1 of 6

Y-12

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OAK RIDGE Y-12 PLANT

FISCAL YEAR 1993 WELL PLUGGING AND ABANDONMENT PROGRAM, Y-12 PLANT, OAK RIDGE, TENNESSEE

September 1993

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ENVIRONMENTAL MANAGEMENT DEPARTMENT HEALTH, SAFETY, ENVIRONMENT, AND ACCOUNTABILITY ORGANIZATION

Prepared by

Science Applications International Corporation
P.O. Box 2502, 800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830

Under Purchase Order 30B-99928C-Y22

for the

Oak Ridge Y-12 Plant
Oak Ridge, Tennessee

Managed by

Martin Marietta Energy Systems, Inc.
for the
U.S. Department of Energy

Under Contract Number DE-AC05-84OR21400

MANAGED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

MASTER

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1.1.	FY 1992 well plugging and abandonment locations
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ACRONYMS

API	American Petroleum Institute
BCBG	Bear Creek Burial Grounds
BGS	below ground surface
CME	Central Mining Equipment
CR	Chestnut Ridge
CRSP	Chestnut Ridge Security Pits
DOT	Department of Transportation
Energy Systems	Martin Marietta Energy Systems, Inc.
FID	flame ionization detector
FY	fiscal year
GWPP	Groundwater Protection Program
Highland	Highland Drilling Company
HSEA	Health, Safety, Environment, and Accountability Organization
ID	inside diameter
OD	outside diameter
OL	Oil Landfarm Area
OVA	organic vapor analyzer
PID	photoionization detector
PPE	personal protective equipment
PVC	polyvinyl chloride
SAIC	Science Applications International Corporation
SPAD	Steam Plant Ash Disposal
S3	S-3 Ponds Area
TD	total depth
TOWR	top of weathered rock
TOFR	top of fresh rock
WIPS	Walk in Pits Site

EXECUTIVE SUMMARY

This report is a synopsis of the progress of the well plugging and abandonment program at the Y-12 Plant, Oak Ridge, Tennessee, from December 1992 through August 20, 1993. A total of 70 wells and borings were plugged and abandoned during the period of time covered in this report. All wells and borings were plugged and abandoned in accordance with the Monitoring Well Plugging and Abandonment Plan for the U.S. Department of Energy, Y-12 Plant, Oak Ridge, Tennessee (HSW, Inc. 1991).

1. INTRODUCTION

In late November 1992, Science Applications International Corporation (SAIC) was authorized by Martin Marietta Energy Systems, Inc. (Energy Systems) to provide technical oversight for the plugging and abandonment of obsolete and damaged groundwater monitoring wells, piezometers, and core holes in the vicinity of the Y-12 Plant at Oak Ridge, Tennessee. The scope of the authorized oversight was to supervise drilling activities and to provide health and safety monitoring during those activities. Energy Systems provided procedures and guidelines for plugging and abandonment, waste disposal, and health and safety monitoring requirements. This report is a synopsis of the progress of the plugging and abandonment program from first implementation of activities on December 1, 1992, until ~ August 20, 1993.

The criteria for determining the need for plugging and abandonment of monitoring wells, piezometers, and core holes were stated in the plugging and abandonment plan (HSW, Inc. 1991). Plugging and abandonment of a well, piezometer, or boring occurred if (1) its construction did not meet current standards (substandard construction), (2) it was irreparably damaged or had deteriorated beyond practical repair, (3) its location interfered with or otherwise impeded site operations, construction, or closure activities, or (4) special circumstances existed as defined on a case-by-case basis and approved by the Y-12 Plant GWPP Manager.

Seventy monitoring wells, piezometers, and borings were plugged and abandoned in FY 1993 (Plate 1.1). Subsequent sections of this report discuss general geology, health and safety monitoring, and waste disposal. Descriptions of the field methods and procedures used in implementation of the plugging and abandonment program for FY 1993 are also provided in this report. Enclosed are short narratives describing activities at each abandonment site. Detailed activity reports and diagrams of all well plugging and abandonments are contained in Appendixes A and B, respectively.

40,000 E

45,000 E

30,000 N

25,000 N

40,000 E

45,000 E

PINE RIDGE

1100

1200

1000

1035

1038

GW-035

GW-036

GW-088

1027

1040

1071

GW-077

1041

GW-032

GW-038

GW-234

1036

GW-030

GW-031

GW-512

1033

1037

BEAR CREEK BURIAL GROUNDS

1029

1032

1028

1052

1049

10

1050

BEAR CREEK VALLEY ROAD

1100

1100

1100

1100

● FY 1993 Well Plugging and Abandonment Location

Scale in Feet

C.I. = 100 feet

Plate P.I. Well Plugging and Abandonment Locations.

55,000 E

60,000 E

PINE RIDGE

BEAR CREEK VALLEY ROAD

CHESTNUT RIDGE

SPAD LANDFILL SITE

OLD BETHEL VALLEY ROAD

BETHEL VALLEY ROAD

GW-607

GW-580

GW-561

GW-572

SB-12

PZ-32

GW-571

GW-551

GW-556

GW-565

1133

PZ-12

1132

GW-573S

GW-573D

SB-41B

1134

SB-72A

1131

PZ-24

PZ-34

GW-566

SB-34

SB-14

PZ-14

GW-553

SB-24

SB-54

1130

900

1000

900

55,000 E

60,000 E

2. GENERAL GEOLOGY

The Oak Ridge Y-12 Plant is located within Bear Creek Valley in the southern part of the Valley and Ridge Physiographic Province. This province is characterized by narrow elongated ridges and valleys trending northeast-southwest. Resistant sandstone, siltstone, and siliceous limestone and dolostone typically form ridges; valleys are commonly underlain by less resistant shale and soluble carbonates (Rodgers 1953).

The ages of bedrock units in the Y-12 Plant vicinity range from Cambrian to Ordovician. From oldest to youngest, the bedrock units are the Rome Formation, Conasauga Group, and Knox Group (Fig. 2.1). Formations in the Y-12 Plant vicinity strike N 47°E to N 67°E and dip 30° to 50° to the southeast (King and Haase 1987). The Rome Formation has a thickness of ~800 ft (Fig 2.1) and is composed of maroon to dark brown, interbedded sandstone, siltstone, and shale. The Conasauga Group contains six formations. These are composed of alternating layers and laminations of shale, siltstone, and limestone. These formations are, from oldest to youngest, the Pumpkin Valley Shale, Rutledge Limestone, Rogersville Shale, Maryville Limestone, Nolichucky Shale, and Maynardville Limestone (Fig. 2.1). The bedrock units are overlain by unconsolidated deposits of varying thickness (10-30 ft) and composition, which generally consist of fill, alluvium, colluvium, and in situ weathered bedrock (residuum).

The principal formation of interest within the Knox Group is the basal Copper Ridge Dolomite. The Copper Ridge Dolomite has an aggregate thickness of 900 to 1000 ft (Fig. 2.1) and consists of variable bedded, siliceous, often stylonitic and laminated dolostone with thin, bedded chert layers and thin interbeds of siltstone, silty shale, and limestone.

Age	Group	Formation	Approximate Thickness (ft)		
			King and Haase 1987	Milici 1973	McMaster 1963
Lower Ordovician	KNOX	Mascot Formation	Not Determined	400-800	3000 (undivided)
		Kingsport Formation		200-320	
		Longview Dolomite		250-450	
		Chepuitepec Dolomite		725-880	
		Copper Ridge Dolomite		900-1000	
Middle & Upper Cambrian	CONASAUGA	Maynardville Limestone	418-450		1500 (undivided)
		Nolchucky Shale	422-550		
		Maryville Limestone	346-445		
		Rogersville Shale	90-120		
		Rutledge Limestone	90-120		
		Pumpkin Valley Shale	260-320		
Lower Cambrian		Rome	Not Determined		800+

Fig. 2.1. Stratigraphic units in the vicinity of the Y-12 Plant.

3. WELL PLUGGING AND ABANDONMENT

3.1 DRILLING CONTRACTORS

The principal drilling contractor for plugging and abandonment activities during FY 1993 was Highland Drilling Company (Highland). Highland subcontracted part of the plugging and abandonment carried out at the Steam Plant Ash Disposal (SPAD) Landfill Site to Law Engineering (Table 3.1). All other activities were conducted by Highland.

A variety of drilling and augering rigs were used by Highland during FY 1993. Law Engineering used a Central Mining Equipment (CME) 55 auger rig to plug and abandon wells PZ-14, PZ-24, PZ-34, SB-14, SB-24, SB-34, SB-44B, SB-54, GW-573S and GW-573D. A CME-75 core drilling rig was used by Law Engineering to remove 1.0-in. diameter piezometer tubing in wells GW-551 and GW-553. The remaining portions of GW-551 and GW-553 were removed by Highland using an Ingersoll Rand XL-750 air rotary rig. This air rotary rig was the principal drilling rig used during FY 1993 and was also used to plug and abandon wells PZ-12, PZ-32, SB-12, SB-72A, 1003, 1013, 1014, 1017, 1024, 1027, 1028, 1029, 1032, 1033, 1036, 1037, 1048, 1049, 1050, 1051, 1052, 1130, 1131, 1132, 1133, 1134, GW-063, GW-088, GW-234, GW-556, GW-561, GW-565, GW-566, GW-571, GW-572, GW-580, and GW-607. Another air rotary rig, an Ingersoll Rand T4W, was used by Highland to plug and abandon wells 1020, 1025 and 1025A. Highland used an Altec auger truck to plug and abandon wells 1007, 1010, 1011, and 1027. Due to logistics and mobility, a Ford 555B tractor with a McMillen Diggerhead™ auger attachment was used to plug and abandon wells 1035, 1038, 1040, 1041, 1043, 1071, GW-030, GW-031, GW-032, GW-035, GW-036, GW-037, GW-038, and GW-502.

3.2 PLUGGING AND ABANDONMENT METHODS

Four generalized plugging and abandonment methods, approved by the Tennessee Department of Environment and Conservation, were followed. The four methods are discussed in *Monitoring Well Plugging and Abandonment Plan for the Department of Energy Y-12 Plant, Oak Ridge, Tennessee* (HSW, Inc. 1991). These methods are applicable to different types of well or boring construction. Wells that were plugged and abandoned during FY 1993 required the use of all of these methods.

Method A is used for wells constructed of ≤ 7 -in. outside diameter (OD) steel or stainless steel well casing, typically completed with 5- to 20-ft well screens and sand filter packs. Wells completed in bedrock may also have 8- to 12-in. OD steel or polyvinyl chloride (PVC) surface casing extending from ground surface to the top of bedrock. Some wells may also be completed with a conductor casing in place. This method involves the overwash and removal of casing with washover pipe. The borehole is reamed with a tricone bit at least 0.25 in. larger in diameter than the original bore. API Class A (Type I) neat cement is tremied to within 4 ft of the surface (if there is no surface casing or conductor casing) and, after verification of the depth to the grout plug, the remaining 4 ft of bore is capped using compacted noncontaminated soil. If the well was completed with surface casing, the first grout plug is tremied to the bottom of the surface casing and allowed to cure. The surface casing is then overwashed in the same manner as the inner casing, and grout is tremied from the bottom to within 4 ft of the surface. If the well was also completed with a conductor casing, it is removed in a manner similar to that for the surface casing. During FY 1993, method A was followed for the plugging and abandonment of wells GW-030, GW-031, GW-032, GW-035, GW-036, GW-037, GW-038, GW-063, GW-088, GW-234, GW-561, GW-565, GW-566, GW-571, GW-572, GW-573D, GW-573S, GW-580, and GW-607.

Method B is used for wells constructed of ≤ 7 -in. OD steel or PVC well casing and completed with open-hole intervals in competent bedrock. The well casing typically extends from the ground surface to the top of the open-hole interval, which typically extends from 5 to 100 ft

Table 3.1. Summary of drilling contractor services provided at each abandoned well or boring

Well no.	Contractor	Service supplied
PZ-12	Highland Drilling Co.	Plugging and abandonment of a PVC piezometer
PZ-14	Law Engineering, Inc.	Plugging and abandonment of a PVC piezometer
PZ-24	Law Engineering, Inc.	Plugging and abandonment of a PVC piezometer
PZ-32	Highland Drilling Co.	Plugging and abandonment of a PVC piezometer
PZ-34	Law Engineering, Inc.	Plugging and abandonment of a PVC piezometer
SB-12	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
SB-14	Law Engineering, Inc.	Plugging and abandonment of a PVC monitoring well
SB-34	Law Engineering, Inc.	Plugging and abandonment of a PVC monitoring well
SB-44B	Law Engineering, Inc.	Plugging and abandonment of a PVC monitoring well
SB-54	Law Engineering, Inc.	Plugging and abandonment of a PVC monitoring well
SB-72A	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1003	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1007	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1010	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1011	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1013	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well

Table 3.1 (continued)

Well no.	Contractor	Service supplied
1014	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1017	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1022	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1024	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1025	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1025A	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1027	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1028	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1029	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1032	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1033	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1035	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1036	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1037	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1038	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1040	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well

Table 3.1 (continued)

Well no.	Contractor	Service supplied
1041	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1041	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1043	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1048	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1049	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1050	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1051	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1052	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1071	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1088	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
1130	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1131	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1132	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1133	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
1134	Highland Drilling Co.	Plugging and abandonment of a PVC monitoring well
GW-030	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-031	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well

Table 3.1 (continued)

Well no.	Contractor	Service supplied
GW-032	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-035	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-036	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-037	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-038	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-063	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-088	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-234	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-502	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
GW-551	Law Engineering, Inc.	Plugging and abandonment of the open interval of this monitoring well
	Highland Drilling Co.	Plugging and abandonment of the multiple steel casings of this open interval monitoring well
GW-553	Law Engineering, Inc.	Plugging and abandonment of the open interval of this monitoring well
	Highland Drilling Co.	Plugging and abandonment of the multiple steel casings of this open interval monitoring well
GW-556	Highland Drilling Co.	Plugging and abandonment of an open interval monitoring well
GW-561	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-565	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well

Table 3.1 (continued)

Well no.	Contractor	Service supplied
GW-566	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-571	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-572	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-573D	Law Engineering, Inc.	Plugging and abandonment of a stainless steel monitoring well
GW-573S	Law Engineering, Inc.	Plugging and abandonment of a stainless steel monitoring well
GW-580	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well
GW-607	Highland Drilling Co.	Plugging and abandonment of a stainless steel monitoring well

below the bottom of the well casing. The wells may also be completed with 8- to 12-in. OD steel or PVC surface casing extending from ground surface to the top of bedrock. Some wells may also be completed with a conductor casing. In method B, the open interval of the well is reamed by lowering a tricone drill bit through the casing. After reaming, the open interval is tremied with API Class A neat cement to the bottom of the well casing. After the initial plug has cured, the well casing is over washed or drilled out (depending on casing material) using a bit or washover pipe at least 0.25-in. diameter greater than the original bore. This upper portion of the bore is then filled using grout tremied to within 4 ft of the surface and capped as detailed in method A. During FY 1993, method B was used in the plugging and abandonment of wells 1013, 1014, 1017, 1020, 1022, 1024, 1025, 1025A, 1027, 1035, 1036, 1043, 1048, 1088, and GW-502.

Method C is used for wells constructed of 7-in. OD or smaller PVC well casing, typically completed with 5- to 20-ft well screens and sand filter packs. Wells completed in bedrock may also have 8- to 12-in. OD steel or PVC surface casing extending to bedrock in addition to conductor casing. In method C, the well casing is removed by either overwashing or (if the well casing material allows) by drilling out the well casing with a tricone roller bit. In both cases, the bore is reamed to at least 0.25 in. larger than the original diameter. The initial grout plug is created by placing API Class A neat cement by tremie to within 4 ft of the surface or to the bottom of surface casing. If surface casing or conductor casing is used in the well construction, removal is done as described in methods A and B. The bore is capped using compacted, noncontaminated soil to the surface. During FY 1993, method C was used in the plugging and abandonment of wells PZ-12, PZ-14, PZ-24, PZ-32, PZ-34, SB-12, SB-14, SB-24, SB-34, SB-44B, SB-54, SB-72A, 1003, 1007, 1010, 1011, 1028, 1029, 1032, 1037, 1038, 1040, 1041, 1049, 1050, 1051, 1052, 1071, 1130, 1131, 1132, 1133, and 1134.

Method D is a variation of method B that is used solely for exploratory core holes with 4.5-in. OD or smaller steel surface casings. The only variance from method B is that, in method D, the open interval of these core holes is not conditioned or reamed to expose fresh rock. This would require the prior removal of the surface casing with the resulting potential for bore collapse. In addition, open intervals are typically very deep and sometimes highly deviated from vertical. Rotary bits required for open interval reaming are not manufactured in a size small enough to ream NX core holes. The subsequent steps in the plugging and abandonment of wells using method D, from setting the initial grout plug to placing the cap, are similar to those given for method B. During FY 1993, method D was used in the plugging and abandonment of wells 1033, GW-551, GW-553, and GW-556.

The health and safety risk of working in the vicinity of the Walk in Pits Site (WIPS) and adjacent Bear Creek Burial Grounds (BCBG) "B" area necessitated a less intensive plugging and abandonment effort on the wells. The Y-12 GWPP Manager approved a modified plugging and abandonment work plan for the wells at the WIPS site that included: sealing the well casing in place, removing the well casing to ~ 4 ft below ground surface (BGS), then capping the site. In general, the wells at the WIPS site were sealed with cement-grout and/or bentonite aggregate and allowed to cure and/or hydrate. A pit was then excavated around the wellhead, and the casing stick-up was cut off and buried in the pit along with the protective posts. A detailed plugging and abandonment summary for each of the WIPS wells is found with the well summaries in Sect. 4. The wells that were plugged and abandoned at the WIPS were 1043, GW-030, GW-031, GW-032, GW-035, GW-036, GW-037, GW-038, and GW-502.

3.3 GROUTING PROCEDURES

Open Interval Wells

During plugging of the open-interval wells, the open intervals were cleaned of as much debris as possible, and API Class I (Type I) cement was either hand-mixed or delivered neat. Cement was tremied through 1.5-in. OD PVC tremie pipe. The plug of each open interval was brought up to the bottom of the innermost (deepest) casing of each well. The grout plug was allowed to cure overnight or 24 h before further plugging and abandonment activities were pursued at each well.

Following removal of casing and reaming of the borehole to expose fresh rock, cement grout was tremied to within ≤ 4 ft of the ground surface. Tremie pipe used was 1.5-in. OD PVC. Where bore depth was < 20 ft BGS and/or danger of the bore bridging was negligible, neat grout was poured from the surface. The remaining bore (≤ 4 ft BGS) was subsequently filled with a compacted clay/soil cap after the plug had cured. Some abandoned wells were capped with gravel from the surrounding area to maintain use of the site as a parking or traffic area (wells 1003, 1007, 1010, and 1011).

Screened Monitoring Wells and Piezometers

Following removal of casing from these wells, neat cement grout was placed into the bore to within ≤ 4 ft of the bottom of surface casing (if no surface casing was present, grout was brought to within ≤ 4 ft of the surface). After the grout had cured, surface casings were removed, and neat cement grout was placed into the reamed bore to within 4 ft BGS. This grout was allowed to cure, and the remaining open bore was filled with a clay/soil plug.

Highland either hand-mixed API Class I (Type I) grout used in plugging and abandonment or used premixed cement delivered to the site of the same specifications. In bores > 20 ft deep, grout was tremied through 1.5-in. OD PVC tremie pipe at a depth of ~ 10 to 20 ft from the bottom of the bore. Grouting of boreholes ≤ 20 ft deep or where the danger of bridging was negligible was accomplished by pouring or by pumping grout through a short hose into the bore.

3.4 WASTE MANAGEMENT PRACTICES

A waste management plan for the plugging and abandonment program was supplied by Energy Systems (Appendix C). Because the majority of the abandonment sites were outside areas of known or suspected contamination, drilling cuttings and water were discharged to the ground surface or to an excavated cuttings pit, provided that field screening criteria for radiation, volatile organics, and pH were not exceeded. Wells 1003, 1007, 1008, 1010, 1011, 1027, 1028, 1029, 1032, 1033, 1035, 1036, 1037, 1038, 1040, 1041, 1043, 1071, 1048, 1049, 1050, 1051, 1052, 1088, GW-063, GW-030, GW-031, GW-032, GW-035, GW-036, GW-037, GW-038, GW-234, and GW-502 were within areas of known or suspected contamination, and separate site-specific waste management plans were issued. Site-specific waste management plans for wells in the BCBG WIPS called for containerized disposal of personal protective equipment (PPE) and any contaminated equipment, with all casings and soils left at the site. Well 1011 (S-3 Ponds Functional Area) exhibited radioactive contamination below health and safety upgrade action levels but above waste disposal action levels, and contaminated portions of soil materials were containerized.

4. PLUGGING AND ABANDONMENT SUMMARIES

Seventy wells, piezometers, and borings were plugged and abandoned during FY 1993. A summary of the recorded well construction is given in Tables 4.1 and 4.2. (Y/TS-881). Occasional minor differences existed between reported construction and actual construction. These differences, as well as deviations from the plugging and abandonment procedures, are noted below. The location of each of the plugged and abandoned wells is shown on Plate 1.1.

PZ-12

PZ-12 was an obsolete piezometer of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this piezometer also impeded construction activities. The 2.0-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by reaming with a 10 5/8-in. diameter tricone roller bit to a depth of 73.5 ft BGS (2.0 ft deeper than the original bore). Type I Portland cement (2 yd) was tremied into the bore through 60 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~57 ft BGS. This grout was allowed to cure overnight and was tagged at 11.6 ft BGS. An additional 0.25 yd³ of Portland cement was poured into the bore. This grout was allowed to cure overnight and was tagged at 0.5 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

PZ-14

PZ-14 was an obsolete piezometer of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this piezometer also impeded construction activities. The 2.0-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 10 5/8-in. OD, 6 1/4-in. inside diameter (ID) hollow-stem auger to a depth of 93.6 ft BGS. Due to mechanical problems with the drill rig incurred from attempting to auger through a chert layer, the Health, Safety, Environment, and Accountability Organization (HSEA) allowed the remaining 3.4 ft of the original well to be abandoned in place. The resulting dressed bore was filled by inserting 80 ft of 1.5-in. OD PVC tremie pipe to a depth of ~77 ft BGS. Through this pipe, 2.5 yd³ of Type I Portland cement was tremied. Upon extraction of the PVC tremie pipe, a bore collapse at ~20 ft BGS required the abandonment of 50 ft of the PVC tremie pipe within the bore. The grout was allowed to cure overnight and was tagged the following day at 21 ft BGS. An additional eight 94-lb sacks (~9.5 ft³) of Portland cement were hand-mixed and poured into the bore. This grout was allowed to cure and was tagged at 4.5 ft BGS. The bore was plugged from a depth of 93.6 ft BGS to 4.5 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

PZ-24

PZ-24 was an obsolete piezometer of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this piezometer also impeded construction activities. The 2.0-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 10 5/8-in. OD, 6 1/4-in. ID hollow-stem auger to a depth of 52.0 ft BGS (1.0 ft deeper than the original well boring). The resulting dressed bore was filled by inserting 40 ft of 1.5-in. OD PVC tremie pipe to a depth of ~37 ft BGS. Through this pipe, 16.3 ft³ (12 94-lb sacks) of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged the following day at 9 ft BGS. An additional three 94-lb sacks (~4.1 ft³) of Portland cement were hand-mixed and poured into the bore. This grout was allowed to cure and was tagged at 1.9 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

Table 4.1. Summary of abandoned well construction data, Part I (Jones, Harrington, and Field 1992)

Well no.	Y-12 Plant coordinates		Surface elevation	Total depth	Functional area	Other names	Screened (S)
	northing	easting	(ft MSL) ^a	(ft BGS) ^b			Open (O)
PZ-12	N27175	E59740	Unknown	70.5	SPAD	None	S
PZ-14	N26175	E60212	Unknown	97.0	SPAD	None	S
PZ-24	N26908	E60400	Unknown	51.0	SPAD	None	S
PZ-32	N27586	E58886	Unknown	71.5	SPAD	None	S
PZ-34	N26627	E60887	Unknown	47.0	SPAD	None	S
SB-12	N27783	E59490	Unknown	19.9	SPAD	None	S
SB-14	N26580	E60323	Unknown	44.0	SPAD	None	S
SB-24	N26099	E60728	Unknown	20.0	SPAD	None	S
SB-34	N26253	E61150	Unknown	41.0	SPAD	None	S
SB-44B	N26655	E61235	Unknown	39.0	SPAD	None	S
SB-54	N25702	E60296	Unknown	21.0	SPAD	None	S
SB-72A	N26750	E59397	Unknown	96.0	SPAD	None	S
1003	N29939	E51595	1000.86	48	S3 ponds	YGMW-02/YMW-10/AP-03	S
1007	N29995	E52310	1007.8	18	S3 ponds	AP-07/YAP-03/W-03/No. 02	S
1010	N30556	E52206	1019.15	20	S3 ponds	AP-10/YAP-04/W-04/No. 06	S
1011	N29981	E52016	1006.52	22.5	S3 ponds	AP-11/YAP-05/W-05/No. 05	S
1013	N31611	E51496	1067.05	42	S-3	Y-04/AP-13	O
1014	N31759	E51522	1102.22	46.4	S-3	Y-05/AP-14	O
1017	N31683	E51399	1078.86	44.4	S-3	Y-08/AP-17	O
1022	N31280	E51512	1056.14	48	S-3	Y-13/AP-22	O
1024	N31681	E51703	1060.69	40.0	S-3	Y-15/AP-24	O
1025	N31581	E51554	1060.05	50	S-3	Y-16/AP-25	O
1025A	Unknown	Unknown	Unknown	Unknown	S-3	Unknown	O
1027	N30663	E44309	1022.98	100.0	BCBG	YGMW-05/BG-01/No. 07	O
1028	N29427	E45511	923.84	29.0	BCBG	YGMW-06/YMW-11/BG-02	S
1029	N29502	E44102	927.92	18.5	BCBG	YGMW-07/BG-03/No. 09	S
1032	N29243	E43748	917.74	57.0	BCBG	YGMW-10/YMW-01/BG-06	S
1033	N30016	E42899	948.28	160.0	BCBG	YGMW-11/BG-07	O
1035	N31011	E42430	1001.60	100.0	BCBG	YGMW-13/BG-09/No. 03	O
1036	N30197	E42173	944.30	100.0	BCBG	YGMW-14/BG-10/No. 06	O
1037	N29731	E41185	914.40	45.0	BCBG	YGMW-15/YMW-07/BG-11	S
1038	N31111	E42810	1008.16	26.0	BCBG	BG-12/No. 01	S
1040	N30766	E42331	966.69	23.0	BCBG	BG-14/No. 04/YBG2-4	S
1041	N30313	E42185	955.50	29.6	BCBG	BG-15/No. 05	S
1043	N30434	E42887	1009.07	150.0	BCBG/WIPS	BG-17/USGS A/YBG2-7	O
1048	N30288	E47771	981.65	100.0	OL	YGMW-17/OD-01/No. 13	O
1049	N29883	E47387	954.49	20.0	OL	YGMW-18/YMW-05/OD-02	S
1050	N29370	E46969	944.13	22.0	OL	YGMW-19/OD-03/No. 10	S
1051	N29797	E47777	963.67	28.0	OL	OD-04/No. 12	S

