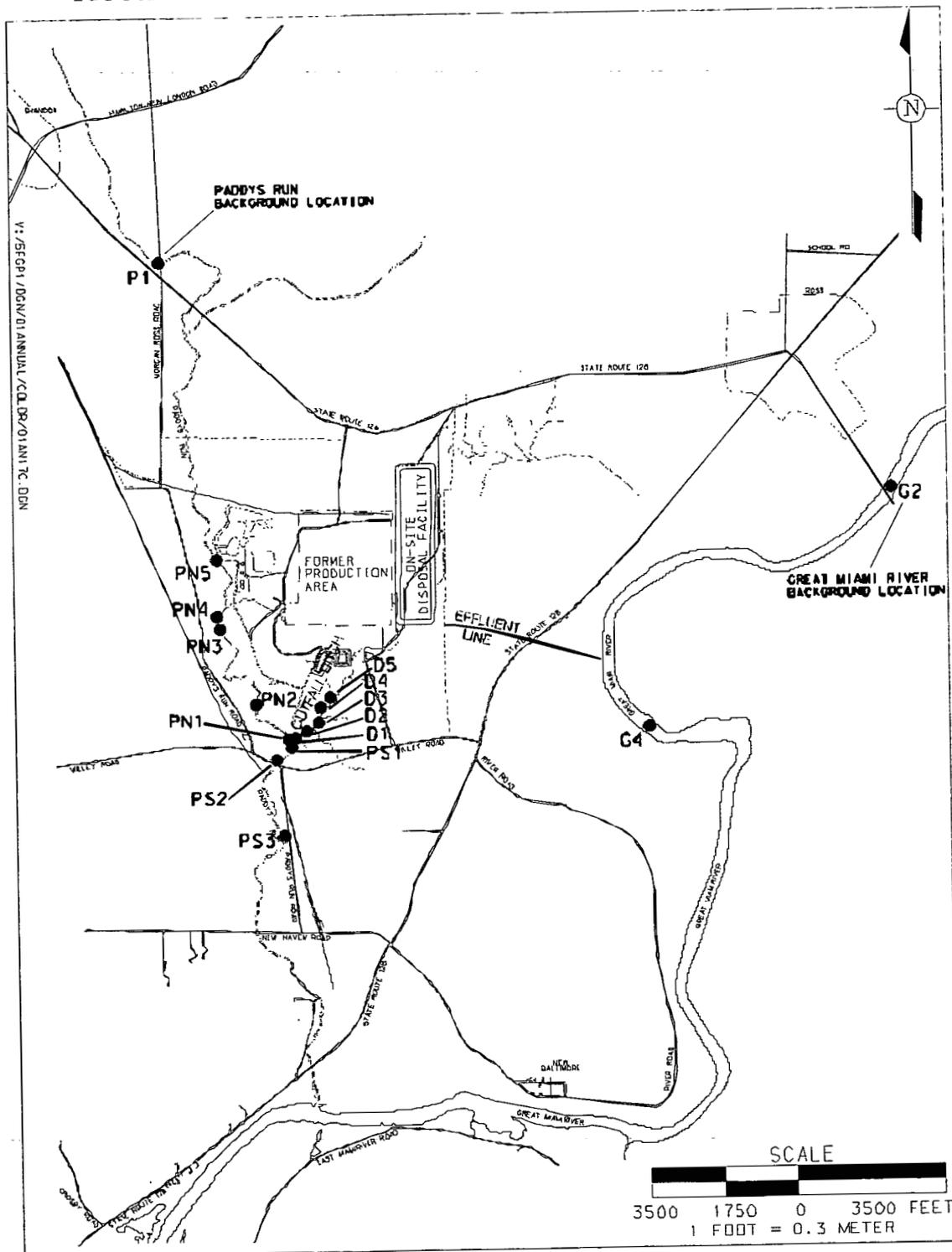


FIGURE 1-10. PILOT PLANT DRAINAGE DITCH SAMPLING RESULTS

FIGURE 1-11 LOCATIONS OF SEDIMENT MONITORING SAMPLING



V:\SECR1\DCN\01 ANNUAL\COL DR\01 ANI TC.DGN

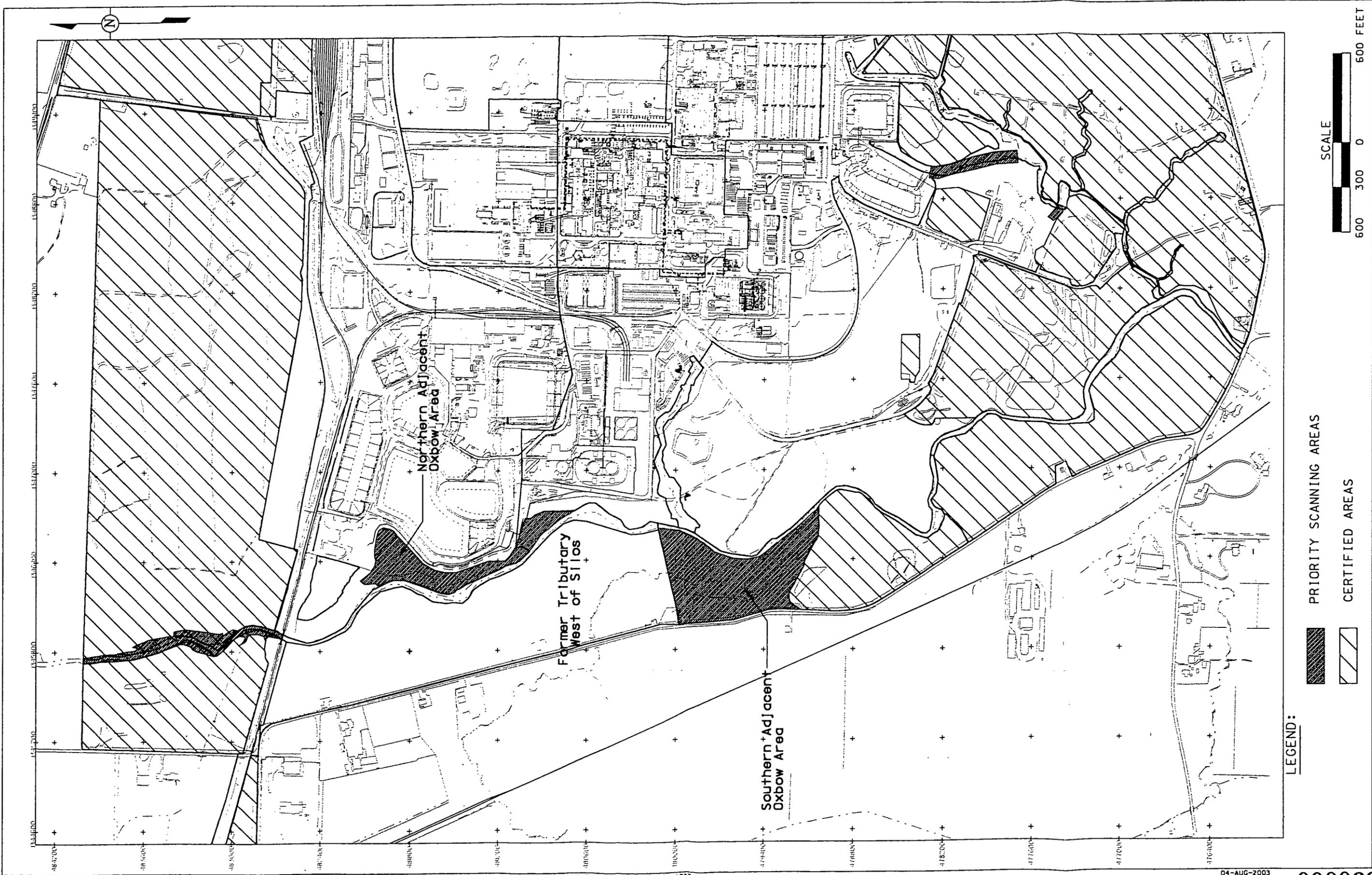


FIGURE 2-1. PRIORITY SCANNING AREAS WITHIN PADDY'S RUN

APPENDIX A
DATA QUALITY OBJECTIVES
SL-054 REVISION 1

Control Number _____

Fernald Closure Project

Data Quality Objectives

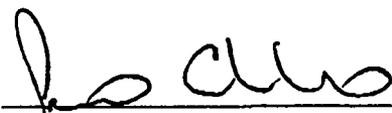
**Title: Real Time Instrumentation Measurement
Program: Precertification Monitoring**

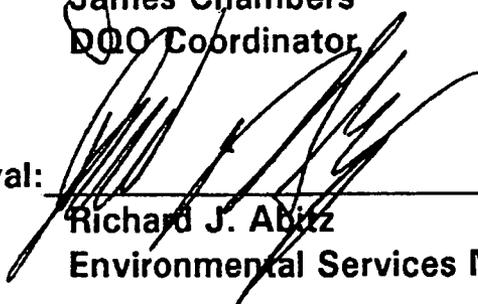
Number: SL-054

Revision: 2

Effective Date: 8/11/03

Contact Name: Richard J. Abitz

Approval:  Date: 8/6/03
James Chambers
DQO Coordinator

Approval:  Date: 8/6/03
Richard J. Abitz
Environmental Services Manager

Rev. #	0	1	2				
Effective Date:	6/03/99	12/01/02	8/11/03				

ORIGINAL

**Data Quality Objectives
Real Time Instrumentation Measurement Program
Precertification Monitoring**

1.0 Statement of Problem

This data quality objective (DQO) describes the Real Time Instrumentation Measurement Program (RTIMP) methods used to precertify remediated areas. If physical soil samples need to be collected during precertification activities, they will be collected under a separate DQO.

Conceptual Model of the Process

The general soil remediation process at the Fernald Closure Project (FCP) includes *in situ* gamma spectrometry measurements performed by the RTIMP. RTIMP supports 1) pre-design investigations that define excavation boundaries, 2) excavation activities to demonstrate that contaminated soil meets the On Site Disposal Facility (OSDF) waste acceptance criteria (WAC) for uranium, and 3) precertification activities to demonstrate that remediated areas are free of uranium (U), thorium (Th) and radium (Ra) concentrations that exceed 3 times their respective final remediation levels (FRLs). Item 3 is the subject of this DQO.

Precertification measurements of U-238 (used to calculate total uranium), Th-232, and Ra-226 activity in surface soil are performed with mobile sodium iodide (NaI) and stationary high purity germanium (HPGe) detectors. Measurements can be made over a barren excavated surface or where vegetation is present on undisturbed soil. If vegetation is present, the only requirement is that personnel and equipment can traverse the area in a safe and efficient manner, which may require some cutting of the vegetation prior to performing the measurements.

RTIMP measurements are collected according to procedures in the RTIMP Operations Manual (RTIMP-M-003) and protocols discussed in the *User Guidelines, Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectroscopy at the Fernald Site* (User's Manual), and the *Sitewide Excavation Plan* (SEP). The RTIMP Protocols in the User's Manual provide detail on the 3 phases of precertification monitoring, which can be summarized as follows:

- Phase 1 measurements consist primarily of scans with a mobile NaI detector over as much of the area as possible. In zones that are inaccessible to the mobile equipment that houses the NaI detectors, stationary HPGe detectors are used to obtain the remaining Phase 1 measurements. Target parameters for the NaI and HPGe measurements are gross gamma (only NaI), total uranium, Th-232 and Ra-226 activity. Action levels for NaI measurements correspond to the highest gross gamma activity in each batch file (see Methods of Data Collection in Section 3), total uranium and Th-238 activities

that exceed 3-times their respective FRL, and Ra-226 activity that exceeds its FRL by a factor of 7 (7xFRL). For HPGe measurements, the action levels for total uranium, Th-232 and Ra-226 activities are set to 3-times their respective FRL. Phase I action levels dictate the location of Phase 2 measurements.

- Phase 2 measurements are performed only with HPGe detectors. Measurements are collected at Phase 1 locations that correspond to the NaI action levels of highest gross gamma activity, total uranium or Th-232 activity greater than 3xFRL, and/or Ra-226 activity that exceeds 7xFRL. For HPGe Phase I locations, Phase 2 measurements are performed if total uranium, Th-232 or Ra-226 activity exceeds 3xFRL (i.e., a hotspot). The objective of Phase 2 measurements is to screen the locations that exceed Phase I action levels and to confirm and delineate any hotspots that may be present at these locations. If hotspots are absent, certification activities can begin in the area. When hotspots are found, they are excavated and removed prior to performing Phase 3 measurements.
- Phase 3 measurements are performed only with HPGe detectors, and only if hotspots were identified and removed during Phase 2 activities. The area impacted by the hotspot removal is covered with a triangular grid and each node (4-meter nodes) is measured to confirm that total uranium, Th-232 or Ra-226 activity is below 3xFRL (i.e., the hotspot is removed). If Phase 3 measurements confirm that the hotspot has been removed, certification activities can begin. When Phase 3 measurements indicate a hotspot remains in the area, additional Phase 2 measurements are performed to delineate the extent of the contamination.

Available Resources

Time: Precertification of remediated areas must be completed in a timely manner by the RTIMP field team to provide information required for the Certification Design Letter.

Project Constraints: Soil remediation activities must be consistent with the SEP and be completed in accordance with the Fluor Fernald Closure Plan. Precertification activities must be performed with existing manpower and equipment, with reasonable consideration given to the replacement or repair of equipment that fails. Certification of all site property as meeting the FRLs, and regrading of remediated areas to meet final land use commitments, is dependent on successful completion of the RTIMP precertification work.

Personnel: The RTIMP requires a staff of individual trained to internal procedural requirements and methods to maintain efficient operations under the current accelerated schedule. The staff size is dependent on the number of soil remediation areas requiring RTIMP services at any point in time. Personnel are distributed as follows: Manager, Field Operations Supervisor, Systems Supervisor, Technical Support Scientist and field technicians.

Equipment: The RTIMP maintains approximately six NaI and seven HPGe systems. Each system is comprised of a detector, a multi-channel analyzer, a portable PC, and associated electronic components (e.g., cables and batteries). Global Positioning Systems (GPS) are used with the NaI and HPGe detectors to determine the geographic coordinates of the measurements. The NaI detector systems are fixed to mobile platforms that consist of a John Deere tractor (RTRAK), a Gator vehicle, three three-wheeled carts (RSSI, RSSII and RSSIII), and an excavation monitoring system (EMS) attached to a John Deere excavator. HPGe systems are placed on stationary tripods to obtain the measurements as well the EMS in a stationary mode.

2.0 Identify the Decision

Decision

In situ measurements with the NaI and HPGe gamma-ray detectors support two decisions:

Decision 1: Phase 1 measurements indicate whether the area is free of total uranium, Th-232 and Ra-226 contamination in excess of 3xFRL (i.e., hotspots are absent) when using HPGe systems. When using NaI systems, measurements can indicate whether the area is free of total uranium and Th-232 contamination in excess of 3xFRL and 7xFRL for Ra-226 contamination.

Decision 2: Phase 2 measurements confirm whether hotspots (based on Phase 1 findings) are present ($> 3xFRL$) or absent ($< 3xFRL$), and whether additional excavation is required to remove the contamination. If no $> 3xFRL$ hotspots are identified in Phase 1, a Phase 2 measurement will be performed at the highest gross gamma count (if using a NaI detector in Phase 1) location to determine whether or not it represents a hotspot

Results of Decision 1

When Phase 1 measurements indicate the area contains no hotspots (as discussed in Decision 1 above), no Phase 2 HPGe measurements are necessary with one exception. The Phase 1 location having the highest gross gamma count will be measured with an HPGe detector to verify that this discrete area does not exceed the 3xFRL level. If Phase 1 indicates potential hotspots (as discussed in Decision 2 above), then Phase 2 measurements must be initiated.

If Phase 1 measurements indicate no hotspots, the area is released to begin the certification process. Precertification results are provided as maps to document that total uranium, Th-232 and Ra-226 levels are below 3xFRL, and these maps are placed in the Certification Design Letter.

Results of Decision 2

Phase 2 measurements that identify hotspots are used to delineate the extent of the excavation, and the contamination is removed as additional scope under the Integrated Remedial Design Plan that is applicable to the area. Upon completion of the excavation and removal of the contaminated soil, Phase 3 measurements must be performed to verify that total uranium, Th-232 and Ra-226 levels are below 3xFRL.

If Phase 3 measurements indicate the area contains no hotspots after excavation, the area is released to begin the certification process. Precertification results are provided as maps to document that total uranium, Th-232 and Ra-226 levels are below 3xFRL, and these maps are placed in the Certification Design Letter.

If Phase 3 measurements indicate hotspots remain in the area, additional Phase 2 measurements are required to delineate the extent of the contamination. Decision 2 is then repeated until the area is released for certification.

3.0 Identify Inputs That Affect the Decision**Required Information**

Information needed to make the decisions identified in Section 2 include gamma spectra collected with the NaI and HPGe detectors, soil moisture readings to correct the measurement results to dry-weight basis, log files generated from the software reduction of the spectra to reportable nuclide activity, geographic coordinates to allow the plotting of results on maps, and maps indicating the activity of the total uranium, Th-232, and Ra-226 nuclides.

Sources of Information

GammaVision software is used to collect and save the gamma spectra and geographic coordinates obtained from the GPS. The spectra are then analyzed with LabView (NaI) or EGAS (HPGe) software to quantify the activity of total uranium, Th-232, and Ra-226. Log files written by LabView and EGAS report sample identification, collection date, geographic coordinates, nuclide results and errors, and a flag column that indicates potential problems during the data reduction process. The log files are imported into Excel to check the results and flag column and then assign final quality-check codes. Maps are produced using Surfer software and the information contained in the Excel spreadsheet.

Action Levels

Action levels for the NaI measurements are the highest value for gross gamma counts in each batch file (a batch file is a continuous scan that contains hundreds to thousands of 4-second spectra), total uranium and Th-232 levels that exceed 3XFRL, and Ra-226 results that exceed 7xFRL. For HPGe measurements, action levels are set at 3xFRL for U-238, Th-232 and Ra-226.

Methods of Data Collection

NaI measurements are collected in a continuous scan mode by moving the detector and GPS antenna over the surface at a nominal speed of 1 mph. Traverses across the area are carried out in a manner that produces approximately 40 cm of overlap on each adjacent path. The detector height above the surface is 31 cm and a spectrum and GPS coordinates are collected every 4 seconds and stored in a batch file. A batch file is generated each time the NaI systems are mobilized to a work area. Procedures that describe the initiation of the NaI system and acquisition of data are contained in RTIMP-M-003, *RTIMP Operations Manual*.

HPGe measurements are obtained from a stationary tripod at a detector height of 100 cm (Phase 1), 31 cm or 15 cm (Phases 2 and 3) for a period of 300 seconds. A larger area is evaluated with the 100 cm detector height used for Phase 1 measurements, as this initial screening assumes no hotspots are present. If measurements cannot be obtained due to unsafe conditions (e.g., trench) or standing water, measurements may be carried out at a detector height of 15 cm on small circular soil pads that are created with a backhoe and placed adjacent to the area that is inaccessible. Procedures that describe the initiation of the HPGe system and acquisition of data are contained in RTIMP-M-003, *RTIMP Operations Manual*.