Table (continued)

Well no.	Y-12 Plant coordinates		Surface elevation	Total depth	Functional area	Other names	Screened (S)
	northing	easting	(ft MSL) ^a	(ft BGS) ^b			Open (O)
1052	N29836	E46990	948.91	22.0	OL	OD-05/No. 11	S
1071	N30961	E42826	980.35	21.0	BCBG	BG-13/No. 02	S
1088	N29342	E49162	960.93	117.7	OL	CO-6	O
1130	N26314	E59972	948.14	23.5	SPAD	None	S
1131	N26834	E60036	969.19	30.0	SPAD	None	S
1132	N27243	E60134	984.43	30.0	SPAD	None	S
1133	N27423	E59147	1060.81	24.0	SPAD	None	S
1134	N26814	E58819	1094.57	190.0	SPAD	None	S
GW-030	N30235	E43108	969.79	40.0	BCBG/WIPS	None	S
GW-031	N30240	E43109	970.11	70.0	BCBG/WIPS	None	S
GW-032	N30388	E42850	998.92	54.1	BCBG/WIPS	None	S
GW-035	N30712	E43183	993.94	62.0	BCBG/WIPS	None	S
GW-036	N30778	E43262	991.77	39.1	BCBG/WIPS	None	S
GW-037	N30685	E43346	1002.32	70.0	BCBG/WIPS	None	S
GW-038	N30533	E43373	1004.67	52.5	BCBG/WIPS	None	S
GW-063	N29016	E48257	958.89	35.0	OL	None	S
GW-088	N30578	E43768	956.66	30.0	BCBG	None	S
GW-234	N30620	E43621	947.36	16.5	BCBG	None	S
GW-502	N30269	E43114	977.81	260.0	BCBG/WIPS	None	O
GW-551	N27299	E60263	990.36	350.20	SPAD	None	O
GW-553	N26363	E61047	1045.26	599.3	SPAD	None	O
GW-556	N27359	E58159	982.46	354.5	SPAD	None	O
GW-561	N27811	E59323	1030.74	94.00	CR	None	S
GW-565	N27363	E58174	982.68	61.00	CR	None	S
GW-566	N26360	E61060	1045.62	188.00	CR	None	S
GW-571	N27672	E58936	1062.22	80.00	CR	None	S
GW-572	N27751	E58964	1072.09	74.0	CR	None	S
GW-573D	N27028	E60852	979.95	89.8	CR	None	S
GW-573S	N27044	E60847	980.04	15.0	CR	None	S
GW-580	N27846	E59309	1032.91	80.0	CR	None	S
GW-607	N27866	E58922	1072.86	151.3	CRSP	None	S

^a MSL = mean sea level^b BGS = below ground surface

Table 4.2. Summary of abandoned well construction data, Part II (Jones, Harrington, and Field 1992)

Well no.	Protective casing Depth/O.D. (ft, BGS/in.)	Surface casing ^a type	Surface casing depth ^a O.D. (ft, BGS/in.)	TOWR ^b (ft, BGS)	TOFR ^c (ft, BGS)	Plugging and Abandonment method	Rock formations
PZ-12	None	PVC/#40	70.5/2.0	70.0	Unknown	C	Knox
PZ-14	None	PVC/#40	97.0/2.0	Unknown	Unknown	C	Knox
PZ-24	None	PVC	51.0/2.0	50	Unknown	C	Knox
PZ-32	None	PVC/#40	71.5/2.0	Unknown	Unknown	C	Knox
PZ-34	None	PVC	47.0/2.0	Unknown	Unknown	C	Knox
SB-12	None	PVC	19.9/2.0	Unknown	Unknown	C	Knox
SB-14	None	PVC	44.0/2.0	Unknown	Unknown	C	Knox
SB-24	None	PVC	20.0/2.0	Unknown	Unknown	C	Knox
SB-34	None	PVC	41.0/2.0	Unknown	Unknown	C	Knox
SB-44B	None	PVC	39.0/2.0	Unknown	Unknown	C	Knox
SB-54	None	PVC	21.0/2.0	Unknown	Unknown	C	Knox
SB-72A	None	PVC	96.0/2.0	84.5	Unknown	C	Knox
1003	None	PVC/#40	48.0/6.5	15.0	26.0	C	Nolichucky
1007	None	PVC/#40	18.1/6.5	Unknown	Unknown	C	Nolichucky
1010	None	PVC/#40	23.2/6.5	24.0	Unknown	C	Nolichucky/Maryville
1011	None	PVC/#40	20.0/6.5	Unknown	Unknown	C	Nolichucky
1013	None	Steel	28.0/6.5	28.0	Unknown	B	Con: Pumpkin Valley
1014	None	Steel	36.0/6.5	36.0	Unknown	B	Con: Pumpkin Valley
1017	None	Steel	29.0/6.5	29.0	Unknown	B	Con: Pumpkin Valley
1022	None	Steel	30.0/6.5	30.0	Unknown	B	Con: Rutledge
1024	None	Steel	20.0/6.5	20.0	Unknown	B	Con: Pumpkin Valley
1025	None	Steel	30.0/6.5	30.0	Unknown	B	Con: Pumpkin Valley
1025A	Unknown	Unknown	Unknown	Unknown	Unknown	B	Unknown
1027	None	PVC/#40	28.0/6.5	15.0	42.0	B	Maryville
1028	None	PVC/#40	29.0/6.5	2.2	12.2	C	Nolichucky
1029	None	PVC/#40	18.5/6.5	6.0	18.5	C	Nolichucky
1032	None	PVC/#40	57.0/6.5	3.0	38.0	C	Maynardville
1033	None	Steel/Gal.	110.0/6.5	7.0	45.0	D	Maryville
1035	None	PVC/#40	28.0/6.5	11.0	23.0	B	Pumpkin Valley
1036	None	PVC/#40	33.3/6.5	10.0	33.0	B	Maryville
1037	None	PVC/#40	45.0/6.5	0.0	15.0	C	Nolichucky
1038	None	PVC/#40	26.0/6.5	2.0	25.0	C	Pumpkin Valley
1040	None	PVC/#40	23.0/6.5	6.0	23.0	C	Rutledge
1041	None	PVC/#40	29.5/6.5	5.0	29.6	C	Maryville
1043	None	Steel	unk./6.62	Unknown	Unknown	B	Maryville

Table 2 (continued)

Well no.	Protective casing Depth/O.D. (ft, BGS/in.)	Surface casing ^a type	Surface casing depth ^a O.D. (ft, BGS/in.)	TOWR ^b (ft, BGS)	TOFR ^c (ft, BGS)	Plugging and Abandonment method	Rock formations
1048	None	PVC/#40	30.0/6.5	3.6	25.0	B	Maryville
1049	None	PVC/#40	20.0/6.5	1.0	22.0	C	Nolichucky
1050	None	PVC/#40	22.0/6.5	5.6	22.0	C	Maynardville
1051	None	PVC/#40	28.0/6.5	7.6	28.0	C	Nolichucky
1052	None	PVC/#40	22.0/6.5	4.0	22.0	C	Nolichucky
1071	None	PVC/#40	20.0/6.5	3.5	19.0	C	Rutledge
1088	None	Steel	Unk./6.5	Unknown	Unknown	B	Maynardville
1130	None	PVC/#40	23.5/4.0	Unknown	Unknown	C	Knox
1131	None	PVC/#40	30.0/4.0	Unknown	Unknown	C	Knox
1132	None	PVC/#40	27.6/4.0	Unknown	Unknown	C	Knox
1133	5.0/6.0	PVC/#40	24.0/4.0	Unknown	Unknown	C	Knox
1134	86.0/8.75	PVC/#40	189.0/4.0	81.9	85.3	C	Knox
GW-030	Unknown	SS/#304	37.8/2.37	0.0	38.0	A	Maryville
GW-031	Unknown	SS/#304	65.7/2.37	0.0	38.5	A	Maryville
GW-032	unk./4.0	SS/#304	49.5/2.37	0.0	28.6	A	Maryville
GW-035	None	SS/#304	59.1/2.37	0.0	17.0	A	Maryville
GW-036	2.1/6.62	SS/#304	36.9/2.37	1.5	Unknown	A	Rogersville
GW-037	2.7/6.62	SS/#304	66.5/2.37	1.5	39.0	A	Maryville
GW-038	3.3/6.62	SS/#304	51.2/2.37	3.7	Unknown	A	Maryville
GW-063	2.7/6.5	SS/#304	32.7/2.37	Unknown	16.7	A	Maynardville
GW-088	2.9/5.0	SS/#304	30.0/2.37	Unknown	Unknown	A	Maryville
GW-234	2.0/4.0	SS/#304	16.5/2.37	7.0	Unknown	A	Maryville
GW-502	unk./10.75	Steel/F25	223.7/6.62	0.0	32.5	B	Nolichucky
GW-551	90.5/6.5	Steel	145.0/1.0	Unknown	90.5	D	Knox
GW-553	90.5/6.5	Steel	361.0/2.0	Unknown	Unknown	D	Knox
GW-556	101.0/4.0						
	50.0/11.75	Steel	Unk./1.0	Unknown	70.3	D	Knox
	77.0/6.63						
	70.7/4.6						
GW-561 ^d	None	PVC/#40	27.0/1.0	54.3	87.7	A	Knox
	None	SS/#304	89.9/4.0	Unknown	Unknown		Knox
GW-565	3.5/10.75	SS/#304	57.3/4.0	Unknown	46.5	A	Knox
GW-566	None	SS/#304	173.0/4.0	Unknown	67.0	A	Knox
GW-571	None	SS/#304	73.3/2.0	Unknown	22.0	A	Knox
GW-572	None	SS/#304	67.4/2.0	Unknown	Unknown	A	Knox
GW-573D	None	SS/#304	89.8/2.0	Unknown	Unknown	A	Knox
GW-573S	None	SS/#304	15.0/2.0	Unknown	Unknown	A	Knox

Table 4.2 (continued)

Well no.	Protective casing Depth/O.D. (ft, BGS/in.)	Surface casing ^a type	Surface casing depth ^a O.D. (ft, BGS/in.)	TOWR ^b (ft, BGS)	TOFR ^c (ft, BGS)	Plugging and Abandonment method	Rock formations
GW-580	None	SS/#304	76.7/2.0	Unknown	Unknown	A	Knox
GW-607	106.8/10.75	SS/#304	151.3/4.5	Unknown	107.0	A	Knox

^a Surface casing denotes surface casing for open -nterval wells and well casing for screened-interval wells in this column.

^b TOWR - Top Of Weathered Rock

^c TOFR - Top Of Fresh Rock

^d Second entry for GW-607 is for nested piezometer installed in the same original bore

PZ-32

PZ-32 was an obsolete piezometer of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this piezometer also impeded construction activities. The 2.0-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by reaming with a 10 5/8-in. diameter tricone roller bit to a depth of 73.7 ft BGS (2.2 ft deeper than the original bore). The resulting dressed bore was filled by inserting 60 ft of 1.5-in. OD PVC tremie pipe to a depth of ~ 57 ft BGS. Through this pipe, 2.0 yd³ of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged at 37.5 ft BGS. An additional 0.5 yd³ of Portland cement was tremied into the remaining bore through 20 ft of 1.5-in. OD PVC tremie pipe installed to ~17 ft BGS. This grout was allowed to cure overnight and was tagged at 6 ft BGS. HSEA approved leaving the depth to the top of this plug at 6 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

PZ-34

PZ-34 was an obsolete piezometer of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this piezometer also impeded construction activities. The 2.0-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 10 5/8-in. OD, 6 1/4-in. ID hollow-stem auger to a depth of 48.0 ft BGS (1.0 ft deeper than the original well boring). The resulting dressed bore was filled by inserting 40 ft of 1.5-in. OD PVC tremie pipe to a depth of ~37 ft BGS. Through this pipe, 16.3 ft³ (12 94-lb sacks) of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged the following day at 27 ft BGS. An additional ten 94-lb sacks (~13.6 ft³) of Portland cement were hand-mixed and poured into the bore. This grout was allowed to cure and was tagged at 6.0 ft BGS. HSEA approved leaving the depth to the top of this plug at 6 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

SB-12

SB-12 was an obsolete monitoring well of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this monitoring well also impeded construction activities. The 2.0-in. OD PVC casing and screen were removed, and the original well boring was enlarged to fresh material by reaming with a 10 5/8-in. diameter tricone roller bit to a depth of 20.7 ft BGS (0.8 ft deeper than the original bore). The resulting dressed bore was filled by pouring seven 94-lb. sacks of Type I Portland cement into the bore. This grout was allowed to cure overnight and was tagged at 5.6 ft BGS. HSEA approved leaving the depth to the top of this plug at 5.6 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

SB-14

SB-14 was an obsolete monitoring well of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this monitoring well also impeded construction activities. The 2.0-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 10 5/8-in. OD, 6 1/4-in. ID hollow-stem auger to a depth of 45.0 ft BGS (1.0 ft deeper than the original well boring). The resulting dressed bore was filled by inserting 40 ft of 1.5-in. OD PVC tremie pipe to a depth of ~ 37 ft BGS. Through this pipe, 16.3 yd³ (12 94-lb sacks) of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged the following day at 6.3 ft BGS. An additional two 94-lb sacks (~2.7 ft³) of Portland cement were hand-mixed and poured into the bore. This grout was allowed to cure and was tagged at 1.2 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

SB-24

SB-24 was an obsolete monitoring well of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this monitoring well also impeded construction activities. The 2.0-in. OD PVC casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 10 5/8-in. OD, 6 1/4-in. ID hollow-stem auger to a depth of 22.0 ft BGS (2.0 ft deeper than the original well boring). The resulting dressed bore was filled by inserting 20 ft of 1.5-in. OD PVC tremie pipe to a depth of ~16 ft BGS. Through this pipe 4.1 ft³ (three 94-lb sacks) of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged the following day at 5.8 ft BGS. HSEA approved leaving the depth to the top of this plug at 5.6 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

SB-34

SB-34 was an obsolete monitoring well of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this monitoring well also impeded construction activities. The 2.0-in. OD PVC casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 10 5/8-in. OD, 6 1/4-in. ID hollow-stem auger to a depth of 42.0 ft BGS (1.0 ft deeper than the original well boring). The resulting dressed bore was filled by inserting 40 ft of 1.5-in. OD PVC tremie pipe to a depth of ~37 ft BGS. Through this pipe 16.3 ft³ (12 94-lb sacks) of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged the following day at 8.0 ft BGS. An additional three 94-lb. sacks of Type I Portland cement were mixed and poured into the bore and allowed to cure overnight. The following day, grout was tagged at 0.3 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

SB-44B

SB-44B was an obsolete monitoring well of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this monitoring well also impeded construction activities. The 2.0-in. OD PVC casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 10 5/8-in. OD, 6 1/4-in. ID hollow-stem auger to a depth of 40.0 ft BGS (1.0 ft deeper than the original well boring). The resulting dressed bore was filled by inserting 30 ft of 1.5-in. OD PVC tremie pipe to a depth of ~27 ft BGS. Through this pipe 16.3 ft³ (12 94-lb sacks) of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged the following day at 2.3 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

SB-54

SB-54 was an obsolete monitoring well of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this monitoring well also impeded construction activities. The 2.0-in. OD PVC casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 10 5/8-in. OD, 6 1/4-in. ID hollow-stem auger to a depth of 22.0 ft BGS (1.0 ft deeper than the original well boring). The resulting dressed bore was filled by inserting 20 ft of 1.5-in. OD PVC tremie pipe to a depth of ~17 ft BGS. Through this pipe 5.4 ft³ (four 94-lb sacks) of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged the following day at 5.1 ft BGS. HSEA approved leaving the depth to the top of this plug at 5.6 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

SB-72A

SB-72A was an obsolete monitoring well of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location

of this monitoring well also impeded construction activities. The 2.0-in. OD PVC casing and screen were removed, and the original well boring was enlarged to fresh material by reaming with a 10 5/8-in. diameter tricone roller bit to a depth of 98.3 ft BGS (2.3 ft deeper than the original bore). The resulting dressed bore was filled by inserting 90 ft of 1.5-in. OD PVC tremie pipe to a depth of ~ 87 ft BGS. Through this pipe, 3.5 yd³ of Type I Portland cement was tremied. The grout was allowed to cure overnight and was tagged at 60.5 ft BGS. An additional 2.0 yd³ of Portland cement was tremied into the remaining bore through 50 ft of 1.5-in. OD PVC tremie pipe installed to ~ 47 ft BGS. This grout was allowed to cure overnight and was tagged at 82.0 ft BGS. Apparently, the "grout level" tagged previously was an object bridging the bore instead of grout. HSEA approved the use of bentonite. Eight 50-lb. sacks of bentonite aggregate were poured into the bore and hydrated with 50 gal of potable water. After allowing ~ 7 h for complete hydration, the bentonite was tagged at 70.6 ft BGS. An additional 2.0 yd³ of Type I Portland cement was tremied through 30 ft of 1.5-in. OD PVC tremie pipe installed to 28 ft BGS. The following day, grout was tagged at 22 ft BGS. A final 0.5 yd³ of cement grout was poured into the bore. After allowing the grout to cure overnight, grout level was tagged at 2.9 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

1003

Monitoring well 1003 was obsolete with substandard construction. The 6.5-in. OD PVC/#80 casing and screen were partially removed, and the original well boring was enlarged to fresh material by reaming the well riser with a 10 5/8-in. diameter tricone roller bit to a depth of 27.0 ft BGS. Due to the nature of the fill material in which the well was installed, the boring was unstable and repeatedly collapsed. HSEA gave permission to abandon the remainder of the bore (from ~ 27.0 ft BGS to 48.0 ft BGS) in place. The bore collapsed and filled from 27.0 ft BGS to 20.0 ft BGS as the drill was extracted. The remaining bore was filled by pouring 1.5 yd³ of Type I Portland cement directly in from the surface. This grout was allowed to cure overnight and was tagged the following day at 7.5 ft BGS. An additional 0.25 yd³ of grout was poured into the bore and allowed to cure. The final depth to grout was 1.0 ft BGS. The remaining bore was backfilled with gravel from the surrounding area to match the area usage with the permission of HSEA.

1007

Monitoring well 1007 was obsolete with substandard construction. The 6.5-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 12-in. OD, 8-in. ID hollow-stem auger to a depth of 20.0 ft BGS (1.9 ft deeper than the original well boring). The resulting dressed bore was filled by pouring 16 94-lb sacks (18.9 ft³) of Type I Portland cement. The grout was allowed to cure overnight and was tagged the following day at 3.0 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface.

1010

Monitoring well 1010 was obsolete with substandard construction. The 6.5-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 12-in. OD, 8-in. ID hollow-stem auger to a depth of 24.0 ft BGS (0.8 ft deeper than the original well boring).

The bore collapsed and filled from 24.0 ft BGS to 19.0 ft BGS as the drill was extracted. The remaining bore was filled by pouring 0.5 yd³ of Type I Portland cement. The grout was allowed to cure overnight and was tagged the following day at 10.0 ft BGS. An additional five 94-lb sacks of Type I Portland cement were mixed and poured into the remaining bore. This grout was allowed to cure overnight and was tagged at 0.5 ft BGS. With the permission of HSEA, gravel from the surrounding parking lot was used to cap the remaining bore to the surface.

1011

Monitoring well 1011 was obsolete with substandard construction. The 6.5-in. OD PVC/#40 casing and screen were removed, and the original well boring was enlarged to fresh material by over-drilling the well riser with a 12-in. OD, 8-in. ID hollow-stem auger to a depth of 21.0 ft BGS (1.0 ft deeper than the original well boring). The resulting dressed bore was filled by pouring 0.5 yd³ of Type I Portland cement. The grout was allowed to cure overnight and was tagged the following day at 3.7 ft BGS. A clay/soil cap was used to fill the remaining bore to the surface. During over-drilling of the casing, returned cuttings from 9.0 ft BGS to ~ 13 ft BGS exceeded on-site disposal criteria by exhibiting beta radiation emissions greater than 500 cpm above background. HSEA was notified, and the contaminated cuttings were drummed. Maximum beta emissions were ~ 700 cpm and did not exceed the criteria for an upgrade in PPE. All tools and materials that had the potential to come into contact with contaminants were screened to verify that they did not exceed 100 cpm above background levels before they were allowed to leave the site.

1013

Monitoring well 1013 was obsolete with substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The open interval of this well was reamed to fresh material using a 6 1/8-in. diameter tricone roller bit to 47.2 ft BGS (2.3 ft deeper than the actual depth of 44.9 ft BGS) and was plugged with four 94-lb sacks (4.7 cubic ft) of Type I Portland cement pumped through 40 ft of 1.5-in OD PVC tremie pipe installed to 37 ft BGS. This plug was allowed to cure overnight and was tagged the following day at 19.2 ft BGS (8.8 ft higher than the bottom of the steel surface casing). The 6.5-in. OD steel surface casing was washed over to a depth of 21.9 ft BGS with 9.5-in. OD, 8.25-in. ID washover pipe.

The total amount of casing extracted was 30.6 ft. The resulting bore was reamed to 30.8 ft BGS (2.8 ft deeper than the casing depth) with a 10 5/8-in. diameter tricone roller bit. This bore was then plugged by pumping fourteen 94-lb sacks (16.5 cubic ft) of Type I Portland cement through 30 ft of 1.5-in. OD PVC tremie pipe installed to 29 ft BGS. This plug was allowed to cure overnight and grout was tagged the following day at 2.9 ft BGS. The remainder of the bore was capped using clay/soil.

1014

Monitoring well 1014 was obsolete and of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The open interval of this well was reamed to a depth of 48.5 ft BGS (2.0 ft deeper than the original reported well depth) with a 6 1/8-in. diameter tricone roller bit. The dressed open interval was plugged with three 94-lb sacks of Type I Portland cement pumped through 30 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 29 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 34.5 ft BGS. The 6.5-in. OD steel surface casing was removed by overwashing with 9.5-in. OD, 8.25-in. ID washover pipe to a depth of 36.0 ft BGS.

The total amount of casing extracted was 37.0 ft (including 1.0 ft of casing stick-up that was cut off prior to over-drilling). The resulting bore was not reamed because the bore produced by overwashing was larger than the original well boring. The open bore was plugged by pumping ten 94-lb sacks (11.8 ft³) of Type I Portland cement through 30 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 27 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 5.5 ft BGS. An additional two 94-lb sacks of Type I Portland cement (2.4 ft³) were poured into the bore. This grout was allowed to cure overnight and was tagged at 1.5 ft BGS. The bore was capped with clay/soil.

1017

Monitoring well 1017 was obsolete with substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The open interval of this well was reamed to fresh material using a 6 1/8-in. diameter tricone roller bit to 47.5 ft BGS (3.0 ft deeper than the actual depth of 44.5 ft BGS) and was plugged with four 94-lb sacks (4.7 cubic ft) of Type I Portland cement pumped through 40 ft of 1.5-in OD PVC tremie pipe installed to 37 ft BGS. This plug was allowed to cure overnight and was tagged the following day at 21.0 ft BGS (8.0 ft higher than the bottom of the steel surface casing). The 6.5-in. OD steel surface casing was washed over to a depth of 23.0 ft BGS with 9.5-in. OD, 8.25-in. ID washover pipe.

The total amount of casing extracted was 28.7 ft. The resulting bore was reamed to 31.0 ft BGS (2.0 ft deeper than the casing depth) with a 10 5/8-in. diameter tricone roller bit. This bore was then plugged by pumping twelve 94-lb sacks (14.2 cubic ft) of Type I Portland cement through 30 ft of 1.5-in. OD PVC tremie pipe installed to 27 ft BGS. This plug was allowed to cure overnight and grout was tagged the following day at 1.5 ft BGS. The remainder of the bore was capped using clay/soil.

1022

Monitoring well 1014 was obsolete and of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The open interval of this well was reamed to a depth of 49.6 ft BGS (1.6 ft deeper than the original reported well depth) with a 6 1/8-in. diameter tricone roller bit. The dressed open interval was plugged with four 94-lb sacks of Type I Portland cement pumped through 50 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 49 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 27.7 ft BGS. The 6.5-in. OD steel surface casing was removed by overwashing with 9.5-in. OD, 8.25-in. ID washover pipe to a depth of 22.5 ft BGS.

The total amount of casing extracted was 31.0 ft (including 3.0 ft of casing stick-up cut off prior to over-drilling). The resulting bore was reamed to a depth of 31.0 ft BGS with a 9 7/8-in. diameter tricone roller bit. The open bore was plugged by pumping 12 94-lb sacks (14.6 ft³) of Type I Portland cement through 20 ft of 1.5 -in. OD PVC tremie pipe installed to a depth of ~ 19 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 8.0 ft BGS. An additional 94-lb sack of Type I Portland cement (1.2 ft³) was poured into the bore. This grout was allowed to cure overnight and was tagged at 2.0 ft BGS. The bore was capped with clay/soil.

1024

Monitoring well 1024 was obsolete and of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The open interval of this well was reamed to a depth of 43.2 ft BGS (3.2 ft deeper than the original reported well depth) with a 6 1/8-in. diameter tricone roller bit. The dressed open interval was plugged with four 94 lb sacks of Type I Portland cement pumped through 40 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~39 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 13.0 ft BGS. The 6.5-in. OD steel surface casing was removed by over washing with 9.5-in. OD, 8.25-in. ID washover pipe to a depth of 22.4 ft BGS.

The total amount of casing extracted was 20 ft. The open bore was plugged by pumping ten 94-lb sacks (11.8 ft³) of Type I Portland cement through 20 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~19 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 3.0 ft BGS. The bore was capped with clay/soil.

1025

Monitoring well 1025 was obsolete with substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The open interval of this well was reamed to fresh material using a 6 1/8-in. diameter tricone roller bit to 51.5 ft BGS (1.5 ft deeper than the reported depth of 50.0 ft BGS) and was plugged with four 94-lb sacks (4.7 cubic ft) of Type I Portland cement pumped through 50 ft of 1.5-in OD PVC tremie pipe installed to 46 ft BGS. This plug was allowed to cure overnight and was tagged the following day at 30.6 ft BGS (0.6 ft below the bottom of the steel surface casing). The 6.5-in. OD steel surface casing was washed over to a depth of 22.0 ft BGS with 9.5-in. OD, 8.25-in. ID washover pipe.

The total amount of casing extracted was 29.6 ft. This bore was then plugged by pumping ten 94-lb sacks (11.8 cubic ft) of Type I Portland cement through 20 ft of 1.5-in. OD PVC tremie pipe installed to 19 ft BGS. This plug was allowed to cure overnight and grout was tagged the following day at 4.0 ft BGS. The remainder of the bore was capped using clay/soil.

1025A

Monitoring well 1025A was obsolete with substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The open interval of this well was reamed to fresh material using a 6 1/8-in. diameter tricone roller bit to 44.6 ft BGS (3.0 ft deeper than the actual depth of 41.6 ft BGS) and was plugged with three 94-lb sacks (3.5 cubic ft) of Type I Portland cement pumped through 40 ft of 1.5-in OD PVC tremie pipe installed to 38 ft BGS. This plug was allowed to cure overnight and was tagged the following day at 25.1 ft BGS (2.5 ft higher than the bottom of the steel surface casing). The 6.5-in. OD steel surface casing was washed over to a depth of 23.2 ft BGS with 9.5-in. OD, 8.25-in. ID washover pipe.

The total amount of casing extracted was 28.9 ft. The resulting bore was reamed to 30.3 ft BGS (2.7 ft deeper than the casing depth) with a 10 5/8-in. diameter tricone roller bit. This bore was then plugged by pumping fifteen 94-lb sacks (17.7 cubic ft) of Type I Portland cement through 30 ft of 1.5-in. OD PVC tremie pipe installed to 28.5 ft BGS. This plug was allowed to cure overnight and grout was tagged the following day at 5.8 ft BGS. An additional sack of cement was poured into the bore and allowed to cure. The top of cured grout was tagged at 2.0 ft BGS. The remainder of the bore was capped using clay/soil.

1027

Monitoring well 1027 was obsolete and of substandard construction. Well security was compromised by an absence of a locking mechanism to prevent unauthorized access. The location of this monitoring well also interfered with closure activities. The 6.5-in. OD PVC/#40 casing was removed, and the subtending open interval was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 101.5 ft BGS (1.5 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the boring was unstable and repeatedly collapsed. The bore collapsed and filled from 101.5 ft BGS to 85.0 ft BGS as the drill was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. The remaining bore was filled by pouring 2.5 yd³ of Type I Portland cement through 80 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 77 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 7.5 ft BGS. An additional 2.5 94-lb sacks of cement (~ 3 ft³) of grout was poured into the bore and allowed to cure. The final depth to grout were 2.0 ft BGS. The remaining bore was capped with clay/soil.

1028

Monitoring well 1028 was obsolete and of substandard construction. The location of this monitoring well also interfered with closure activities. The 6.5-in. OD PVC/#40 casing and screen were removed and the borehole enlarged to fresh material by reaming the well with a 10 5/8-in.

diameter tricone roller bit to a depth of 30.2 ft BGS (1.2 ft deeper than the original depth). The resulting bore was filled by pouring 0.6 yd³ of Type I Portland cement through 30 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 29 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 5.2 ft BGS. An additional 94-lb sack of cement (~ 1.2 ft³) of grout was poured into the bore and allowed to cure. The final depth to grout was 2.2 ft BGS. The remaining bore was capped with clay/soil.

1029

Monitoring well 1029 was obsolete and of substandard construction. The location of this monitoring well also interfered with closure activities. The 6.5-in. OD PVC/#40 casing and screen were removed and the borehole enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 19.5 ft BGS (1.0 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the boring was unstable and filled from 19.5 ft BGS to 19.0 ft BGS as the drill was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. The remaining bore was filled by pouring four 94-lb sacks (5.4 ft³) of Type I Portland cement directly into the boring. This grout was allowed to cure overnight and was tagged the following day at 2.2 ft BGS. The remaining bore was capped with clay/soil.

1032

Monitoring well 1032 was obsolete and of substandard construction. The location of this monitoring well also interfered with closure activities. The 6.5-in. OD PVC/#40 casing and screen were removed and the borehole enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 59.0 ft BGS (2.0 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the boring was unstable and filled from 59.0 ft BGS to 57.0 ft BGS as the drill was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. The remaining bore was filled by pumping ~ 1 yd³ of Type I Portland cement through 50 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 49 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 21.0 ft BGS. An additional 10.5 ft³ (eight 94-lb sacks) of Type I Portland cement was poured into the bore. This grout was allowed to cure overnight and was tagged at 4.7 ft BGS. An additional 0.3 sack of cement was poured into the bore, and the remaining bore was capped with clay/soil with a curing time less than 24 h.

1033

Monitoring well 1033 was obsolete and of substandard construction. The location of this monitoring well also interfered with closure activities. The open interval of this well was reamed to a depth of 162.0 ft BGS (2.0 ft deeper than the original well depth) with a 6 1/8-in. diameter tricone roller bit. The dressed open interval was plugged with nine 94-lb sacks of Type I Portland cement pumped through 140 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 137 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 99.9 ft BGS. The 6.5-in. OD galvanized steel surface casing was removed by overwashing with 9.0-in. OD, 8.5-in. ID washover pipe to a depth of 86.0 ft BGS. The resulting bore was reamed to a depth of 92 ft BGS with a 10 5/8-in. diameter tricone roller bit. Due to the nature of the material in which the well was installed, the boring was unstable and caved, trapping the bit. The drill rod was overwashed with 6.0-in. OD, 5.0-in. ID washover pipe to a depth of 66.4 ft BGS in order to free the tools. The tools were extracted from the boring, and HSEA gave permission to abandon the collapsed portion of the bore in place (from 99.9 ft BGS to 32.2 ft BGS) and to seal the remaining bore with bentonite to the measured predrilling piezometric surface level. The bore was sealed from 32.2 ft BGS to 18.4 ft BGS by pouring 47 50-lb sacks of bentonite aggregate directly from the surface. The remaining open bore was plugged by pumping eight 94-lb sacks (9.4 ft³) of Type I Portland cement through 20 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 17 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 7.5 ft BGS. An additional 2.4 ft³ (two 94-lb

sacks) of Type I Portland cement was poured into the bore. This grout was allowed to cure overnight and was tagged at 1.9 ft BGS. The bore was capped with clay/soil.

1035

Monitoring well 1035 was obsolete and of substandard construction. The location of this monitoring well also interfered with closure activities. Well 1028 was located in a radiological area, and in order to minimize the amount of waste generated, HSEA gave permission to plug the open interval of the well (28.0 ft BGS to 100.0 ft BGS) by pouring nineteen, 50 lb sacks of bentonite aggregate into the bore and hydrated with existing well water overnight. The following day, the top of the hydrated bentonite was tagged at 24.5 ft BGS. The 6.5-in. OD PVC/#40 casing was over-drilled and enlarged to fresh material with a 12-in. OD, 8-in. ID hollow-stem auger to a refusal depth of 18.3 ft BGS. The total amount of casing extracted was 13.4 ft (including 1.4 ft of casing stick-up cut off prior to over-drilling).

The bore collapsed and filled from 24.5 ft BGS to 17.0 ft BGS as the tools were extracted. HSEA gave permission to abandon the remaining 16.6 ft of PVC casing and the collapsed portion of the well in place. The remaining bore was filled by mixing and pouring nine 94-lb sacks (10.6 ft³) of Type I Portland cement. The grout was allowed to cure overnight and was tagged the following day at 2.5 ft BGS. The bore was capped with clay/soil.

1036

Monitoring well 1036 was obsolete and of substandard construction. The location of this monitoring well also interfered with closure activities. The 6.5-in. OD PVC/#40 surface casing was removed, and the open interval was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 102.4 ft BGS (2.4 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the boring was unstable and filled from 102.4 ft BGS to 88.0 ft BGS as the drill was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. The resulting bore was plugged by pouring 2.0 yd³ of Type I Portland cement through 80 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 78 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 33.5 ft BGS. An additional 0.5 yd³ of Type I Portland cement was tremied through 30 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 28 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 9.9 ft BGS. A further 0.1 yd³ of cement was poured into the bore. This grout was allowed to cure overnight and was tagged at 2.5 ft BGS the following day. The bore was capped with clay/soil.

1037

Monitoring well 1037 was obsolete and of substandard construction. The location of this well also interfered with closure activities. The 6.5-in. OD PVC/#40 surface casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 47.3 ft BGS (2.3 ft deeper than the reported original depth). At this depth, returned cuttings still were comprised of PVC and grout fragments. HSEA requested that drilling be continued until all of the casing was out, but to no deeper than 60 ft BGS. Reaming was continued to 60.0 ft BGS. The last observed PVC and grout fragments came from the 52- to 53-ft BGS interval. Due to the nature of the material in which the well was installed, the boring was unstable and filled from 60.0 ft BGS to 57.8 ft BGS as the drill was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. The resulting bore was plugged by pouring 1.25 yd³ of Type I Portland cement through 50 ft of 1.5 -in. OD PVC tremie pipe installed to a depth of ~ 49 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 19.8 ft BGS. An additional 0.5 yd³ of Type I Portland cement was tremied through 20 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 19 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 5.8 ft BGS. An additional 5.4 ft³ (four 94-lb

sacks) of cement was poured into the bore. This grout was allowed to cure overnight and was tagged at 2.6 ft BGS the following day. The bore was capped with clay/soil.

1038

Monitoring well 1038 was obsolete and of substandard construction. The location of the well also interfered with closure activities. The 6.5-in. OD PVC/#40 casing was over-drilled and the borehole was enlarged to fresh material with a 12-in. OD, 8-in. ID hollow-stem auger to a refusal depth of 25.3 ft BGS (0.7 ft less than the reported total depth of 26.0 ft BGS). The total amount of casing extracted was 26.3 ft. The bore collapsed and filled from 26.3 ft BGS to 21.5 ft BGS as the tools were extracted. HSEA gave permission to abandon the collapsed portion of the well in place. The remaining bore was filled by pouring pre-mixed cement into the loader bucket of a backhoe and transporting to the site. Approximately 0.5 yd³ of Type I Portland cement was poured through 20 ft of 1.5-in. OD PVC tremie pipe installed to ~ 19 ft BGS in this manner. The grout was allowed to cure overnight and was tagged at 2.7 ft BGS the next day. The bore was capped with clay/soil.

1040

Monitoring well 1040 was obsolete and of substandard construction. The location of the well also interfered with closure activities. The 6.5-in. OD PVC/#40 casing was over-drilled and the borehole was enlarged to fresh material with a 12-in. OD, 8-in. ID hollow-stem auger to a refusal depth of 23.0 ft BGS (the same depth as the reported total depth). The total amount of casing extracted was 16.5 ft (leaving 6.5 ft of casing in the bore). The bore collapsed and filled from 23.0 ft BGS to 21.5 ft BGS as the tools were extracted. HSEA gave permission to abandon the remaining 6.5 ft of casing and the collapsed portion of the well in place. The remaining bore was filled by pouring pre-mixed cement into the loader bucket of a backhoe and transporting to the site. Approximately 1.4 ft³ of Type I Portland cement was poured through 20 ft of 1.5-in. OD PVC tremie pipe installed to ~ 18 ft BGS in this manner before it was determined that grout transport to the well in the backhoe bucket was inefficient. The grout was allowed to cure overnight and was tagged at 18.5 ft BGS the next day. An additional 10.9 ft³ (eight 94-lb sacks) of cement was hand-mixed and tremied through 20 ft of 1.5-in. OD PVC pipe installed at a depth of ~ 18 ft BGS. A 10-ft section of tremie pipe was removed, and four more sacks of cement were tremied at a depth of ~ 8 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 2.5 ft BGS. The bore was capped with clay/soil.

1041

Monitoring well 1041 was obsolete and of substandard construction. The location of the well also impeded closure activities. The 6.5-in. OD PVC/#40 casing was over-drilled and the borehole was enlarged to fresh material with a 12-in. OD, 8-in. ID hollow-stem auger to a refusal depth of 30.0 ft BGS (0.4 ft less than the reported total depth). The total amount of casing extracted was 33.9 ft (including stick-up). The bore collapsed and filled from 30.0 ft BGS to 28.5 ft BGS as the tools were extracted. HSEA gave permission to abandon the collapsed portion of the well in place. The remaining bore was filled by pouring ~ 0.5 yd³ of Type I Portland cement through 20 ft of 1.5-in. OD PVC tremie pipe installed to ~ 19 ft BGS. The grout was allowed to cure overnight and was tagged at 4.9 ft BGS the next day. An additional 94-lb sack of cement (1.2 ft³) was mixed and poured into the bore. This grout was allowed to cure overnight and was tagged at 3.3 ft BGS the following day. The bore was capped with clay/soil.

1043

Well 1043 was an open-interval monitoring well with an open interval located between 150.0 ft and 100.0 ft BGS. The open interval and casing were sealed with Hole Plug™ to 79.8 ft BGS, then grouted to 1.1 ft BGS. The well was plugged and abandoned because its location impeded closure activities at the BCBG/WIP site.

1048

Monitoring well 1048 was damaged and of substandard construction. The well's location impeded closure activities for the BCBG/WIPS. The 6.5-in. OD PVC/#40 casing was removed, and the subtending open interval was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 101.5 ft BGS (1.5 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the bore collapsed and filled from 101.5 ft BGS to 97.3 ft BGS. HSEA gave permission to abandon the collapsed portion of the bore in place. The remaining bore was filled by pouring 2.5 yd³ of Type I Portland cement through 90 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 89 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 22.4 ft BGS. An additional 0.5 yd³ of grout was poured into the bore and allowed to cure. The following day grout was tagged at 6.6 ft BGS. A final two 94-lb sacks of cement were mixed, poured into the bore, and allowed to cure overnight. The final depth to grout was 2.5 ft BGS. The remaining bore was capped with clay/soil.

1049

Monitoring well 1049 was obsolete, exhibited substandard construction, and impeded BCBG/WIPS closure activities. The 6.5-in. OD PVC/#40 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 22.3 ft BGS (2.3 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the boring was unstable and filled from 22.3 ft BGS to 20.0 ft BGS as the drill was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. The remaining bore was filled by pouring 0.5 yd³ of Type I Portland cement directly in the bore. This grout was allowed to cure overnight and was tagged the following day at 5.5 ft BGS. An additional 94-lb sack of cement (1.2 ft³) was poured into the boring. This grout was allowed to cure overnight and was tagged the following day at 2.9 ft BGS. The remaining bore was capped with clay/soil.

1050

Monitoring well 1050 was obsolete, exhausted substandard construction, and impeded the BCBG/WIPS closure activities. The 6.5-in. OD PVC/#80 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 90.0 ft BGS (1.0 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the boring was unstable and filled from 90.0 ft BGS to 80.0 ft BGS as the drill was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. A volume of 2 yd³ of Type I Portland cement was tremied through 80.0 ft of 1.5-in OD PVC tremie pipe installed to ~ 77 ft BGS and allowed to cure overnight. The following day, grout was tagged at 36.2 ft BGS. HSEA gave permission to plug the interval of the bore where lost circulation zones were found during reaming (from 36.2 ft BGS to 15 ft BGS). Twenty-one 50-lb sacks of bentonite aggregate were poured into the bore. The top of unhydrated bentonite was tagged at ~ 16 ft BGS, and 50 gal of potable water was poured into the bore. During tagging of the bentonite, the weighted tape became hung in PVC casing debris, and 20 ft of fiberglass tape with the stainless steel weight were lost in the bore. The following day, the hydrated bentonite was tagged at 15.3 ft BGS. The remaining bore was filled by pouring 0.5 yd³ of Type I Portland cement directly in the bore. This grout was allowed to cure overnight and was tagged the following day at 4.6 ft BGS. An additional 94-lb sack of cement (1.2 ft³) was poured into the boring. This grout was allowed to cure overnight and was tagged the next day at 2.2 ft BGS. The remaining bore was capped with clay/soil.

1051

Monitoring well 1051 was obsolete with substandard construction and interfered with the BCBG/WIPS closure activities. The 6.5-in. OD PVC/#40 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller

bit to a depth of 29.5 ft BGS (1.5 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the boring was unstable and filled from 29.5 ft BGS to 25.0 ft BGS as the drill was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. The remaining bore was plugged by pouring 0.5 yd³ of Type I Portland cement directly in the bore. This grout was allowed to cure overnight and was tagged the following day at 4.8 ft BGS. An additional 94-lb sack of cement (1.2 ft³) was poured into the boring. This grout was allowed to cure overnight and was tagged the following day at 2.3 ft BGS. The remaining bore was capped with clay/soil.

1052

Monitoring well 1052 was obsolete and of substandard construction. The location of this well interfered with the BCBG/WIPS closure activities. The 6.5-in. OD PVC/#80 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 23.0 ft BGS (1.0 ft deeper than the original depth). The bore was plugged by pouring 1.0 yd³ of Type I Portland cement directly in the bore. This grout was allowed to cure overnight and was tagged the following day at 13.0 ft BGS. An additional 0.25 yd³ of cement was poured into the bore and allowed to cure overnight. The following day grout was tagged at 5.0 ft BGS. A final 94-lb sack of cement (1.2 ft³) was poured into the boring. This grout was allowed to cure overnight and was tagged the following day at 2.7 ft BGS. The remaining bore was capped with clay/soil.

1071

Well 1071 was a PVC, screened well completed to 20.0 ft BGS. This well was obsolete and of substandard construction, and impeded the BCBG/WIPS closure activities. The 6.5-in. OD casing was over-drilled with an 8.0-in. ID, 13.0-in. OD hollow-stem auger advanced to 22.0 ft BGS (1.0 ft beyond the TD of the well bore). The top 3.2 ft of well casing (including 2.3 ft of stick-up) was extracted from the borehole, with the remaining casing apparently ground up by the auger cutter. The borehole was grouted to 1.4 ft BGS with neat, Type I Portland cement and capped with native clay soil.

1088

Monitoring well 1088 was an obsolete well of substandard construction. Access to this well for the normal plugging and abandonment procedure would have necessitated excessive filling and grading to support a drill rig with subsequent removal of fill and regrading following abandonment; therefore, HSEA granted permission to plug the open interval and surface casing of this well in place. The open interval of the well was tagged at 115.4 ft BGS (the reported depth was 117.7 ft BGS) and seven 94-lb sacks of Type I Portland cement were tremied into the bore through 100 ft of 1.5-in. OD PVC tremie pipe. Due to a malfunction in the diaphragm pump, grouting was discontinued until the following day, when the top of grout was tagged at 124.7 ft BGS. Apparently the depth tagged previously had been the depth to an obstruction. Permission was granted by HSEA to use bentonite to plug the open interval of the well. Six 50-lb sacks of bentonite aggregate were poured into the bore; the top of the unhydrated bentonite was tagged at 21.7 ft BGS. The bentonite was allowed to hydrate for 4 h and was then tagged at 21.6 ft BGS. The remainder of the bore was plugged by mixing and pouring a 94-lb sack of Type I Portland cement (1.2 ft³) through 20 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 19 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 3.2 ft BGS. A shallow excavation was made around the surface casing stick-up with a backhoe, and the 4.0-in. OD, 3.5-in. ID (originally reported as 6.5-in. OD) steel surface casing was cut off at a depth of 2.3 ft BGS. The remaining open interval of casing and the shallow excavation were capped with clay/soil.

1130

Monitoring well 1130 was obsolete, with substandard construction. The well location interfered with landfill construction. The 4.0-in. OD PVC/#40 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 25.0 ft BGS (1.5 ft deeper than the original depth). Due to the nature of the material in which the well was installed, the boring was unstable and filled from 25.0 ft BGS to 22.5 ft BGS as the drill string was extracted. HSEA gave permission to abandon the collapsed portion of the bore in place. The resulting bore was filled by pumping ~ 0.5 yd³ of Type I Portland cement through 20 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 18 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 5.0 ft BGS. HSEA gave permission to cap the bore with the grout level at 5.0 ft BGS. The remaining bore was capped with clay/soil.

1131

Monitoring well 1131 was obsolete with substandard construction and interfered with landfill construction. The 4.0-in. OD PVC/#40 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 31.8 ft BGS (1.8 ft deeper than the original depth). The resulting bore was filled by pumping ~ 0.5 yd³ of Type I Portland cement through 20 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 18 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 5.0 ft BGS. An additional 94-lb sack of cement was mixed and poured into the bore and allowed to cure overnight. The final grout level was tagged the following day at 2.5 ft BGS. The remaining bore was capped with clay/soil.

1132

Monitoring well 1132 was obsolete with substandard construction and interfered with landfill construction. The 4.0-in. OD PVC/#40 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 30.3 ft BGS (6.8 ft deeper than the original depth). The resulting bore was filled by pumping ~ 0.5 yd³ of Type I Portland cement through 30 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 28 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 6.9 ft BGS. Approximately 0.1 yd³ of additional cement was poured into the bore and allowed to cure overnight. The final grout level was tagged the following day at 1.6 ft BGS. The remaining bore was capped with clay/soil.

1133

Monitoring well 1133 was obsolete with substandard construction and interfered with landfill construction. The 4.0-in. OD PVC/#40 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 10 5/8-in. diameter tricone roller bit to a depth of 25.0 ft BGS (1.0 ft deeper than the original depth). The resulting bore was filled by pumping ~ 0.5 yd³ of Type I Portland cement through 20 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 16 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 2.5 ft BGS. The remaining bore was capped with clay/soil.

1134

Monitoring well 1134 was a damaged monitoring well. The 4.0-in. OD PVC/#40 casing and screen were removed and the borehole was enlarged to fresh material by reaming the well with a 7 5/8-in. diameter tricone roller bit to a depth of 192.0 ft BGS (2.0 ft deeper than the original depth). Removal of the well revealed many lost circulation zones and voids. Approximately 1.5 yd³ of Type I Portland cement was pump-tremied through 180 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 177 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 168.9 ft BGS. Permission was granted by HSEA to fill the 7 5/8-in. bore from 168.9 ft BGS

to the top of the first reported lost circulation zone with quartzite pea gravel. Approximately 1.5 tons of pea gravel was poured into the bore (to 101.5 ft BGS). Next, three 50-lb sacks of 3/8-in. diameter bentonite pellets were poured into the bore using well water in the bore to hydrate. To form a solid plug, two 94-lb sacks of Type I Portland cement were mixed and tremied through 80.0 ft of 1.5-in. OD PVC tremie pipe installed to ~ 76 ft BGS. This grout was allowed to cure overnight, and was tagged the next day at 85.3 ft BGS. The 8.75-in. OD steel surface casing was overwashed to a depth of 89.8 ft BGS with 13.5-in. OD, 13.0-in. ID washover pipe. A total of 86.0 ft of 7.75-in. OD, 8.25-in. ID steel surface casing was extracted from the bore. The remaining bore was dry and potential for bridging was minimal. Approximately 4.5 yd³ of Type I Portland cement was poured into the bore. This grout was allowed to cure overnight and was tagged the following day at 79.1 ft BGS. Permission was granted by HSEA to fill the bore to the top of the first observed lost circulation zone with quartzite pea gravel. Approximately 9.5 tons of pea gravel were poured into the bore (to 14.1 ft BGS). Two 50-lb sacks of bentonite aggregate were poured into the bore and hydrated with potable water. The bentonite was allowed to hydrate overnight and was tagged the next day at 13.4 ft BGS. The remaining bore was plugged by mixing and pouring 13 94-lb sacks of Portland cement into the bore. This grout was allowed to cure overnight and was tagged the next day at 3.8 ft BGS. The bore was then capped with clay/soil.

GW-030

Well GW-030 was a stainless steel, screened well installed to 37.8 ft BGS. The well screen and riser were sealed with bentonite Hole Plug™ from total depth (TD) to 12.2 ft (displaced water level) BGS. The well casing was then sealed with 2% bentonite-cement grout from 12.2 ft to 3.0 ft BGS, removed to 3.0 ft BGS, and buried in the excavation as the well-site was capped with native clay soil. This well was plugged and abandoned because it interfered with the BCBG/WIPS closure activities.

GW-031

Well GW-031 was a stainless steel, screened well installed to 65.7 ft BGS. However, the well was located on the edge of an excavation where erosion had removed ~ 12.5 ft of soil and weathered bedrock. The screen and casing were filled with Hole Plug™ to the displaced water level (5.5 ft BGS). The casing was then topped off with 2% bentonite-cement grout to the present ground surface and removed. Finally, the slope was collapsed over the well site, creating a 2.5-ft-thick native clay soil cap. This well was plugged and abandoned because it interfered with the BCBG/WIPS closure activities.

GW-032

Well GW-032 was a stainless-steel, screened well installed on an approximate 40° angle from vertical to a TD of 49.5 ft BGS. The well screen and riser casing were grouted with 4% bentonite-cement grout from TD to ~ 20 ft BGS. The remainder of the casing from 20 ft to 4.0 ft BGS was filled with Hole Plug™ and allowed to hydrate. The casing was cut off to 4.0 ft BGS, and the site was capped with native clay soil. This well was plugged and abandoned because it interfered with the BCBG/WIPS closure activities.

GW-035

An effort was made to physically locate the GW-035 (a stainless-steel, screened well) well casing when the well evaded identification during preliminary reconnaissance efforts. During excavation of a pit over the staked well location, stainless steel well casing with a badly deformed collar was exposed at ~ 3.0 ft BGS. The well was subsequently decommissioned by removing ~ 1.0 ft of the damaged well casing, sealing its entire length (from 59.1 ft to 4.0 ft) with Hole Plug™, and refilling the excavation with native clay soil. This well was plugged and abandoned because it interfered with the BCBG/WIPS closure activities.

GW-036

Well GW-036 was a stainless steel, screened well installed to 36.9 ft BGS. The well screen and casing were sealed with Hole Plug™ to the displaced water level (25.5 ft BGS). From 25.5 ft to 3.6 ft BGS, the casing was grouted using a 2% bentonite-cement grout; the site was then capped with native clay soil. This well was plugged and abandoned because it interfered with the BCBG/WIPS closure activities.

GW-037

Well GW-037 was a stainless steel, screened well completed to 66.5 ft BGS. The well casing was sealed from TD to 31.2 ft BGS with Hole Plug™, then filled to 3.3 ft BGS with 2% bentonite-cement grout. The top 3.3 ft of casing was removed, and a cap of native clay soil was installed. This well was plugged and abandoned because it impeded BCBG/WIPS closure activities.

GW-038

Well GW-038 was a stainless steel, screened well installed to 51.2 ft BGS. The well was sealed from TD to 44.5 ft BGS, topped off with 2% bentonite-cement grout to 3.0 ft BGS, and capped. This well was plugged and abandoned because it impeded BCBG/WIPS closure activities.