4.0 The Boundaries of the Situation

Spatial Boundaries

Domain of the Decision: Measurements are limited to the top 6 inches of soil in areas planned for certification, as defined in the precertification PSP.

Soil Population: All disturbed and undisturbed soil on the FCP property that has been passed into the precertification stage of remediation.

Temporal Boundaries

Time Constraints: The scheduling of precertification scanning is tied to the schedule for collection of certification samples. Precertification scans must be completed after excavation, if any, and before certification activities begin. The *in situ* measurements must be checked, verified and processed into maps to allow the information to be presented in the Certification Design Letter.

Practical Considerations: *In situ* measurements cannot be collected during precipitation events or if snow or water covers the soil. Additionally, if soil moisture exceeds 40 weight percent, measurements should be delayed until the soil moisture falls below this value. Prior to performing the measurements, some areas may require cutting of grass or removal of undergrowth, fencing and other obstacles, which requires coordination with appropriate maintenance personnel.

5.0 Develop a Logic Statement

Parameters of Interest

The parameters of interest are gross counts, total uranium, Th-232, Th-228, Ra-228 and Ra-226. Activities associated with the Th-228 and Ra-228 isotopes are not measured directly, as they are assumed to be equal to the Th-232 activity (i.e., in secular equilibrium with Th-232). The total uranium value is calculated based on the U-238 activity.

Action Levels

Precertification action levels for each batch file collected with a NaI system are values corresponding to the highest gross counts (i.e., total gamma activity), 3xFRL for total uranium and Th-232, and 7xFRL for Ra-226. For HPGe detectors, the action levels are 3xFRL for total uranium, Th-232 and Ra-226.

Decision Rules

If Phase 2 results indicate hotspots are absent (i.e., contamination is below 3xFRL for total uranium, Th-232 or Ra-226), certification sampling can begin. However, when a Phase 2 measurement indicates a hotspot is present, the extent of the hotspot will be delineated and mapped to provide a record for removal of the hotspot.

After the hotspot is excavated and removed from the area, Phase 3 measurements will be taken to verify the removal of the hotspot. If Phase 3 measurements indicate the hotspot is gone, certification activities may begin. When a Phase 3 measurement records total uranium, Th-232, or Ra-226 activity above 3xFRL, additional Phase 2 measurements are performed to delineate and map the additional contamination.

6.0 Establish Constraints on the Uncertainty of the Decision

Types of Decision Errors and Consequences

Decision Error 1: This decision error occurs when the Phase 2 measurements indicate an area is ready for certification when the soil contains one or more of the primary radiological COCs (U-238, Th-232, Th-228, Ra-228 and Ra-226) at levels above 3xFRL (i.e., the hotspot criterion fails when it is thought to pass). This decision error could lead to the area failing certification for one or several of the primary radiological COCs. If an area fails certification, additional excavation, precertification, and certification activities would be necessary.

Decision Error 2: This decision error occurs when the Phase 2 measurements indicate the area contains a hotspot when the soil activities of the primary radiological COCs are below 3xFRL (i.e., the hotspot criterion passes when it is thought to fail). This decision error results in additional excavation and precertification activities, as well as the placement of clean soil in the OSDF.

True Nature of the Decision Errors

Because Decision Error 2 results in additional costs that are incurred before a certification pass/fail decision is made, the funds must be expended every time this decision error occurs. However, with Decision Error 1, costs are incurred only if certification fails. Therefore, Decision Error 2 is the more severe error.

7.0 Optimize a Design for Obtaining Quality Data

In situ measurements are collected with the mobile NaI detectors (ASL A) and the stationary HPGe detectors (ASL A or B). Surface moisture readings are obtained in conjunction with the NaI and HPGe measurements using the Zeltex moisture meter. The soil moisture is used to correct the measured total uranium, Th-232, and Ra-226 activities to a dry-weight basis. Measured Ra-226 activity is also subject to a radon correction to account for differences in laboratory and *in situ* results and for background radon levels when evaluating Ra-226 hotspots. The User's Manual contains a detailed discussion on Ra-226 corrections.

Sodium Iodide Detectors

The NaI systems are used to scan as much of the area as possible, taking into consideration the topography and vegetation that may limit access. During the NaI scan, the mobile platform moves at a nominal speed of 1 mph and a gamma-ray spectrum is collected every 4 seconds and synchronized with GPS coordinates to locate each measurement. The spectra and GPS information are recorded and stored on a field PC hard drive until it is transferred to the FCP Local Area Network (LAN). Quality checks are performed on the data before the results are released to the SED or used in the preparation of maps, and optimization of the system operations occurs during calibration checks, field measurements and data reduction.

Prior to and after the NaI systems are mobilized to the field, the detector is checked with a Th-232 source to verify the location of the thallium-208 (Tl-208) peak and the net counts in the area under this peak. Detector efficiency is calculated annually for the protactinium-234, bismuth-214 and Tl-208 peaks, which are used to evaluate U-238 (total uranium), Ra-226 and Th-232 activity, respectively. Descriptions and pass/fail criteria for these calibration checks are given in the RTIMP-M-003, *RTIMP Operations Manual* and Appendix H of the SCQ.

Field measurements in forested areas are carried out during winter months, when the leaf canopy is absent and GPS signals can reach the receiver. Measurements over steep terrain and in trenches are executed using the EMS and John-Deere excavator to avoid unsafe working conditions for personnel.

Individual 4-second spectra are evaluated during the data reduction process and the net gross counts for each spectrum are used to plot total gamma activity. However, a meaningful evaluation of soil contamination associated with U-238 (total uranium), Th-232 and Ra-226 activities requires that two 4-second spectra be combined to obtain a sufficient number of counts in the area of interest. This optimization of the counting statistics allows total uranium and Th-232 contamination to be evaluated at levels that correspond to 3xFRL, and for Ra-226 at values 7xFRL. More measurements can be aggregated to achieve lower detection levels, but the area evaluated becomes very large and spatial resolution is lost.

High Purity Germanium Detectors

The HPGe systems are used to verify NaI measurements, identify and delineate hotspots (if found), and confirm that the area is ready for certification activities. HPGe detectors are set on stationary tripods, as well the EMS in a stationary mode, and a gamma-ray spectrum is collected every 300 seconds. GPS coordinates at the measurement location are obtained prior to or after the measurement. The spectra and GPS information are recorded and stored on a field PC hard drive until it is transferred to the FCP Local Area Network (LAN). Quality checks are performed on the data before the results are released to the SED or used in the preparation of maps, and optimization of the system operations occurs during calibration checks, field measurements and data reduction.

Prior to and after the HPGe systems are mobilized to the field, the detector is checked with a NIST source to verify the location and resolution of the americium-241 (Am-241), cesium-137 (Cs-137) and cobalt-60 (Co-60) peaks and the net counts in the area under each of the peaks. Detector efficiency is calculated annually using numerous gamma rays associated with the decay of Am-241, Cs-137, Co-60 and europium-152. Descriptions and pass/fail criteria for these calibration checks are given in the RTIMP-M-003, *RTIMP Operations Manual and Appendix H of the SCQ*.

Field measurements include a duplicate measurement for each detector in the field every 20 measurements or daily, whichever is more frequent. When Ra-226 hotspots are being evaluated, an independent HPGe detector is set up as a radon monitor to track daily variance in Ra-226 measurements that arises from a change in the rate of radon emanation from the soil. The HPGe detector serving as the radon monitor station collects a spectrum every 300 seconds, and the station is activated before the first HPGe field measurement and shut down after the last daily field measurement. The application of this information to the correction of Ra-226 results is discussed in the User's Manual.

Individual HPGe spectra are evaluated during the data reduction process and the results from one or more gamma-ray energy lines are used to quantify U-238 (to calculate total uranium), Th-232 and Ra-226 activities. In particular, interference from nearby sources of gamma radiation can be evaluated during the data reduction process to screen out anomalous results. For example, U-238 activity, and ultimately total uranium, is calculated using a low-energy and high-energy gamma ray. If the low-energy gamma ray is less than 80 percent of the activity recorded for the high-energy gamma ray, a local uranium source may be interfering with the measurement. Optimization of the data reduction process is discussed in RTIMP-M-003, *RTIMP Operations Manual*.

**Data Quality Objectives
In Situ Precertification Measurements**

1A. Task/Description: *In situ* precertification measurements.

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

RI	FS	RD	RA	X	RvA	OTHER
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1.C. DQO No.: SL-054, Rev. 2 DQO Reference No.: Current Sampling DQO

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

<u>Air</u>		<u>Biological</u>		<u>Groundwater</u>		<u>Sediment</u>	X	<u>Soil</u>	X
<u>Waste</u>		<u>Wastewater</u>		<u>Surface Water</u>		<u>Other (specify)</u>			

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					Risk Assessment								
A	X	B	X	C	D	E	A	B	C	D	E		
Evaluation of Alternatives					Engineering Design								
A		B		C	D	E	A	B	C	D	E		
Monitoring during remediation activities					Other: Precertification								
A	X	B	X	C	D	E	A	X	B	X	C	D	E

4.A. Drivers: Applicable or Relevant and Appropriate Requirements (ARARs), Operable Unit 5 Record of Decision (ROD), Appendix H of the SCQ, RTIMP-M-003, *RTIMP Operations Manual*, RTIMP User's Manual, Sitewide Excavation Plan, and various Project-Specific Plans (PSP).

4.B. Objective: To determine if the area of interest is free of hotspots (i.e., total uranium, Th-232 or Ra-226 less than 3xFRL) and likely to pass certification.

5. Site Information (Description): The OU2 and OU5 RODs have identified areas at the FCP that require remediation activities. The total uranium, Th-232 and Ra-226 levels in soil in these areas must be below the established FRLs.
- 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		2.	Uranium*	X*	3.	BTX	
	Temperature			Full Rad.*	X*		TPH	
	Spec. Conductance			Metals			Oil/Grease	
	Dissolved Oxygen			Cyanide				
	Technitium-99			Silica				
4.	Cations		5.	VOA		6.	Other (specify)	
	Anions			ABN			Percent Moisture	
	TOC			Pesticides				
	TCLP			PCB				
	CEC							
	COD							

* Full rad is total uranium, Th-232 and Ra-226.

6.B. Equipment Selection and SCQ Reference:

Equipment Selection

Refer to SCQ Section

ASL A Nal and HPGe

SCQ Section: Appendix H

ASL B HPGe

SCQ Section: Appendix H

ASL C _____

SCQ Section:

ASL D _____

SCQ Section:

ASL E _____

SCQ Section:

DQO # SL-054, Rev. 2
Effective Date: 8/11/03

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

Biased	X	Composite		Environmental		Grab		Grid	X
Intrusive		Non-Intrusive	X	Phased		Source			

7.B. Sample Work Plan Reference: The DQO is being established prior to completion of the Project-Specific Plans.

Background samples: OU5 RI/FS

7.C. Sample Collection Reference:

RTIMP-M-003, *RTIMP Operations Manual*

User Guidelines, Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectroscopy at the Fernald Site (User's Manual)

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

8.A. Field Quality Control Samples:

Trip Blanks		Container Blanks	
Field Blanks		Duplicate Samples	X*
Equipment Rinsate Samples			
Preservative Blanks			
Other (specify): <i>Source Checks, Control Charts,</i> <i>Radon Monitoring, Moisture</i>	X*		

* If specified in the PSP.

8.B. Laboratory Quality Control Samples:

Method Blank		Matrix Duplicate/Replicate	
Matrix Spike		Surrogate Spikes	
Other (specify):			

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

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APPENDIX B
HISTORICAL DATA FROM OXBOW LOCATIONS
ADJACENT TO PADDYS RUN

APPENDIX B-1
HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
1,1,2-Trichloroethane	Unknown	061077	481074.26	1346563.08	6 U		ug/kg	1.5	2
1,1,2-Trichloroethane	Unknown	061028	482073.77	1346590.37	6 U		ug/kg	1.5	2
1,1,2-Trichloroethane	Unknown	061035	481873.87	1346584.87	6 U		ug/kg	1.5	2
1,1,2-Trichloroethane	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
1,1,2-Trichloroethane	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
1,1,2-Trichloroethane	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
1,1,2-Trichloroethane	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
1,1,2-Trichloroethane	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
1,1,2-Trichloroethane	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
1,1,2-Trichloroethane	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
1,1,2-Trichloroethane	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
1,1-Dichloroethene	Unknown	061077	481074.26	1346563.08	6 U		ug/kg	1.5	2
1,1-Dichloroethene	Unknown	061028	482073.77	1346590.37	6 U		ug/kg	1.5	2
1,1-Dichloroethene	Unknown	061035	481873.87	1346584.87	6 U		ug/kg	1.5	2
1,1-Dichloroethene	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
1,1-Dichloroethene	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
1,1-Dichloroethene	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
1,1-Dichloroethene	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
1,1-Dichloroethene	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
1,1-Dichloroethene	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
1,1-Dichloroethene	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
1,1-Dichloroethene	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
1,2-Dichloroethene (Total)	Unknown	061077	481074.26	1346563.08	6 U		ug/kg	1.5	2
1,2-Dichloroethene (Total)	Unknown	061028	482073.77	1346590.37	6 U		ug/kg	1.5	2
1,2-Dichloroethene (Total)	Unknown	061035	481873.87	1346584.87	6 U		ug/kg	1.5	2
1,2-Dichloroethene (Total)	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
1,2-Dichloroethene (Total)	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
1,2-Dichloroethene (Total)	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
1,2-Dichloroethene (Total)	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
1,2-Dichloroethene (Total)	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
1,2-Dichloroethene (Total)	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
1,2-Dichloroethene (Total)	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
1,2-Dichloroethene (Total)	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
3,3'-Dichlorobenzidine	RI/FS	123275	481177.02	1346409.88	360 U		ug/kg	0	0.5

APPENDIX B-1
HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
3,3'-Dichlorobenzidine	RI/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
3,3'-Dichlorobenzidine	RI/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
3,3'-Dichlorobenzidine	RI/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
3,3'-Dichlorobenzidine	RI/FS	123287	481902	1346539	540	UJ	ug/kg	0	0.5
3,3'-Dichlorobenzidine	Unknown	061077	481074.26	1346563.08	780	UJ	ug/kg	1.5	2
3,3'-Dichlorobenzidine	Unknown	061028	482073.77	1346590.37	790	U	ug/kg	1.5	2
3,3'-Dichlorobenzidine	Unknown	061049	481479.56	1346374.08	800	U	ug/kg	1.5	2
3,3'-Dichlorobenzidine	Unknown	061042	481679.46	1346379.58	810	UJ	ug/kg	1.5	2
3,3'-Dichlorobenzidine	Unknown	061035	481873.87	1346584.87	870	U	ug/kg	1.5	2
3,3'-Dichlorobenzidine	RI/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
4-Methyl-2-pentanone	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
4-Methyl-2-pentanone	RI/FS	123273	481295.48	1346363.17	11	U	ug/kg	0	0.5
4-Methyl-2-pentanone	RI/FS	123276	481481	1346307	11	U	ug/kg	0	0.5
4-Methyl-2-pentanone	RI/FS	123411	481060.07	1346522.41	11	UJ	ug/kg	0	0.5
4-Methyl-2-pentanone	Unknown	061077	481074.26	1346563.08	12	U	ug/kg	1.5	2
4-Methyl-2-pentanone	Unknown	061028	482073.77	1346590.37	12	U	ug/kg	1.5	2
4-Methyl-2-pentanone	Unknown	061042	481679.46	1346379.58	12	U	ug/kg	1.5	2
4-Methyl-2-pentanone	Unknown	061049	481479.56	1346374.08	12	U	ug/kg	1.5	2
4-Methyl-2-pentanone	Unknown	061035	481873.87	1346584.87	13	U	ug/kg	1.5	2
4-Methyl-2-pentanone	RI/FS	123287	481902	1346539	16	U	ug/kg	0	0.5
4-Methyl-2-pentanone	RI/FS	123278	481681	1346320	28	U	ug/kg	0	0.5
4-Nitroaniline	Unknown	061028	482073.77	1346590.37	1900	U	ug/kg	1.5	2
4-Nitroaniline	Unknown	061049	481479.56	1346374.08	1900	U	ug/kg	1.5	2
4-Nitroaniline	Unknown	061077	481074.26	1346563.08	1900	UJ	ug/kg	1.5	2
4-Nitroaniline	Unknown	061042	481679.46	1346379.58	2000	UJ	ug/kg	1.5	2
4-Nitroaniline	Unknown	061035	481873.87	1346584.87	2100	U	ug/kg	1.5	2
Acetone	RI/FS	123411	481060.07	1346522.41	11	U	ug/kg	0	0.5
Acetone	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
Acetone	RI/FS	123273	481295.48	1346363.17	11	U	ug/kg	0	0.5
Acetone	RI/FS	123276	481481	1346307	11	U	ug/kg	0	0.5
Acetone	Unknown	061077	481074.26	1346563.08	12	UJ	ug/kg	1.5	2
Acetone	Unknown	061028	482073.77	1346590.37	12	UJ	ug/kg	1.5	2
Acetone	Unknown	061042	481679.46	1346379.58	12	UJ	ug/kg	1.5	2
Acetone	Unknown	061035	481873.87	1346584.87	13	UJ	ug/kg	1.5	2