GW-063

Monitoring well GW-063 was a damaged well. The 5.0-ft length of 6.5-in. OD steel protective casing and the 2.37-in. OD #304 stainless steel well casing were first overwashed to a depth of 36.0 ft BGS with a 7.0-in. OD, 6.25-in ID washover pipe. The protective casing was removed, but only 9.9 ft of the stainless steel well casing was retrieved. Permission was received to mill out the remaining stainless steel casing. The bore and fugitive casing were drilled out to a depth of 36.0 ft BGS using a 10 5/8-in. diameter tricone rotary bit. With permission from HSEA, two 50-lb buckets of 3/8-in. diameter bentonite pellets and 15 50-lb sacks of bentonite aggregate were poured into the bore and hydrated with 25 gal of potable water to plug a void encountered during drilling. The top of the unhydrated bentonite was tagged at 19.0 ft BGS. The bentonite plug was allowed to hydrate overnight and was tagged the following day at 18.7 ft BGS. The remaining bore was plugged with ~ 0.3 yd³ of Type I Portland cement poured from the surface. This grout was allowed to cure overnight and was tagged the next day at 4.2 ft BGS. To finish plugging the bore, 0.5 sack of cement was mixed and poured into the bore. This grout was also allowed to cure overnight and was tagged the next day at 3.8 ft BGS. The bore was capped with clay/soil.

GW-088

Monitoring well GW-088 was a damaged well. The 5.0-ft length of 5.0-in. OD steel protective casing and the 2.37-in. OD #304 stainless steel well casing were first overwashed to a depth of 14.6 ft BGS with a 6.0-in. OD, 5.25-in ID washover pipe. The protective casing and 32.9 ft of 2.37-in. OD stainless steel well casing and screen were removed. The bore was reamed out to a depth of 32.0 ft BGS using a 10 5/8-in. diameter tricone rotary bit. The bore was plugged with ~ 1.0 yd³ of Type I Portland cement poured from the surface. This grout was allowed to cure overnight and was tagged the next day at 4.5 ft BGS. To finish plugging the bore, 1.5 sack of cement was mixed and poured into the bore. This grout was also allowed to cure overnight and was tagged the next day at 4.0 ft BGS. The bore was capped with clay/soil.

GW-234

Well GW-234 was a shallow, stainless steel screened well installed to 16.5 ft BGS. The 2.37-in. OD well casing, along with a 5.0-ft section of 4.0-in. OD protective casing, was overwashed with 5.0-in. ID, 6.0-in. OD washover pipe to 10.9 ft BGS. After having lost circulation, the washover pipe was tripped out of the borehole, revealing that the slightly bent protective casing had wedged into the

washover bit, shearing the well casing at 2.0 ft BGS. Continued overwashing had deformed the well casing and pushed it deeper into the borehole. HSEA authorized the reaming of the present borehole and deformed well casing with a 10 5/8-in. diameter tricone bit. The hole was dressed to 17.5 ft BGS (1.0 ft beyond the reported TD) and filled with 2% bentonite-cement grout to 11.7 ft BGS. Hole Plug™ was used to bridge a lost circulation interval in the borehole from 11.7 ft to 3.2 ft BGS. The borehole was then topped off with more cement to 1.4 ft BGS and capped with native clay/soil. This well was plugged and abandoned because it was damaged.

GW-502

Well GW-502 was an open-interval monitoring well completed to 260.0 ft BGS, with surface casing to 223.7 ft BGS. The open interval and a large portion of the surface casing were sealed with Hole Plug™ from TD to 34.6 ft. BGS to 3.0 ft. BGS. The surface casing and protective casing were cut off at 3.0 ft BGS, and the site was capped with native clay soil. This well was selected for plugging and abandonment because it obstructed BCBG/WIPS closure activities.

GW-551

Monitoring well GW-551 was obsolete with substandard construction, and it obstructed landfill construction. The open interval of this well had been previously plugged from 350.2 ft BGS to 145.0 ft BGS. A CME 75 core drill with HQ (3.79-in. OD) drill rods was used to over-drill the 1.0-in. OD black steel tube to 145.9 ft BGS (0.9 ft deeper than the bottom depth of the black steel tube). A volume of 80 gal (~ five 94-lb sacks) of Type I Portland cement was tremied through the HQ drill rods at a depth of ~ 115.9 ft BGS. This grout was allowed to cure overnight and was tagged the next day at 67.7 ft BGS. The CME core drill was moved from the site, and all remaining work was conducted using an air rotary drill. The 6.5-in. OD steel surface casing was overwashed to a depth of 82.7 ft BGS using 9.0-in. OD, 8.5-in. ID washover pipe. Before the surface casing could be extracted, the remaining cement grout on the inside had to be drilled out to a depth of 97.0 ft BGS with a 6.25-in diameter tricone roller bit. The drill rig was still unable to pull the surface casing, and the 9.0-in. OD, 8.5-in. ID washover pipe was used to overwash the surface casing further to 90.4 ft BGS. A total of 91.1 ft of 6.5-in. OD steel surface casing was extracted. The resulting bore was reamed to 92.0 ft BGS using a 10 5/8-in. diameter tricone roller bit. A volume of 2 yd³ of Type I Portland cement was tremied into the bore through 70 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 67 ft BGS. This grout was allowed to cure overnight and was tagged at 2.4 ft BGS after curing. The remainder of the bore was capped with clay/soil.

GW-553

Monitoring well GW-553 was obsolete with substandard construction, and it obstructed landfill construction. The open interval of this well had been previously plugged from 599.3 ft BGS to 361.0 ft BGS. A CME 75 core drill with HQ (3.79-in. OD) drill rods was used to over-drill the 1.0-in. OD black steel tube to 32.6 ft BGS. Because of the unforeseen amount of damage incurred to the core drilling tools and rig, over-drilling of the 1.0-in. OD steel pipe was halted. It was noted that the 4.5-in. OD steel surface casing was loose, and an attempt to pull the surface casing was made. A total of 101.0 ft of 4.5-in. OD steel casing was extracted. Also extracted was 152.0 ft of 1.0-in. OD black steel tube, which was grouted inside of the surface casing. The hole left by the casing extraction was tagged at 94.0 ft BGS. The HQ drill rod was used to continue drilling to 111.3 ft BGS. No further drilling was performed with the core drill due to caving of the bore. Permission was received from HSEA to abandon the bore in place from 111.3 ft BGS to 361.0 ft BGS. All further work was conducted using an air rotary drill. The 6.5-in. OD steel conductor casing was overwashed to a depth of 86.0 ft BGS using 9.0-in. OD, 8.5-in. ID washover pipe. A total of 93.4 ft of 6.5-in. OD steel surface casing was extracted. The resulting bore was reamed to 94.0 ft BGS using a 10 5/8-in. diameter tricone roller bit. A volume of 3 yd³ of Type I Portland cement was tremied into the bore through 70 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 67 ft BGS. This grout was allowed to cure overnight and was tagged at 58.0 ft BGS after curing. An additional 3 yd³ of grout was tremied into the bore through 40.0 ft of 1.5-in. OD PVC tremie pipe inserted to ~ 37 ft

BGS. This grout was also allowed to cure overnight and was tagged the following day at 12 ft BGS. A further 0.5 yd³ of grout was poured into the bore and allowed to cure. The following day, grout level was tagged at 4.4 ft BGS. Permission was received from HSEA to cap the bore with the grout level at 4.4 ft BGS, and the remainder of the bore was capped with clay/soil.

GW-556

Monitoring well GW-556 was obsolete with substandard construction. Its location also impeded landfill construction. The open interval of this well had been previously plugged from 356.5 ft BGS to 272.6 ft BGS. The 6.5-in. OD steel conductor casing was overwashed to a depth of 72.0 ft BGS using 9.0-in. OD, 8.5-in. ID washover pipe. A total of 70.3 ft of 6.5-in. OD steel casing, 68.8 ft of 4.5-in. OD steel casing, and 69.3 ft of 1.0-in OD black steel pipe was extracted (casings were nested and grouted together). Permission was received from HSEA to abandon the remaining casings and bore in place from 272.6 ft BGS to 73.0 ft BGS. The resulting bore was reamed to 73.0 ft BGS using a 10 5/8-in. diameter tricone roller bit. Premixed cement grout was delivered to the site, and 0.5 yd³ of Type I Portland cement was used to plug the bore and the intact casings extending it through 70 ft of 1.5-in. OD PVC tremie pipe installed to a depth of ~ 66 ft BGS. This grout was allowed to cure overnight and was tagged at 40.5 ft BGS. This plug was drilled out to the below the bottom of the 11.75-in. OD steel conductor casing using a 10 5/8-in. diameter tricone roller bit. The 11.75-in. OD steel conductor casing was overwashed to a depth of 47.0 ft BGS using a 14.5-in. OD, 13.0-in. ID washover pipe. All attempts to pull the 11.75-in. OD casing were unsuccessful, HSEA gave permission to unthread the casing and to extract as much as possible (leaving the remainder in the ground). Only 22.1 ft of 11.75-in. OD casing was removed. A volume of 2.5 yd³ of grout was tremied into the bore through 50.0 ft of 1.5-in. OD PVC tremie pipe inserted to ~ 47 ft BGS. This grout was also allowed to cure overnight and was tagged the following day at 16.0 ft BGS. A further 0.5 yd³ of grout was poured into the bore and allowed to cure. The following day grout level was tagged at 10.0 ft BGS. A final 0.5 yd³ of cement was poured into the bore and allowed to cure. The final grout level was tagged at 3.7 ft BGS. The remainder of the bore was capped with clay/soil.

GW-561

Monitoring well GW-561 impeded the landfill construction at the SPAD site. At this well, both a screened well and a shallow piezometer were installed in the same borehole. The 4.0-in. OD PVC well casing was first overwashed to a depth of 54.3 ft BGS. Fragmented and twisted PVC casing was extracted. HSEA gave permission to ream out the remainder of the well and the piezometer in one pass. The remaining well casing and the 1.0-in. OD PVC piezometer were reamed out to a depth of 92.0 ft BGS using a 10 5/8-in diameter tricone roller bit. The bore was plugged by pumping 2.5 yd³ of Type I Portland cement through 50 ft of 1.5-in OD PVC tremie pipe installed to ~ 47 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 21.0 ft BGS. Approximately 0.5 yd³ of additional cement was poured into the bore and allowed to cure. The following day, the grout level was tagged at 17.5 ft BGS. A final 0.5 yd³ of cement was poured into the bore and allowed to cure. The final grout level was tagged at 5.0 ft BGS. Permission was received from HSEA to cap the bore with the grout level at 5.0 ft BGS. The remainder of the bore was capped with clay/soil.

GW-565

Monitoring well GW-565 impeded the landfill construction at the SPAD site. The 4.5-in. OD, 4.25-in. ID stainless steel well casing and screen were overwashed to a depth of 62.5 ft BGS using 6.0-in. OD, 5.5-in. ID washover pipe. A total of 59.2 ft of twisted stainless steel casing was extracted, and the resulting bore was reamed to a depth of 62.0 ft BGS using a 10 5/8-in. diameter tricone roller bit. The bore was plugged by pumping 2.5 yd³ of Type I Portland cement through 70.0 ft of 1.5-in. OD PVC tremie pipe inserted to a depth of ~ 67 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 4.7 ft BGS. Permission was received from HSEA to cap the bore with the grout level at 4.7 ft BGS. The remainder of the bore was capped with clay/soil.

GW-566

Monitoring well GW-566 impeded the landfill construction at the SPAD site. The 4.0-in. OD, 3.75-in. ID stainless steel well casing and screen were overwashed to a depth of 142.5 ft BGS using 6.0-in. OD, 5.5-in. ID washover pipe. During overwash, the stainless steel casing became twisted and broke into fragments. The uppermost fragment was located ~ 20 ft BGS, and a taper tap attached to drill rods was used to extract casing fragments. A total of 65.9 ft of twisted stainless steel casing was extracted. HSEA gave permission to abandon the ~ 107 ft of casing remaining in the well (the original well was previously abandoned in place from the original TD of 174.0 ft BGS to 142.5 ft BGS). Four feet of 10.75-in. OD steel conductor casing was extracted, and the overwash bore was reamed to a depth of 95.0 ft BGS using a 10 5/8-in. diameter tricone roller bit. HSEA gave permission to halt reaming at this depth due to inability of the drilling equipment to drill the balled up casing without drifting from the original bore or hanging up. The bore was plugged by pumping 3.0 yd³ of Type I Portland cement through 70.0 ft of 1.5-in. OD PVC tremie pipe inserted to a depth of ~ 65 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 44.0 ft BGS. An additional 3.0 yd³ of cement was pumped through 40.0 ft of 1.5-in. OD PVC tremie pipe inserted to a depth of ~ 37 ft BGS. This grout was allowed to cure overnight and was tagged the next day at 3.0 ft BGS. The remainder of the bore was capped with clay/soil.

GW-571

Monitoring well GW-571 impeded the landfill construction at the SPAD site. The 2.0-in. OD stainless steel well casing and screen were overwashed to a depth of 39.0 ft BGS using 6.0-in. OD, 5.5-in. ID washover pipe. At 39.0 ft BGS; it was discovered that the casing was being crumpled by overwashing. Permission was received from HSEA to drill out the stainless steel casing using a roller bit. The remaining casing was drilled out to a depth of 81.5 ft BGS (1.5 ft deeper than the original TD) with a 10 5/8-in. diameter tricone roller bit. It was discovered that the casing has been pushed aside by the roller bit, and a total of 83.3 ft of twisted casing was extracted. The bore was plugged by pumping 2.0 yd³ of Type I Portland cement through 20.0 ft of 1.5-in. OD PVC tremie pipe inserted to a depth of ~ 17 ft BGS (no additional tubing could be inserted). This grout was allowed to cure overnight and was tagged the following day at 3.7 ft BGS. The remainder of the bore was capped with clay/soil.

GW-572

Monitoring well GW-572 impeded the landfill construction at the SPAD site. The 2.0-in. OD stainless steel well casing and screen were overwashed to a depth of 39.9 ft BGS using 6.0-in. OD, 5.5-in. ID washover pipe. It was discovered that the casing was being crumpled by overwashing. Permission was received from HSEA to ream the bore to 39.9 ft BGS and to abandon the remainder of the well in place. The bore was reamed to a depth of 39.9 ft BGS with a 10 5/8-in. diameter tricone roller bit. The bore was plugged by pumping 1.25 yd³ of Type I Portland cement through 1.5-in. OD PVC tremie pipe. This grout was allowed to cure overnight and was tagged the following day at 8.6 ft BGS. Approximately 3.0 ft³ of premixed cement was used to top off the grout level. This grout was allowed to cure overnight and was tagged at 2.1 ft BGS. The remainder of the bore was capped with clay/soil.

GW-573D

Monitoring well GW-573D impeded the landfill construction at the SPAD site. The 2.0-in. OD stainless steel well casing and screen were over-drilled to a depth of 70.0 ft BGS using a 10 5/8-in. OD, 6.25-in. ID hollow-stem auger. A total of 94.0 ft of stainless steel casing was extracted. The remaining well was over-drilled to 90.2 ft BGS with the hollow-stem auger. The resulting bore was plugged by pumping 2.5 yd³ of Type I Portland cement through 80.0 ft of 1.5-in. OD PVC tremie pipe inserted to a depth of ~ 73 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 12.6 ft BGS. An additional four 94-lb sacks of cement (4.7 ft³) were mixed and

poured into the bore. This grout was allowed to cure overnight and was tagged the following day at 3.8 ft BGS. The remainder of the bore was capped with clay/soil.

GW-573S

Monitoring well GW-573S impeded the landfill construction at the SPAD site. The 2.0-in. OD stainless steel well casing and screen were over-drilled to a depth of 16.0 ft BGS using 10 5/8-in. OD, 6.25-in. ID hollow-stem auger. A total of 5.5 ft of stainless steel casing was extracted. The remaining casing was not visible from the surface, and HSEA gave permission to abandon any remaining casing in place. The resulting bore was plugged by pumping 2.5 yd³ of Type I Portland cement through 20.0 ft of 1.5-in. OD PVC tremie pipe inserted to a depth of ~ 18 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 3.7 ft BGS. The remainder of the bore was capped with clay/soil.

GW-580

Monitoring well GW-580 impeded the landfill construction at the SPAD site. The 2.0-in. OD stainless steel well casing and screen were overwashed to a depth of 79.6 ft BGS using 6.0-in. OD, 5.5-in. ID washover pipe. It was discovered that the casing had been pushed to one side by washover pipe. HSEA gave permission to abandon the casing in place. A volume of 1 yd³ of Type I Portland cement was tremied through 20 ft of 1.5-in. OD PVC tremie pipe into the stainless steel casing, and an additional 1.0 yd³ was poured into the pit excavated around the casing. This grout was allowed to cure overnight and was tagged the following day at 10.4 ft BGS. The grout was topped off with ~ 2 ft³ of premixed grout. This grout was allowed to cure and was tagged at 4.5 ft BGS. Permission was received from HSEA to cap the bore with the grout level at 4.5 ft BGS. The remainder of the bore was capped with clay/soil.

GW-607

Monitoring well GW-607 impeded the landfill construction at the SPAD site. The 4.5-in. OD, 4.0-in. ID stainless steel well casing and screen were drilled out to a depth of 118.2 ft BGS using a 9 7/8-in. diameter tricone roller bit. HSEA granted permission to abort efforts to drill out the stainless steel casing due to the great degree of wear on the equipment. The 10.75-in. OD F/25 steel surface casing was overwashed to depth of 107.1 ft BGS using 13.5-in. OD, 12.25-in. ID washover pipe. A total of 107.2 ft of 10.75-in. OD steel conductor casing was extracted, and the overwash bore was reamed to a depth of 109.0 ft BGS using a 15-in. diameter hole opener (110.5 ft total depth of tool, but reaming cones reached 109.0 ft). The bore was plugged by pumping 2.5 yd³ of Type I Portland cement through 90.0 ft of 1.5-in. OD PVC tremie pipe inserted to a depth of ~ 87 ft BGS. This grout was allowed to cure overnight and was tagged the following day at 32.0 ft BGS. Permission was received from HSEA to use bentonite to prevent grout loss in voids. Two 50-lb sacks of bentonite aggregate were poured into the bore and allowed to hydrate overnight. Hydrated bentonite was tagged the following day at 25.0 ft BGS. An additional 2.0 yd³ of cement was pumped through 20.0 ft of 1.5-in. OD PVC tremie pipe inserted to a depth of ~ 17 ft BGS. This grout was allowed to cure overnight and was tagged the next day at 4.0 ft BGS. The remainder of the bore was capped with clay/soil.

5. QUALITY ASSURANCE

Quality control was closely monitored during all plugging and abandonment activities to ensure that borings and well abandonments conformed to Energy Systems plugging and abandonment procedures (Energy Systems 1991). All task-related activities were observed and documented by a registered professional geologist employed by SAIC. Any deviations were approved by the GWPP Manager. Drill rigs and all ancillary drilling equipment were steam cleaned before drilling operations at each site. During plugging and abandonment operations, equipment was routinely inspected for fuel and oil leaks, and a spill control kit was present during each abandonment.

Plastic sheeting and straw bale berms were used to contain normal drilling cuttings and water when abandonment activities occurred near surface waters. Only vegetable-oil-based or nonpetroleum thread lubricant (i.e., Kopr-Kote™ or Jet Lube™) was used when needed during drilling.

At all times when cuttings were circulated and available for collection, these were sampled continuously over 10- to 20-ft intervals. All samples were screened and inspected for comparison with expected well and boring materials.

6. HEALTH AND SAFETY

A Health and Safety Plan [Y/SUB/92-99928c(Y11/1)] was followed for all FY 1993 plugging and abandonment activities. All on-site personnel were in compliance with training requirements mandated by 29 CFR 1910.120, and all were enrolled in an annual health screening, occupational medical examination program. Additionally, all personnel present onsite during plugging and abandonment activities wore thermoluminescent dosimeter badges collected and monitored by Energy Systems. During the period of work covered by the annual report, no personnel received radiation exposure exceeding permissible limits based on field screening. Low potential for exposure to hazardous materials at all work sites allowed use of Level D personal protection. This protective level consisted of not less than steel-toed footwear, gloves, hard hats, hearing protection in the form of plugs or muffs, and safety glasses.

Technical oversight personnel provided health and safety monitoring at the work sites using monitoring equipment supplied and maintained by Energy Systems. Instrumentation used on-site typically consisted of an HNu Model HW-101 photoionization detector (PID), an OVA Model 108 or Model 128 flame ionization detector (FID), and Ludlum radiation meters. The HNu PID and OVA FID were used to detect ionizable organic vapors. Radiation detection instruments included a Ludlum Model 3 Survey Meter for detection of beta and gamma radiation with a Geiger-Mueller "pancake" type probe. Alpha radiation was monitored using a Ludlum Model 12 Count Ratemeter with a scintillation tube probe or an air probe.

In addition to screening for health and safety, drilling returns were screened per Energy Systems guidelines in a general waste management plan for drilling activities (Appendix C). This daily screening consisted of alpha, beta, and gamma radiation screening of composited drill cuttings. A headspace analysis of organic vapors and a pH measurement were also performed on this composited cuttings sample. Because grout cuttings often were a significant component of drilling returns during overwashing and borehole reaming, pH levels sometimes exceeded the upper bounds of waste-screening criteria. If grout cuttings were present, as identified visually, and no screening parameters other than pH exceeded guideline criteria, then no containment actions were taken. Screening results are contained in Appendix E.

Health and safety plan action levels (SAIC 1992) and waste management guideline values used during plugging and abandonment activities are presented in Table 6.1.

Table 6.1. Action levels used for health and safety monitoring during well plugging and abandonment

Parameter	Action Level
Waste Management Guidelines:	
pH	<4.0 and >10.5 standard units
Organic vapors	>5 ppm
Alpha radiation	>500 counts per minute
Beta/gamma radiation	>100 counts per minute
Health and Safety Plan:	
pH	Below 5 or above 9
Explosivity	>25% Lower Explosive Limit (LEL)
Organic vapors	>10 ppm in breathing zone
Radiation	>2 millirem/h, and/or an 8-h time-weighted average of 0.25 millirem/h at chest level

7. REFERENCES

- Energy Systems (Martin Marietta Energy Systems, Inc.) 1991. Well Plugging and Abandonment Procedure, G-003, Rev. 0, October.
- HSW, Inc. (HSW Environmental Consultants, Inc.) 1991. *Monitoring Well Plugging and Abandonment Plan for the Department of Energy Y-12 Plant, Oak Ridge, Tennessee, Oak Ridge Y-12 Plant, Y/SUB/91-YP507C/6.*
- Jones, S.B., B.K. Harrington, and S.M. Field 1992. *Updated Subsurface Data Base for Bear Creek Valley, Chestnut Ridge, and Parts of Bethel Valley on the U.S. Department of Energy, Oak Ridge Reservation, Y/TS-881, September.*
- King, H.L. and C.S. Haase 1987. *Subsurface - Controlled Geologic Map for the Y-12 Plant and Adjacent Areas of Bear Creek Valley, ORNL/TM-10112.*
- Rodgers, J. 1953. *Geologic Map of East Tennessee with Explanatory Text, Tennessee Division of Geology, Bulletin 58, Part II.*
- SAIC (Science Applications International Corporation) 1992. *Health and Safety Plan for Well Installation and Plugging and Abandonment Activities, Y-12 Plant, Oak Ridge, Tennessee. Prepared for Martin Marietta Energy Systems, Inc., Y/SUB/92-99928c (Y11)/1, July.*

APPENDIX A
Activity/Progress Reports

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-12</u>
WELL PLUGGING and ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>3/10/93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>3/18/93</u>	
HELPERS: <u>Mark Baker - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>Victor R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/10/93	1036	1050	Crew rigs up a 10 5/8-in. diameter tricone roller bit and stabilizer (total length = 9.2 ft). Stickup of casing previously removed. Table height = 2.6 ft.
	1050	1118	Begin reaming [2-in. outside diameter (OD), 1.75-in. inside diameter (ID)]. Use compressed air only. Advance to 6.6 ft below ground surface (BGS). Cuttings consist of 50% stiff, gritty, reddish-yellow (Munsel 7.5 YR 6/6) clay with 48% very dark gray (Munsel 7.5 YR 3/0) angular grout chips and approximately 2% PVC fragments. Crew adds 25 ft of drill rod.
	1118	1123	Continue reaming, begin using potable water to circulate cuttings.
	1123	1148	Advance 20 ft BGS. Cuttings are 25% yellow (Munsel 10 YR 7/8) locally to very pale brown (Munsel 10 YR 8/2) gritty clay, with 70% angular chert fragments ranging in coloration from yellow to brownish-yellow (Munsel 10 YR 7/8 to 10 YR 7/1), ranging in size from 1/16-in. to 1-in. Remaining fraction = 5% PVC cuttings (Munsel N8).
	1148	1224	Resume reaming. Advance to 57 ft BGS. Cuttings similar to 0-20 ft interval. Coloration of clay changes from reddish-yellow (Munsel 7.5 YR 7/8) to dark brown (7.5 YR 4/4). Driller requests oversight screen at table due to changes in cuttings. Breathing zone analysis yields 0.2 ppm organic vapors; beta/gamma at table = 60 cpm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-12</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT Continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/10/93	1224	1304	Continue reaming. Advance to final depth of 73.5 ft BGS. Void
(cont.)			encountered from 72 ft to 73.5 ft BGS. Top of weathered rock at
			70 ft BGS. Cuttings almost entirely composed of angular chert
			fragments. A few exhibit iron oxide staining. Most are 1/16-in. to
			1-in. in size, and range in coloration from dark gray (Munsel
			2.5 YR 4/0) to light gray (2.5 YR 7/0). Those fragments exhibiting
			iron oxide stains or adhering clay are yellowish-brown (10 YR 5/6).
			Approximately 5% of cuttings comprised of stiff, gritty yellowish-
			brown clay. Crew breaks for lunch.
	1401	1457	Crew installs 60 ft of 1.5-in. outside diameter (OD) PVC tremie pipe
			to 57 ft BGS in drill bore. Prepare for grout delivery.
	1457	1648	Awaiting grout delivery.
	1648	1749	Grout delivery arrives. Tremie 2 yds ³ into bore. Grout at surface.
	1749	1759	Clean, secure site, and depart.
3/11/93	0922	0954	Tag grout level at 11.6 ft BGS, water level at 11 ft BGS.
	1348	1356	Grout delivery arrives. Pour approximately 0.25 yds ³ into bore.
			Circulating grout.
	1356	1432	Clean, secure site and depart.
3/16/93	am		Tag grout at 0.5 ft BGS.
3/18/93	1305	1312	Clay cap installed. Deviation of cap depth from 4.0 ft BGS to 0.5 ft
			BGS approved by Steve Jones (HSEA). P&A of PZ-12 complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-14</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 5
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2/3/93</u>	
DRILLERS: <u>John Voekel/Jason Smith - Law Eng.</u>		FINISH: <u>3/18/93</u>	
HELPERS: <u>Jason Smith/Matthew Guyman - Law Eng.</u>		METHOD: <u>C</u>	
DRILL: <u>CME Model 55</u>		LOGGED BY: <u>Michael Klidzejs - SAIC</u> <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/3/93	1610	1700	Rig is moved into position over piezometer. Attempt to tag water level and find that piezometer is dry. Total depth of piezometer is 100.5 ft below ground surface (BGS).
	1700	1708	Well protector pad and 2-ft column of cement are removed using the rig's mast winch. Stickup of PVC piezometer casing is cut off at 0.6 ft above ground surface. Rig up with first hollow-stem auger section and bit, total length 5.2 ft. Inside diameter (ID) is 6 1/4 in., outside diameter (OD) is 10 5/8 in.
	1708	1823	Begin augering. Additional auger flight added sequentially at the end of each 5-ft interval. Cuttings consist of light brown (5YR 5/6) moist clayey soil and some cement cuttings. When adding fourth auger section, having drilled to approximately 15 ft BGS, notice that casing is not visible in stem of auger. Driller says that the process of bit grinding cement destroys PVC casing. Augering continues. Organic vapors in breathing zone = 0.0 ppm. Beta and gamma at borehole = 50 cpm, alpha = 40 cpm. Reach 24.2 ft BGS, stop for the day. Crew and oversight depart.
2/4/93	0805	0820	Technical oversight by T.J. Coffey (SAIC). Arrive at PZ-14 site. Wait on drillers.
	0820	0828	Drill crew arrives: Jason Smith (Law) is the driller, Matthew Guyman (Law) is the helper. Fuel drill.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-14</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/4/93	0828	0833	Start drill rig. Add auger flight.
(cont.)			
	0833	1105	Commence augering from 24.2 ft BGS. Auger to approximately 76 ft BGS. Cuttings throughout entire interval consist of: light brown (5YR 5/6) to moderate brown (5YR 4/4), moist, clayey soil/ residuum with small but abundant fragments of pale yellowish-orange (10YR 8/6) residual chert. No PVC or cement fragments observed this entire interval. Noted diminished returns between 34 ft and 40 ft BGS. Heavy chatter of auger flights and slow advance rate occasionally between 34 ft and 49 ft BGS. Augers begin binding in hole at approximately 76 ft BGS.
	1105	1206	Trip out of the hole, trying to turn augers. Lead auger flight out of the hole, recover 8.5-ft section of PVC well casing. Tag bottom of hole at 68.0 ft BGS (some caving of the bore has occurred).
	1206	1221	Break for lunch.
	1221	1346	Trip back into bore, turning augers in hole. Screening cuttings composite from 24.2 ft to 76.0 ft BGS: Alpha = 0 cpm, beta & gamma = 40 cpm (background), headspace = 0.3 ppm, and pH = N/A (no groundwater encountered).
	1346	1350	Have lead auger to approximately 60 ft BGS. Augers will not turn, but will free-fall into hole. Driller suspects a problem with the drill rig clutch.
	1350	1424	Drill crew departs to phone their office with status.
	1424	1520	Drillers return. Lay rig mast down to work on cable pulley. Waiting for S. Wilkerson (Law) to arrive.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-14</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/4/93	1520	1620	Sam arrives, assists drill crew in working on rig. Determine that
(cont.)			a slip-clutch went out. Having another shipped overnight. Will
			install first thing 2-5-93. Oversight departs.
2-5-93	0905	0956	Arrive at PZ-14 site. Drill crew onsite replacing slip-clutch.
	0956	1016	Continue tripping augers into the bore.
	1016	1143	At 76.0 ft BGS, commence augering. Auger to 93.0 ft BGS.
			Cuttings slow to appear at surface. Cuttings consist of light brown
			(5YR 5/6), moist, clayey soil/residuum with small fragments of
			white (N9) to pale yellowish-orange (10YR 8/6). Organic vapor
			readings fluctuating from 0.2 to 1.8 ppm (may be humidity
			effects).
	1143	1149	Interrupt augering to make adjustments to the part replaced this
			morning.
	1149	1158	Continue augering. Auger from 93.0 ft to 93.6 ft BGS.
	1158	1202	Break down. Possible broken chain in rig drive box. Shut off drill
			rig.
	1202	1316	Drillers depart to report status to office. Screening cuttings from
			76.0 ft to 93.6 ft BGS: Alpha = 10 cpm, beta & gamma = 40 cpm,
			headspace = 0.3 ppm, and pH = 8.6.
	1316	1441	Drill crew returns and begins dismantling drill rig head to make
			repairs. Obviously, no more drilling will occur today. Oversight
			departs.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-14</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/8/93	0805	0810	Meeting with Tim Coffey (SAIC), Bill Thedford (HSEA), and Steve Jones (HSEA) concerning status of PZ-14. Steve Jones agreed to trip out of the borehole at 93.6 ft instead of 98 ft due to the mechanical problems the rig was encountering when trying to go through the chert layer at this depth.
	0810	0851	Technical oversight by S.L. Abston (SAIC). Arrived at PZ-14. J. Voekel and S. Smith (both of Law), were on site working on rig.
	0851	1005	Trip out of borehole. Lead auger flight out of borehole, recover 5-ft section of PVC well casing.
	1005	1040	Break down rig to move to next site. Tag bottom of hole at 92 ft BGS (some caving of the borehole has occurred).
	1040	1130	Drill crew moves augers to steam cleaning area and leaves site to get a load of water.
	1130	1200	Break for lunch.
	1200	1240	Awaiting the arrival of the cement truck to grout borehole. Drillers place eight 10-ft sections of 1.5-in. OD PVC tremie pipe down borehole.
	1240	1257	Tremie 2.5 cubic yds of grout using the drill pump into borehole. Cement truck departs site.
	1257	1315	Drill crew cleaning site and pulling tremie pipe. Lose 50 ft of tremie pipe in the borehole due to collapse around the pipe at approximately 20 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. PZ-14

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

PAGE 5 of 5

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-24</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>John Voekel - Law Engineering</u> HELPERS: <u>Shawn Smith - Law Engineering</u> DRILL: <u>CME 55</u>		DATE: START: <u>2/9/93</u> FINISH: <u>3/18/93</u> METHOD: <u>C</u> LOGGED BY: <u>Susan Abston - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/9/93	1328	1440	Technical oversight by Susan Abston (SAIC). Arrive at PZ-24 site.
			Tag bottom of well at 50.7 ft below ground surface (BGS). Drill
			crew, John Voekel and Shawn Smith (both of Law), begin drilling.
	1440	1545	Removed 4 ft section of protective casing using drill rig's mast
			cable. Install hollow-stem auger section and bit. Total length of
			5.2 ft. Inside diameter (ID) 6 1/4-in. Outside diameter (OD) is
			10 5/8-in. Begin augering. Additional auger flights added
			sequentially at the end of each 5-ft interval. Chert layer between
			17 ft -18.5 ft BGS. Drill to 20 ft BGS.
	1545	1629	Continued drilling. Several chert layers between 19 ft and 24 ft BGS.
			Resistant chert layer at 30 ft BGS. Drill to 34 ft BGS.
	1629	1640	Resistant layer from 34 ft to 36 ft BGS.
	1640	1735	Continue drilling. Encounter moisture at 49 ft BGS. Resident layer
			encountered at 50 ft BGS. Drilled to 52 ft BGS. Cuttings
			throughout entire interval consist of light brown (5YR 5/6) to
			moderate brown (5YR 4/4), moist, clayey soil/residuum with small
			chert fragments and PVC fragments. Beta/Gamma readings
			= 70 cpm, and Alpha reading = 0 cpm.
	1735	1745	Tripping augers out of borehole.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-24</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/9/93	1745	1800	Stop tripping out of borehole to drain water tank and secure site. pH
(cont.)			readings = 7.8 and Organic vapor readings = 0.6 ppm. Drill crew
			departs site.
2/10/93	0800	0840	Arrive at PZ-24 site. Drill crew J. Voekel and S. Smith (Law) arrive
			at site. Drillers continue to trip remaining augers out of borehole.
			Recovered 8.1 ft of well pipe with last augers. Remainder of well
			pipe destroyed during augering of borehole.
	0840	0945	Drill crew moves auger to steam cleaning area and departs for a
			load of water. Upon return, load grout. Tagged bottom of PZ-24
			at 47.3 ft BGS. Some cave-in at bottom of borehole.
	0945	1033	Mixed twelve sacks (16.3 ft ³) of 2% bentonite-cement grout with
			drill rig pump and tremied it into borehole through 40 ft of 1 1/2-in.
			PVC tremie pipe.
	1033	1100	Pull out tremie pipe and cleanup.
	1100	1200	Break for lunch. Oversight leaves site.
	1200	1325	Oversight returns to site. Drillers steam clean augers.
2/11/93	1245	1300	Tagged grout level at 9 ft BGS.
3/12/93	1110	1130	S. Brown and G. Shillings (both of Highland) mixed three sacks
			(4.1 ft ³) of 2% bentonite-cement grout and poured into borehole.
3/17/93	1535	1542	Tagged grout level at 1.9 ft BGS in borehole.
3/18/93	1357	1404	S. Brown and G. Shillings (both of Highland) capped borehole with
			clay/soil.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-32</u>
WELL PLUGGING and ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>1/22/93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling</u>		FINISH: <u>2/1/93</u>	
HELPERS: <u>Bob Bowers - Highland Drilling</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1/22/93	1334	1432	Technical oversight by V.R. Harness - SAIC. Crew setting up rig on PZ-32. Protective casing removed with part of PVC riser (2.0-in. outside diameter). Crew rigs up 10 5/8-in. tricone roller bit. Bit and stabilizer = 9.2 ft length.
	1432	1519	Commence drilling out PVC casing. Table height = 2.2 ft. Compressed air only. Advance to 12 ft below ground surface (BGS).
	1519	1621	Begin use of water in drilling. Returns comprised of stiff yellowish-brown clay residuum with occasional angular to subangular chert fragments intermingled with grout and PVC fragments. Advance to 55 ft BGS. Crew partially trips out tools, secures site. All depart.
1/25/93	0818	0847	Awaiting crew.
	0847	0941	Trip tools back down. Resume drilling out well. Advance to 73.7 ft BGS. Clean out bore and trip out.
	0941	1108	Grout delivery arrives. Insert 60 ft of 1.5-in. outside diameter (OD), PVC tremie pipe to 57 ft BGS. Pump tremie 2 cubic yds of Type I neat cement grout into bore with hand-powered diaphragm pump. No grout visible from surface.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-34</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2

LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>John Voekel - Law Engineering</u> HELPERS: <u>Shawn Smith - Law Engineering</u> DRILL: <u>CME 55</u>	DATE: START: <u>2/10/93</u> FINISH: <u>3/18/93</u> METHOD: <u>C</u> LOGGED BY: <u>Susan Abston - SAIC</u>
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DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/10/93	1300	1325	Technical oversight by S. L. Abston (SAIC). Arrive at PZ-34 site.
			Tag the bottom of well at 46.5 ft below ground surface (BGS). Well information reports Total Depth (TD) of PZ-34 at 47.0 ft BGS.
	1325	1353	Drill crew moves drill rig onsite and fills water tank.
	1353	1400	Drill crew removes 4-in. diameter protective casing and 3.3-ft well pipe using the drill rig mast cable.
	1400	1402	Prepare to drill. Adding first hollow-stem auger flight and bit. Total length 5.2 ft. Inside diameter (ID) 6 1/4-in. Outside diameter (OD) 10 5/8-in.
	1402	1545	Commence augering from 0.0 ft BGS. Auger to approximately 48 ft BGS. Cuttings throughout entire interval consist of light brown (5YR 5/6) to moderate brown (5YR 4/4), moist, clayey soil/residuum with small fragments of chert, grout, and PVC.
	1545	1615	Trip out of the borehole. Lead auger flight out of borehole, recover 39.1 ft of PVC well casing. Beta/Gamma readings = 60 cpm, and Alpha readings = 20 cpm.
	1615	1655	Preparing site to grout borehole. Tag borehole at 46.6 ft BGS.
			Some cave-in at bottom of borehole.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>PZ-34</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/10/93 (cont.)	1655	1730	Mix and tremie 12 sacks (16.3 cubic ft) of 2% bentonite-cement grout into borehole using the drill rig pump and 40 ft of 1.5-in. diameter PVC tremie pipe.
	1730	1810	Clean equipment used during grouting, and secure site. Drill crew and oversight depart from site. pH in composite sample is 10.8, which is above the limit of 10.5 due to grout fragments in the grab sample. Organic vapors = 0.4 ppm.
2/11/93	0830	0845	Arrive at PZ-34 site. Tag grout at 27 ft BGS in borehole.
	0845	1115	Drill crew waiting on water to steam clean equipment.
	1115	1145	Oversight departs site for lunch and returns.
	1145	1300	Drill crew steam cleans equipment and prepares to move to next site.
3/12/93	1430	1530	Steve Brown and Greg Shillings (both of Highland) mix 10 sacks (13.6 cubic ft) of 2% bentonite-cement grout and pour into borehole.
3/16/93	1545	1552	Tag grout level in borehole at 6.0 ft BGS.
3/18/93	1345	1350	Steve Brown and Greg Shillings cap borehole with clay soil after receiving permission from Steve Jones (HSEA) to deviate from the maximum of 4 ft depth to grout.
			P&A of PZ-34 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-12</u>
WELL PLUGGING and ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>1/25/93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>2/1/93</u>	
HELPERS: <u>Bob Bowers - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750 Drillmaster</u>		LOGGED BY: <u>V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1/25/93			Technical oversight by V.R. Harness-SAIC. Crew setting up rig.
			Protective casing and part of PVC riser removed.
1/26/93	0902	1043	Crew rigs up 9.2 ft long stabilizer and bit assembly. Bit is 10 5/8-in. diameter tricone roller bit. Removed protective casing is 4-in. square metal housing 3.5 ft long. PVC riser (2.0-in OD) removed with protective casing to 10 ft below ground surface (BGS).
	1043	1046	Begin drilling out PVC casing. Breathing zone analysis (BZA) with OVA = 0.2 ppm. Beta/gamma measurement at table = 50 cpm. Table height = 2.5 ft.
	1046	1058	Advance to 3.7 ft BGS, air only. Organic vapor analysis of moist clay cuttings = 3.0 ppm. Beta/gamma measurement at table = 45 cpm.
	1058	1113	Advance to 14 ft BGS, BZA = 0.2 ppm. Began using water to drill at 3.7 ft BGS. Concrete delivery arrives.
	1113	1115	Advance to 17.2 ft BGS. Beta/Gamma at table = 50 cpm.
	1115	1136	Advance to 20.7 ft BGS. Clean bore, trip out. Move rig to allow grout delivery mixer access. Bore is shallow so grout will be poured from surface (no danger of bridging).

WELL NO. SB-12

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-14</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2/8/93</u>	
DRILLERS: <u>John Voekel - Law Engineering</u>		FINISH: <u>3/18/93</u>	
HELPERS: <u>Shawn Smith - Law Engineering</u>		METHOD: <u>C</u>	
DRILL: <u>CME 55</u>		LOGGED BY: <u>Susan Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/8/93	1415	1430	Technical oversight by S.L. Abston (SAIC). Arrive at SB-14 site.
			Drill rig is moved into position over piezometer.
	1430	1500	Tag total depth (TD) of piezometer at 39.2 ft below ground surface
			(BGS). Well information states TD of SB-14 at 44.0 ft BGS.
			Unable to tag bottom of piezometer due to silt in the bottom.
	1500	1510	Remove 4 ft of well protective casing using drill rig's mast cable.
			PVC casing stickup of piezometer is at 0.5 ft above ground surface.
	1510	1512	Install hollow steam auger section and bit. Total length is 5.2 ft.
			Inside diameter (ID) is 6 1/4-in., and outside diameter (OD) is
			10 5/8-in.
	1512	1550	Begin augering. Additional auger flights added sequentially at the
			end of each 5-ft interval. Cuttings become wet at ~19.5 ft BGS. Drill
			to 34.7 ft BGS, and stop for the day. Cuttings consist of light brown
			(5YR 5/6) moist, clayey soil/residuum with some weathered chert
			fragments and grout fragments. Beta/Gamma readings = 60 cpm,
			and Alpha readings = 30 cpm.
	1550	1600	Drill crew secures site and departs.
	1600	1708	Screening cuttings (see Well Cuttings Field Screening/Disposal
			Sheet). Composite grab sample pH of 10.8. High pH likely due
			to grout in soil sample.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-14</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/9/93	0750	0810	Arrive at SB-14 site. Have augered 34.2 ft BGS.
	0810	0821	Drill crew (Law) arrives and prepares to continue drilling.
	0821	0845	Commence augering from 34.2 ft BGS. Auger to 45 ft BGS.
			Cuttings throughout entire interval consist of light brown (5YR 5/6),
			moist, clayey soil/residuum. Organic vapors reading = 0.6 ppm.
	0845	0900	Trip one auger out of borehole.
	0910	0911	Pulled 34.6 ft of 2-in. PVC well pipe out of borehole. Bottom portion
			of well screen broke lead auger.
	0911	1000	Pull remaining nine flights of augers; 5.4 ft of well pipe inside lead
			auger.
	1000	1008	Tagged bottom of borehole at 45 ft BGS.
	1008	1020	Drill crew departs site to get water, cement, and bentonite in order
			to grout hole.
	1020	1028	Drill crew returns to site and places 40 ft of 1 1/2-in. PVC tremie pipe
			into the borehole and prepares to mix grout.
	1028	1155	Mix 12 sacks (16.3 cubic ft) of 2% bentonite-cement grout with
			pump on drill rig and tremie it down borehole.
	1155	1215	Remove tremie pipe and clean equipment and site.
	1215	1245	Break for lunch.
	1245	1315	Move drill and equipment off site.

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-24</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2/17/93</u>	
DRILLERS: <u>John Voekel - Law Engineering</u>		FINISH: <u>3/18/93</u>	
HELPERS: <u>Shawn Smith - Law Engineering</u>		METHOD: <u>C</u>	
DRILL: <u>CME 55</u>		LOGGED BY: <u>Susan Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-17-93	0830	0845	Technical oversight by S. L. Abston (SAIC). Arrived at SB-24.
			Tag bottom of well at 20.7 ft below ground surface (BGS) with
			3.5 ft of stickup of well pipe. Depth of 20 ft BGS reported in well
			information. Depart site.
	1255	1410	Return to SB-24 site. John Voekel and Shawn Smith move rig to
			site with the assistance of the backhoe, which is operated by
			Steve Brown (Highland). Drill crew moves augers to site.
	1410	1426	Prepare rig for drilling. Remove 4-in. diameter protective casing
			using the drill rig mast cable. Pulled 5.0 ft of well pipe with the
			protective casing. Used cable to pull the remaining 19.2 ft of well
			pipe screen and end plug. Added first hollow-stem auger flight
			and bit. Total length 5.2 ft. Inside diameter (ID) 6 1/4-in. Outside
			diameter (OD) 10 5/8-in. Commenced augering from 0.0 ft BGS.
	1426	1452	Additional auger flights added sequentially at the end of each
			5-ft interval. Augered to 22.0 ft BGS. Cuttings throughout section
			consist of light brown (5YR 5/6), moist, clayey soil/residuum with
			fragments of chert.
	1452	1506	Trip out of borehole. Lead auger flight out of borehole. Beta/
			Gamma reading = 60 cpm, and Alpha reading = 40 cpm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. SB-24

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-34</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2/11/93</u>	
DRILLERS: <u>John Voekel - Law Engineering</u>		FINISH: <u>3/18/93</u>	
HELPERS: <u>Shawn Smith - Law Engineering</u>		METHOD: <u>C</u>	
DRILL: <u>CME 55</u>		LOGGED BY: <u>Susan Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/11/93	1239	1300	Technical oversight by S. L. Abston (SAIC). Arrive at SB-34. Tag bottom of well at 40.9 ft below ground surface (BGS). Waiting on drill crew to finish steam cleaning: John Voekel, driller (Law), and Shawn Smith, helper (Law).
	1300	1328	Move drill rig onsite and remove 4-in. diameter protective casing using the drill rig mast cable.
	1328	1511	Adding first hollow-stem auger flight and bit. Total length 5.2 ft. Inside diameter (ID) 6 1/4-in. Outside diameter (OD) 10 5/8-in. Commence augering from 0 ft BGS. Auger to 42 ft BGS. Cuttings through section consist of light brown (5YR 5/6) to moderate brown (5YR 4/4), moist, clayey soil/residuum with fragments of chert, grout, and PVC.
	1511	1600	Trip out of borehole. Lead auger flight out of borehole. Recovered 16 ft of PVC well pipe. The remaining well pipe was destroyed during augering. Beta/Gamma reading = 70 cpm, and Alpha readings = 40 cpm.
	1600	1617	Preparing to mix grout for borehole. Placed 40 ft of 1.5-in. diameter PVC tremie pipe in borehole.
	1617	1650	Mix and tremie twelve sacks (16.3 ft³) of 2% bentonite-cement grout into borehole using the pump on the drill rig.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-44B</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2/12/93</u>	
DRILLERS: <u>John Voekel - Law Engineering</u>		FINISH: <u>3/18/93</u>	
HELPERS: <u>Shawn Smith - Law Engineering</u>		METHOD: <u>C</u>	
DRILL: <u>CME 55</u>		LOGGED BY: <u>Susan Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/12/93	1050	1145	Technical oversight by S. L. Abston (SAIC). Arrived at SB-44B.
			Tag bottom of well at 39.0 ft below ground surface (BGS). Waiting on drill crew to finish steam cleaning.
	1145	1200	Move drill rig to site and prepare to drill.
	1200	1230	Break for lunch.
	1230	1245	Remove 4-in. diameter protective casing using drill rig mast cable.
			Add first hollow-stem auger flight and bit. Total length 5.2 ft. Inside diameter (ID) 6 1/4-in. Outside diameter (OD) 10 5/8-in.
	1245	1415	Commence augering from 0 ft BGS. Auger to 40 ft BGS. Cuttings throughout section consist of light brown (5 YR 5/6), moist, clayey soil/residuum with fragments of chert and grout.
	1415	1500	Trip out of borehole. Lead auger flight out of borehole. Recovered 42 ft of PVC well pipe (39 ft plus 3 ft of stickup).
	1500	1510	Preparing to mix grout for borehole. Placed 30 ft of 1.5-in. diameter PVC tremie pipe in borehole.
	1510	1540	Mix and tremie 12 sacks (16.3 cubic ft) of 2% bentonite-cement grout into borehole using the pump on the drill rig. At 1520, pH of composite grab sample was 10.6 due to the grout fragments in the sample. Organic vapors were at 11.0 ppm due to alcohol

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. SB-44B

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-54</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>John Voekel - Law Engineering</u> HELPERS: <u>Shawn Smith - Law Engineering</u> DRILL: <u>CME 55</u>		DATE: START: <u>2/16/93</u> FINISH: <u>3/18/93</u> METHOD: <u>C</u> LOGGED BY: <u>Susan Abston - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/16/93	0915	1330	Technical oversight by S. L. Abston (SAIC). Arrived at SB-54. Tag bottom of well at 17 ft below ground surface (BGS) with 3.5 ft of stickup. Log of boring reports total depth of well to be 21 ft BGS. Not able to move drill rig onsite because of slippery road brought on by abundant rain fall recently. Winched drill rig up near site but backhoe not available to move rig onsite until tomorrow. Secure site and depart.
2/17/93	0805	0935	Oversight and drill crew onsite waiting on backhoe to move rig into position over well hole.
	0935	1015	Greg Shillings (Highland) onsite with backhoe and move drill rig into position over well bore.
	1015	1025	Moving augers and cement to site.
	1025	1040	Setting rig up to drill. Remove 4-in. diameter protective casing using drill rig mast cable. Pulled 5.4 ft of well casing with protective casing. Used cable to pull 19.1 ft of casing with end plug.
	1040	1103	Add first hollow-stem auger flight and bit. Total length 5.2 ft. Inside diameter (ID) 6 1/4-in. Outside diameter (OD) 10 5/8-in. Commence augering from 0.0 ft BGS. Auger to 22 ft BGS. Cuttings throughout section consist of light brown (5YR 5/6) to dark yellowish orange (10YR 6/6), moist to saturated, clayey soil/residuum

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-54</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/17/93	1040	1103	with fragments of chert and some grout fragments. Beta/Gamma
(cont'd)			reading = 60 cpm and Alpha reading = 40 cpm.
	1103	1130	Trip out of borehole.
	1130	1154	Tag bottom of borehole at 19.2 ft BGS. Some cave-in of bottom
			of borehole. Prepare to mix grout for borehole. Placed 20 ft of
			1.5-in. diameter PVC tremie pipe in borehole (4 ft of stickup).
			Mixed and tremied four sacks (5.4 ft ³) of 2% bentonite-cement
			grout into borehole using drill rig pump.
	1154	1225	Clean equipment used during grouting, and break down rig to
			move to next site.
	1458	1505	Composite grab sample is 10.7 pH due to grout fragments in the
			sample. Organic vapors = 10.2 ppm due to alcohol anti-freeze
			used to winterize drill rig.
2/18/93	1035	1045	Tag grout level in borehole at 5.1 ft BGS.
3/18/93	1505	1515	Steve Brown (Highland) and Greg Shillings (Highland) cap bore-
			hole with clay soil after receiving permission from Steve Jones
			(HSEA) to deviate from the maximum of 4 ft depth to grout.
			P&A of SB-54 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-72a</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 5
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>Rick Mayberry - Highland Drilling Co.</u> HELPERS: <u>Paul McCormick - Highland Drilling Co.</u> DRILL: <u>Ingersoll Rand XL-750 Drillmaster</u>		DATE: START: <u>3/8/93</u> FINISH: <u>3/18/93</u> METHOD: <u>C</u> LOGGED BY: <u>Dwight Hollon (SAIC) Victor R. Harness (SAIC)</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/8/93	0815	0918	Technical oversight by D. Hollon (SAIC). Arrive at SB-72a site.
			Was called by T. Coffey (SAIC) and told that Highland would not
			be at the site until approximately 0900 hours. Left the site to go
			to the Biology Building (Y-12 Plant) to get an Alpha meter and a
			beta and gamma meter.
	0918	0933	Return to SB-72a site. Personnel at the site are R. Phillips,
			P. McCormick, R. Mayberry, D. Key (all of Highland) and B.
			Thedford (HSE).
	0933	0941	Measured bit and stabilizer to be 9.2 ft. Table height measured
			to be 2.2 ft. Crew will ream a 2-in. outside diameter (OD) PVC
			casing in an 8-in. OD grouted hole with a 10 5/8-in. OD tricone bit.
			Beta and gamma survey of the rig is 30 cpm: background is
			30 cpm.
	0941	0955	Reaming begins. Cuttings consist of grout, clayey soil, and PVC.
			HNu survey of the breathing zone at 6.5 ft BGS is 0 ppm.
	0955	1011	Bit and stabilizer down to 7.0 ft BGS. Crew works to get bushings
			seated. Table height adjusted to 2.4 ft. Add drill rod.
	1011	1053	Reaming continues. Water added to flush cuttings from the hole
			at 1026 hrs. At 13.8 ft BGS, rig shimmies as drilling becomes
			harder. HNu surveys of the breathing zone at 16.8 ft BGS and
			25 ft BGS both read 0.2 ppm. Increase in water encountered at