APPENDIX B-1
HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Acetone	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
Acetone	Unknown	061049	481479.56	1346374.08	29 U		ug/kg	1.5	2
Acetone	RI/FS	123278	481681	1346320	160 -		ug/kg	0	0.5
Antimony	Unknown	061072	481074.26	1346563.08	20.3 J		mg/kg	0	0.5
Antimony	Unknown	061030	481873.87	1346584.87	21.3 J		mg/kg	0	0.5
Antimony	Unknown	061037	481679.46	1346379.58	22.7 J		mg/kg	0	0.5
Antimony	Unknown	061023	482073.77	1346590.37	27.8 J		mg/kg	0	0.5
Antimony	Unknown	061058	481176.96	1346465.78	28 J		mg/kg	0	0.5
Antimony	Unknown	061044	481479.56	1346374.08	29.5 J		mg/kg	0	0.5
Aroclor-1254	Unknown	061044	481479.56	1346374.08	64 J		ug/kg	0	0.5
Aroclor-1254	Unknown	061037	481679.46	1346379.58	180 U		ug/kg	0	0.5
Aroclor-1254	Unknown	061072	481074.26	1346563.08	190 U		ug/kg	0	0.5
Aroclor-1254	Unknown	061023	482073.77	1346590.37	200 U		ug/kg	0	0.5
Aroclor-1254	Unknown	061030	481873.87	1346584.87	200 U		ug/kg	0	0.5
Aroclor-1254	Unknown	061058	481176.96	1346465.78	200 U		ug/kg	0	0.5
Aroclor-1260	Unknown	061037	481679.46	1346379.58	180 U		ug/kg	0	0.5
Aroclor-1260	Unknown	061072	481074.26	1346563.08	190 U		ug/kg	0	0.5
Aroclor-1260	Unknown	061044	481479.56	1346374.08	190 U		ug/kg	0	0.5
Aroclor-1260	Unknown	061023	482073.77	1346590.37	200 U		ug/kg	0	0.5
Aroclor-1260	Unknown	061030	481873.87	1346584.87	200 U		ug/kg	0	0.5
Aroclor-1260	Unknown	061058	481176.96	1346465.78	200 U		ug/kg	0	0.5
Arsenic	RI/FS	123278	481681	1346320	1 UJ		mg/kg	0	0.5
Arsenic	RI/FS	123275	481177.02	1346409.88	2.6 UJ		mg/kg	0	0.5
Arsenic	RI/FS	123273	481295.48	1346363.17	3.2 J		mg/kg	0	0.5
Arsenic	Unknown	061072	481074.26	1346563.08	3.5 J		mg/kg	0	0.5
Arsenic	Unknown	061058	481176.96	1346465.78	3.9 J		mg/kg	0	0.5
Arsenic	Unknown	061030	481873.87	1346584.87	4.2 J		mg/kg	0	0.5
Arsenic	Unknown	061037	481679.46	1346379.58	4.2 J		mg/kg	0	0.5
Arsenic	Unknown	061044	481479.56	1346374.08	4.5 J		mg/kg	0	0.5
Arsenic	RI/FS	123411	481060.07	1346522.41	5.2 J		mg/kg	0	0.5
Arsenic	RI/FS	123276	481481	1346307	6.2 J		mg/kg	0	0.5
Arsenic	Unknown	061023	482073.77	1346590.37	6.4 J		mg/kg	0	0.5
Arsenic	RI/FS	123287	481902	1346539	13.5 J		mg/kg	0	0.5
Barium	Unknown	061037	481679.46	1346379.58	27.2 -		mg/kg	0	0.5

APPENDIX B-1
HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Barium	RI/FS	123273	481295.48	1346363.17	29.5	-	mg/kg	0	0.5
Barium	RI/FS	123278	481681	1346320	36.5	J	mg/kg	0	0.5
Barium	RI/FS	123275	481177.02	1346409.88	42.1	-	mg/kg	0	0.5
Barium	Unknown	061072	481074.26	1346563.08	48.2	-	mg/kg	0	0.5
Barium	RI/FS	123411	481060.07	1346522.41	48.7	-	mg/kg	0	0.5
Barium	Unknown	061044	481479.56	1346374.08	49.9	-	mg/kg	0	0.5
Barium	Unknown	061058	481176.96	1346465.78	51.9	-	mg/kg	0	0.5
Barium	Unknown	061023	482073.77	1346590.37	52.5	-	mg/kg	0	0.5
Barium	Unknown	061030	481873.87	1346584.87	64.7	-	mg/kg	0	0.5
Barium	RI/FS	123276	481481	1346307	64.9	-	mg/kg	0	0.5
Barium	RI/FS	123287	481902	1346539	123	-	mg/kg	0	0.5
Benzene	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2
Benzene	Unknown	061028	482073.77	1346590.37	6	U	ug/kg	1.5	2
Benzene	Unknown	061035	481873.87	1346584.87	6	U	ug/kg	1.5	2
Benzene	Unknown	061042	481679.46	1346379.58	6	U	ug/kg	1.5	2
Benzene	Unknown	061049	481479.56	1346374.08	6	U	ug/kg	1.5	2
Benzene	RI/FS	123411	481060.07	1346522.41	11	U	ug/kg	0	0.5
Benzene	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
Benzene	RI/FS	123273	481295.48	1346363.17	11	U	ug/kg	0	0.5
Benzene	RI/FS	123276	481481	1346307	11	U	ug/kg	0	0.5
Benzene	RI/FS	123287	481902	1346539	16	U	ug/kg	0	0.5
Benzene	RI/FS	123278	481681	1346320	28	U	ug/kg	0	0.5
Benzene	RI/FS	123287	481902	1346539	99	J	ug/kg	0	0.5
Benzo(a)anthracene	RI/FS	123275	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
Benzo(a)anthracene	RI/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
Benzo(a)anthracene	RI/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
Benzo(a)anthracene	Unknown	061077	481074.26	1346563.08	390	U	ug/kg	1.5	2
Benzo(a)anthracene	RI/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
Benzo(a)anthracene	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
Benzo(a)anthracene	Unknown	061042	481679.46	1346379.58	400	U	ug/kg	1.5	2
Benzo(a)anthracene	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
Benzo(a)anthracene	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
Benzo(a)anthracene	RI/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
Benzo(a)anthracene	RI/FS	123287	481902	1346539	110	J	ug/kg	0	0.5

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APPENDIX B-1
HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Benzo(a)pyrene	R/I/FS	123276	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
Benzo(a)pyrene	R/I/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
Benzo(a)pyrene	R/I/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
Benzo(a)pyrene	Unknown	061077	481074.26	1346563.08	390	U	ug/kg	1.5	2
Benzo(a)pyrene	R/I/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
Benzo(a)pyrene	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
Benzo(a)pyrene	Unknown	061042	481679.46	1346379.58	400	U	ug/kg	1.5	2
Benzo(a)pyrene	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
Benzo(a)pyrene	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
Benzo(a)pyrene	R/I/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
Benzo(b)fluoranthene	R/I/FS	123276	481481	1346307	39	J	ug/kg	0	0.5
Benzo(b)fluoranthene	R/I/FS	123287	481902	1346539	190	J	ug/kg	0	0.5
Benzo(b)fluoranthene	R/I/FS	123275	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
Benzo(b)fluoranthene	R/I/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
Benzo(b)fluoranthene	R/I/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
Benzo(b)fluoranthene	Unknown	061077	481074.26	1346563.08	390	U	ug/kg	1.5	2
Benzo(b)fluoranthene	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
Benzo(b)fluoranthene	Unknown	061042	481679.46	1346379.58	400	U	ug/kg	1.5	2
Benzo(b)fluoranthene	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
Benzo(b)fluoranthene	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
Benzo(b)fluoranthene	R/I/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
Benzo(k)fluoranthene	R/I/FS	123275	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
Benzo(k)fluoranthene	R/I/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
Benzo(k)fluoranthene	R/I/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
Benzo(k)fluoranthene	Unknown	061077	481074.26	1346563.08	390	U	ug/kg	1.5	2
Benzo(k)fluoranthene	R/I/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
Benzo(k)fluoranthene	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
Benzo(k)fluoranthene	Unknown	061042	481679.46	1346379.58	400	U	ug/kg	1.5	2
Benzo(k)fluoranthene	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
Benzo(k)fluoranthene	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
Benzo(k)fluoranthene	R/I/FS	123287	481902	1346539	540	UJ	ug/kg	0	0.5
Benzo(k)fluoranthene	R/I/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
Beryllium	R/I/FS	123411	481060.07	1346522.41	0.42	U	mg/kg	0	0.5
Beryllium	R/I/FS	123275	481177.02	1346409.88	0.43	U	mg/kg	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Beryllium	RI/FS	123273	481295.48	1346363.17	0.45	U	mg/kg	0	0.5
Beryllium	RI/FS	123276	481481	1346307	0.45	U	mg/kg	0	0.5
Beryllium	Unknown	061037	481679.46	1346379.58	0.58	-	mg/kg	0	0.5
Beryllium	Unknown	061072	481074.26	1346563.08	0.62	-	mg/kg	0	0.5
Beryllium	RI/FS	123287	481902	1346539	0.65	U	mg/kg	0	0.5
Beryllium	Unknown	061030	481873.87	1346584.87	0.69	-	mg/kg	0	0.5
Beryllium	Unknown	061058	481176.96	1346465.78	0.72	-	mg/kg	0	0.5
Beryllium	Unknown	061023	482073.77	1346590.37	0.75	-	mg/kg	0	0.5
Beryllium	Unknown	061044	481479.56	1346374.08	0.76	-	mg/kg	0	0.5
Beryllium	RI/FS	123278	481681	1346320	0.99	UJ	mg/kg	0	0.5
bis(2-Chloroisopropyl) ether	RI/FS	123275	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
bis(2-Chloroisopropyl) ether	RI/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
bis(2-Chloroisopropyl) ether	RI/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
bis(2-Chloroisopropyl) ether	Unknown	061077	481074.26	1346563.08	390	UJ	ug/kg	1.5	2
bis(2-Chloroisopropyl) ether	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
bis(2-Chloroisopropyl) ether	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
bis(2-Chloroisopropyl) ether	Unknown	061042	481679.46	1346379.58	400	UJ	ug/kg	1.5	2
bis(2-Chloroisopropyl) ether	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
bis(2-Chloroisopropyl) ether	RI/FS	123287	481902	1346539	540	UJ	ug/kg	0	0.5
bis(2-Chloroisopropyl) ether	RI/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	Unknown	061035	481873.87	1346584.87	55	J	ug/kg	1.5	2
bis(2-Ethylhexyl)phthalate	Unknown	061042	481679.46	1346379.58	200	J	ug/kg	1.5	2
bis(2-Ethylhexyl)phthalate	RI/FS	123275	481177.02	1346409.88	370	J	ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	RI/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	RI/FS	123276	481481	1346307	390	U	ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	RI/FS	123273	481295.48	1346363.17	450	J	ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	RI/FS	123287	481902	1346539	540	U	ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	Unknown	061028	482073.77	1346590.37	600	-	ug/kg	1.5	2
bis(2-Ethylhexyl)phthalate	RI/FS	123278	481681	1346320	840	U	ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	Unknown	061077	481074.26	1346563.08	1100	-	ug/kg	1.5	2
bis(2-Ethylhexyl)phthalate	Unknown	061049	481479.56	1346374.08	1100	-	ug/kg	1.5	2
Bromodichloromethane	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2
Bromodichloromethane	Unknown	061028	482073.77	1346590.37	6	U	ug/kg	1.5	2
Bromodichloromethane	Unknown	061035	481873.87	1346584.87	6	U	ug/kg	1.5	2

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

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Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Bromodichloromethane	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
Bromodichloromethane	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
Bromodichloromethane	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
Bromodichloromethane	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
Bromodichloromethane	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
Bromodichloromethane	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
Bromodichloromethane	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
Bromodichloromethane	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
Bromoform	Unknown	061077	481074.26	1346563.08	6 U		ug/kg	1.5	2
Bromoform	Unknown	061028	482073.77	1346590.37	6 U		ug/kg	1.5	2
Bromoform	Unknown	061035	481873.87	1346584.87	6 U		ug/kg	1.5	2
Bromoform	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
Bromoform	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
Bromoform	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
Bromoform	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
Bromoform	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
Bromoform	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
Bromoform	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
Bromoform	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
Bromomethane	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
Bromomethane	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
Bromomethane	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
Bromomethane	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
Bromomethane	Unknown	061049	481479.56	1346374.08	12 U		ug/kg	1.5	2
Bromomethane	Unknown	061077	481074.26	1346563.08	12 U		ug/kg	1.5	2
Bromomethane	Unknown	061028	482073.77	1346590.37	12 U		ug/kg	1.5	2
Bromomethane	Unknown	061042	481679.46	1346379.58	12 U		ug/kg	1.5	2
Bromomethane	Unknown	061035	481873.87	1346584.87	13 U		ug/kg	1.5	2
Bromomethane	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
Bromomethane	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
Cadmium	RI/FS	123411	481060.07	1346522.41	1 U		mg/kg	0	0.5
Cadmium	RI/FS	123275	481177.02	1346409.88	1.1 U		mg/kg	0	0.5
Cadmium	RI/FS	123273	481295.48	1346363.17	1.1 U		mg/kg	0	0.5
Cadmium	RI/FS	123276	481481	1346307	1.1 U		mg/kg	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Cadmium	RI/FS	123287	481902	1346539	1.6 U		mg/kg	0	0.5
Cadmium	RI/FS	123278	481681	1346320	2.5 UJ		mg/kg	0	0.5
Cadmium	Unknown	061030	481873.87	1346584.87	3.4 J		mg/kg	0	0.5
Cadmium	Unknown	061072	481074.26	1346563.08	4 J		mg/kg	0	0.5
Cadmium	Unknown	061037	481679.46	1346379.58	4.6 J		mg/kg	0	0.5
Cadmium	Unknown	061023	482073.77	1346590.37	5.7 J		mg/kg	0	0.5
Cadmium	Unknown	061058	481176.96	1346465.78	5.7 J		mg/kg	0	0.5
Cadmium	Unknown	061044	481479.56	1346374.08	5.9 -		mg/kg	0	0.5
Carbazole	RI/FS	123273	481295.48	1346363.17	40 J		ug/kg	0	0.5
Carbazole	RI/FS	123287	481902	1346539	76 J		ug/kg	0	0.5
Carbazole	RI/FS	123275	481177.02	1346409.88	360 UJ		ug/kg	0	0.5
Carbon disulfide	Unknown	061077	481074.26	1346563.08	6 U		ug/kg	1.5	2
Carbon disulfide	Unknown	061028	482073.77	1346590.37	6 U		ug/kg	1.5	2
Carbon disulfide	Unknown	061035	481873.87	1346584.87	6 U		ug/kg	1.5	2
Carbon disulfide	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
Carbon disulfide	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
Carbon disulfide	RI/FS	123411	481060.07	1346522.41	11 UJ		ug/kg	0	0.5
Carbon Tetrachloride	Unknown	061077	481074.26	1346563.08	6 U		ug/kg	1.5	2
Carbon Tetrachloride	Unknown	061028	482073.77	1346590.37	6 U		ug/kg	1.5	2
Carbon Tetrachloride	Unknown	061035	481873.87	1346584.87	6 U		ug/kg	1.5	2
Carbon Tetrachloride	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
Carbon Tetrachloride	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
Carbon Tetrachloride	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
Carbon Tetrachloride	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
Carbon Tetrachloride	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
Carbon Tetrachloride	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
Carbon Tetrachloride	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
Carbon Tetrachloride	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
Cesium-137	RI/FS	123273	481295.48	1346363.17	0.018 UJ		pCi/g	0	0.5
Cesium-137	RI/FS	123275	481177.02	1346409.88	0.0434 J		pCi/g	0	0.5
Cesium-137	RI/FS	123276	481481	1346307	0.0862 J		pCi/g	0	0.5
Cesium-137	RI/FS	123287	481902	1346539	0.091 J		pCi/g	0	0.5
Cesium-137	CIS	SD-31-005	481260.3827	1346385.051	0.1 UNV		pCi/g	0	0.5
Cesium-137	RI/FS	123411	481060.07	1346522.41	0.12 UJ		pCi/g	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Cesium-137	RI/FS	123278	481681	1346320	0.121	J	pCi/g	0	0.5
Cesium-137	Unknown	005435	482029.3832	1346431.042	0.2	J	pCi/g	0	0.16667
Cesium-137	Unknown	005496	481029.3843	1346531.053	0.2	U	pCi/g	0	0.16667
Cesium-137	Unknown	075500	481152.4441	1346513.712	0.2	UJ	pCi/g	0	0.5
Cesium-137	Unknown	005493	481629.38	1346131.047	0.2	UJ	pCi/g	0	0.16667
Cesium-137	Unknown	005125	482029.3843	1346531.042	0.2	UJ	pCi/g	0	0.16667
Cesium-137	Unknown	005126	482029.3843	1346531.042	0.2	UJ	pCi/g	0	0.16667
Cesium-137	CIS	SD-31-004	481170.3832	1346433.052	0.2	UNV	pCi/g	0	0.25
Cesium-137	CIS	SD-31-006	481353.3823	1346348.05	0.3	UNV	pCi/g	0	0.5
Cesium-137	CIS	SD-31-003	481117.3841	1346513.052	0.7	UNV	pCi/g	0	0.5
Cesium-137	CIS	SD-26-018	482082.3812	1346241.042	0.7	UNV	pCi/g	0	0.25
Chlorobenzene	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2
Chlorobenzene	Unknown	061028	482073.77	1346590.37	6	U	ug/kg	1.5	2
Chlorobenzene	Unknown	061035	481873.87	1346584.87	6	U	ug/kg	1.5	2
Chlorobenzene	Unknown	061042	481679.46	1346379.58	6	U	ug/kg	1.5	2
Chlorobenzene	Unknown	061049	481479.56	1346374.08	6	U	ug/kg	1.5	2
Chlorobenzene	RI/FS	123411	481060.07	1346522.41	11	U	ug/kg	0	0.5
Chlorobenzene	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
Chlorobenzene	RI/FS	123273	481295.48	1346363.17	11	U	ug/kg	0	0.5
Chlorobenzene	RI/FS	123276	481481	1346307	11	U	ug/kg	0	0.5
Chlorobenzene	RI/FS	123287	481902	1346539	16	U	ug/kg	0	0.5
Chlorobenzene	RI/FS	123278	481681	1346320	28	U	ug/kg	0	0.5
Chloroethane	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
Chloroethane	RI/FS	123273	481295.48	1346363.17	11	U	ug/kg	0	0.5
Chloroethane	RI/FS	123276	481481	1346307	11	U	ug/kg	0	0.5
Chloroethane	RI/FS	123411	481060.07	1346522.41	11	UJ	ug/kg	0	0.5
Chloroethane	Unknown	061077	481074.26	1346563.08	12	U	ug/kg	1.5	2
Chloroethane	Unknown	061028	482073.77	1346590.37	12	U	ug/kg	1.5	2
Chloroethane	Unknown	061042	481679.46	1346379.58	12	U	ug/kg	1.5	2
Chloroethane	Unknown	061049	481479.56	1346374.08	12	U	ug/kg	1.5	2
Chloroethane	Unknown	061035	481873.87	1346584.87	13	U	ug/kg	1.5	2
Chloroethane	RI/FS	123287	481902	1346539	16	U	ug/kg	0	0.5
Chloroethane	RI/FS	123278	481681	1346320	28	U	ug/kg	0	0.5
Chloroform	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Chloroform	Unknown	061028	482073.77	1346590.37	6 U		ug/kg	1.5	2
Chloroform	Unknown	061035	481873.87	1346584.87	6 U		ug/kg	1.5	2
Chloroform	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
Chloroform	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
Chloroform	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
Chloroform	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
Chloroform	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
Chloroform	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
Chloroform	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
Chloroform	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
Chromium	Unknown	061037	481679.46	1346379.58	6.1 -		mg/kg	0	0.5
Chromium	Unknown	061044	481479.56	1346374.08	7.4 -		mg/kg	0	0.5
Chromium	RI/FS	123278	481681	1346320	8.3 J		mg/kg	0	0.5
Chromium	RI/FS	123275	481177.02	1346409.88	9.1 -		mg/kg	0	0.5
Chromium	RI/FS	123273	481295.48	1346363.17	9.5 -		mg/kg	0	0.5
Chromium	RI/FS	123411	481060.07	1346522.41	9.8 -		mg/kg	0	0.5
Chromium	RI/FS	123276	481481	1346307	13 -		mg/kg	0	0.5
Chromium	Unknown	061072	481074.26	1346563.08	13.3 -		mg/kg	0	0.5
Chromium	Unknown	061058	481176.96	1346465.78	14.4 -		mg/kg	0	0.5
Chromium	Unknown	061023	482073.77	1346590.37	16.3 -		mg/kg	0	0.5
Chromium	RI/FS	123287	481902	1346539	16.5 -		mg/kg	0	0.5
Chromium	Unknown	061030	481873.87	1346584.87	17 -		mg/kg	0	0.5
Chrysene	RI/FS	123287	481902	1346539	100 J		ug/kg	0	0.5
Chrysene	RI/FS	123275	481177.02	1346409.88	360 UJ		ug/kg	0	0.5
Chrysene	RI/FS	123273	481295.48	1346363.17	370 UJ		ug/kg	0	0.5
Chrysene	RI/FS	123411	481060.07	1346522.41	380 UJ		ug/kg	0	0.5
Chrysene	Unknown	061077	481074.26	1346563.08	390 U		ug/kg	1.5	2
Chrysene	RI/FS	123276	481481	1346307	390 UJ		ug/kg	0	0.5
Chrysene	Unknown	061028	482073.77	1346590.37	400 U		ug/kg	1.5	2
Chrysene	Unknown	061042	481679.46	1346379.58	400 U		ug/kg	1.5	2
Chrysene	Unknown	061049	481479.56	1346374.08	400 U		ug/kg	1.5	2
Chrysene	Unknown	061035	481873.87	1346584.87	440 U		ug/kg	1.5	2
Chrysene	RI/FS	123278	481681	1346320	920 UJ		ug/kg	0	0.5
Cobalt	RI/FS	123275	481177.02	1346409.88	3.9 -		mg/kg	0	0.5