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-72a</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/8/93			26 ft BGS. Depth is 31.8 ft BGS at 1048 hrs. Beta and gamma
(cont.)			scan of the cuttings is 30-40 cpm; background 30 cpm. Lithology:
			chert, white (N9), medium light gray to dark gray (N6-N4) and
			black (N1). Minor amounts of grout, medium dark gray (N4).
			Minor PVC cuttings.
	1053	1109	Add drill rod, continue reaming. Drill to 51.6 ft BGS. Returns are
			sporadic throughout this interval. HNu survey of the breathing
			zone is 0.2 ppm at 36 ft BGS. Slight shimmying of the rig at 40.8 ft
			BGS. Lithology: chert, black (N1), white, (N9) medium light gray
			to medium gray (N6-N5). No grout fragments, no PVC cuttings.
	1109	1123	Add drill rod, continue reaming. Borehole may be collapsing.
			Informed R. Phillips (Highland) that there was an absence of grout
			in the cuttings. Was told by him to continue.
	1123	1135	Reaming continues. HNu surveys of the breathing zone at 53 ft
			BGS and 63 ft BGS are 0 ppm. R. Mayberry (Highland), reports
			that drilling is felt to be on the PVC casing. If drill bit were in
			residium the drilling would be faster because it is soft.
	1135	1145	At 70.8 ft BGS rig shimmies and bounces. Shimmying continues
			to 73.5 ft BGS. Lithology: Chert, black (N1), white (N9), medium
			light gray to medium gray (N6-N5). No grout.
	1145	1148	B. Thedford (HSEA) and R. Phillips (Highland) on site. B. Thedford
			(HSEA) agreed with decision to continue reaming.
	1148	1200	Drilled depth is 81.8 ft BGS. Add drill rod, continue reaming. Rig
			shimmies at 83.0 ft BGS. At 1158 hrs. visitors leave. Lithology:
			chert, black (N1), white (N9), medium light gray to medium gray,
			(N6-N5) black (N1), weathered sandstone. No grout. No PVC

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-72a</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/8/93			cuttings.
(cont.)			
	1200	1206	HNu survey of the breathing zone at 84.0 ft BGS is 0 ppm. Top of weathered rock at 84.5 ft BGS. Lithology: Dolostone, medium gray to brownish gray (N5-5 YR 4/1). Cuttings contain weathered veins and staining. Chert, black (N1), white (N9), medium light gray to dark gray (N6-N4). No PVC cuttings. No grout.
	1206	1216	Increase in water encountered between 84.5 ft and 85 ft BGS. Returns sporadic. Ratty drilling from 84.5 ft to 87.8 ft BGS and 88.8 ft to 89.0 ft BGS. Soft interval from 89.0 to 92.0 ft BGS. Stringer at 92.8 ft BGS locked up drilling bit. Drilling became slightly smoother from 96 ft BGS to 98.3 ft BGS. Stopped drilling at 98.3 ft BGS. Lithology: Dolostone, medium gray to brownish-gray (N5-5 YR 4/1). Chert, black (N1), white (N9), medium light gray to dark gray (N6-N4). Cuttings contain weathered veining features. No PVC cuttings. No grout.
	1216	1227	HNu survey of the breathing zone at 98.3 ft BGS is 0.2 ppm. Beta and gamma scan of all cuttings were 50-60 cpm; background 50 cpm. Alpha scan of all cuttings was 0-20 cpm; background 0-20 cpm.
	1227	1330	Crew pulls 50 ft off of bottom. Will eat lunch and get tremie pipe afterwards. Calculate 2.25 yds ³ of grout to fill borehole to the top. R. Mayberry (Highland) orders for 3.5 yds ³ of grout. Leave site with S. Abston (SAIC), who will oversee grouting.
	1330	1400	HNu survey of the headspace sample is 8 ppm. Sample cuttings were not totally dry; condensation was observed on the sides of the jar and, an alcohol odor was noticed when drilling began. Consulted with V. Harness (SAIC), and he contributed the reading

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>SB-72a</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/8/93			to the factors stated above. V. Harness (SAIC) will oversee
(cont.)			grouting instead of S. Abston (SAIC). Leave SPAD landfill site.
	1400	1432	Oversight provided by V. R. Harness (SAIC). Crew installs 90 ft
			of 1.5-in. OD PVC tremie pipe to 87 ft BGS. Awaiting grout
			delivery.
	1432	1529	Grout arrives, pump tremie 3.5 yds ³ of neat, Type I Portland
			cement into bore. Grout level observed at approximately 30 ft
			BGS and is visibly dropping.
	1529	1537	Clean up, secure site, and depart.
3/9/93	0830	0845	Last night crew raised tremie above grout and left in bore at 27 ft
			BGS. Tag mud in bore at 12 ft BGS. Attempted tagging grout
			through tremie, maximum sounding depth = 60.5 ft BGS.
	1612	1630	Tremie 2 yds ³ into bore. Grout level visible at approximately 20 ft
			BGS. Secure site and depart.
3/10/93	0854	0905	Tagged grout at 82 ft BGS! Received permission from Bill
			Thedford and Kevin Jago (HSE) to use Hole Plug™ in this bore.
	0905	0923	Getting Hole Plug™ and potable water.
	0923	1025	Slowly pour eight 50 lb sacks (5.5 ft ³) of Hole Plug™ into bore and
			hydrate with 50 gallons of potable water. Will allow Hole Plug™
			to hydrate for 4-6 hrs. Tag water at 30 ft BGS and bentonite at
			70.6 ft BGS. Depart site.
	1759	1818	Crew installs 30 ft of 1.5-in. OD PVC tremie line to 28 ft BGS.
			Remainder of pipe had damaged threads. Crew tremies 2 yds ³

DATE	START	FINISH	ACTIVITY/COMMENTS
	TIME		

5-20-93	0904	0923	Technical oversight by Victor R. Harness (SAIC). Crew and oversight arrive at 1003 hr. Crew successfully pulls up 2 guard posts with no concrete anchor, but third post requires being cut with oxy-acetylene torch. Hydrogen sulfide odor from well bore and holes where posts were pulled up. Breathing zone analysis (BZA) and vapor check in well = 0.0 ppm = background (BCK).

Setting up rig. Casing is 6.5-in. outside diameter (OD) PVC/#80	0940	0923	
and stickup height = 2.4 ft. Tag a soft bottom inside well at 38.7 ft			
below ground surface (BGS). Screening of weighted probe on			
tape gives 0.0 ppm organic vapors, 50 cpm beta gamma = BCK			
and 0 cpm alpha = BCK.			
Steve Jones (HSEA) on site, states no excavation permit is	0953	0949	

needed and all paperwork is complete. Screen interior of well			
casing for organic vapors, results = 0.0 ppm. Jones requests			
continuous monitoring of BZA due to our location. Crew begins			
excavating small circulation pit.			
Crew rigging up 10 5/8-in. diameter tricone roller bit with	1041	0953	
subadapter. Total length = 4.6 ft. Crew departs for supplies and			

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1003</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-20-93	1105	1117	Begin drilling with compressed air only. Table height = 2.4 ft.
(cont.)			
	1117	1130	Advance to 2 ft BGS. Area accountability manager for Energy Systems, Bill Lambdon, arrives; rig shut down. Crew and rig begin stand-by while we are cleared to work in this area.
	1130	1148	Stand by.
	1148	1200	Steve Jones (HSEA) calls to instruct us to sign out and take lunch break. All depart.
	1301	1329	All return to site, all clear to continue. Resume drilling. Beta/gamma of excavated pit soils = 80 cpm. Add 25-ft drill rod and advance to 27 ft BGS. Clean bore and trip out. BZA from 2 ft to 27 ft BGS never strayed above 0.0 ppm. Cease drilling to install portable dikes around table to control cuttings/water run off.
	1329	1336	Awaiting crews return with portable dikes.
			Description of 0 ft to 27 ft cuttings:
			25% (by volume) is comprised of saprolitic rock fragments.
			Siliceous, punky, ranging in coloration from moderate yellowish brown (10YR 5/4) to dark yellowish orange (10YR 6/6). 70% of sample is medium dark gray (N4) finely crystalline dolomitic limestone which is aggregate transported to site. 5% of sample is PVC cuttings.
	1336	1341	Crew returns with PVC dikes and begins installing them.
	1341	1350	Trip tools in, resume drilling. Hole has collapsed to 13 ft BGS. The predominant fill material we have drilled through so far makes for

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1003</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-20-93			an unstable hole with lots of potential to cave and possibly hang
(cont.)			up the tools. Hole at surface has already washed out to 2 ft across.
			After crew adds 25-ft drill rod to continue drilling at 27 ft, they find
			bit has become hung by the hole collapsing.
	1350	1401	Steve Jones (HSEA) instructs us to withdraw tools and to tremie
			grout into hole.
	1401	1410	Tag fill in bore at 20 ft BGS and water at 18 ft. Grout delivery is
			here, waiting so decision is made to pour grout immediately before
			hole collapses.
	1410	1429	Pour 1.5 cubic yds of neat, Type I Portland cement into bore. Bore
			seems to be taking grout. Final liquid grout level is 6 ft BGS.
	1429	1503	Additional grout ordered for 5-21-93 at 1100 hr. Secure site and
			depart.
5-21-93	0940	0944	Tag depth to grout at 7.5 ft BGS. Depart.
	1252	1258	Grout delivery arrives. Pour 0.25 cubic yds into bore. Grout to
			surface. Depart.
5-24-93	1350	1400	Tag depth to grout at 1 ft BGS. Crew caps bore with clay and
			backfills cuttings pit. Clean site and depart.
			P&A of 1003 complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1007</u> Alternate Names: AP-07 W-03 YAP-03 No. 2
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>S-3 Ponds Functional Area</u> DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u> HELPERS: <u>Greg Anderson - Highland Drilling Co.</u> DRILL: <u>Altec Auger Truck</u>		DATE: START: <u>5-25-93</u> FINISH: <u>5-27-93</u> METHOD: <u>C</u> LOGGED BY: <u>V.R. Harness - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-25-93	0930	0956	Arrive at site. Technical oversight by V.R. Harness (SAIC). Crew unloading hollow-stem auger flights. Auger is 8.0-in. inside diameter (ID) and 12.0-in. outside diameter (OD). First flight (with bit) is 5.3 ft in length and subsequent flights are 5 ft long. Well casing is 6.5-in. OD PVC/#40 extending 2.1 ft above surface. Guard posts are creosote-treated poles. Break off riser stickup at ground surface. Depth to water = 11.9 ft below ground surface (BGS). Well total depth = 18.1 ft BGS. Breathing zone analysis around uncapped well = 0.0 ppm. Organic vapors inside casing stickup = 0.0 ppm. Background (BCK) radiation: beta/gamma = 60 cpm, alpha = 0 cpm.
	0956	1013	Rig up first auger flight and begin augering. Advance to 4.5 ft BGS. Beta/gamma of returns: at 2 ft BGS = 80 cpm, at 3 ft BGS = 100 cpm, at 4 ft BGS = 60 cpm. BZA: at 2 ft BGS = 0.0 ppm, at 3 ft BGS = 0.0 ppm, at 4.5 ft BGS = 0.0 ppm. Alpha at 4.5 ft BGS = 0 cpm.
	1013	1037	Add second flight of hollow-stem auger. Resume augering. Advance to 9 ft BGS. Beta/gamma: at 5 ft BGS = 70 cpm, at 7 ft BGS = 60 cpm, at 7.6 ft BGS = 60 cpm. BZA: at 5 ft BGS = 0.0 ppm, at 7.0 ft BGS = 0.0 ppm at 7.5 ft BGS = 0.0 ppm, at 9 ft BGS = 100 cpm. Organic vapors beside auger = 25 ppm at 9 ft BGS and 40 ppm inside casing but BZA 1 ft away = 0.0 ppm. Slight odor near open bore similar to ammonia.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1007</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-25-93	1037	1051	Let bore ventilate until organic vapors inside bore = 2 ppm.
(cont.)			
	1051	1054	Add 3rd auger flight and resume augering. Advance to 15 ft BGS.
			BZA at 13 ft BGS = 0.0 ppm. Organic vapors at 0.5 ft distance from
			bore at 15 ft BGS = 4 ppm. Organic vapors inside bore = 8 ppm.
			Beta/gamma at 15 ft BGS = 90 cpm. Returns become muddy at
			15 ft BGS. Alpha at 15 ft = 20 cpm.
	1054	1116	Allow bore to ventilate.
	1116	1126	Rig up 4th auger flight and resume augering. Advance to 20 ft
			BGS. BZA: at 17 ft BGS = 0 ppm, at 18 ft 0 ppm. Organic vapors
			at 18 ft BGS (0.5 ft from bore) = 2 ppm. Beta/gamma: at 17 ft BGS
			= 80 cpm, at 18 ft BGS = 80 cpm, at 20 ft BGS = 80 cpm. Alpha
			at 20 ft BGS = 20 cpm.
			Description of 0.0 to 20.0 ft returns:
			Reddish-brown fill material with wood, metal and ceramic debris.
			Angular chert fragments and weathered shale fragments. Satur-
			ation at 15 ft BGS.
	1126	1206	Trip out augers. Casing fragmented. Crew cleans and secures
			site. Depart.
	1411	1442	Crew mix and pour 16 (18.9 cubic ft) sacks of neat, Type I Portland
			cement into bore. Grout to surface.
5-27-93	am		Tag cement at 3 ft BGS. Crew plugs with clay and removes guard
			posts.
			P&A of 1007 complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1010</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>S3 Ponds Functional Area</u>		DATE: START: <u>5-21-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>5-27-93</u>	
HELPERS: <u>Greg Anderson, Steve Brown - Highland</u>		METHOD: <u>C</u>	
DRILL: <u>Altec Auger Truck</u>		LOGGED BY: <u>V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-21-93	0944	1008	Technical oversight by V.R. Harness-SAIC. Arrive at site. Crew setting up auger truck. Measure background (BCK) parameters: beta/gamma = 60 cpm, alpha = 0 cpm, organic vapors = 0.0 ppm. Crew will be augering with: 8.0-in. inside diameter (ID) and 12-in. outside diameter (OD) auger.
	1008	1047	Awaiting return of crew with cable choker replacement used to secure rotation motor.
	1047	1120	Fabricating choker from cable and clamps. Tag bottom of well at 23.3 ft below ground surface (BGS). Casing stick up is 1.3 ft of PVC/#40, 6.5-in. OD.
	1120	1131	Rig up first flight of auger with bit. Length = 5.3 ft. All subsequent flights are 5 ft long. Total of 5 flights = 25.3 ft.
	1131	1147	Begin augering. Advance to 4 ft BGS. Breathing zone analysis (BZA) = 0.2 ppm. Organic vapors 2 ft inside casing = 15 ppm. Adding auger flight.
	1147	1206	Advance to 10 ft BGS. At 5 ft BGS beta/gamma = 50 cpm. At 7 ft BGS, beta/gamma = 60 cpm. Adding auger flight. BZA at 10 ft BGS = 0.0 ppm. Organic vapors 2 ft inside casing = 4.0 ppm.
	1206	1233	Resume. Engine quits. Break for possible repair.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1010</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-21-93	1206	1233	Description of 0 ft to 10 ft auger returns:
(cont.)	(cont.)	(cont.)	
			Olive brown (2.5 Y 4/4) silty, clayey loam with 0.5 mm to 3 cm dark
			gray (2.5 Y 4/0) angular chert fragments and occasional fragments
			of dolostone aggregate from surface.
	1233	1245	Resume. Crew failed to switch gas tanks, problem corrected.
			Advance to 15 ft BGS. Beta/gamma = 50 cpm. 10 ft to 15 ft returns
			a continuation of 0 ft to 10 ft interval with more moisture. Returns
			beginning to ball up. Adding auger flight. BZA = 0.0 ppm, organic
			vapors 2 ft inside casing = 1 ppm.
	1245	1347	Shut down rig due to lightning. Lunch break.
	1347	1413	Resume. Advance to 20 ft. Beta/gamma at 18 ft = 50 cpm, at 16 ft,
			80 cpm. BZA at 20 ft = 0.0 ppm. Adding auger flight. Returned
			cuttings continuation from preceding interval. Rock fragments had
			increased to 6 ft BGS. From 16 ft to 20 ft no rock fragments.
			Returns are mud.
	1413	1439	Resume. Advance to target depth of 24 ft BGS (refusal). Last 4 ft
			slow advance. Beta/gamma at 22 ft = 60 cpm, at 23 ft = 80 cpm;
			at 24 ft = 80 cpm.
			Description of 20 ft to 24 ft sample: Olive brown (2.5 Y 4/4) moist
			clay with quartz sand from well sand pack.
	1439	1542	Trip out. Extract a total of 23.2 ft of PVC/#40 casing and screen
			(minus 1.3 ft stick up, which would bring total to 24.5). Bottom 10 ft
			of casing is saw-slotted every 6-in. water audibly running into open
			hole. Secure site and depart.

WELL NO. 1010

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1011</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			Alternate Names: AP-11, YAP-05, W-05, No. 05
LOCATION: <u>S3 Ponds Functional Area</u>			DATE: START: <u>5-24-93</u>
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>			FINISH: <u>5-25-93</u>
HELPERS: <u>Greg Anderson, Steve Brown - Highland</u>			METHOD: <u>C</u>
DRILL: <u>Altec Auger Truck</u>			LOGGED BY: <u>V.R. Harness - SAIC</u>

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-24-93	1302	1328	Technical oversight by V.R. Harness-SAIC. Arrive at site. Crew positioning auger truck. Well stick-up is broken but remains in place. Remove 3.7 ft length of 6.5-in. outside diameter (OD) PVC/#40 casing. Breathing zone analysis (BZA) = 0.0 ppm. Background (BCK) radiation: beta/gamma = 60 cpm, alpha = 0 cpm. Tag bottom of well at 20 ft BGS. Beta/gamma around well = BCK.
	1328	1333	Rig up with 8.0-in. inside diameter (ID), 12.0-in. outside diameter (OD), hollow-stem auger. First flight with bit = 5.3 ft length. All subsequent flights = 5.0 ft length. Begin augering. Soil is brown silty loam with gravel aggregates and concrete fragments. Advance to 5 ft below ground surface (BGS), alpha = 0 cpm.
	1333	1348	Add second auger flight. Resume augering and advance to 9 ft BGS. At 9 ft BGS returns are medium dark gray (N4) moist clay with beta/gamma = 700 cpm.
	1348	1408	Stop rig. Crew on standby, upwind and 15 ft away from bore. Radiation is beta and is undetectable from 2 ft away. Contacting Kevin Jago, HSE for directive.
	1408	1431	Radiation is at 4200 decays per minute (dpm) or 3900 dpm above BCK. Upgrade level for personal protective equipment is 5000 dpm above BCK. Jago (HSE) instructs us to go ahead but that returns >500 cpm above BCK must be drummed. Awaiting delivery of US DOT approved 55-gal. drums.

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1011</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-24-93	1445	1450	Advance to 13 ft BGS, maximum 600 cpm beta/gamma, returns containerized.
(cont.)			
	1450	1456	Continue to 15 ft BGS, maximum beta/gamma level of returns drops to 200 cpm. Add auger flight and resume.
	1456	1514	Advance to target depth of 21 ft BGS. Collect composited sample of returns from 0-21 ft BGS, radiation of this composite, beta/gamma = 200 cpm, alpha = 0 cpm.
	1514	1603	Trip out. Extract 20 ft of PVC/#40. Bottom-most 10 ft of casing saw-slotted every 6-in. of length to form screen. Grout delivery arrives. Pour 0.5 cubic yards of grout into bore. Cement at surface.
	1603	1618	Screen all auger flights, extracted casing, tools, boots, and gloves which may have contacted contaminated returns. All clean and not over 160 cpm (100 cpm + 60 cpm BCK). Secure site and depart.
5-25-93	1208	1273	Tag grout at 3.7 ft BGS. Depart.
	1430	1700	Crew cuts protective posts with oxy-acetylene torch. Hole capped. Secure site and depart.
			P & A of 1011 complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1013</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>S3 Ponds Functional Area</u>		DATE: START: <u>8-4-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Company</u> <u>Steve Brown/Russell Jones - Highland</u>		FINISH: <u>8-10-93</u>	
HELPERS: <u>Drilling Company</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll Rand T4W</u>		LOGGED BY: <u>Tim J. Coffey - SAIC</u> <u>Susan L. Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-4-93	0820	0825	Arrive at site. Technical oversight provided by Susan L. Abston (SAIC). Tag bottom of 1013 at 44.9 ft below ground surface (BGS). Records report total depth as 42 ft BGS (discrepancy).
	0825	0905	Crew arrives; driller Hubert Hall; helpers, Randy Phillips and Russell Jones of Highland Drilling Co. Rig up 0.8 ft long, 6 1/8-in. diameter tricone roller bit. Table height = 3.5 ft. Torch pull holes in well casing. Casing is 6.5-in. outside diameter (OD) and 6.25-in. inside diameter (ID).
	0905	0928	Trip down tools. Ream open interval of well to 47.2 ft BGS. Analysis of organic vapors in breathing zone = 0.0 ppm initially and 0.0 ppm at 30 ft BGS. Encountered blackish water at approximately 25 ft BGS. Description of composited returns: blackish-brown to gray shale (N4) with 60% of volume comprised of grout fragments.
	0928	1005	Trip out tools. Tag bore at 47.2 ft BGS. Insert 40 ft of 1.5-in. OD PVC tremie pipe to 37 ft BGS.
	1005	1026	Mix and tremie 4 sacks of neat, Type I Portland cement. Cement to cure overnight before over washing casing. Secure site and depart.
8-5-93	0918	0938	Technical oversight by T.J. Coffey (SAIC). Arrive at 1013 site. Drill crew has already rigged up with an 8.0-in. ID, 9.5-in. OD

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1013</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-5-93			washover pipe; length = 24.5 ft, length of drilling subadapter = 1.0
(cont.)			ft, total length of washover assembly = 25.5 ft. Tag cement level
			in well at 19.2 ft BGS. Table height = 3.6 ft. B. Thedford (HSEA)
			and R. Phillips (Highland) arrive on site.
	0938	0958	Commence over wash. Over wash surface casing from ground
			surface to 21.9 ft BGS. Washover pipe binding on casing at 9.5 ft
			BGS, and again at approximately 11.5 ft BGS. Ratty and hard
			drilling at 21.7 ft BGS (annular cement). Cuttings from 0.0 ft to
			21.9 ft BGS consist primarily of: grayish-red (5R 4/2) and medium
			dark gray (N4), thinly laminated shale; greenish-black (N2) massive
			micrite; and dark greenish-gray (5GY 4/1) and light olive gray
			(5Y 6/1) banded, glauconitic, fine-grained sandstone to sandy
			shale along with grayish-orange (10YR 6/2) to light brown
			(5YR 5/6) clayey soil. No cement fragments were observed while
			over washing the casing.
	0958	1015	At 21.9 ft BGS. Flushing borehole clean. Now observing scattered
			cement fragments in returns.
	1015	1027	Trip washover pipe out of the hole, and rig down.
	1027	1034	Attempt to pull casing. Casing is sluggish at first, then pulls out
			easily. Pull all of casing out of the hole.
	1034	1050	Driller's helper departs to get another chain to lay casing down.
			Screening cuttings from 0.0 ft to 21.9 ft BGS (see Well Cuttings
			Field Screening/Disposal Sheet).
	1050	1055	Helper returns with chain. Lay casing down on ground. A total of
			30.6 ft of casing extracted from this well.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1013</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-5-93	1055	1102	Rig up with a 10-5/8-in. diameter tricone bit on a subadapter;
(cont.)			length of assembly = 6.3 ft, table height = 3.5 ft. Add drill rod.
	1102	1106	Trip into borehole. Encounter resistance at 22.3 ft BGS: begin
			reaming portion of hole that was not cut with the washover pipe.
			Ream to 27.8 ft BGS. Cuttings from this interval are almost
			exclusively medium light gray (N6) cement fragments with minor
			dark reddish-brown (10R 3/4), weathered shale and dark yellowish-
			orange (10YR 6/6) clayey soil.
	1106	1111	At 27.8 ft BGS. Add drill rod.
	1111	1113	Continue reaming borehole. Ream from 27.8 ft to 30.8 ft BGS.
			Cuttings from this interval include approximately equal amounts of
			grayish-red (5R 4/2), thinly laminated shale and greenish-black
			(5G 2/1)/light olive gray (5Y 6/1), banded, glauconitic, fine-grained
			sandstone to sandy shale with minor weathered rock fragments
			and olive gray (5Y 4/1), rounded, uncured cement lumps.
	1113	1118	At 30.8 ft BGS. Clean out borehole.
	1118	1124	Trip out, rig down bit and subadapter assembly. Tag bottom of
			hole at 30.8 ft BGS. Calculate a borehole volume to 4.0 ft BGS of
			17.3 cubic ft, equivalent to 14.7 sacks of Type I Portland cement.
	1124	1214	Run 3, 10.0-ft sections of 1.5-in. OD PVC tremie pipe into the
			borehole to approximately 29 ft BGS. Set up diaphragm hand
			pump. Mix and pump-tremie 14 sacks (16.5 cubic ft) of neat,
			Type I Portland cement into the borehole. Circulate 100% cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1013

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT**
continued

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1014</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			Alternate Names: Y-05/AP-14
LOCATION: <u>S3 Ponds Functional Area</u>			DATE: START: <u>7-15-93</u>
DRILLERS: <u>Hubert Hall - Highland Drilling</u>			FINISH: <u>7-27-93</u>
HELPERS: <u>Steve Brown/Rick Thomas - Highland</u>			METHOD: <u>B</u>
DRILL: <u>Ingersoll-Rand XL-750</u>			LOGGED BY: <u>S.L. Abston - SAIC</u> <u>V.R. Harness - SAIC</u>