APPENDIX B-1
HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Cobalt	RI/FS	123273	481295.48	1346363.17	4.6	-	mg/kg	0	0.5
Cobalt	RI/FS	123411	481060.07	1346522.41	4.9	-	mg/kg	0	0.5
Cobalt	RI/FS	123278	481681	1346320	4.9	UU	mg/kg	0	0.5
Cobalt	RI/FS	123276	481481	1346307	5.1	-	mg/kg	0	0.5
Cobalt	Unknown	061037	481679.46	1346379.58	7	-	mg/kg	0	0.5
Cobalt	RI/FS	123287	481902	1346539	8.5	-	mg/kg	0	0.5
Cobalt	Unknown	061072	481074.26	1346563.08	8.5	-	mg/kg	0	0.5
Cobalt	Unknown	061044	481479.56	1346374.08	9	-	mg/kg	0	0.5
Cobalt	Unknown	061058	481176.96	1346465.78	10.6	-	mg/kg	0	0.5
Cobalt	Unknown	061023	482073.77	1346590.37	10.9	-	mg/kg	0	0.5
Cobalt	Unknown	061030	481873.87	1346584.87	11.1	-	mg/kg	0	0.5
Copper	RI/FS	123275	481177.02	1346409.88	9.1	-	mg/kg	0	0.5
Copper	Unknown	061037	481679.46	1346379.58	11.4	-	mg/kg	0	0.5
Copper	RI/FS	123411	481060.07	1346522.41	12.2	-	mg/kg	0	0.5
Copper	RI/FS	123273	481295.48	1346363.17	12.3	-	mg/kg	0	0.5
Copper	Unknown	061072	481074.26	1346563.08	13.8	-	mg/kg	0	0.5
Copper	RI/FS	123278	481681	1346320	13.8	J	mg/kg	0	0.5
Copper	RI/FS	123276	481481	1346307	14.6	-	mg/kg	0	0.5
Copper	Unknown	061030	481873.87	1346584.87	14.6	-	mg/kg	0	0.5
Copper	Unknown	061058	481176.96	1346465.78	14.8	-	mg/kg	0	0.5
Copper	Unknown	061023	482073.77	1346590.37	18.3	-	mg/kg	0	0.5
Copper	Unknown	061044	481479.56	1346374.08	18.5	-	mg/kg	0	0.5
Copper	RI/FS	123287	481902	1346539	22	-	mg/kg	0	0.5
Cyanide	RI/FS	123273	481295.48	1346363.17	0.11	U	mg/kg	0	0.5
Cyanide	RI/FS	123276	481481	1346307	0.11	U	mg/kg	0	0.5
Cyanide	Unknown	061072	481074.26	1346563.08	0.11	U	mg/kg	0	0.5
Cyanide	Unknown	061037	481679.46	1346379.58	0.11	U	mg/kg	0	0.5
Cyanide	Unknown	061044	481479.56	1346374.08	0.11	U	mg/kg	0	0.5
Cyanide	RI/FS	123411	481060.07	1346522.41	0.11	UU	mg/kg	0	0.5
Cyanide	Unknown	061023	482073.77	1346590.37	0.12	U	mg/kg	0	0.5
Cyanide	Unknown	061058	481176.96	1346465.78	0.12	U	mg/kg	0	0.5
Cyanide	Unknown	061030	481873.87	1346584.87	0.13	U	mg/kg	0	0.5
Cyanide	RI/FS	123275	481177.02	1346409.88	0.2	-	mg/kg	0	0.5
Cyanide	RI/FS	123278	481681	1346320	0.33	J	mg/kg	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Cyanide	RI/FS	123287	481902	1346539	0.47	-	mg/kg	0	0.5
Dibenzo(a,h)anthracene	RI/FS	123275	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
Dibenzo(a,h)anthracene	RI/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
Dibenzo(a,h)anthracene	RI/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
Dibenzo(a,h)anthracene	Unknown	061077	481074.26	1346563.08	390	U	ug/kg	1.5	2
Dibenzo(a,h)anthracene	RI/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
Dibenzo(a,h)anthracene	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
Dibenzo(a,h)anthracene	Unknown	061042	481679.46	1346379.58	400	U	ug/kg	1.5	2
Dibenzo(a,h)anthracene	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
Dibenzo(a,h)anthracene	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
Dibenzo(a,h)anthracene	RI/FS	123287	481902	1346539	540	UJ	ug/kg	0	0.5
Dibenzo(a,h)anthracene	RI/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
Dieldrin	Unknown	061037	481679.46	1346379.58	18	U	ug/kg	0	0.5
Dieldrin	Unknown	061072	481074.26	1346563.08	19	U	ug/kg	0	0.5
Dieldrin	Unknown	061044	481479.56	1346374.08	19	U	ug/kg	0	0.5
Dieldrin	Unknown	061030	481873.87	1346584.87	20	-	ug/kg	0	0.5
Dieldrin	Unknown	061023	482073.77	1346590.37	20	U	ug/kg	0	0.5
Dieldrin	Unknown	061058	481176.96	1346465.78	20	U	ug/kg	0	0.5
Di-n-octyl phthalate	RI/FS	123275	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
Di-n-octyl phthalate	RI/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
Di-n-octyl phthalate	RI/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
Di-n-octyl phthalate	Unknown	061077	481074.26	1346563.08	390	U	ug/kg	1.5	2
Di-n-octyl phthalate	RI/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
Di-n-octyl phthalate	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
Di-n-octyl phthalate	Unknown	061042	481679.46	1346379.58	400	U	ug/kg	1.5	2
Di-n-octyl phthalate	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
Di-n-octyl phthalate	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
Di-n-octyl phthalate	RI/FS	123287	481902	1346539	540	UJ	ug/kg	0	0.5
Di-n-octyl phthalate	RI/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
Ethylbenzene	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2
Ethylbenzene	Unknown	061028	482073.77	1346590.37	6	U	ug/kg	1.5	2
Ethylbenzene	Unknown	061035	481873.87	1346584.87	6	U	ug/kg	1.5	2
Ethylbenzene	Unknown	061042	481679.46	1346379.58	6	U	ug/kg	1.5	2
Ethylbenzene	Unknown	061049	481479.56	1346374.08	6	U	ug/kg	1.5	2

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Ethylbenzene	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
Ethylbenzene	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
Ethylbenzene	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
Ethylbenzene	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
Ethylbenzene	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
Ethylbenzene	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
Heptachlorodibenzofurans	RI/FS	123275	481177.02	1346409.88	490 U		ng/kg	0	0.5
Heptachlorodibenzofurans	RI/FS	123273	481295.48	1346363.17	610 U		ng/kg	0	0.5
Heptachlorodibenzofurans	RI/FS	123411	481060.07	1346522.41	730 U		ng/kg	0	0.5
Heptachlorodibenzofurans	RI/FS	123276	481481	1346307	990 U		ng/kg	0	0.5
Heptachlorodibenzofurans	RI/FS	123287	481902	1346539	1000 U		ng/kg	0	0.5
Heptachlorodibenzofurans	RI/FS	123278	481681	1346320	1200 U		ng/kg	0	0.5
Heptachlorodibenzo-p-dioxins	RI/FS	123275	481177.02	1346409.88	190 U		ng/kg	0	0.5
Heptachlorodibenzo-p-dioxins	RI/FS	123411	481060.07	1346522.41	220 U		ng/kg	0	0.5
Heptachlorodibenzo-p-dioxins	RI/FS	123273	481295.48	1346363.17	300 U		ng/kg	0	0.5
Heptachlorodibenzo-p-dioxins	RI/FS	123276	481481	1346307	380 U		ng/kg	0	0.5
Heptachlorodibenzo-p-dioxins	RI/FS	123278	481681	1346320	430 U		ng/kg	0	0.5
Heptachlorodibenzo-p-dioxins	RI/FS	123287	481902	1346539	580 U		ng/kg	0	0.5
Indeno(1,2,3-cd)pyrene	RI/FS	123287	481902	1346539	65 J		ug/kg	0	0.5
Indeno(1,2,3-cd)pyrene	RI/FS	123275	481177.02	1346409.88	360 UJ		ug/kg	0	0.5
Indeno(1,2,3-cd)pyrene	RI/FS	123273	481295.48	1346363.17	370 UJ		ug/kg	0	0.5
Indeno(1,2,3-cd)pyrene	RI/FS	123411	481060.07	1346522.41	380 UJ		ug/kg	0	0.5
Indeno(1,2,3-cd)pyrene	Unknown	061077	481074.26	1346563.08	390 U		ug/kg	1.5	2
Indeno(1,2,3-cd)pyrene	RI/FS	123276	481481	1346307	390 UJ		ug/kg	0	0.5
Indeno(1,2,3-cd)pyrene	Unknown	061028	482073.77	1346590.37	400 U		ug/kg	1.5	2
Indeno(1,2,3-cd)pyrene	Unknown	061042	481679.46	1346379.58	400 U		ug/kg	1.5	2
Indeno(1,2,3-cd)pyrene	Unknown	061049	481479.56	1346374.08	400 U		ug/kg	1.5	2
Indeno(1,2,3-cd)pyrene	Unknown	061035	481873.87	1346584.87	440 U		ug/kg	1.5	2
Indeno(1,2,3-cd)pyrene	RI/FS	123278	481681	1346320	920 UJ		ug/kg	0	0.5
Lead	RI/FS	123273	481295.48	1346363.17	5.4 -		mg/kg	0	0.5
Lead	Unknown	061072	481074.26	1346563.08	7.8 J		mg/kg	0	0.5
Lead	RI/FS	123275	481177.02	1346409.88	7.9 -		mg/kg	0	0.5
Lead	Unknown	061058	481176.96	1346465.78	7.9 J		mg/kg	0	0.5
Lead	Unknown	061037	481679.46	1346379.58	8.4 J		mg/kg	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Lead	RI/FS	123278	481681	1346320	8.6	J	mg/kg	0	0.5
Lead	Unknown	061023	482073.77	1346590.37	10.5	J	mg/kg	0	0.5
Lead	RI/FS	123411	481060.07	1346522.41	10.8	-	mg/kg	0	0.5
Lead	RI/FS	123276	481481	1346307	11.7	-	mg/kg	0	0.5
Lead	Unknown	061030	481873.87	1346584.87	12.1	J	mg/kg	0	0.5
Lead	Unknown	061044	481479.56	1346374.08	13.5	J	mg/kg	0	0.5
Lead	RI/FS	123287	481902	1346539	18.8	-	mg/kg	0	0.5
Manganese	RI/FS	123278	481681	1346320	142	J	mg/kg	0	0.5
Manganese	Unknown	061037	481679.46	1346379.58	426	-	mg/kg	0	0.5
Manganese	Unknown	061023	482073.77	1346590.37	438	-	mg/kg	0	0.5
Manganese	RI/FS	123411	481060.07	1346522.41	450	-	mg/kg	0	0.5
Manganese	RI/FS	123275	481177.02	1346409.88	467	-	mg/kg	0	0.5
Manganese	RI/FS	123273	481295.48	1346363.17	470	-	mg/kg	0	0.5
Manganese	RI/FS	123276	481481	1346307	476	-	mg/kg	0	0.5
Manganese	Unknown	061058	481176.96	1346465.78	556	-	mg/kg	0	0.5
Manganese	Unknown	061044	481479.56	1346374.08	638	-	mg/kg	0	0.5
Manganese	Unknown	061030	481873.87	1346584.87	655	-	mg/kg	0	0.5
Manganese	Unknown	061072	481074.26	1346563.08	707	-	mg/kg	0	0.5
Manganese	RI/FS	123287	481902	1346539	1020	-	mg/kg	0	0.5
Mercury	RI/FS	123411	481060.07	1346522.41	0.1	U	mg/kg	0	0.5
Mercury	RI/FS	123275	481177.02	1346409.88	0.1	U	mg/kg	0	0.5
Mercury	RI/FS	123273	481295.48	1346363.17	0.11	U	mg/kg	0	0.5
Mercury	RI/FS	123276	481481	1346307	0.11	U	mg/kg	0	0.5
Mercury	Unknown	061037	481679.46	1346379.58	0.11	U	mg/kg	0	0.5
Mercury	Unknown	061044	481479.56	1346374.08	0.11	U	mg/kg	0	0.5
Mercury	Unknown	061072	481074.26	1346563.08	0.12	U	mg/kg	0	0.5
Mercury	Unknown	061023	482073.77	1346590.37	0.12	U	mg/kg	0	0.5
Mercury	Unknown	061030	481873.87	1346584.87	0.12	U	mg/kg	0	0.5
Mercury	Unknown	061058	481176.96	1346465.78	0.12	U	mg/kg	0	0.5
Mercury	RI/FS	123287	481902	1346539	0.16	U	mg/kg	0	0.5
Mercury	RI/FS	123278	481681	1346320	0.27	UJ	mg/kg	0	0.5
Methylene chloride	Unknown	061035	481873.87	1346584.87	6	UJ	ug/kg	1.5	2
Methylene chloride	Unknown	061028	482073.77	1346590.37	11	UJ	ug/kg	1.5	2
Methylene chloride	Unknown	061042	481679.46	1346379.58	12	UJ	ug/kg	1.5	2