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-15-93	0920	1005	Arrive at site. Technical oversight provided by S.L. Abston (SAIC).
			Tag bottom of bore at 46.5 ft below ground surface (BGS). Rig up
			6 1/8-in. diameter tricone roller bit 0.8 ft long.
	1005	1020	Trip in bit and tools. Table height = 2.2 ft. Breathing zone analysis
			indicates 0.4 ppm organic vapors. Background organic vapors
			0.0 ppm. Background radiation = 60 cpm beta/gamma and 0 cpm
			alpha. Ream to 48.5 ft BGS. Description of reaming cuttings: 50%
			medium dark gray shale (N4) with white (N1-N2) grout fragments.
	1020	1030	Trip out tools. Pass technical oversight to V.R. Harness - SAIC and
			depart site.
	1030	1130	Crew inserts 30 ft of 1.5-in. OD PVC tremie pipe to 29 ft BGS. Mix
			and tremie 3 sacks of neat, Type I Portland cement. Will allow
			cement to cure overnight before overwash. Secure site and
			depart.
7-16-93	0832	0953	Arrive on site. Crew rigs up 9.5-in. OD (at bit) 8.25-in. ID washover
			pipe. 24.6 ft of washover pipe. Length with subadapter = 25.5 ft.
			Table height = 2.0 ft. The steel 6.5-in. OD surface casing stickup
			= 0.5 ft. Grout level tagged with weighted tape at 34.5 ft BGS.
			Bottom of surface casing at 36.4 ft BGS. Crew torches pull holes
			in casing.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1014</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-16-93	0953	1028	Begin overwash. Advance to 23.5 ft BGS. Trip out.
(cont.)			
	1028	1045	Rig down washover pipe. Description of 0.0 to 23.5 ft BGS overwash sample: 75% yellow (10YR 7/8) plastic, silty clay. 25% dark gray (5Y 4/1) calcareous shale.
	1045	1200	Attempt to pull casing. Crew attempting to pull again. Casing tears.
	1200	1407	Crew departs for lunch and tools to facilitate casing pull.
	1407	1416	Crew returns with a fabricated lifting bell to fit over casing and pull. During subsequent pull attempt casing shears again.
	1416	1439	Crew decides to get more washover pipe and overwash casing deeper. Will be prepared to resume next working day. Secure site and depart.
7-19-93	0840	0911	Arrive at site. Crew unloads second piece of washover pipe 9.5-in. OD, 8.25-in. ID. Length = 16.5 ft.
	0911	0917	Rig up second piece of washover pipe. Total length of washover in string = 41.1 ft. Table height = 2.0 ft. Begin overwash.
	0917	0944	Advance to 36 ft BGS.
	0944	1115	Trip out. Description of 23.5 to 36 ft BGS overwash cuttings sample = 95% dark gray (N4) calcareous shale with (N7) white grout fragments.
	1115	1210	Extract 37 ft of 6.5-in. OD steel surface casing (1.0 ft of this was stickup). Tag bore firm at 37 ft BGS. Calculate 18 sacks to fill 37 ft

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1014

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT
continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1017</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>S3 Ponds Functional Area</u>		DATE: START: <u>7-20-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>8-10-93</u>	
HELPER: <u>Steve Brown - Highland Drilling</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>T.J. Coffey - SAIC</u> <u>V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-20-93	0820	0911	Technical oversight provided by V.R. Harness (SAIC). Crew setting up drill rig.
	0911	1054	A hydraulic valve malfunctions. Crew departs to get parts and replace valve. No leak.
	1054	1121	Rig repaired. Rig up 6 1/8-in. diameter tricone roller bit to ream open interval of well.
	1121	1131	Table height = 3 ft. Begin reaming. Encounter stagnant water at 15 ft below ground surface (BGS). Advance to 47.5 ft BGS.
	1131	1147	Insert 40 ft of 1.5-in. outside diameter (OD) tremie pipe into bore to approximately 37 ft BGS. Calculate 4 sacks of cement required to fill open interval (4.72 cubic ft).
	1147	1209	Mix and tremie cement. Secure site and depart.
7-21-93	0818	0844	Technical oversight by T.J. Coffey - SAIC. Arrive at 1017 site. Tag cement level at 21.0 ft BGS (8.0 ft above the top of the reported bottom of casing). Crew is digging a cuttings pit, and replacing batteries on the drill rig.
	0844	0850	Rig up with a 24.5-ft -long section of 8.0-in inside diameter (ID), 9.5-in. OD washover pipe; length of subadapter = 1.0 ft, table height = 2.9 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1017</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-21-93	0850	0854	Commence overwash with compressed air and water. Overwash
(cont.)			casing to 4.0 ft BGS. Returns from 0.0 to 1.5 ft BGS consist of
			grayish-brown (5YR 3/2) to dusky brown (5YR 2/2) surface soil.
			From 1.5 ft to 4.0 ft BGS, the cuttings are: medium dark gray (N4)
			to medium bluish-gray (5B 5/1) fresh shale fragments with pale
			yellowish-orange (10YR 8/6), clayey soil, and moderate brown
			(5YR 3/4) agglomerations of small rock fragments and iron oxide
			cement.
	0854	0930	At 4.0 ft BGS. Shut off drill rig, waiting for auditors who will be on-
			site at approximately 0930 hrs to observe Plugging and
			Abandonment.
	0930	1022	Start drill rig. Continue overwash. Overwash casing from 4.0 ft to
			17.7 ft BGS. At 6.5 ft BGS, appear to be making more water than
			what is being added. K. Jago (HSEA) arrives at site with auditors:
			P. Barndt (DOE), B. Hedberg (Analysas), and H. Crabtree (TOA)
			at 0938 hrs. Rate of advance appears to slow at 9.0 ft BGS. The
			cuttings from 4.0 ft to 15.0 ft BGS are the same as the 1.5-ft to 4.0-ft
			interval. The cuttings from 15.0 ft to 17.7 ft BGS are the same as
			above, but include fragments of light gray (N7) cement. Advance
			rate slows again at 16.8 ft BGS.
	1022	1109	Subadapter weld breaks. Shut down drill rig. Depth of washover
			pipe is 17.7 ft BGS. D. Hewitt (Highland) is called to come to site
			and re-weld subadapter. While waiting, auditors examine the site
			and scrutinize the P&A procedures with K. Jago (HSE) and
			oversight.
	1109	1232	D. Hewitt (Highland) arrives. Makes repairs on subadapter.
	1232	1310	Crew breaks for lunch.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1017</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-21-93	1310	1353	Resume overwash. Table height = 2.8 ft. Overwash casing from
(cont.)			17.7 ft to 23.0 ft BGS. Cuttings consist of: dark yellowish-orange
			(10YR 6/6), weathered shale and dark reddish-brown (10R 3/4),
			weathered sandy shale; dark gray (N3) to dark greenish-gray
			(5GY 4/1), thinly laminated, calcareous shale; and light gray (N7)
			to very light gray (N8) cement fragments. Observe a musty odor
			at about 21 ft BGS: breathing zone analysis = 1.0 - 1.2 ppm. At
			22.0 ft BGS, have less water circulating from hole. Water truck
			runs out of water.
	1353	1416	At 23.0 ft BGS. Flush borehole clean.
	1416	1435	Break connection and trip washover pipe out of the hole. S. Jones
			(HSEA) returns to site with auditors.
	1435	1440	D. Hewitt burns lifting holes in top of casing.
	1440	1551	Attach fabricated lifting device and attempt to pull casing: casing
			is loose enough to pull. Remove lifting device and pull casing to
			top of mast with chain. Burn hole in casing, allow water to drain,
			S. Jones (HSEA) and auditors depart. Continue pulling casing.
			Extract a total of 28.7 ft of 6.5-in. OD steel casing in 2 pieces.
	1551	1558	Crew retrieves drill bit and stabilizer from the last P&A site.
	1558	1606	Rig up with a 9 7/8-in. diameter tricone bit and subadapter; length
			= 6.3 ft. Plan to ream remainder of cased portion of well on
			7-22-93. Clean up, secure site, and depart.
7-22-93	1339	1402	Technical oversight assumed by V.R. Harness (SAIC). Arrive at
			site. Crew rigs up 9 7/8-in. diameter tricone roller bit. Bit and
			subassembly = 6.2 ft long. Table height = 3.0 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1017

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT
continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1022</u> Alternate Names: <u>Y-13/AP-22</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>S3 Ponds Functional Area</u> DRILLERS: <u>Hubert Hall - Highland Drilling</u> HELPERS: <u>Steve Brown/Mark Baker - Highland</u> DRILL: <u>Ingersoll-Rand XL-750</u>		DATE: START: <u>7-13-93</u> FINISH: <u>7-27-93</u> METHOD: <u>B</u> LOGGED BY: <u>V.R. Harness - SAIC</u> <u>T.J. Coffey - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-13-93	0815	0832	Arrive at site. Technical oversight provided by V.R. Harness (SAIC). Crew setting up site. Rig up 6 1/8-in. diameter tricone roller bit to ream open interval.
	0832	0841	Tripping in 6 1/8-in. bit. Bit is 0.8 ft long. Table height = 3.0 ft.
	0841	0845	At 22.6 ft below ground surface (BGS). Have encountered no water and no resistance. Add 25 ft drill rod and resume tripping in.
	0845	0850	Advance to 47 ft BGS, encounter first resistance to advance rate. Returning organic debris. Encountered water at 23 ft BGS.
	0850	0902	Continue advance to 49.6 ft BGS (1.6 ft below original TD) cleaning hole.
	0902	0915	Trip out tools. Calculate 20 ft of 6 1/8-in. open interval will require 4.0 cubic ft of grout.
	0915	0931	Crew departs for cement.
	0931	0952	Crew returns with cement. Insert 50 ft of 1.5-in. OD PVC tremie pipe into bore to 46 ft BGS.
	0952	1010	Crew mixes and pump tremie 4, 96-lb. sacks of neat, Type I Portland cement into bore.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1022</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-13-93	1010	1025	Will allow grout to cure overnight before removing casing.
(cont.)			Description of 30 to 49.6 ft BGS reaming cuttings: 95% greenish-black (5GY 2/1) silty shale with 5% rotten wood, bark, and organic debris. Secure site and depart.
7-14-93	0810	0846	Arrive at site. Tag grout in bore at 27.7 ft BGS. Await crew.
	0846	1011	Crew arrives. Rig up fabricated washover pipe 9.5-in. OD (at bit), 8.25-in. ID, washover pipe is 25.5 ft from bit to subattachment. Pipe alone is 24.6 ft long. Torch pull holes in well casing (6.5-in. OD steel).
	1011	1028	Begin overwash. Table height = 3 ft. Breathing zone analysis = 0.0 ppm. Advance to 22.5 ft BGS (maximum depth attainable with 1st washover pipe segment).
	1028	1041	Crew cleans bore and trips out washover pipe.
	1041	1100	Description of 0.0 to 22.5 ft overwash cuttings sample: 90% dark grey shale (2.58 4/0) blotchy with irregular fracture. 5% light yellowish-brown (2.5Y 6/4) weathered shale, 5% white (2.5Y 8/0) grout fragments. Accessory organic debris. Shales observed are very uniform in texture with unweathered fragments being calcareous and reacting with both 10% HCL and Aligarin-Red.
	1100	1129	Calculate 14 sacks of grout required to fill 30 ft of 9 7/8-in. reamed bore. Crew extracts 31 ft of 6.5-in. OD, 6.25-in. ID steel surface casing (3 ft of this was stickup).
	1129	1305	Crew departs for lunch and to get grout.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1022</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 3 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-14-93	1305	1325	Crew returns with 9 7/8-in. diameter tricone roller bit to ream
(cont.)			washover bore. Bit and subadapter = 6.2 ft long. Rig up bit and
			commence reaming. Table height = 3.0 ft.
	1325	1333	Ream to 31 ft BGS. Encountered standing water at 16.2 ft.
	1333	1359	Trip out tools. Description of reaming cuttings: grout fragments =
			45%, shale (of same composition as 0.0 to 22.5 overwash sample)
			= 55%. Tag bore at 31.5 ft BGS.
	1359	1427	Plan to grout tomorrow. Crew secures site and departs.
7-15-93	1130	1202	Arrive at site. Insert 20 ft of 1.5-in. OD PVC tremie pipe to 19 ft
			BGS. Mix and pump tremie 12 sacks of neat Portland Type I
			cement into bore. Grout to surface but seems to be dropping
			slightly.
	1202	1214	Clean, secure site. Depart.
7-16-93	0852	0904	Tag depth to grout at 8 ft BGS. Depart site.
7-20-93	1021	1049	Mix and pour 1 sack of cement grout into bore. Secure site and
			depart. Liquid grout level at 1.5 ft BGS.
7-27-93	1036	1040	Technical oversight assumed by T.J. Coffey (SAIC). Grout level
			at 2 ft BGS. Well capped with clay/soil.
			P&A of Well 1022 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1024</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>S3 Ponds Functional Area</u>		DATE: START: <u>8-18-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>8-20-93</u>	
HELPERS: <u>Steve Brown/Randy Phillips - Highland</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll Rand-T4W</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-18-93	0825	0847	Arrive at 1024 site. Drilling rig set up over well location. Rig and down-hole equipment appears to have been adequately steam cleaned. Measure depth of well at 37.8 ft below top of casing (BTOC) = 37.0 ft below ground surface (BGS). Water level is 2.5 ft BTOC = 1.7 ft BGS. Note: Subsurface Data Base (Y/TS-881) reports total depth (TD) of well to be 40.0 ft. Crew arrives and performs pre-work equipment inspections.
	0847	0850	Thread a 6 1/8-in. diameter tricone bit onto a drill rod; length of bit is 0.5 ft, length of drill rod plus bit is 25.5 ft, table height = 3.0 ft.
	0850	0854	Trip bit into well, encounter water almost immediately: foul, black water returns.
	0854	0856	Encounter resistance at approximately 20 ft BGS, commence reaming open interval. Ream from 20.0 ft to 22.5 ft BGS.
	0856	0900	At 22.5 ft BGS. Add drill rod.
	0900	0905	Continue reaming open interval. Ream from 22.5 ft to 42.5 ft BGS. Returning black sediment at 34.0 ft BGS. Hard, ratty drilling (advance rate decreases) at 37.0 ft BGS.
	0905	0913	At 42.5 ft BGS. Clean out borehole.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1024</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-18-93	0913	0920	Trip out, rig down bit. Tag bottom of reamed hole at 43.2 ft BGS.
(cont.)			Calculate a borehole volume (to 20 ft BGS) of 4.7 cubic ft,
			equivalent to 4.0 sacks of Type I Portland cement.
	0920	0928	Run 4, 10.0-ft sections of 1.5-in. outside diameter (OD) PVC
			tremie pipe into the borehole to 38.5 ft BGS.
	0928	0944	Mix and pump-tremie 4 sacks (4.7 cubic ft) of neat, Type I Portland
			cement into the borehole.
	0944	1005	Complete. Pull out tremie pipe. Clean up, secure site, and depart.
8-19-93	0824	0852	Arrive at 1024 site. Tag cement level at 13.8 ft BTOC - 13.0 ft BGS.
	0852	0905	Crew arrives and performs pre-work equipment inspections.
	0905	0912	Rig up with a section of 9.5-in. OD, 8.0-in. inside diameter (ID)
			washover pipe; length = 24.5 ft, length of subadapter = 1.0 ft, total
			length = 25.5 ft, table height = 3.1 ft.
	0912	0932	Commence over wash. Over wash casing with compressed air
			only from the ground surface to 22.4 ft BGS. Encounter a small
			amount of water at 6.4 ft BGS: cuttings became muddy. Cuttings
			from 0.0 ft to 6.4 ft BGS consist of grayish-brown (5YR 3/2) to light
			brown (5YR 5/6), moist, clayey soil and subsoil. Cuttings from 6.4
			ft to 18.0 ft BGS return in a pale yellowish-brown (10YR 6/2), wet,
			clayey slurry. At 18.0 ft, the cuttings dry up and the washover pipe
			encounters resistance: suspect the bedrock surface. A large
			amount of water is encountered at 20.0 ft BGS. Cuttings from 18.0
			ft to 22.4 ft consist primarily of medium dark gray (N4) laminated
			shale; with minor amounts of medium dark gray (N4) to dark
			greenish-gray (5G 4/1), massive micrite, and grayish-red (5R 4/2),

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1024</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-19-93			thinly laminated shale. Interval also contains rare lumps of olive
(cont.)			gray (5Y 4/1) uncured cement.
	0932	0945	At 22.4 ft BGS. Add water and flush out borehole.
	0945	0952	Interrupt operations to scrape thick mud from around well location
			with dozer.
	0952	1005	Trip out washover pipe. Casing has dropped down into the
			borehole approximately 3 ft. Crew needs a special clamp that
			grips the casing wall. The clamp is at another site and will take
			some time to retrieve.
	1005	1253	Waiting for clamp to be brought to site. C. Green (Energy Systems
			Internal Auditing) is onsite briefly. She examines R. Phillip's drilling
			certification, asks several questions about the drill rig, then de-
			parts. Break for lunch.
	1253	1319	Clamp arrives at site. Pull casing up above ground surface. Burn
			a lifting hole in well casing. Extract 20.0 ft of 6.5-in OD steel casing.
			Tag bottom of hole at 22.5 ft BGS. Calculate a borehole volume (to
			4.0 ft BGS) of 9.1 cubic ft, equivalent to 7.7 sacks of Type I Portland
			cement.
	1319	1333	Lower mast on drill rig, and move rig off site.
	1333	1336	Run 2, 10.0-ft sections of 1.5-in. OD PVC tremie pipe into the
			borehole to 19.0 ft BGS.
	1336	1415	Mix and pump-tremie 10 sacks (11.8 cubic ft) of neat, Type I
			Portland cement into the borehole. Circulate approximately 50%
			cement.

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1025</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>S3 Ponds Functional Area</u>		DATE: START: <u>7-26-93</u>	
DRILLERS: <u>Russell Jones - Highland Drilling Co.</u>		FINISH: <u>8-10-93</u>	
HELPERS: <u>Steve Brown - Highland Drilling Co.</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u> <u>Victor Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-26-93	1246	1256	Arrive at site, drill rig already positioned over well. Note: Well was originally labelled "No Number/Unknown." The inside of the surface casing was marked "Y-16", which, according to the Subsurface Data Base (Y/TS-881) is another name for well 1025. This well will henceforth be referred to as 1025. Drill rig has been steam-cleaned. Casing stick-up = 1.2 ft. Tag bottom of well at 44.8 ft below ground surface (BGS).
	1256	1307	Crew arrives and completes positioning rig over the well.
	1307	1311	Thread a 6.25-in. diameter tricone bit to the end of a 25-ft drill rod; length of bit = 0.8 ft, table height = 2.9 ft.
	1311	1328	Trip bit into casing. Encounter water at approximately 19.5 ft BGS.
	1328	1344	Begin to return to rock fragments at 30 ft BGS. Commence reaming open interval. Ream from approximately 30.0 ft to 47.9 ft BGS. Observe foul smelling, black returns from about 45 ft to end of rod.
	1344	1348	Continue reaming open interval. Ream from 47.9 ft to 51.5 ft BGS. Reaming becoming more difficult at 48.9 ft BGS: suspect bottom of open interval/TD of well.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1025</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-26-93	1348	1415	At 51.5 ft BGS. Clean out borehole. S. Brown (Highland) departs
(cont.)			to get pump to cement reamed open interval. Screening cuttings
			from 30.0 ft to 51.5 ft BGS (see Well Cuttings Field Screening/
			Disposal Sheet). Description of cuttings:
			Predominantly grayish-red (5R 4/2) and medium gray (N5),
			thinly laminated shale; with common greenish-gray (5GY 6/1)
			and dark greenish-gray (5GY 4/1), banded, very fine-grained
			sandstone and sandy shale. Minor amounts of leaves, pine
			needles, small mammal bones, and hair.
	1415	1419	Begin tripping out of the well. Rod comes unthreaded at the top
			of the mast. Shut off rig.
	1419	1433	Wait for S. Brown to return.
	1433	1504	Steve returns to site. Crew using chain wrench to break connection
			at the table. Lack of tools at the site is slowing the work. Continue
			tripping rods and bit out of the well.
	1504	1521	Hydraulic hose on carousel arm bursts while stacking a rod. Shut
			off drill rig. Less than 8 oz. of hydraulic fluid spilled. None of the
			fluid reaches the ground, but pools up at several locations on the
			rig. Using oil absorbent pads on pooling fluid. Crew departs for
			tools and replacement hose. Secure site. Oversight departs.
7-27-93	0914	0925	Arrive at 1025 site, right behind drill crew. Crew puts new hydraulic
			hose on rig.
	0925	0937	Start up drill rig, continue tripping out of the well. Tag bottom of well
			at 51.5 ft BGS. Calculate the volume of the reamed open interval
			at 4.6 cubic ft, equivalent to 4.0 sacks of neat, Type I Portland
			cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1025</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			
			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
7-27-93	0937	0943	Run 5, 10.0-ft sections of 1.5-in. inside diameter (ID) PVC tremie
(cont.)			pipe into the well to approximately 46 ft BGS.
	0943	1019	Mix and gravity tremie (attempted to use diaphragm pump to
			tremie cement, but rubber bladder is stretched and worn and will
			not work) 4 sacks (4.7 cubic ft) of neat, Type I Portland cement into
			the well. Circulate water.
	1019	1028	Complete. Pull out tremie pipe. Clean up. Secure site and depart.
7-28-93	0831	0835	Arrive at 1025 site. Tag cement level at 30.6 ft BGS (0.6 ft below
			bottom of surface casing). Depart site.
8-2-93	1359	1451	Technical oversight assumed by Victor R. Harness (SAIC). Crew
			rigging up 25.5 ft length of 9.5-in. outside diameter (OD) (at bit)
			8.25-in. ID washover pipe.
	1440	1451	Commence overwash. Table height 3.0 ft.
	1451	1549	Advance to 22 ft BGS and trip tools out. Will attempt to pull casing
			tomorrow. Returned cuttings from 0 ft to 22.0 ft BGS are: 75% dark
			gray to gray (N4 to N5) silty shale with 25% strong brown
			(7.5 YR 5/8) silty shale. No cement fragments in returns.
	1549	1615	Secure and depart site.
8-3-93	0840	0906	Arrive at 1025 site. Crew trips in washover and cleans out hole.
			Trip out washover and remove from rig.
	0906	1019	Crew torches pull hole in casing. Extract 29.6 ft of 6.5-in. OD,
			6.25-in. ID steel casing from hole. Tag bore at 30 ft BGS, no water
			in hole. Top of grout is 30.6 ft BGS. Minor borehole collapse has

WELL NO. 1025

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1025A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 5
LOCATION: <u>S3 Ponds Functional Area</u>		DATE: START: <u>8-6-93</u>	
DRILLERS: <u>Hubert Hall/Randy Phillips - Highland Drilling Co.</u>		FINISH: <u>8-10-93</u>	
HELPERS: <u>Russell Jones/Steve Brown - Highland</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll-Rand T4W</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-6-93	0918	1000	Arrive at well site, drillers arrive shortly after. It is raining hard: plan to wait a while to see if the rain lets up. Drill rig is positioned over the well.
	1000	1016	The rain appears to be letting up. Inspect drill rig: rig appears to have been adequately steam cleaned. Tag bottom of well at 43.5 ft below top of casing (BTOC) = 42.2 ft below ground surface (BGS). This well has no markings or tags to indicate its name/number. HSEA to designate the Well 1025A. Drill crew spreads plastic under drill rig.
	1016	1024	Thread a 6 1/8-in. diameter tricone bit onto one of the drill rods. Length of the bit is 0.8 ft.
	1024	1031	Trip into well. Return water is black. Begin to get rock fragments in returns at approximately 30-31 ft BGS, suspect top of open interval at this point: commence reaming open interval. Ream to 44.6 ft BGS. Foul, black returns beginning at about 39 ft BGS (sediment/debris accumulation at bottom of well). Ratty drilling (suspect bottom of open interval) at 41.6 ft BGS. Cuttings from about 31 ft to 44.6 ft BGS consist primarily of approximately equal amounts of grayish-red (5R 4/2), thinly laminated shale and dark greenish-gray (5GY 4/1) and light olive gray (5Y 6/1), to light brownish gray (5YR 6/1), banded, glauconitic, fine-grained sandstone to sandy shale.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1025A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-6-93			gray (5Y 6/1), to light brownish gray (5YR 6/1), banded, glauconitic,
(cont.)			fine-grained sandstone to sandy shale.
	1031	1035	At 44.6 ft BGS. Clean out borehole.
	1035	1043	Trip out. Remove 6 1/8-in. bit. Tag bottom of borehole at 44.6 ft
			BGS. Calculate the volume of the reamed open interval (assume
			casing to 30 ft BGS) of 3.2 cubic ft, equivalent to 2.7 sacks of Type I
			Portland cement.
	1043	1057	Run 4, 10.0-ft sections of 1.5-in. outside diameter (OD) PVC
			tremie pipe into borehole to approximately 38 ft BGS. Mix and
			pump tremie 3 sacks (3.5 cubic ft) of neat, Type I Portland cement
			into the borehole.
	1057	1113	Complete. Pull out tremie pipe. Clean up, secure site, and depart.
8-9-93	0827	0900	Arrive at 1025A well site. Tag cement level at 25.1 ft BGS. Drill
			crew arrives.
	0900	0922	Rig up with a section of 8.0-in. inside diameter (ID), 9.5-in. OD steel
			washover pipe; length = 24.5 ft, length of subadapter = 1.0 ft, total
			length = 25.5 ft. Table height = 4.7 ft.
	0922	0942	Commence over wash with compressed air only. Over wash
			casing from ground surface to 20.8 ft BGS. Slightly ratty drilling at
			approximately 11.0 ft BGS. Lithology change at 15.8 ft BGS as
			cuttings also become moist. Cuttings from 0.0 ft to 15.8 ft BGS
			consist of pale brown (5YR 5/2) to grayish-brown (5YR 3/2),
			weathered, thinly laminated shale; dark greenish-gray (5G 4/1)
			glauconitic sandstone with dark yellowish-brown (10YR 4/2) soil.
			Casing begins to bind in washover pipe at 17.0 ft BGS. Begin to