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Methylene chloride	Unknown	061077	481074.26	1346563.08	14 UJ		ug/kg	1.5	2
Methylene chloride	Unknown	061049	481479.56	1346374.08	24 U		ug/kg	1.5	2
Methylene chloride	RI/FS	123275	481177.02	1346409.88	38 U		ug/kg	0	0.5
Methylene chloride	RI/FS	123276	481481	1346307	38 U		ug/kg	0	0.5
Methylene chloride	RI/FS	123273	481295.48	1346363.17	39 U		ug/kg	0	0.5
Methylene chloride	RI/FS	123411	481060.07	1346522.41	58 UJ		ug/kg	0	0.5
Methylene chloride	RI/FS	123287	481902	1346539	67 U		ug/kg	0	0.5
Methylene chloride	RI/FS	123278	481681	1346320	140 U		ug/kg	0	0.5
Molybdenum	Unknown	061030	481873.87	1346584.87	3 -		mg/kg	0	0.5
Molybdenum	Unknown	061072	481074.26	1346563.08	3.3 -		mg/kg	0	0.5
Molybdenum	Unknown	061037	481679.46	1346379.58	3.9 -		mg/kg	0	0.5
Molybdenum	Unknown	061044	481479.56	1346374.08	4.1 -		mg/kg	0	0.5
Molybdenum	RI/FS	123411	481060.07	1346522.41	4.2 U		mg/kg	0	0.5
Molybdenum	RI/FS	123275	481177.02	1346409.88	4.3 U		mg/kg	0	0.5
Molybdenum	Unknown	061058	481176.96	1346465.78	4.4 -		mg/kg	0	0.5
Molybdenum	RI/FS	123273	481295.48	1346363.17	4.5 U		mg/kg	0	0.5
Molybdenum	Unknown	061023	482073.77	1346590.37	4.6 -		mg/kg	0	0.5
Molybdenum	RI/FS	123276	481481	1346307	5.2 -		mg/kg	0	0.5
Molybdenum	RI/FS	123287	481902	1346539	6.5 U		mg/kg	0	0.5
Molybdenum	RI/FS	123278	481681	1346320	9.9 UJ		mg/kg	0	0.5
Neptunium-237	RI/FS	123287	481902	1346539	0.371 J		pCi/g	0	0.5
Neptunium-237	RI/FS	123278	481681	1346320	0.408 J		pCi/g	0	0.5
Neptunium-237	RI/FS	123273	481295.48	1346363.17	0.526 J		pCi/g	0	0.5
Neptunium-237	Unknown	005496	481029.3843	1346531.053	0.6 U		pCi/g	0	0.16667
Neptunium-237	Unknown	005493	481629.38	1346131.047	0.6 U		pCi/g	0	0.16667
Neptunium-237	Unknown	005435	482029.3832	1346431.042	0.6 U		pCi/g	0	0.16667
Neptunium-237	Unknown	005125	482029.3843	1346531.042	0.6 UJ		pCi/g	0	0.16667
Neptunium-237	Unknown	005126	482029.3843	1346531.042	0.6 UJ		pCi/g	0	0.16667
Neptunium-237	RI/FS	123411	481060.07	1346522.41	0.629 J		pCi/g	0	0.5
Neptunium-237	RI/FS	123275	481177.02	1346409.88	0.636 J		pCi/g	0	0.5
Neptunium-237	RI/FS	123276	481481	1346307	1.1 J		pCi/g	0	0.5
Nickel	RI/FS	123275	481177.02	1346409.88	7.6 -		mg/kg	0	0.5
Nickel	RI/FS	123278	481681	1346320	11.5 J		mg/kg	0	0.5
Nickel	RI/FS	123411	481060.07	1346522.41	11.9 -		mg/kg	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Nickel	R/I/FS	123273	481295.48	1346363.17	14.3	-	mg/kg	0	0.5
Nickel	R/I/FS	123276	481481	1346307	14.5	-	mg/kg	0	0.5
Nickel	Unknown	061037	481679.46	1346379.58	19.7	-	mg/kg	0	0.5
Nickel	Unknown	061072	481074.26	1346563.08	20.8	-	mg/kg	0	0.5
Nickel	R/I/FS	123287	481902	1346539	23.5	-	mg/kg	0	0.5
Nickel	Unknown	061044	481479.56	1346374.08	26.8	-	mg/kg	0	0.5
Nickel	Unknown	061023	482073.77	1346590.37	27.8	-	mg/kg	0	0.5
Nickel	Unknown	061030	481873.87	1346584.87	27.9	-	mg/kg	0	0.5
Nickel	Unknown	061058	481176.96	1346465.78	31.9	-	mg/kg	0	0.5
N-Nitrosodiphenylamine	R/I/FS	123275	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
N-Nitrosodiphenylamine	R/I/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
N-Nitrosodiphenylamine	R/I/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
N-Nitrosodiphenylamine	Unknown	061077	481074.26	1346563.08	390	U	ug/kg	1.5	2
N-Nitrosodiphenylamine	R/I/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
N-Nitrosodiphenylamine	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
N-Nitrosodiphenylamine	Unknown	061042	481679.46	1346379.58	400	U	ug/kg	1.5	2
N-Nitrosodiphenylamine	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
N-Nitrosodiphenylamine	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
N-Nitrosodiphenylamine	R/I/FS	123287	481902	1346539	540	UJ	ug/kg	0	0.5
N-Nitrosodiphenylamine	R/I/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
Octachlorodibenzofuran	R/I/FS	123278	481681	1346320	210	U	ng/kg	0	0.5
Octachlorodibenzofuran	R/I/FS	123276	481481	1346307	230	U	ng/kg	0	0.5
Octachlorodibenzofuran	R/I/FS	123273	481295.48	1346363.17	250	U	ng/kg	0	0.5
Octachlorodibenzofuran	R/I/FS	123275	481177.02	1346409.88	290	U	ng/kg	0	0.5
Octachlorodibenzofuran	R/I/FS	123411	481060.07	1346522.41	300	U	ng/kg	0	0.5
Octachlorodibenzofuran	R/I/FS	123287	481902	1346539	300	U	ng/kg	0	0.5
Octachlorodibenzo-p-dioxin	R/I/FS	123276	481481	1346307	240	J	ng/kg	0	0.5
Octachlorodibenzo-p-dioxin	R/I/FS	123278	481681	1346320	260	U	ng/kg	0	0.5
Octachlorodibenzo-p-dioxin	R/I/FS	123273	481295.48	1346363.17	350	U	ng/kg	0	0.5
Octachlorodibenzo-p-dioxin	R/I/FS	123275	481177.02	1346409.88	400	U	ng/kg	0	0.5
Octachlorodibenzo-p-dioxin	R/I/FS	123411	481060.07	1346522.41	510	U	ng/kg	0	0.5
Octachlorodibenzo-p-dioxin	R/I/FS	123287	481902	1346539	660	U	ng/kg	0	0.5
Pentachlorophenol	R/I/FS	123275	481177.02	1346409.88	880	UJ	ug/kg	0	0.5
Pentachlorophenol	R/I/FS	123273	481295.48	1346363.17	900	UJ	ug/kg	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Pentachlorophenol	RI/FS	123411	481060.07	1346522.41	910	UJ	ug/kg	0	0.5
Pentachlorophenol	RI/FS	123276	481481	1346307	930	UJ	ug/kg	0	0.5
Pentachlorophenol	RI/FS	123287	481902	1346539	1300	UJ	ug/kg	0	0.5
Pentachlorophenol	Unknown	061077	481074.26	1346563.08	1900	U	ug/kg	1.5	2
Pentachlorophenol	Unknown	061028	482073.77	1346590.37	1900	U	ug/kg	1.5	2
Pentachlorophenol	Unknown	061049	481479.56	1346374.08	1900	U	ug/kg	1.5	2
Pentachlorophenol	Unknown	061042	481679.46	1346379.58	2000	U	ug/kg	1.5	2
Pentachlorophenol	Unknown	061035	481873.87	1346584.87	2100	U	ug/kg	1.5	2
Pentachlorophenol	RI/FS	123278	481681	1346320	2200	UJ	ug/kg	0	0.5
Phenanthrene	RI/FS	123287	481902	1346539	310	J	ug/kg	0	0.5
Phenanthrene	RI/FS	123275	481177.02	1346409.88	360	UJ	ug/kg	0	0.5
Phenanthrene	RI/FS	123273	481295.48	1346363.17	370	UJ	ug/kg	0	0.5
Phenanthrene	RI/FS	123411	481060.07	1346522.41	380	UJ	ug/kg	0	0.5
Phenanthrene	Unknown	061077	481074.26	1346563.08	390	U	ug/kg	1.5	2
Phenanthrene	RI/FS	123276	481481	1346307	390	UJ	ug/kg	0	0.5
Phenanthrene	Unknown	061028	482073.77	1346590.37	400	U	ug/kg	1.5	2
Phenanthrene	Unknown	061042	481679.46	1346379.58	400	U	ug/kg	1.5	2
Phenanthrene	Unknown	061049	481479.56	1346374.08	400	U	ug/kg	1.5	2
Phenanthrene	Unknown	061035	481873.87	1346584.87	440	U	ug/kg	1.5	2
Phenanthrene	RI/FS	123278	481681	1346320	920	UJ	ug/kg	0	0.5
Plutonium-238	RI/FS	123411	481060.07	1346522.41	0.0935	J	pCi/g	0	0.5
Plutonium-238	RI/FS	123273	481295.48	1346363.17	0.166	J	pCi/g	0	0.5
Plutonium-238	RI/FS	123276	481481	1346307	0.179	J	pCi/g	0	0.5
Plutonium-238	RI/FS	123275	481177.02	1346409.88	0.2	J	pCi/g	0	0.5
Plutonium-238	RI/FS	123287	481902	1346539	0.24	J	pCi/g	0	0.5
Plutonium-238	RI/FS	123278	481681	1346320	0.285	J	pCi/g	0	0.5
Plutonium-238	Unknown	075500	481152.4441	1346513.712	0.6	U	pCi/g	0	0.5
Plutonium-238	Unknown	005496	481029.3843	1346531.053	0.6	U	pCi/g	0	0.16667
Plutonium-238	Unknown	005435	482029.3832	1346431.042	0.6	U	pCi/g	0	0.16667
Plutonium-238	Unknown	005493	481629.38	1346131.047	0.6	UJ	pCi/g	0	0.16667
Plutonium-238	Unknown	005125	482029.3843	1346531.042	0.6	UJ	pCi/g	0	0.16667
Plutonium-238	Unknown	005126	482029.3843	1346531.042	0.6	UJ	pCi/g	0	0.16667
Plutonium-239/240	RI/FS	123411	481060.07	1346522.41	0.0911	J	pCi/g	0	0.5
Plutonium-239/240	RI/FS	123276	481481	1346307	0.116	J	pCi/g	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Plutonium-239/240	RI/FS	123273	481295.48	1346363.17	0.118 J		pCi/g	0	0.5
Plutonium-239/240	RI/FS	123287	481902	1346539	0.165 J		pCi/g	0	0.5
Plutonium-239/240	RI/FS	123278	481681	1346320	0.168 J		pCi/g	0	0.5
Plutonium-239/240	RI/FS	123275	481177.02	1346409.88	0.186 J		pCi/g	0	0.5
Plutonium-239/240	Unknown	075500	481152.4441	1346513.712	0.6 U		pCi/g	0	0.5
Plutonium-239/240	Unknown	005496	481029.3843	1346531.053	0.6 U		pCi/g	0	0.16667
Plutonium-239/240	Unknown	005435	482029.3832	1346431.042	0.6 U		pCi/g	0	0.16667
Plutonium-239/240	Unknown	005125	482029.3843	1346531.042	0.6 U		pCi/g	0	0.16667
Plutonium-239/240	Unknown	005126	482029.3843	1346531.042	0.6 U		pCi/g	0	0.16667
Plutonium-239/240	Unknown	005493	481629.38	1346131.047	0.6 UJ		pCi/g	0	0.16667
Radium-226	CIS	SD-31-006	481353.3823	1346348.05	0.4 NV		pCi/g	0	0.5
Radium-226	Unknown	005125	482029.3843	1346531.042	0.4 UJ		pCi/g	0	0.16667
Radium-226	Unknown	005126	482029.3843	1346531.042	0.5 UJ		pCi/g	0	0.16667
Radium-226	Unknown	075500	481152.4441	1346513.712	0.53 J		pCi/g	0	0.5
Radium-226	Unknown	005496	481029.3843	1346531.053	0.6 -		pCi/g	0	0.16667
Radium-226	CIS	SD-31-004	481170.3832	1346433.052	0.6 UNV		pCi/g	0	0.25
Radium-226	Unknown	005493	481629.38	1346131.047	0.7 J		pCi/g	0	0.16667
Radium-226	RI/FS	123275	481177.02	1346409.88	0.717 -		pCi/g	0	0.5
Radium-226	RI/FS	123273	481295.48	1346363.17	0.756 -		pCi/g	0	0.5
Radium-226	Unknown	005435	482029.3832	1346431.042	0.8 J		pCi/g	0	0.16667
Radium-226	RI/FS	123411	481060.07	1346522.41	0.963 -		pCi/g	0	0.5
Radium-226	CIS	SD-31-005	481260.3827	1346385.051	1 UNV		pCi/g	0	0.5
Radium-226	CIS	SD-26-018	482082.3812	1346241.042	1.2 NV		pCi/g	0	0.25
Radium-226	CIS	SD-31-003	481117.3841	1346513.052	1.3 NV		pCi/g	0	0.5
Radium-226	RI/FS	123276	481481	1346307	1.36 -		pCi/g	0	0.5
Radium-226	RI/FS	123287	481902	1346539	1.8 -		pCi/g	0	0.5
Radium-226	RI/FS	123278	481681	1346320	1.99 -		pCi/g	0	0.5
Radium-228	Unknown	075500	481152.4441	1346513.712	0.5 UJ		pCi/g	0	0.5
Radium-228	RI/FS	123275	481177.02	1346409.88	0.54 -		pCi/g	0	0.5
Radium-228	RI/FS	123273	481295.48	1346363.17	0.593 -		pCi/g	0	0.5
Radium-228	Unknown	005496	481029.3843	1346531.053	0.6 -		pCi/g	0	0.16667
Radium-228	Unknown	005493	481629.38	1346131.047	0.6 J		pCi/g	0	0.16667
Radium-228	Unknown	005435	482029.3832	1346431.042	0.6 J		pCi/g	0	0.16667
Radium-228	Unknown	005125	482029.3843	1346531.042	0.8 UJ		pCi/g	0	0.16667

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Radium-228	Unknown	005126	482029.3843	1346531.042	0.9	UJ	pCi/g	0	0.16667
Radium-228	R/FS	123411	481060.07	1346522.41	0.948	-	pCi/g	0	0.5
Radium-228	R/FS	123276	481481	1346307	1.45	-	pCi/g	0	0.5
Radium-228	R/FS	123287	481902	1346539	2.08	-	pCi/g	0	0.5
Radium-228	R/FS	123278	481681	1346320	2.1	-	pCi/g	0	0.5
Selenium	R/FS	123411	481060.07	1346522.41	0.33	UJ	mg/kg	0	0.5
Selenium	R/FS	123273	481295.48	1346363.17	0.35	UJ	mg/kg	0	0.5
Selenium	R/FS	123275	481177.02	1346409.88	0.43	UJ	mg/kg	0	0.5
Selenium	R/FS	123276	481481	1346307	0.44	UJ	mg/kg	0	0.5
Selenium	Unknown	061072	481074.26	1346563.08	0.45	U	mg/kg	0	0.5
Selenium	Unknown	061037	481679.46	1346379.58	0.45	U	mg/kg	0	0.5
Selenium	Unknown	061058	481176.96	1346465.78	0.48	U	mg/kg	0	0.5
Selenium	Unknown	061023	482073.77	1346590.37	0.5	U	mg/kg	0	0.5
Selenium	Unknown	061030	481873.87	1346584.87	0.5	U	mg/kg	0	0.5
Selenium	Unknown	061044	481479.56	1346374.08	0.54	U	mg/kg	0	0.5
Selenium	R/FS	123287	481902	1346539	0.63	UJ	mg/kg	0	0.5
Selenium	R/FS	123278	481681	1346320	4.9	UJ	mg/kg	0	0.5
Silver	R/FS	123275	481177.02	1346409.88	2.2	U	mg/kg	0	0.5
Silver	R/FS	123273	481295.48	1346363.17	2.2	U	mg/kg	0	0.5
Silver	R/FS	123411	481060.07	1346522.41	2.7	-	mg/kg	0	0.5
Silver	R/FS	123287	481902	1346539	3.6	-	mg/kg	0	0.5
Silver	R/FS	123276	481481	1346307	4.2	-	mg/kg	0	0.5
Silver	R/FS	123278	481681	1346320	4.9	UJ	mg/kg	0	0.5
Silver	Unknown	061044	481479.56	1346374.08	6.7	J	mg/kg	0	0.5
Silver	Unknown	061030	481873.87	1346584.87	7.2	-	mg/kg	0	0.5
Silver	Unknown	061037	481679.46	1346379.58	7.6	-	mg/kg	0	0.5
Silver	Unknown	061072	481074.26	1346563.08	9.4	-	mg/kg	0	0.5
Silver	Unknown	061023	482073.77	1346590.37	10.3	-	mg/kg	0	0.5
Silver	Unknown	061058	481176.96	1346465.78	10.3	-	mg/kg	0	0.5
Strontium-90	R/FS	123276	481481	1346307	0.22	UJ	pCi/g	0	0.5
Strontium-90	R/FS	123287	481902	1346539	0.22	UJ	pCi/g	0	0.5
Strontium-90	R/FS	123275	481177.02	1346409.88	0.23	UJ	pCi/g	0	0.5
Strontium-90	R/FS	123273	481295.48	1346363.17	0.23	UJ	pCi/g	0	0.5
Strontium-90	R/FS	123278	481681	1346320	0.23	UJ	pCi/g	0	0.5

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Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Strontium-90	RI/FS	123411	481060.07	1346522.41	0.28	UU	pCi/g	0	0.5
Strontium-90	Unknown	005126	482029.3843	1346531.042	0.5	-	pCi/g	0	0.16667
Strontium-90	Unknown	005496	481029.3843	1346531.053	0.5	U	pCi/g	0	0.16667
Strontium-90	Unknown	005493	481629.38	1346131.047	0.5	U	pCi/g	0	0.16667
Strontium-90	Unknown	005435	482029.3832	1346431.042	0.5	U	pCi/g	0	0.16667
Strontium-90	Unknown	005125	482029.3843	1346531.042	0.6	-	pCi/g	0	0.16667
Strontium-90	Unknown	075500	481152.4441	1346513.712	1.01	J	pCi/g	0	0.5
Technetium-99	RI/FS	123411	481060.07	1346522.41	0.45	UU	pCi/g	0	0.5
Technetium-99	RI/FS	123276	481481	1346307	0.48	UU	pCi/g	0	0.5
Technetium-99	RI/FS	123275	481177.02	1346409.88	0.49	UU	pCi/g	0	0.5
Technetium-99	RI/FS	123273	481295.48	1346363.17	0.5	UU	pCi/g	0	0.5
Technetium-99	RI/FS	123278	481681	1346320	0.606	J	pCi/g	0	0.5
Technetium-99	Unknown	005493	481629.38	1346131.047	0.9	U	pCi/g	0	0.16667
Technetium-99	Unknown	005435	482029.3832	1346431.042	0.9	U	pCi/g	0	0.16667
Technetium-99	Unknown	005125	482029.3843	1346531.042	0.9	U	pCi/g	0	0.16667
Technetium-99	Unknown	005126	482029.3843	1346531.042	0.9	U	pCi/g	0	0.16667
Technetium-99	Unknown	075500	481152.4441	1346513.712	0.9	UU	pCi/g	0	0.5
Technetium-99	Unknown	005496	481029.3843	1346531.053	0.9	UU	pCi/g	0	0.16667
Technetium-99	RI/FS	123287	481902	1346539	1.13	J	pCi/g	0	0.5
Tetrachloroethene	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2
Tetrachloroethene	Unknown	061028	482073.77	1346590.37	6	U	ug/kg	1.5	2
Tetrachloroethene	Unknown	061035	481873.87	1346584.87	6	U	ug/kg	1.5	2
Tetrachloroethene	Unknown	061042	481679.46	1346379.58	6	U	ug/kg	1.5	2
Tetrachloroethene	Unknown	061049	481479.56	1346374.08	6	U	ug/kg	1.5	2
Tetrachloroethene	RI/FS	123411	481060.07	1346522.41	11	U	ug/kg	0	0.5
Tetrachloroethene	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
Tetrachloroethene	RI/FS	123273	481295.48	1346363.17	11	U	ug/kg	0	0.5
Tetrachloroethene	RI/FS	123276	481481	1346307	11	U	ug/kg	0	0.5
Tetrachloroethene	RI/FS	123287	481902	1346539	16	U	ug/kg	0	0.5
Tetrachloroethene	RI/FS	123278	481681	1346320	28	U	ug/kg	0	0.5
Thallium	RI/FS	123411	481060.07	1346522.41	0.33	UU	mg/kg	0	0.5
Thallium	RI/FS	123273	481295.48	1346363.17	0.35	UU	mg/kg	0	0.5
Thallium	RI/FS	123275	481177.02	1346409.88	0.43	UU	mg/kg	0	0.5
Thallium	Unknown	061044	481479.56	1346374.08	0.44	U	mg/kg	0	0.5

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Thallium	RI/FS	123276	481481	1346307	0.44	UJ	mg/kg	0	0.5
Thallium	Unknown	061072	481074.26	1346563.08	0.45	UJ	mg/kg	0	0.5
Thallium	Unknown	061037	481679.46	1346379.58	0.45	UJ	mg/kg	0	0.5
Thallium	Unknown	061058	481176.96	1346465.78	0.48	UJ	mg/kg	0	0.5
Thallium	Unknown	061030	481873.87	1346584.87	0.5	UJ	mg/kg	0	0.5
Thallium	RI/FS	123287	481902	1346539	0.63	UJ	mg/kg	0	0.5
Thallium	Unknown	061023	482073.77	1346590.37	0.68	J	mg/kg	0	0.5
Thallium	RI/FS	123278	481681	1346320	0.98	UJ	mg/kg	0	0.5
Thorium-228	RI/FS	123273	481295.48	1346363.17	0.47	J	pCi/g	0	0.5
Thorium-228	Unknown	005496	481029.3843	1346531.053	0.6	U	pCi/g	0	0.16667
Thorium-228	RI/FS	123411	481060.07	1346522.41	0.63	-	pCi/g	0	0.5
Thorium-228	Unknown	005493	481629.38	1346131.047	0.7	-	pCi/g	0	0.16667
Thorium-228	RI/FS	123275	481177.02	1346409.88	0.712	J	pCi/g	0	0.5
Thorium-228	Unknown	005125	482029.3843	1346531.042	0.9	-	pCi/g	0	0.16667
Thorium-228	Unknown	005126	482029.3843	1346531.042	0.9	-	pCi/g	0	0.16667
Thorium-228	Unknown	005435	482029.3832	1346431.042	1.2	J	pCi/g	0	0.16667
Thorium-228	RI/FS	123278	481681	1346320	1.89	J	pCi/g	0	0.5
Thorium-228	Unknown	075500	481152.4441	1346513.712	2	J	pCi/g	0	0.5
Thorium-228	RI/FS	123287	481902	1346539	2.37	J	pCi/g	0	0.5
Thorium-228	RI/FS	123276	481481	1346307	3.28	J	pCi/g	0	0.5
Thorium-230	Unknown	005496	481029.3843	1346531.053	1.1	-	pCi/g	0	0.16667
Thorium-230	Unknown	075500	481152.4441	1346513.712	1.17	J	pCi/g	0	0.5
Thorium-230	RI/FS	123275	481177.02	1346409.88	1.37	J	pCi/g	0	0.5
Thorium-230	Unknown	005493	481629.38	1346131.047	1.4	-	pCi/g	0	0.16667
Thorium-230	RI/FS	123273	481295.48	1346363.17	1.44	J	pCi/g	0	0.5
Thorium-230	RI/FS	123411	481060.07	1346522.41	1.76	-	pCi/g	0	0.5
Thorium-230	Unknown	005126	482029.3843	1346531.042	2	-	pCi/g	0	0.16667
Thorium-230	Unknown	005435	482029.3832	1346431.042	2	J	pCi/g	0	0.16667
Thorium-230	Unknown	005125	482029.3843	1346531.042	2.1	-	pCi/g	0	0.16667
Thorium-230	RI/FS	123276	481481	1346307	8.21	J	pCi/g	0	0.5
Thorium-230	RI/FS	123287	481902	1346539	17.5	J	pCi/g	0	0.5
Thorium-230	RI/FS	123278	481681	1346320	35.7	J	pCi/g	0	0.5
Thorium-232	CIS	SD-31-006	481353.3823	1346348.05	0.3	NV	pCi/g	0	0.5
Thorium-232	CIS	SD-31-004	481170.3832	1346433.052	0.3	UNV	pCi/g	0	0.25

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HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Thorium-232	RI/FS	123273	481295.48	1346363.17	0.588	J	pCi/g	0	0.5
Thorium-232	Unknown	075500	481152.4441	1346513.712	0.6	U	pCi/g	0	0.5
Thorium-232	Unknown	005496	481029.3843	1346531.053	0.6	U	pCi/g	0	0.16667
Thorium-232	RI/FS	123275	481177.02	1346409.88	0.611	J	pCi/g	0	0.5
Thorium-232	Unknown	005125	482029.3843	1346531.042	0.7	-	pCi/g	0	0.16667
Thorium-232	Unknown	005493	481629.38	1346131.047	0.8	-	pCi/g	0	0.16667
Thorium-232	Unknown	005126	482029.3843	1346531.042	0.8	-	pCi/g	0	0.16667
Thorium-232	Unknown	005435	482029.3832	1346431.042	0.8	J	pCi/g	0	0.16667
Thorium-232	RI/FS	123411	481060.07	1346522.41	0.83	-	pCi/g	0	0.5
Thorium-232	CIS	SD-31-005	481260.3827	1346385.051	1.4	UNV	pCi/g	0	0.5
Thorium-232	RI/FS	123278	481681	1346320	1.65	J	pCi/g	0	0.5
Thorium-232	RI/FS	123287	481902	1346539	1.66	J	pCi/g	0	0.5
Thorium-232	RI/FS	123276	481481	1346307	2.54	J	pCi/g	0	0.5
Thorium-232	CIS	SD-26-018	482082.3812	1346241.042	3.4	UNV	pCi/g	0	0.25
Thorium-232	CIS	SD-31-003	481117.3841	1346513.052	4.3	UNV	pCi/g	0	0.5
Toluene	Unknown	061035	481873.87	1346584.87	1	J	ug/kg	1.5	2
Toluene	RI/FS	123273	481295.48	1346363.17	4	J	ug/kg	0	0.5
Toluene	RI/FS	123287	481902	1346539	5	J	ug/kg	0	0.5
Toluene	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2
Toluene	Unknown	061028	482073.77	1346590.37	6	U	ug/kg	1.5	2
Toluene	Unknown	061042	481679.46	1346379.58	6	U	ug/kg	1.5	2
Toluene	Unknown	061049	481479.56	1346374.08	6	U	ug/kg	1.5	2
Toluene	RI/FS	123276	481481	1346307	10	J	ug/kg	0	0.5
Toluene	RI/FS	123411	481060.07	1346522.41	11	U	ug/kg	0	0.5
Toluene	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
Toluene	RI/FS	123278	481681	1346320	28	U	ug/kg	0	0.5
Toxaphene	Unknown	061037	481679.46	1346379.58	180	U	ug/kg	0	0.5
Toxaphene	Unknown	061072	481074.26	1346563.08	190	U	ug/kg	0	0.5
Toxaphene	Unknown	061044	481479.56	1346374.08	190	U	ug/kg	0	0.5
Toxaphene	Unknown	061023	482073.77	1346590.37	200	U	ug/kg	0	0.5
Toxaphene	Unknown	061030	481873.87	1346584.87	200	U	ug/kg	0	0.5
Toxaphene	Unknown	061058	481176.96	1346465.78	200	U	ug/kg	0	0.5
Trichloroethene	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2
Trichloroethene	Unknown	061028	482073.77	1346590.37	6	U	ug/kg	1.5	2

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APPENDIX B-1
 HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

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Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Trichloroethene	Unknown	061035	481873.87	1346584.87	6 U		ug/kg	1.5	2
Trichloroethene	Unknown	061042	481679.46	1346379.58	6 U		ug/kg	1.5	2
Trichloroethene	Unknown	061049	481479.56	1346374.08	6 U		ug/kg	1.5	2
Trichloroethene	RI/FS	123411	481060.07	1346522.41	11 U		ug/kg	0	0.5
Trichloroethene	RI/FS	123275	481177.02	1346409.88	11 U		ug/kg	0	0.5
Trichloroethene	RI/FS	123273	481295.48	1346363.17	11 U		ug/kg	0	0.5
Trichloroethene	RI/FS	123276	481481	1346307	11 U		ug/kg	0	0.5
Trichloroethene	RI/FS	123287	481902	1346539	16 U		ug/kg	0	0.5
Trichloroethene	RI/FS	123278	481681	1346320	28 U		ug/kg	0	0.5
Uranium, Total	Unknown	075500	481152.4441	1346513.712	1.39 J		mg/kg	0	0.5
Uranium, Total	Unknown	005493	481629.38	1346131.047	2 J		mg/kg	0	0.16667
Uranium, Total	RI/FS	123275	481177.02	1346409.88	5.66 -		mg/kg	0	0.5
Uranium, Total	RI/FS	123273	481295.48	1346363.17	5.82 -		mg/kg	0	0.5
Uranium, Total	Unknown	005496	481029.3843	1346531.053	9 -		mg/kg	0	0.16667
Uranium, Total	CIS	SD-31-005	481260.3827	1346385.051	10.132 NV		pCi/g	0	0.5
Uranium, Total	Unknown	075509	481152.4441	1346513.712	11 UNV		mg/kg	0	0.5
Uranium, Total	Unknown	005126	482029.3843	1346531.042	12.7942 NV		pCi/g	0	0.16667
Uranium, Total	Unknown	005435	482029.3832	1346431.042	13 J		mg/kg	0	0.16667
Uranium, Total	CIS	SD-31-003	481117.3841	1346513.052	14.304 NV		pCi/g	0	0.5
Uranium, Total	Unknown	005125	482029.3843	1346531.042	15.7743 NV		pCi/g	0	0.16667
Uranium, Total	CIS	SD-26-018	482082.3812	1346241.042	18.178 NV		pCi/g	0	0.25
Uranium, Total	CIS	SD-31-004	481170.3832	1346433.052	19.37 NV		pCi/g	0	0.25
Uranium, Total	RI/FS	123411	481060.07	1346522.41	22 -		mg/kg	0	0.5
Uranium, Total	CIS	SD-31-006	481363.3823	1346348.05	37.25 NV		pCi/g	0	0.5
Uranium, Total	RI/FS	123276	481481	1346307	48.7 -		mg/kg	0	0.5
Uranium, Total	RI/FS	123287	481902	1346539	103 -		mg/kg	0	0.5
Uranium, Total	RI/FS	123278	481681	1346320	124 -		mg/kg	0	0.5
Uranium-234	Unknown	075500	481152.4441	1346513.712	0.684 -		pCi/g	0	0.5
Uranium-234	Unknown	005493	481629.38	1346131.047	0.7 -		pCi/g	0	0.16667
Uranium-234	RI/FS	123275	481177.02	1346409.88	0.983 -		pCi/g	0	0.5
Uranium-234	Unknown	005496	481029.3843	1346531.053	1.5 -		pCi/g	0	0.16667
Uranium-234	RI/FS	123273	481295.48	1346363.17	1.56 -		pCi/g	0	0.5
Uranium-234	RI/FS	123411	481060.07	1346522.41	1.71 -		pCi/g	0	0.5
Uranium-234	Unknown	005435	482029.3832	1346431.042	2.3 J		pCi/g	0	0.16667

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APPENDIX B-1
HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Uranium-234	Unknown	005126	482029.3843	1346531.042	2.6 J		pCi/g	0	0.16667
Uranium-234	Unknown	005125	482029.3843	1346531.042	2.9 J		pCi/g	0	0.16667
Uranium-234	RI/FS	123276	481481	1346307	4.15 -		pCi/g	0	0.5
Uranium-234	RI/FS	123278	481681	1346320	8.25 -		pCi/g	0	0.5
Uranium-234	RI/FS	123287	481902	1346539	8.97 -		pCi/g	0	0.5
Uranium-235/236	RI/FS	123273	481295.48	1346363.17	0.068 J		pCi/g	0	0.5
Uranium-235/236	RI/FS	123275	481177.02	1346409.88	0.07 UJ		pCi/g	0	0.5
Uranium-235/236	RI/FS	123411	481060.07	1346522.41	0.12 -		pCi/g	0	0.5
Uranium-235/236	RI/FS	123276	481481	1346307	0.172 J		pCi/g	0	0.5
Uranium-235/236	RI/FS	123278	481681	1346320	0.591 J		pCi/g	0	0.5
Uranium-235/236	Unknown	075500	481152.4441	1346513.712	0.6 U		pCi/g	0	0.5
Uranium-235/236	Unknown	005496	481029.3843	1346531.053	0.6 U		pCi/g	0	0.16667
Uranium-235/236	Unknown	005493	481629.38	1346131.047	0.6 U		pCi/g	0	0.16667
Uranium-235/236	Unknown	005126	482029.3843	1346531.042	0.6 U		pCi/g	0	0.16667
Uranium-235/236	Unknown	005435	482029.3832	1346431.042	0.6 UJ		pCi/g	0	0.16667
Uranium-235/236	Unknown	005125	482029.3843	1346531.042	0.6 UJ		pCi/g	0	0.16667
Uranium-235/236	RI/FS	123287	481902	1346539	0.642 -		pCi/g	0	0.5
Uranium-238	Unknown	005493	481629.38	1346131.047	0.9 -		pCi/g	0	0.16667
Uranium-238	Unknown	075500	481152.4441	1346513.712	0.936 -		pCi/g	0	0.5
Uranium-238	RI/FS	123275	481177.02	1346409.88	1.67 -		pCi/g	0	0.5
Uranium-238	RI/FS	123273	481295.48	1346363.17	2.25 -		pCi/g	0	0.5
Uranium-238	Unknown	005496	481029.3843	1346531.053	3.2 -		pCi/g	0	0.16667
Uranium-238	CIS	SD-31-005	481260.3827	1346385.051	3.4 NV		pCi/g	0	0.5
Uranium-238	Unknown	005126	482029.3843	1346531.042	4.2 J		pCi/g	0	0.16667
Uranium-238	CIS	SD-31-003	481117.3841	1346513.052	4.8 NV		pCi/g	0	0.5
Uranium-238	Unknown	005435	482029.3832	1346431.042	4.9 J		pCi/g	0	0.16667
Uranium-238	Unknown	005125	482029.3843	1346531.042	5.2 J		pCi/g	0	0.16667
Uranium-238	RI/FS	123411	481060.07	1346522.41	5.78 -		pCi/g	0	0.5
Uranium-238	CIS	SD-26-018	482082.3812	1346241.042	6.1 NV		pCi/g	0	0.25
Uranium-238	CIS	SD-31-004	481170.3832	1346433.052	6.5 UNV		pCi/g	0	0.25
Uranium-238	CIS	SD-31-006	481353.3823	1346348.05	12.5 UNV		pCi/g	0	0.5
Uranium-238	RI/FS	123276	481481	1346307	16.9 -		pCi/g	0	0.5
Uranium-238	RI/FS	123278	481681	1346320	34.8 -		pCi/g	0	0.5
Uranium-238	RI/FS	123287	481902	1346539	34.8 -		pCi/g	0	0.5

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APPENDIX B-1
 HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Vanadium	Unknown	061037	481679.46	1346379.58	10.9	-	mg/kg	0	0.5
Vanadium	RI/FS	123278	481681	1346320	13.9	J	mg/kg	0	0.5
Vanadium	Unknown	061044	481479.56	1346374.08	15.4	-	mg/kg	0	0.5
Vanadium	RI/FS	123273	481295.48	1346363.17	15.6	-	mg/kg	0	0.5
Vanadium	RI/FS	123275	481177.02	1346409.88	17.1	-	mg/kg	0	0.5
Vanadium	RI/FS	123411	481060.07	1346522.41	17.9	-	mg/kg	0	0.5
Vanadium	Unknown	061072	481074.26	1346563.08	18	-	mg/kg	0	0.5
Vanadium	Unknown	061058	481176.96	1346465.78	18.9	-	mg/kg	0	0.5
Vanadium	Unknown	061023	482073.77	1346590.37	22.2	-	mg/kg	0	0.5
Vanadium	Unknown	061030	481873.87	1346584.87	23.8	-	mg/kg	0	0.5
Vanadium	RI/FS	123276	481481	1346307	24.2	-	mg/kg	0	0.5
Vanadium	RI/FS	123287	481902	1346539	36.8	-	mg/kg	0	0.5
Vinyl chloride	RI/FS	123411	481060.07	1346522.41	11	U	ug/kg	0	0.5
Vinyl chloride	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
Vinyl chloride	RI/FS	123273	481295.48	1346363.17	11	U	ug/kg	0	0.5
Vinyl chloride	RI/FS	123276	481481	1346307	11	U	ug/kg	0	0.5
Vinyl chloride	Unknown	061077	481074.26	1346563.08	12	U	ug/kg	1.5	2
Vinyl chloride	Unknown	061028	482073.77	1346590.37	12	U	ug/kg	1.5	2
Vinyl chloride	Unknown	061042	481679.46	1346379.58	12	U	ug/kg	1.5	2
Vinyl chloride	Unknown	061049	481479.56	1346374.08	12	U	ug/kg	1.5	2
Vinyl chloride	Unknown	061035	481873.87	1346584.87	13	U	ug/kg	1.5	2
Vinyl chloride	RI/FS	123287	481902	1346539	16	U	ug/kg	0	0.5
Vinyl chloride	RI/FS	123278	481681	1346320	28	U	ug/kg	0	0.5
Xylenes, Total	RI/FS	123273	481295.48	1346363.17	2	J	ug/kg	0	0.5
Xylenes, Total	RI/FS	123276	481481	1346307	2	J	ug/kg	0	0.5
Xylenes, Total	Unknown	061077	481074.26	1346563.08	6	U	ug/kg	1.5	2
Xylenes, Total	Unknown	061028	482073.77	1346590.37	6	U	ug/kg	1.5	2
Xylenes, Total	Unknown	061035	481873.87	1346584.87	6	U	ug/kg	1.5	2
Xylenes, Total	Unknown	061042	481679.46	1346379.58	6	U	ug/kg	1.5	2
Xylenes, Total	Unknown	061049	481479.56	1346374.08	6	U	ug/kg	1.5	2
Xylenes, Total	RI/FS	123411	481060.07	1346522.41	11	U	ug/kg	0	0.5
Xylenes, Total	RI/FS	123275	481177.02	1346409.88	11	U	ug/kg	0	0.5
Xylenes, Total	RI/FS	123287	481902	1346539	16	U	ug/kg	0	0.5
Xylenes, Total	RI/FS	123278	481681	1346320	28	U	ug/kg	0	0.5

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APPENDIX B-1
 HISTORICAL DATA FOR THE NORTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Zinc	Unknown	061072	481074.26	1346563.08	27.7	J	mg/kg	0	0.5
Zinc	Unknown	061037	481679.46	1346379.58	28.9	J	mg/kg	0	0.5
Zinc	Unknown	061044	481479.56	1346374.08	32.2	J	mg/kg	0	0.5
Zinc	RI/FS	123275	481177.02	1346409.88	32.3	-	mg/kg	0	0.5
Zinc	RI/FS	123273	481295.48	1346363.17	33.5	-	mg/kg	0	0.5
Zinc	RI/FS	123411	481060.07	1346522.41	39.9	-	mg/kg	0	0.5
Zinc	Unknown	061058	481176.96	1346465.78	40.9	J	mg/kg	0	0.5
Zinc	RI/FS	123278	481681	1346320	42.4	J	mg/kg	0	0.5
Zinc	Unknown	061023	482073.77	1346590.37	42.5	J	mg/kg	0	0.5
Zinc	RI/FS	123276	481481	1346307	43.6	-	mg/kg	0	0.5
Zinc	Unknown	061030	481873.87	1346584.87	46.7	J	mg/kg	0	0.5
Zinc	RI/FS	123287	481902	1346539	72.6	-	mg/kg	0	0.5

APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
1,1,1-Trichloroethane	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
1,1,1-Trichloroethane	R/I/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
1,1,1-Trichloroethane	R/I/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
1,1,2,2-Tetrachloroethane	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
1,1,2,2-Tetrachloroethane	R/I/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
1,1,2,2-Tetrachloroethane	R/I/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
1,1,2-Trichloroethane	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
1,1,2-Trichloroethane	R/I/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
1,1,2-Trichloroethane	R/I/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
1,1-Dichloroethane	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
1,1-Dichloroethane	R/I/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
1,1-Dichloroethane	R/I/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
1,1-Dichloroethane	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
1,1-Dichloroethane	R/I/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
1,1-Dichloroethane	R/I/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
1,2,4-Trichlorobenzene	Unknown	009147	479636.3832	1346433.968	390	U	ug/kg	0	0.5
1,2,4-Trichlorobenzene	R/I/FS	121045	479544.93	1346398.61	400	U	ug/kg	0	0.5
1,2,4-Trichlorobenzene	R/I/FS	118794	479636.3832	1346433.968	480	U	ug/kg	0	0.5
1,2-Dichlorobenzene	Unknown	009147	479636.3832	1346433.968	390	U	ug/kg	0	0.5
1,2-Dichlorobenzene	R/I/FS	121045	479544.93	1346398.61	400	U	ug/kg	0	0.5
1,2-Dichlorobenzene	R/I/FS	118794	479636.3832	1346433.968	480	U	ug/kg	0	0.5
1,2-Dichloroethane	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
1,2-Dichloroethane	R/I/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
1,2-Dichloroethane	R/I/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
1,2-Dichloroethene (Total)	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
1,2-Dichloroethene (Total)	R/I/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
1,2-Dichloroethene (Total)	R/I/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
1,2-Dichloropropane	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
1,2-Dichloropropane	R/I/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
1,2-Dichloropropane	R/I/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
1,3-Dichlorobenzene	R/I/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
1,3-Dichlorobenzene	R/I/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
1,3-Dichlorobenzene	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5

APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
1,4-Dichlorobenzene	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
1,4-Dichlorobenzene	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
1,4-Dichlorobenzene	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
2,4,5-Trichlorophenol	RI/FS	121045	479544.93	1346398.61	980	U	ug/kg	0	0.5
2,4,5-Trichlorophenol	RI/FS	118794	479636.3832	1346433.968	2000	U	ug/kg	0	0.5
2,4,5-Trichlorophenol	Unknown	009147	479636.3832	1346433.968	2300	U	ug/kg	0	0.5
2,4,6-Trichlorophenol	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
2,4,6-Trichlorophenol	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
2,4,6-Trichlorophenol	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
2,4-Dichlorophenol	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
2,4-Dichlorophenol	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
2,4-Dichlorophenol	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
2,4-Dimethylphenol	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
2,4-Dimethylphenol	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
2,4-Dimethylphenol	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
2,4-Dinitrophenol	RI/FS	118794	479636.3832	1346433.968	2000	U	ug/kg	0	0.5
2,4-Dinitrophenol	Unknown	009147	479636.3832	1346433.968	2300	UJ	ug/kg	0	0.5
2,4-Dinitrotoluene	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
2,4-Dinitrotoluene	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
2,4-Dinitrotoluene	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
2,6-Dinitrotoluene	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
2,6-Dinitrotoluene	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
2,6-Dinitrotoluene	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
2-Butanone	RI/FS	121045	479544.93	1346398.61	12	UJ	ug/kg	0	0.5
2-Butanone	Unknown	009147	479636.3832	1346433.968	15	U	ug/kg	0	0.5
2-Chloronaphthalene	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
2-Chloronaphthalene	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
2-Chloronaphthalene	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
2-Chlorophenol	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
2-Chlorophenol	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
2-Chlorophenol	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
2-Hexanone	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
2-Hexanone	RI/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5

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APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
2-Hexanone	Unknown	009147	479636.3832	1346433.968	15 U		ug/kg	0	0.5
2-Methylnaphthalene	R/FS	121045	479544.93	1346398.61	390 UJ		ug/kg	0	0.5
2-Methylnaphthalene	R/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
2-Methylnaphthalene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
2-Nitroaniline	R/FS	121045	479544.93	1346398.61	980 UJ		ug/kg	0	0.5
2-Nitroaniline	R/FS	118794	479636.3832	1346433.968	2000 U		ug/kg	0	0.5
2-Nitroaniline	Unknown	009147	479636.3832	1346433.968	2300 U		ug/kg	0	0.5
2-Nitrophenol	R/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
2-Nitrophenol	R/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
2-Nitrophenol	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
3,3'-Dichlorobenzidine	R/FS	121045	479544.93	1346398.61	390 UJ		ug/kg	0	0.5
3,3'-Dichlorobenzidine	R/FS	118794	479636.3832	1346433.968	790 U		ug/kg	0	0.5
3,3'-Dichlorobenzidine	Unknown	009147	479636.3832	1346433.968	960 U		ug/kg	0	0.5
3-Nitroaniline	R/FS	121045	479544.93	1346398.61	980 U		ug/kg	0	0.5
3-Nitroaniline	R/FS	118794	479636.3832	1346433.968	2000 U		ug/kg	0	0.5
3-Nitroaniline	Unknown	009147	479636.3832	1346433.968	2300 U		ug/kg	0	0.5
4,4'-DDD	R/FS	121045	479544.93	1346398.61	7.8 U		ug/kg	0	0.5
4,4'-DDD	Unknown	009147	479636.3832	1346433.968	24 U		ug/kg	0	0.5
4,4'-DDE	R/FS	121045	479544.93	1346398.61	7.8 U		ug/kg	0	0.5
4,4'-DDE	Unknown	009147	479636.3832	1346433.968	24 U		ug/kg	0	0.5
4,4'-DDE	R/FS	121045	479544.93	1346398.61	7.8 U		ug/kg	0	0.5
4,4'-DDT	R/FS	121045	479544.93	1346398.61	7.8 U		ug/kg	0	0.5
4,4'-DDT	Unknown	009147	479636.3832	1346433.968	24 U		ug/kg	0	0.5
4,6-Dinitro-2-methylphenol	R/FS	121045	479544.93	1346398.61	24 U		ug/kg	0	0.5
4,6-Dinitro-2-methylphenol	R/FS	118794	479636.3832	1346433.968	980 UJ		ug/kg	0	0.5
4,6-Dinitro-2-methylphenol	Unknown	009147	479636.3832	1346433.968	2000 U		ug/kg	0	0.5
4-Bromophenyl phenyl ether	R/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
4-Bromophenyl phenyl ether	R/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
4-Bromophenyl phenyl ether	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
4-Chloro-3-methylphenol	R/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
4-Chloro-3-methylphenol	R/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
4-Chloro-3-methylphenol	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
4-Chlorophenylphenyl ether	R/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
4-Chlorophenylphenyl ether	R/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5

APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
4-Chlorophenylphenyl ether	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
4-Methyl-2-pentanone	RI/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
4-Methyl-2-pentanone	RI/FS	121045	479544.93	1346398.61	12 UJ		ug/kg	0	0.5
4-Methyl-2-pentanone	Unknown	009147	479636.3832	1346433.968	15 U		ug/kg	0	0.5
4-Nitroaniline	RI/FS	121045	479544.93	1346398.61	980 U		ug/kg	0	0.5
4-Nitroaniline	RI/FS	118794	479636.3832	1346433.968	2000 U		ug/kg	0	0.5
4-Nitroaniline	Unknown	009147	479636.3832	1346433.968	2300 U		ug/kg	0	0.5
4-Nitrophenol	RI/FS	121045	479544.93	1346398.61	980 U		ug/kg	0	0.5
4-Nitrophenol	RI/FS	118794	479636.3832	1346433.968	2000 U		ug/kg	0	0.5
4-Nitrophenol	Unknown	009147	479636.3832	1346433.968	2300 UJ		ug/kg	0	0.5
Acenaphthene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Acenaphthene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Acenaphthene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Acenaphthylene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Acenaphthylene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Acenaphthylene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Acetone	RI/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Acetone	RI/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Acetone	Unknown	009147	479636.3832	1346433.968	15 U		ug/kg	0	0.5
Aldrin	RI/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
Aldrin	Unknown	009147	479636.3832	1346433.968	12 U		ug/kg	0	0.5
alpha-BHC	RI/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
alpha-BHC	Unknown	009147	479636.3832	1346433.968	12 U		ug/kg	0	0.5
alpha-Chlordane	RI/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
alpha-Chlordane	Unknown	009147	479636.3832	1346433.968	120 U		ug/kg	0	0.5
Aluminum	RI/FS	118794	479636.3832	1346433.968	1670 -		mg/kg	0	0.5
Aluminum	Unknown	009147	479636.3832	1346433.968	3353.38 NV		mg/kg	0	0.5
Aluminum	Unknown	009147	479636.3832	1346433.968	3920 -		mg/kg	0	0.5
Aluminum	RI/FS	121045	479544.93	1346398.61	6740 -		mg/kg	0	0.5
Anthracene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Anthracene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Anthracene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Antimony	Unknown	009147	479636.3832	1346433.968	2.5693 NV		mg/kg	0	0.5

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HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Antimony	RI/FS	118794	479636.3832	1346433.968	2.9	UJ	mg/kg	0	0.5
Antimony	RI/FS	121045	479544.93	1346398.61	3.3	U	mg/kg	0	0.5
Aroclor-1016	RI/FS	121045	479544.93	1346398.61	78	U	ug/kg	0	0.5
Aroclor-1016	Unknown	009147	479636.3832	1346433.968	120	U	ug/kg	0	0.5
Aroclor-1221	Unknown	009147	479636.3832	1346433.968	120	U	ug/kg	0	0.5
Aroclor-1221	RI/FS	121045	479544.93	1346398.61	160	U	ug/kg	0	0.5
Aroclor-1232	RI/FS	121045	479544.93	1346398.61	78	U	ug/kg	0	0.5
Aroclor-1232	Unknown	009147	479636.3832	1346433.968	120	U	ug/kg	0	0.5
Aroclor-1242	RI/FS	121045	479544.93	1346398.61	78	U	ug/kg	0	0.5
Aroclor-1242	Unknown	009147	479636.3832	1346433.968	120	U	ug/kg	0	0.5
Aroclor-1248	RI/FS	121045	479544.93	1346398.61	78	U	ug/kg	0	0.5
Aroclor-1248	Unknown	009147	479636.3832	1346433.968	120	U	ug/kg	0	0.5
Aroclor-1254	RI/FS	121045	479544.93	1346398.61	78	U	ug/kg	0	0.5
Aroclor-1254	Unknown	009147	479636.3832	1346433.968	240	U	ug/kg	0	0.5
Aroclor-1260	RI/FS	121045	479544.93	1346398.61	78	U	ug/kg	0	0.5
Aroclor-1260	Unknown	009147	479636.3832	1346433.968	240	U	ug/kg	0	0.5
Arsenic	RI/FS	118794	479636.3832	1346433.968	3.7	-	mg/kg	0	0.5
Arsenic	RI/FS	121045	479544.93	1346398.61	4.7	-	mg/kg	0	0.5
Arsenic	Unknown	009147	479636.3832	1346433.968	6.5	J	mg/kg	0	0.5
Arsenic	Unknown	009147	479636.3832	1346433.968	14.5324	NV	mg/kg	0	0.5
Barium	Unknown	009147	479636.3832	1346433.968	31.2	-	mg/kg	0	0.5
Barium	RI/FS	118794	479636.3832	1346433.968	32.7	-	mg/kg	0	0.5
Barium	RI/FS	121045	479544.93	1346398.61	56.3	-	mg/kg	0	0.5
Barium	Unknown	009147	479636.3832	1346433.968	537.287	NV	mg/kg	0	0.5
Benzene	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
Benzene	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
Benzene	RI/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
Benzo(a)anthracene	RI/FS	121045	479544.93	1346398.61	57	J	ug/kg	0	0.5
Benzo(a)anthracene	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
Benzo(a)anthracene	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
Benzo(a)pyrene	RI/FS	121045	479544.93	1346398.61	42	J	ug/kg	0	0.5
Benzo(a)pyrene	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
Benzo(a)pyrene	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5

APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Benzo(b)fluoranthene	R/I/FS	121045	479544.93	1346398.61	55 J		ug/kg	0	0.5
Benzo(b)fluoranthene	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Benzo(b)fluoranthene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Benzo(g,h,i)perylene	R/I/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Benzo(g,h,i)perylene	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Benzo(g,h,i)perylene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Benzo(k)fluoranthene	R/I/FS	121045	479544.93	1346398.61	61 J		ug/kg	0	0.5
Benzo(k)fluoranthene	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Benzo(k)fluoranthene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Benzoic acid	R/I/FS	121045	479544.93	1346398.61	980 U		ug/kg	0	0.5
Benzoic acid	R/I/FS	118794	479636.3832	1346433.968	2000 UJ		ug/kg	0	0.5
Benzoic acid	Unknown	009147	479636.3832	1346433.968	2300 U		ug/kg	0	0.5
Benzyl alcohol	R/I/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Benzyl alcohol	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Benzyl alcohol	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Beryllium	Unknown	009147	479636.3832	1346433.968	0.5 -		mg/kg	0	0.5
Beryllium	R/I/FS	121045	479544.93	1346398.61	1.4 -		mg/kg	0	0.5
Beryllium	R/I/FS	118794	479636.3832	1346433.968	2.7 J		mg/kg	0	0.5
Beryllium	Unknown	009147	479636.3832	1346433.968	12.9086 NV		mg/kg	0	0.5
beta-BHC	R/I/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
beta-BHC	Unknown	009147	479636.3832	1346433.968	130 UJ		ug/kg	0	0.5
bis(2-Chloroethoxy)methane	R/I/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
bis(2-Chloroethoxy)methane	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
bis(2-Chloroethoxy)methane	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
bis(2-Chloroethyl)ether	R/I/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
bis(2-Chloroethyl)ether	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
bis(2-Chloroethyl)ether	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
bis(2-Chloroisopropyl) ether	R/I/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
bis(2-Chloroisopropyl) ether	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
bis(2-Chloroisopropyl) ether	Unknown	009147	479636.3832	1346433.968	480 UJ		ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	R/I/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
bis(2-Ethylhexyl)phthalate	Unknown	009147	479636.3832	1346433.968	590 U		ug/kg	0	0.5

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APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Bromodichloromethane	Unknown	009147	479636.3832	1346433.968	7 U		ug/kg	0	0.5
Bromodichloromethane	R/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Bromodichloromethane	R/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Bromoform	Unknown	009147	479636.3832	1346433.968	7 U		ug/kg	0	0.5
Bromoform	R/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Bromoform	R/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Bromomethane	R/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Bromomethane	R/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Bromomethane	Unknown	009147	479636.3832	1346433.968	15 U		ug/kg	0	0.5
Butyl benzyl phthalate	R/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Butyl benzyl phthalate	R/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Butyl benzyl phthalate	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Cadmium	R/FS	121045	479544.93	1346398.61	1.2 U		mg/kg	0	0.5
Cadmium	R/FS	118794	479636.3832	1346433.968	1.2 U		mg/kg	0	0.5
Cadmium	Unknown	009147	479636.3832	1346433.968	3.9 -		mg/kg	0	0.5
Cadmium	Unknown	009147	479636.3832	1346433.968	16.9247	NV	mg/kg	0	0.5
Calcium	R/FS	121045	479544.93	1346398.61	63900 -		mg/kg	0	0.5
Calcium	Unknown	009147	479636.3832	1346433.968	78700 -		mg/kg	0	0.5
Calcium	Unknown	009147	479636.3832	1346433.968	81840.8	NV	mg/kg	0	0.5
Calcium	R/FS	118794	479636.3832	1346433.968	186000 -		mg/kg	0	0.5
Carbon disulfide	Unknown	009147	479636.3832	1346433.968	7 U		ug/kg	0	0.5
Carbon disulfide	R/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Carbon disulfide	R/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Carbon Tetrachloride	Unknown	009147	479636.3832	1346433.968	7 U		ug/kg	0	0.5
Carbon Tetrachloride	R/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Carbon Tetrachloride	R/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Cesium-137	R/FS	121050	479544.93	1346398.61	0.2	J	pCi/g	0	0.5
Chlorobenzene	Unknown	009147	479636.3832	1346433.968	7 U		ug/kg	0	0.5
Chlorobenzene	R/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Chlorobenzene	R/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Chloroethane	R/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Chloroethane	R/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Chloroethane	Unknown	009147	479636.3832	1346433.968	15 U		ug/kg	0	0.5

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APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Chloroform	Unknown	009147	479636.3832	1346433.968	7 U		ug/kg	0	0.5
Chloroform	R/I/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Chloroform	R/I/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Chloromethane	R/I/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Chloromethane	R/I/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Chloromethane	Unknown	009147	479636.3832	1346433.968	15 U		ug/kg	0	0.5
Chromium	R/I/FS	118794	479636.3832	1346433.968	2.9 -		mg/kg	0	0.5
Chromium	R/I/FS	121045	479544.93	1346398.61	7.8 J		mg/kg	0	0.5
Chromium	Unknown	009147	479636.3832	1346433.968	18.4 -		mg/kg	0	0.5
Chromium	Unknown	009147	479636.3832	1346433.968	66.4939 NV		mg/kg	0	0.5
Chrysene	R/I/FS	121045	479544.93	1346398.61	75 J		ug/kg	0	0.5
Chrysene	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Chrysene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
cis-1,3-Dichloropropene	Unknown	009147	479636.3832	1346433.968	7 U		ug/kg	0	0.5
cis-1,3-Dichloropropene	R/I/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
cis-1,3-Dichloropropene	R/I/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Cobalt	R/I/FS	118794	479636.3832	1346433.968	4.1 -		mg/kg	0	0.5
Cobalt	R/I/FS	121045	479544.93	1346398.61	5.8 -		mg/kg	0	0.5
Cobalt	Unknown	009147	479636.3832	1346433.968	6.5 -		mg/kg	0	0.5
Cobalt	Unknown	009147	479636.3832	1346433.968	125.616 NV		mg/kg	0	0.5
Copper	R/I/FS	118794	479636.3832	1346433.968	10.6 -		mg/kg	0	0.5
Copper	R/I/FS	121045	479544.93	1346398.61	13.3 -		mg/kg	0	0.5
Copper	Unknown	009147	479636.3832	1346433.968	14.5 -		mg/kg	0	0.5
Copper	Unknown	009147	479636.3832	1346433.968	76.2184 NV		mg/kg	0	0.5
Cyanide	R/I/FS	121045	479544.93	1346398.61	0.3 U		mg/kg	0	0.5
Cyanide	R/I/FS	118794	479636.3832	1346433.968	0.3 U		mg/kg	0	0.5
Cyanide	Unknown	009147	479636.3832	1346433.968	2.7 U		mg/kg	0	0.5
Cyanide	Unknown	009147	479636.3832	1346433.968	25.4249 NV		mg/kg	0	0.5
delta-BHC	R/I/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
delta-BHC	Unknown	009147	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Dibenzo(a,h)anthracene	R/I/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Dibenzo(a,h)anthracene	R/I/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Dibenzo(a,h)anthracene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5

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APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Dibenzofuran	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
Dibenzofuran	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
Dibenzofuran	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
Dibromochloromethane	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
Dibromochloromethane	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
Dibromochloromethane	RI/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
Dieldrin	RI/FS	121045	479544.93	1346398.61	7.8	U	ug/kg	0	0.5
Dieldrin	Unknown	009147	479636.3832	1346433.968	24	U	ug/kg	0	0.5
Diethyl phthalate	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
Diethyl phthalate	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
Diethyl phthalate	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
Dimethyl phthalate	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
Dimethyl phthalate	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
Dimethyl phthalate	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
Di-n-butyl phthalate	Unknown	009147	479636.3832	1346433.968	51	U	ug/kg	0	0.5
Di-n-butyl phthalate	RI/FS	118794	479636.3832	1346433.968	63	J	ug/kg	0	0.5
Di-n-butyl phthalate	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
Di-n-butyl phthalate	RI/FS	121045	479544.93	1346398.61	390	U	ug/kg	0	0.5
Di-n-octyl phthalate	RI/FS	118794	479636.3832	1346433.968	400	U	ug/kg	0	0.5
Di-n-octyl phthalate	Unknown	009147	479636.3832	1346433.968	480	U	ug/kg	0	0.5
Endosulfan II	RI/FS	121045	479544.93	1346398.61	7.8	U	ug/kg	0	0.5
Endosulfan II	Unknown	009147	479636.3832	1346433.968	24	U	ug/kg	0	0.5
Endosulfan sulfate	RI/FS	121045	479544.93	1346398.61	7.8	U	ug/kg	0	0.5
Endosulfan sulfate	Unknown	009147	479636.3832	1346433.968	24	U	ug/kg	0	0.5
Endosulfan-I	RI/FS	121045	479544.93	1346398.61	4	U	ug/kg	0	0.5
Endosulfan-I	Unknown	009147	479636.3832	1346433.968	12	U	ug/kg	0	0.5
Endrin	RI/FS	121045	479544.93	1346398.61	7.8	U	ug/kg	0	0.5
Endrin	Unknown	009147	479636.3832	1346433.968	24	U	ug/kg	0	0.5
Endrin aldehyde	RI/FS	121045	479544.93	1346398.61	7.8	U	ug/kg	0	0.5
Endrin ketone	RI/FS	121045	479544.93	1346398.61	7.8	U	ug/kg	0	0.5
Endrin ketone	Unknown	009147	479636.3832	1346433.968	24	U	ug/kg	0	0.5
Ethylbenzene	Unknown	009147	479636.3832	1346433.968	1	J	ug/kg	0	0.5
Ethylbenzene	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5

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APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Ethylbenzene	RI/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Fluoranthene	RI/FS	118794	479636.3832	1346433.968	56 J		ug/kg	0	0.5
Fluoranthene	RI/FS	121045	479544.93	1346398.61	160 J		ug/kg	0	0.5
Fluoranthene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Fluorene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Fluorene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Fluorene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
gamma-BHC (Lindane)	RI/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
gamma-BHC (Lindane)	Unknown	009147	479636.3832	1346433.968	12 U		ug/kg	0	0.5
gamma-Chlordane	RI/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
gamma-Chlordane	Unknown	009147	479636.3832	1346433.968	120 U		ug/kg	0	0.5
Gross Alpha	RI/FS	118796	479636.3832	1346433.968	8.5 UNV		pCi/g		
Gross Alpha	RI/FS	121050	479544.93	1346398.61	9 NV		pCi/g	0	0.5
Gross Alpha	Unknown	009038	479636.3832	1346433.968	9 NV		pCi/g	0	0.5
Gross Alpha	Unknown	009153	479636.3832	1346433.968	15 NV		pCi/g	0	0.5
Gross Alpha	RI/FS	118765	479636.3832	1346433.968	89 UNV		pCi/L		
Gross Beta	Unknown	009153	479636.3832	1346433.968	9 UNV		pCi/g	0	0.5
Gross Beta	Unknown	009038	479636.3832	1346433.968	13 NV		pCi/g	0	0.5
Gross Beta	RI/FS	118796	479636.3832	1346433.968	16 UNV		pCi/g		
Gross Beta	RI/FS	121050	479544.93	1346398.61	22.5 NV		pCi/g	0	0.5
Gross Beta	RI/FS	118765	479636.3832	1346433.968	200 UNV		pCi/L		
Heptachlor	RI/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
Heptachlor	Unknown	009147	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Heptachlor epoxide	RI/FS	121045	479544.93	1346398.61	4 U		ug/kg	0	0.5
Heptachlor epoxide	Unknown	009147	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Hexachlorobenzene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Hexachlorobenzene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Hexachlorobenzene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Hexachlorobutadiene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Hexachlorobutadiene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Hexachlorobutadiene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Hexachlorocyclopentadiene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Hexachlorocyclopentadiene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5

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APPENDIX B-2
 HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Hexachlorocyclopentadiene	Unknown	009147	479636.3832	1346433.968	480 UJ		ug/kg	0	0.5
Hexachloroethane	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Hexachloroethane	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Hexachloroethane	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Indeno(1,2,3-cd)pyrene	RI/FS	121045	479544.93	1346398.61	40 J		ug/kg	0	0.5
Indeno(1,2,3-cd)pyrene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Indeno(1,2,3-cd)pyrene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Iron	RI/FS	118794	479636.3832	1346433.968	6220 -		mg/kg	0	0.5
Iron	Unknown	009147	479636.3832	1346433.968	8175.48 NV		mg/kg	0	0.5
Iron	Unknown	009147	479636.3832	1346433.968	8830 -		mg/kg	0	0.5
Iron	RI/FS	121045	479544.93	1346398.61	14100 -		mg/kg	0	0.5
Isophorone	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Isophorone	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Isophorone	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Lead	RI/FS	118794	479636.3832	1346433.968	6.8 -		mg/kg	0	0.5
Lead	Unknown	009147	479636.3832	1346433.968	12.6857 NV		mg/kg	0	0.5
Magnesium	RI/FS	121045	479544.93	1346398.61	15300 -		mg/kg	0	0.5
Magnesium	Unknown	009147	479636.3832	1346433.968	18300 -		mg/kg	0	0.5
Magnesium	Unknown	009147	479636.3832	1346433.968	18648.7 NV		mg/kg	0	0.5
Magnesium	RI/FS	118794	479636.3832	1346433.968	29300 -		mg/kg	0	0.5
Manganese	Unknown	009147	479636.3832	1346433.968	415 -		mg/kg	0	0.5
Manganese	Unknown	009147	479636.3832	1346433.968	532.984 NV		mg/kg	0	0.5
Manganese	RI/FS	118794	479636.3832	1346433.968	546 J		mg/kg	0	0.5
Manganese	RI/FS	121045	479544.93	1346398.61	637 -		mg/kg	0	0.5
Mercury	RI/FS	118794	479636.3832	1346433.968	0.06 U		mg/kg	0	0.5
Mercury	RI/FS	121045	479544.93	1346398.61	0.06 UJ		mg/kg	0	0.5
Mercury	Unknown	009147	479636.3832	1346433.968	0.1 U		mg/kg	0	0.5
Mercury	Unknown	009147	479636.3832	1346433.968	0.8177 NV		mg/kg	0	0.5
Methoxychlor	RI/FS	121045	479544.93	1346398.61	40 U		ug/kg	0	0.5
Methoxychlor	Unknown	009147	479636.3832	1346433.968	120 U		ug/kg	0	0.5
Methylene chloride	RI/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Methylene chloride	RI/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Methylene chloride	Unknown	009147	479636.3832	1346433.968	13 U		ug/kg	0	0.5

APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Molybdenum	RI/FS	121045	479544.93	1346398.61	4 U		mg/kg	0	0.5
Molybdenum	RI/FS	118794	479636.3832	1346433.968	4.1 U		mg/kg	0	0.5
Molybdenum	Unknown	009147	479636.3832	1346433.968	5 U		mg/kg	0	0.5
Molybdenum	Unknown	009147	479636.3832	1346433.968	242.396	NV	mg/kg	0	0.5
Naphthalene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Naphthalene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Naphthalene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Nickel	RI/FS	118794	479636.3832	1346433.968	6.8 -		mg/kg	0	0.5
Nickel	RI/FS	121045	479544.93	1346398.61	12.5 -		mg/kg	0	0.5
Nickel	Unknown	009147	479636.3832	1346433.968	19.5 -		mg/kg	0	0.5
Nickel	Unknown	009147	479636.3832	1346433.968	138.754	NV	mg/kg	0	0.5
Nitrobenzene	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
Nitrobenzene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Nitrobenzene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
N-Nitroso-di-n-propylamine	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
N-Nitroso-di-n-propylamine	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
N-Nitroso-di-n-propylamine	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
N-Nitrosodiphenylamine	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
N-Nitrosodiphenylamine	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
N-Nitrosodiphenylamine	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
o-Methylphenol	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
o-Methylphenol	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
o-Methylphenol	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
p-Chloroaniline	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5
p-Chloroaniline	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
p-Chloroaniline	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Pentachlorophenol	RI/FS	121045	479544.93	1346398.61	980 U		ug/kg	0	0.5
Pentachlorophenol	RI/FS	118794	479636.3832	1346433.968	2000 U		ug/kg	0	0.5
Pentachlorophenol	Unknown	009147	479636.3832	1346433.968	2300 U		ug/kg	0	0.5
Phenanthrene	RI/FS	121045	479544.93	1346398.61	71 J		ug/kg	0	0.5
Phenanthrene	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Phenanthrene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Phenol	RI/FS	121045	479544.93	1346398.61	390 U		ug/kg	0	0.5

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APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Phenol	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
Phenol	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
p-Methylphenol	RI/FS	121045	479544.93	1346398.61	390 UJ		ug/kg	0	0.5
p-Methylphenol	RI/FS	118794	479636.3832	1346433.968	400 U		ug/kg	0	0.5
p-Methylphenol	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Potassium	RI/FS	118794	479636.3832	1346433.968	267 -		mg/kg	0	0.5
Potassium	Unknown	009147	479636.3832	1346433.968	655 -		mg/kg	0	0.5
Potassium	RI/FS	121045	479544.93	1346398.61	1000 -		mg/kg	0	0.5
Pyrene	RI/FS	118794	479636.3832	1346433.968	60 J		ug/kg	0	0.5
Pyrene	RI/FS	121045	479544.93	1346398.61	120 J		ug/kg	0	0.5
Pyrene	Unknown	009147	479636.3832	1346433.968	480 U		ug/kg	0	0.5
Radium-226	RI/FS	121050	479544.93	1346398.61	0.2 J		pCi/g	0	0.5
Radium-226	RI/FS	118795	479636.3832	1346433.968	0.3 J		pCi/g	0	0.5
Radium-226	Unknown	009102	479636.3832	1346433.968	0.8 J		pCi/g	0	0.5
Radium-226	RI/FS	118782	479636.3832	1346433.968	0.8 UJ		pCi/g	0	0.5
Radium-226	Unknown	009038	479636.3832	1346433.968	0.9 J		pCi/g	0	0.5
Radium-226	Unknown	009153	479636.3832	1346433.968	1 J		pCi/g	0	0.5
Radium-228	RI/FS	121050	479544.93	1346398.61	0.5 -		pCi/g	0	0.5
Radium-228	RI/FS	118795	479636.3832	1346433.968	0.5 -		pCi/g	0	0.5
Radium-228	Unknown	009038	479636.3832	1346433.968	0.5 UJ		pCi/g	0	0.5
Radium-228	Unknown	009102	479636.3832	1346433.968	0.5 UJ		pCi/g	0	0.5
Radium-228	Unknown	009153	479636.3832	1346433.968	0.5 UJ		pCi/g	0	0.5
Radium-228	RI/FS	118782	479636.3832	1346433.968	0.8 -		pCi/g	0	0.5
Selenium	Unknown	009147	479636.3832	1346433.968	0.5 UJ		mg/kg	0	0.5
Selenium	Unknown	009147	479636.3832	1346433.968	1.0973 NV		mg/kg	0	0.5
Silicon	RI/FS	121045	479544.93	1346398.61	500 J		mg/kg	0	0.5
Silicon	RI/FS	118794	479636.3832	1346433.968	570 J		mg/kg	0	0.5
Silver	Unknown	009147	479636.3832	1346433.968	0.1 U		mg/kg	0	0.5
Silver	RI/FS	121045	479544.93	1346398.61	0.47 -		mg/kg	0	0.5
Silver	Unknown	009147	479636.3832	1346433.968	3.9342 NV		mg/kg	0	0.5
Sodium	RI/FS	121045	479544.93	1346398.61	104 U		mg/kg	0	0.5
Sodium	RI/FS	118794	479636.3832	1346433.968	141 U		mg/kg	0	0.5
Sodium	Unknown	009147	479636.3832	1346433.968	179.459 NV		mg/kg	0	0.5

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APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Eastng	Result	Qualifier	Units	Top Depth	Bottom Depth
Sodium	Unknown	009147	479636.3832	1346433.968	180	J	mg/kg	0	0.5
Strontium-90	RI/FS	121050	479544.93	1346398.61	0	U	pCi/g	0	0.5
Styrene	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
Styrene	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
Styrene	RI/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
Technetium-99	RI/FS	121050	479544.93	1346398.61	0.2	UJ	pCi/g	0	0.5
Tetrachloroethene	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
Tetrachloroethene	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
Tetrachloroethene	RI/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
Thallium	RI/FS	121045	479544.93	1346398.61	0.24	U	mg/kg	0	0.5
Thallium	RI/FS	118794	479636.3832	1346433.968	0.24	UJ	mg/kg	0	0.5
Thallium	Unknown	009147	479636.3832	1346433.968	0.3	U	mg/kg	0	0.5
Thallium	Unknown	009147	479636.3832	1346433.968	11.6419	NV	mg/kg	0	0.5
Thorium, Total	RI/FS	118795	479636.3832	1346433.968	2.73608	NV	pCi/g	0	0.5
Thorium, Total	RI/FS	118782	479636.3832	1346433.968	4.56009	NV	pCi/g	0	0.5
Thorium-228	RI/FS	118782	479636.3832	1346433.968	0.4	J	pCi/g	0	0.5
Thorium-228	RI/FS	118795	479636.3832	1346433.968	0.4	J	pCi/g	0	0.5
Thorium-230	RI/FS	118795	479636.3832	1346433.968	0.6	J	pCi/g	0	0.5
Thorium-230	RI/FS	118782	479636.3832	1346433.968	0.9	J	pCi/g	0	0.5
Thorium-232	RI/FS	118795	479636.3832	1346433.968	0.3	J	pCi/g	0	0.5
Thorium-232	RI/FS	118782	479636.3832	1346433.968	0.5	J	pCi/g	0	0.5
Toluene	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
Toluene	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
Toluene	RI/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
Toxaphene	Unknown	009147	479636.3832	1346433.968	240	U	ug/kg	0	0.5
Toxaphene	RI/FS	121045	479544.93	1346398.61	400	U	ug/kg	0	0.5
trans-1,3-Dichloropropene	Unknown	009147	479636.3832	1346433.968	7	R	ug/kg	0	0.5
trans-1,3-Dichloropropene	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
trans-1,3-Dichloropropene	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
trans-1,3-Dichloropropene	RI/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5
Trichloroethene	Unknown	009147	479636.3832	1346433.968	7	U	ug/kg	0	0.5
Trichloroethene	RI/FS	121045	479544.93	1346398.61	12	U	ug/kg	0	0.5
Trichloroethene	RI/FS	118794	479636.3832	1346433.968	12	U	ug/kg	0	0.5

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APPENDIX B-2
HISTORICAL DATA FOR THE SOUTHERN OXBOW AREA

Parameter	Sampling Program	Sample ID	Northing	Easting	Result	Qualifier	Units	Top Depth	Bottom Depth
Uranium, Total	Unknown	009153	479636.3832	1346433.968	1 J		mg/kg	0	0.5
Uranium, Total	RI/FS	118782	479636.3832	1346433.968	1.7 -		mg/kg	0	0.5
Uranium, Total	RI/FS	118795	479636.3832	1346433.968	2.1 -		mg/kg	0	0.5
Uranium, Total	RI/FS	121050	479544.93	1346398.61	2.3 -		mg/kg	0	0.5
Uranium, Total	Unknown	009038	479636.3832	1346433.968	3 J		mg/kg	0	0.5
Uranium, Total	Unknown	009102	479636.3832	1346433.968	4 J		mg/kg	0	0.5
Uranium, Total	RI/FS	118766	479636.3832	1346433.968	9.3 NV		ug/L	0	0.5
Uranium, Total	RI/FS	118783	479636.3832	1346433.968	11.6 NV		mg/kg	0	0.5
Uranium, Total	RI/FS	118797	479636.3832	1346433.968	15.8 NV		mg/kg	0	0.5
Uranium-234	RI/FS	118782	479636.3832	1346433.968	0.2 J		pCi/g	0	0.5
Uranium-234	RI/FS	121050	479544.93	1346398.61	32.7 J		pCi/g	0	0.5
Uranium-235/236	RI/FS	118782	479636.3832	1346433.968	0.1 UU		pCi/g	0	0.5
Uranium-235/236	RI/FS	121050	479544.93	1346398.61	1.3 J		pCi/g	0	0.5
Uranium-238	RI/FS	118782	479636.3832	1346433.968	0.3 J		pCi/g	0	0.5
Uranium-238	RI/FS	121050	479544.93	1346398.61	30.7 J		pCi/g	0	0.5
Vanadium	RI/FS	118794	479636.3832	1346433.968	10 -		mg/kg	0	0.5
Vanadium	Unknown	009147	479636.3832	1346433.968	14 -		mg/kg	0	0.5
Vanadium	RI/FS	121045	479544.93	1346398.61	16.4 -		mg/kg	0	0.5
Vanadium	Unknown	009147	479636.3832	1346433.968	136.889 NV		mg/kg	0	0.5
Vinyl Acetate	RI/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Vinyl Acetate	RI/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Vinyl Acetate	Unknown	009147	479636.3832	1346433.968	15 U		ug/kg	0	0.5
Vinyl chloride	RI/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Vinyl chloride	RI/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Vinyl chloride	Unknown	009147	479636.3832	1346433.968	15 U		ug/kg	0	0.5
Xylenes, Total	Unknown	009147	479636.3832	1346433.968	7 U		ug/kg	0	0.5
Xylenes, Total	RI/FS	121045	479544.93	1346398.61	12 U		ug/kg	0	0.5
Xylenes, Total	RI/FS	118794	479636.3832	1346433.968	12 U		ug/kg	0	0.5
Zinc	Unknown	009147	479636.3832	1346433.968	24.4 J		mg/kg	0	0.5
Zinc	RI/FS	118794	479636.3832	1346433.968	30.5 -		mg/kg	0	0.5
Zinc	RI/FS	121045	479544.93	1346398.61	44.6 U		mg/kg	0	0.5
Zinc	Unknown	009147	479636.3832	1346433.968	157.858 NV		mg/kg	0	0.5

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