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1025A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-9-93			observe cement fragments in returns at about 17.5 ft BGS.
(cont.)			Cuttings from 15.8 ft to 20.8 ft BGS are predominantly grayish-red
			(5R 4/2), thinly laminated shale and dark greenish-gray (5G 4/1),
			and light olive gray (5Y 6/1), banded, fine-grained, glauconitic
			sandstone to sandy shale; plus fragments of pinkish-gray
			(5YR 8/1) cement.
	0942	0945	At 20.8 ft BGS. Add drill rod. Plan to continue until subadapter
			contacts casing.
	0945	0948	Continue over wash. Over wash casing from 20.8 ft to 23.2 ft BGS.
			Cuttings are the same as the 15.8 ft to 20.8 ft interval described
			above with a possible increase in the volume of cement fragments.
	0948	0958	At 23.2 ft BGS (subadapter contacting the top of the casing).
			Rotating washover pipe to help loosen cement on casing.
	0958	1009	Trip out, rig down washover pipe. Screen cuttings from 0.0 ft to
			23.2 ft (see Well Cuttings Field Screening/Disposal Sheet). Need
			a burning permit to continue.
	1009	1145	Trying to contact someone to issue a burn permit. Waiting.
	1145	1206	B. Thedford (HSEA) arrives and issues a burn permit.
	1206	1230	Break for lunch.
	1230	1316	Begin burning holes in casing to attempt pull. Run out of oxygen
			before completing first hole. R. Phillips (Highland) calls to shop to
			get oxygen bottle. Crew departs to get cement, performing
			various maintenance and clean up tasks at drill site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1025A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 4 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-9-93	1316	1411	R. Phillips departs to pick up oxygen bottle.
(cont.)			
	1411	1420	Randy returns, completes burning holes in casing.
	1420	1425	Attach chain to casing and attempt to pull: chain pulls through one
			of the holes.
	1425	1430	Burn 2 more holes in casing.
	1430	1444	Make second attempt to pull casing: Casing extraction very
			sluggish, then pulls up 0.2 ft to 0.3 ft and stops. Casing finally
			pulled out of borehole and layed down on ground. A total of 28.9 ft
			of 6.5-in. OD steel casing extracted from the borehole.
	1444	1455	Rig up with a 10 5/8-in. diameter tricone bit on a subadapter
			assembly; length = 6.3 ft, table height = 4.6 ft.
	1455	1458	Trip into borehole with compressed air only. Encounter water at
			20.5 ft BGS. Encounter resistance (cement)/ratty drilling at 23.2 ft
			BGS.
	1458	1501	Commence reaming. Ream from 23.2 ft to 25.7 ft BGS. Add water
			at 25.7 ft BGS. Cuttings this interval consist predominantly of: pale
			yellowish-brown (10YR 6/2) cement fragments (>80%); minor
			grayish-red (5R 4/2), thinly laminated shale; and rare dark greenish-
			gray (5G 4/1) glauconitic sandstone along with grayish-brown
			(5YR 3/2) soil.
	1501	1509	At 26.7 ft BGS, clean out borehole.
	1509	1511	Continue reaming with compressed air and water. Ream from
			26.7 ft to an estimated 29.7 ft BGS. Cuttings in this interval: (90%)

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1025A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 5 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
8-9-93			grayish-red (5R 4/2), thinly laminated shale plus minor amounts of
(cont.)			dark greenish-gray (5G 4/1), bedded, fine-grained glauconitic
			sandstone and olive green (5Y 4/1), uncured cement lumps, and
			rare amounts of pale yellowish-brown (10YR 6/2), cured cement
			fragments.
	1511	1515	At 29.7 ft BGS, clean out borehole.
	1515	1527	Trip out, rig down bit and subadapter assembly. Tag bottom of
			reamed hole at 30.3 ft BGS. Calculate a borehole volume to 4.0 ft
			BGS of 16.2 cubic ft, equivalent to 13.7 sacks of Type I Portland
			cement.
	1527	1530	Run 3, 10.0-ft sections of 1.5-in. OD PVC tremie pipe into borehole
			to 28.5 ft BGS. Set up diaphragm hand pump.
	1530	1623	Mix and pump tremie 15 sacks (17.7 cubic ft) of neat, Type I
			Portland cement into the hole. Circulate 100% cement.
	1623	1633	Pull out tremie pipe. Clean up. Secure site and depart.
8-10-93	0838	0843	Arrive at 1025A site. Tag cement level at 5.8 ft BGS. Calculate
			a borehole volume to 4.0 ft BGS of 1.1 cubic ft, equivalent to
			0.9 sacks of Type I Portland cement. Depart site.
	0933	0942	Return to site. Mix and pour 1 sack of neat, Type I Portland cement
			into borehole. Liquid grout to 2.0 ft. BGS.
	1024	1026	Borehole is capped, by hand, with clay soil.
			P&A of well 1025A is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1027</u>
WELL REHABILITATION ACTIVITY/PROGRESS REPORT			Alt. Names: YGMW-05 BG-01 No. 7 PAGE 1 of 4
LOCATION: <u>Y-12 Burial Grounds</u>		DATE: START: <u>4-28-83</u>	
DRILLERS: <u>Hubert Hall-Highland Drilling Co.</u>		FINISH: <u>5-5-93</u>	
HELPERS: <u>Greg Anderson, Jim Gallaher - Highland</u>		METHOD: <u>R</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-28-93	1121	1130	Arrive at site. Technical oversight by V.R. Harness-SAIC.
			Setting up rig. Beta/gamma radiation at well = 80 cpm. Crew departs for supplies and lunch.
	1130	1245	Lunch break. David Wright (Highland) arrives and states that he has ordered 2.5 cubic yards of cement for this well (to be delivered 4-29-93 at 1200 hours).
	1245	1315	Crew returns. Using backhoe to excavate cuttings pit. Excavated soils show beta/gamma = 60 cpm = background (BCK). Breathing Zone Analysis (BZA) around excavation = 0.0 ppm = BCK.
	1315	1320	Crew installs plastic sheeting under rig. Rig up 10 5/8-in. diameter tricone roller bit with stabilizer. Length of assembly = 9.2 ft. Table height = 2.4 ft.
	1320	1325	Begin drilling out PVC casing. Casing stick-up was damaged prior to arrival and casing was broken off flush with ground surface. Advance to 7.0 ft below ground surface (BGS) with compressed air only.
	1325	1351	Add 25 ft of drill rod to string and resume drilling. BZA=0.0 ppm. Radiation at table = BCK for both beta/gamma and alpha. Advance to 31.8 ft BGS. Begin using potable water at 30 ft BGS. Encounter top of weathered rock at 28 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1027</u>
WELL REHABILITATION ACTIVITY/PROGRESS REPORT continued			
			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-28-93			BZA at 25 ft BGS = 0.0 ppm. Beta/gamma and alpha both = BCK
(cont.)			at 25 ft BGS.
	1351	1359	Add 25 ft of drill rod and resume drilling. Advance to 40 ft BGS.
			BZA=0.0 ppm, beta/gamma = BCK. Drilling becomes harder at
			40 ft BGS.
	1359	1407	Advance to 56.8 ft BGS. Encounter a series of small voids
			between 46.5 and 56.8 ft BGS.
	1407	1420	Add 25 ft of drill rod and resume drilling. Advance to 62.2 ft BGS.
			BZA = 0.0 ppm.
	1420	1426	Advance to 81.8 ft BGS. Cease drilling at David Wright's request.
			Crew required by Energy Systems to place erosion controls at
			another site.
			Description of cuttings:
			0 ft to 32 ft BGS: light olive brown (5 GY 2/1) calcitic siltstone with
			brownish gray (5 YR 4/1) silty shale and some PVC cuttings.
			56 ft to 81.8 ft BGS: Greenish black (5 GY 2/1) silty shale.
	1426	1503	Secure site and depart.
4-29-93	0800	0837	Arrive at site. Trip tools back into hole. BZA = 0.0 ppm, beta/
			gamma = 60 cpm and alpha = 0 cpm at table (both = BCK). Bit
			clogs at 56.8 ft BGS.
	0837	0853	Trip tools back out, unclog bit, trip back in.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1027</u>
WELL REHABILITATION ACTIVITY/PROGRESS REPORT continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-29-93	0853	0905	Driller departs to get a 55-gal. drum in order to facilitate addition of Quik-Foam™.
	0905	0911	Receive permission from Steve Jones (HSEA) to use minor amounts of Quik-Foam™ to facilitate drilling. Trip down. Resume drilling at 81.8 ft BGS.
	0911	0918	Temporarily generated too much foam with Quik-Foam™. Advance to 96 ft BGS where bit became hung up.
	0918	1030	Trip out tools, remove stabilizer and reattach tricone bit directly to drill rod. Secure site and depart for lunch.
	1200	1233	Return to site, trip tools back in.
	1233	1249	Resume drilling, advance to 101.5 ft BGS (target depth). Void from 96 to 101.5 ft BGS. Circulation was not lost but returned cuttings insufficient to screen.
	1249	1306	Trip out tools.
	1306	1320	Sounding bore with weighted tape reveals that hole has bridged at 85 ft BGS. Consensus is that further drilling will only loosen the sides of the hole more. Crew installs 80 ft. of 1.5-in. OD PVC tremie pipe to 77 ft BGS.
	1320	1505	Awaiting grout delivery.
	1505	1535	Grout arrives. Gravity tremie 2.5 cubic yds of neat, Type I Portland cement into bore. Grout to surface.

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1028</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-6-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>5-17-93</u>	
HELPERS: <u>Greg Anderson - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL 750</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-6-93	1444	1454	At 1028 site. Drill crew onsite. Drill rig positioned over well. Crew has already rigged up with a 10 5/8-in. diameter tri-cone bit on a subadapter only; length=4.6 ft, table height=2.4 ft. Crew cuts off casing (originally a stick-up of 3.1 ft) flush with the ground surface.
	1454	1456	Commence reaming casing and borehole with compressed air only. Ream to 2.2 ft below ground surface (BGS). Encounter water at 2.0 ft BGS. Cuttings consist of dark yellowish-brown (10 YR 4/2) to moderate yellowish-brown (10 YR 5/4), moist, clayey soil with medium light gray (N6) cement fragments and white (N9) PVC fragments.
	1456	1458	At 2.2 ft BGS. Add drill rod.
	1458	1511	Continue reaming casing and borehole with compressed air only. Ream from 2.2 ft to 27.2 ft BGS. Cuttings from 2.2 ft to 12.2 ft BGS are a continuation of the 0.0 to 2.2 ft interval with the addition of pale brown (5 YR 5/2) to light olive gray (5Y 5/2), weathered and stained shale fragments. Drilling becomes very hard (rate decreases) at 12.2 ft BGS (fresh bedrock). Adding water at 14.2 ft BGS. Drilling alternating between ratty and smooth from 15.5 ft BGS to 20.2 ft BGS. Cuttings from 12.2 ft to 27.2 ft BGS consist of very dusky purple (5P 2/2) and medium dark gray (N4), thinly laminated shale; medium gray (N5) cement fragments; and white (N9) PVC fragments. Between 20.2 ft and 27.2 ft BGS,

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1028</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-6-93	1458	1511	cuttings include coarse grains of angular sand (filter pack).
(cont.)			Detect sewage-like odor at 22.2 ft BGS. Breathing zone analysis
			(BZA) = 0.2 ppm.
	1511	1516	At 27.2 ft BGS. Clean out borehole.
	1516	1518	Trip bit out to ground surface. Will complete reaming on 5-7-93.
	1518	1541	Shut off drill rig. Clean up, secure site, and depart.
5-7-93	0933	0948	Arrive at 1028 site, crew onsite waiting. Trip into borehole to
			27.2 ft BGS (table height remains at 2.4 ft).
	0948	0951	Clean out borehole. Add drill rod.
	0951	0954	Commence reaming casing and borehole with air and water.
			Ream from 27.2 ft to 30.2 ft BGS. Cuttings are a continuation of
			the 12.2 to 27.2 ft interval (includes coarse grains of angular
			sand).
	0954	0959	At 30.2 ft BGS. Clean out borehole.
	0959	1005	Trip out, rig down stabilizer. Tag bottom of borehole at 30.2 ft
			BGS (clean). Calculate a borehole volume to 4.0 ft BGS of
			16.2 cubic ft = 0.6 cubic yds.
	1005	1016	Secure rig and move off site. Cement order scheduled for
			1100 hrs.
	1016	1112	Waiting for cement. Run 3, 10.0-ft sections of 1.5-in. outside
			diameter (OD) PVC tremie pipe into borehole to 29.0 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1028

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1029</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-5-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>5-7-93</u>	
HELPERS: <u>Greg Anderson - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-5-93	0800	0812	Arrive at 1029 site. Casing stickup = 1.0 ft. Water level at 10.5 ft below ground surface (BGS). Bottom of well measured at 17.8 ft BGS. Crew arrives, reports B. McMaster (HSEA) gave approval to decommission this well without the use of a cuttings pit.
	0812	0816	Rig up with a 10 5/8-in. diameter tricone bit on a subadapter only (no stabilizer); length = 4.6 ft, table height = 2.3 ft.
	0816	0817	Commence reaming casing and borehole with compressed air only. Ream to 2.3 ft BGS. Cuttings consist of dark yellowish-brown (10YR 4/2) to dusky brown (5YR 2/2), moist, clayey soil with minor amounts of undifferentiated gravel (approximately 1.0-in. diameter), and PVC fragments.
	0817	0821	At 2.3 ft BGS. Add drill rod.
	0821	0827	Continue reaming casing and borehole with compressed air only. Ream to 19.5 ft BGS. Cuttings from 2.3 ft to 8.3 ft BGS consist of dark yellowish-orange (10YR 6/6) to moderate yellowish-brown (10YR 5/4), dry to moist, clayey subsoil/residuum and PVC fragments. No cement fragments. Encounter moisture at 12.0 ft BGS. Cuttings from 8.3 ft to 19.5 ft BGS consist of pale brown (5YR 5/2) to light olive gray (5Y 5/2), thinly laminated, stained, weathered shale. No PVC or cement fragments. No cement fragments observed over entire borehole.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1029</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-5-93	0827	0830	At 19.5 ft BGS. Clean out borehole.
(cont.)			
	0830	0840	Trip out, rig down bit and subadapter. Tag bottom of borehole at 19.0 ft BGS (0.5 ft of fill). Oversight departs.
	0934	0946	Return to 1029 site. No PVC casing visible in borehole. Calculate a borehole volume to 4.0 ft BGS of 9.3 cubic ft = 0.3 cubic yds. Depart site.
	1602	1606	Return to 1029 site with cement truck. Pour cement (dry hole) into borehole, fill to within 1 ft of ground surface. Depart site.
5-6-93	0731	0735	Arrive at 1029 site. Tag cement level at 10.0 ft BGS. A large fragment of PVC casing is visible in borehole at approximately 2 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 3.7 cubic ft, equivalent to 2.7 sacks of 2% bentonite-cement grout. Depart site.
	1130	1141	Technical oversight by Victor Harness (SAIC). Return to 1029 site. Extract approximately 6 ft long shard of PVC casing from borehole. Mix and pour 4 sacks (5.4 cubic ft) of 2% bentonite-cement grout into the borehole. Cement to 0.5 ft BGS. Depart site.
5-7-93	0737	0741	Oversight resumed by Timothy Coffey (SAIC). Arrive at 1029 site. Cement level at 2.2 ft BGS. Borehole is ready to be capped. Depart site.
			Borehole 1029 capped with clay soil on 5-7-93.
			P&A of 1029 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1032</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-5-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>5-7-93</u>	
HELPERS: <u>Greg Anderson - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-5-93	0950	1016	Arrive at 1032 site. Crew on site. Rig is set up over the well, already rigged up with a 10 5/8-in. diameter tricone bit on a subadapter only; length = 4.6 ft, table height = 2.6 ft. Casing stickup = 2.4 ft. Bottom of the well = 52.4 ft below ground surface (BGS). Water level at 10.5 ft BGS. Excavating cuttings pit. Note: The driller reported having detected a sewage-like odor when first digging the pit. Scan of pit, pit walls, and excavated material with HNu resulted in reading of 0.5 ppm (max.).
	1016	1018	Commence reaming casing and borehole with compressed air only. Ream to 2.0 ft BGS. Cuttings consist of moderate brown (5YR 4/4), dry to moist, clayey surface soil with approximately 50% light gray (N7) to medium gray (N5) cement fragments.
	1018	1021	At 2.0 ft BGS. Add drill rod.
	1021	1026	Continue reaming casing and borehole with compressed air only. Ream from 2.0 ft to 27.0 ft BGS. Encounter slight moisture at 4.0 ft BGS. Obvious weathered bedrock encountered at 6.0 ft BGS. Cuttings from 2.0 ft to 6.0 ft BGS the same as reported previously. Encounter water at 11.0 ft BGS. Add water at 17.0 ft BGS. Cuttings from 6.0 ft to 27.0 ft BGS consist of light olive gray (5Y 5/2), thinly laminated, weathered and stained shale and moderate yellowish-brown (10YR 5/4), massive weathered micrite. Interval also contains medium light gray (N6) cement fragments and white (N9) PVC fragments.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1032</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-5-93	1026	1030	At 27.0 ft BGS. Clean out borehole. Add drill rod.
(cont.)			
	1030	1047	Continue reaming casing and borehole with compressed air and water. Ream from 27.0 ft to 52.0 ft BGS. Hard drilling and ratty from 29.0 ft to 32.0 ft BGS. Cuttings from 27.0 ft to 37.0 ft BGS same as above. PVC fragments increasing this interval. Cuttings from 37.0 ft to 47.0 ft BGS consist predominantly of medium gray (N5), massive micrite and intramicrite; PVC fragments; and cement fragments. Cuttings from 47.0 ft to 52.0 ft BGS are same as above, but include coarse, angular grains of sand (filter pack).
	1047	1053	At 52.0 ft BGS. No obvious slotted PVC fragments yet. Clean out borehole. Add drill rod.
	1053	1058	Continue reaming casing and borehole with compressed air and water. Ream from 52.0 ft to 59.0 ft BGS are same as above. Drilling very hard and ratty from 57.5 ft to 59.0 ft BGS (have milled through casing and are now drilling fresh hole).
	1058	1103	At 59.0 ft BGS. Clean out borehole.
	1103	1128	Trip out, rig down bit and subadapter. Tag bottom of borehole at 57.0 ft BGS (2.0 ft of fill). Rig down drill rig. Calculate a borehole volume to 4.0 ft BGS of 32.9 cubic ft = 1.2 cubic yds.
	1128	1135	Move drill rig off location.
	1135	1143	Run 5, 10.0-ft sections of 1.5-in. outside diameter (OD) PVC tremie pipe into borehole to 49.0 ft BGS. Cement scheduled for 1330 hrs. Depart site.
	1330	1532	Return to 1032 site. Waiting for cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1032</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 3 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-5-93	1532	1555	Cement truck finally arrives at 1032 site. Tremie cement into
(cont.)			borehole. Water level rises, but never above about 2 ft BGS.
	1555	1602	Halt cement tremie. Pull out tremie pipe. Clean up. A portion of
			this load was for another borehole, so cement truck departs to fill
			that hole.
	1607	1623	Cement truck returns to 1032 site with small amount of cement
			remaining. Crew places 1, 10.0-ft section of 1.5-in. OD PVC tremie
			pipe in borehole. Tremie the rest of the load into the borehole. Still
			no circulation of water, water rose to maximum height of 1 ft BGS.
	1623	1631	Pull out tremie pipe. Clean up, secure site, and depart.
5-6-93	0735	0743	Arrive at 1032 site. Tag cement level at 21.0 ft BGS. Calculate a
			borehole volume to 4.0 ft BGS of 10.5 cubic ft, equivalent to
			7.7 sacks of 2% bentonite-cement grout. Depart site.
	1146	1202	Technical oversight by Victor Harness (SAIC). At 1032 site. Mix
			and pour 8 sacks (10.9 cubic ft) of 2% bentonite-cement grout into
			borehole. Cement to ground surface. Depart site.
5-7-93	0741	0747	Oversight resumed by Timothy Coffey (SAIC). Arrive at 1032 site.
			Tag cement level at 4.7 ft BGS. Calculate a borehole volume to
			4.0 ft BGS of 0.4 cubic ft, equivalent to 0.3 sacks of 2% bentonite-
			cement grout. Depart site.
	1228	1231	Return to 1032 site with cement truck. Pour cement into borehole,
			fill to approximately 2 ft BGS. Depart.
			Borehole 1032 capped with clay soil on 5-7-93 with less than 24-hr
			cure time on latest cement.
			P&A of 1032 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 14
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>4-5-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>4-27-93</u>	
HELPERS: <u>Jim Gallaher, Steve Brown, Mark Baker</u>		METHOD: <u>Air Rotary</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>T.J. Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-5-93	1328	1347	Technical oversight provided by V.R. Harness (SAIC). Depth to water = 7.7 ft below top of casing (BTOC) = 5.3 ft below ground surface (BGS).
	1347	1409	Crew installs 3.8-ft length of 11.75-in. outside diameter (OD), 11.25-in. inside diameter (ID) steel conductor around surface casing by pushing casing down with the backhoe bucket. Remove protective posts with backhoe. Measure background (BCK) radiation. Beta & gamma = 80 cpm (maximum) and alpha = 0 cpm. Measurement of radiation from excavated protective posts = BCK.
	1409	1429	10.5 tons of 3- to 5-in. gravel is delivered and placed around well location and in drainage ditch to build up site for drill rig. Cut off 2.3 ft of casing stickup. Surface casing is 6.5-in. OD, 6.0-in. ID steel.
	1429	1546	The attempt to move the rig onto the site was partially completed. Will continue tomorrow. Secure site and depart.
4-6-93	0852	0921	Crew delivers dozer. Use dozer to help maneuver rig into position. Backhoe used to excavate small cuttings pit. Siltation fencing installed along three sides of excavated pit (downgradient). Pit will be enlarged as needed but will be kept as small as possible (verbal communication with Steve Jones - HSEA).
	0921	1018	Raise mast on rig. Crew departs to collect water truck and other materials.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-6-93	1018	1032	Crew returns and unloads 2 additional 25 ft sections of drill rod.
(cont.)			Site is flagged off. Awaiting delivery of 6-in bit.
	1135	1245	Calculate 9.8 cubic ft or approximately 9, 50-lb sacks of cement required to fill open interval of well. Crew breaks for lunch and to get cement.
	1245	1304	John Young (Highland) delivers 0.8 ft long, 6-in. diameter tricone roller bit. Crew rigs this bit up and trips into well.
	1304	1307	Table height = 2.4 ft. Trip into well 23.4 ft BGS. Displaced water screened at table: alpha = 0 cpm, beta & gamma = 80 cpm. Breathing zone analysis (BZA) = 0.2 ppm.
	1307	1312	Add second 25 ft drill rod. Trip in to 48.4 ft BGS. BZA @ 50 ft = 0.2 ppm. Displaced well water becomes black and has a metallic odor.
	1312	1316	Add third 25 ft drill rod. Trip in to 73.4 ft BGS. Displaced water is draining through gravel pad and into ditch rather than into pit. Screening of water at table: beta & gamma = 80 cpm. BZA @ 73.4 ft BGS = 0.0 ppm. Displaced water becoming yellowish-brown and losing metallic odor. Trip up 25 ft.
	1316	1332	Crew spreads plastic sheeting under table to prevent loss of water into ditch.
	1332	1337	Trip back in. Plastic sheeting under table successfully diverting water into pit. Pit already filling. Screening of displaced well water: alpha = 0 cpm, beta & gamma = 60 cpm. BZA = 0.0 ppm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-6-93	1337	1340	Crew enlarges pit to approximately 6 ft (deep) x 6 ft (wide) x 8 ft (long).
(cont.)			
	1340	1346	Add fourth, 25 ft drill rod. Trip into bore to 98.4 ft BGS. Displaced water becoming greenish-black. BZA @ 98.4 ft = 0.2 ppm.
	1346	1351	Add fifth, 25-ft drill rod. Trip in to 100.3 ft BGS where first resistance is met. Commence reaming.
	1351	1401	Ream to 123.4 ft BGS. Add sixth, 25-ft drill rod. Screening of displaced well water @ 111 ft BGS: alpha = 50 cpm, beta & gamma = 45 cpm. Returned water turning greenish-brown with an oily film.
	1401	1405	Ream to 148.4 ft BGS with almost no cuttings returned to surface. BZA @ 148.4 ft BGS = 0.2 ppm. Screen of displaced water: alpha = 20 cpm, beta & gamma = 50 cpm. Add seventh, 25-ft piece of drill rod.
	1405	1416	Ream to 154 ft BGS. BZA exhibited momentary 20 ppm hit. Shut rig down. Caught water sample. Organic vapors (non-sealed) emanating from sample = 10-15 ppm. Seal sample for head space analysis (HSA).
	1416	1438	Steve Jones (HSEA) and Tom McDermott (DOE) arrive. HSA of sealed water sample = 40 ppm. Resealed sample. Oversight departs site to get flame ionization detector to check results given by photoionization detector. Crew and rig on stand-by.
	1513	1527	Oversight returns with OVA. HSA of sample with OVA yields 900 ppm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-6-93	1527	1543	Continuous monitoring of breathing zone, by oversight and Steve
(cont.)			Jones (HSEA) using both HNu and OVA as crew trips back in.
			Ream to 162 ft BGS. BZA remainder of drilling does not exceed
			0.0 ppm. Water sample from earlier exhibits a separated, lighter-
			than-water oily film of amber coloration.
	1543	1620	Trip out tools. Retrieve composited cuttings sample from 100 to
			162 ft BGS. Comprised of blocky, slightly silty shale of blackish-
			green (5G 2/1 Munsell) coloration. Secure site and depart.
4-7-93	0837	0851	Arrive on site. Continuous monitoring of breathing zone by
			oversight using OVA during all drilling activities begun. Trip tools
			down to 162 ft BGS to insure that bore is open. Screening of
			displaced water: alpha = 20 cpm, beta & gamma = 80 cpm. BZA
			= 2.0 ppm
	0851	0918	Trip out tools. Organic vapors 0.25-in. from drill rods with OVA =
			40-50 ppm, however; 6-in. away undetectable. BZA remains at
			2.0 ppm
	0918	0956	All tools out of ground. At table: alpha = 40 cpm, beta & gamma
			= 80 cpm. BZA = 1.2 ppm. Crew cleans, assembles and inserts
			140 ft of 1.5-in. OD PVC tremie line to 137 ft BGS.
	0956	1028	Crew mixes and tremies nine, 50-lb sacks of neat Type I Portland
			cement into reamed open bore. Circulating blackish-green, turbid
			water. BZA = 1.0 ppm.
	1028	1047	Crew removes and cleans tremie line. Will allow grout to cure
			24 hrs. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 5 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-7-93	1543	1558	Return to site to enlarge pit for over wash. Pit excavated to 8 ft
(cont.)			wide x 8 ft long x 6 ft deep. Rearrange original silt fence and add
			an additional supplemental silt fence downgradient of first.
			Screening of excavated soil: alpha = 40 cpm, beta & gamma =
			90 cpm. New pit flagged. Secure site and depart.
4-8-93	0832	0906	Tag grout at 100 ft BTOC = 99.9 ft BGS. Since 6.5-in OD surface
			casing is reported to extend to 110 ft BGS, this should be
			adequate.
	0906	0918	Crew rigging up first section of 9-in. OD, 8.5-in. ID washover pipe.
			Total length of first piece = 21.5 ft. Washover bit comprises 3.6 ft
			of this length, and attached subadapter is an additional 2.5 ft long.
			Screening at table: alpha = 40 cpm, beta & gamma = 50 cpm.
	0918	0926	Commence over wash with compressed air only. Table height =
			2.9 ft. Advance to 3 ft BGS.
	0926	0944	Continue over wash begin use of water. Advance to 7 ft BGS. BZA
			⊗ 7.0 ft BGS = 0.0 ppm. Returns are shale chips in yellowish-
			brown muddy water. Conductor casing is loose.
	0944	0950	Pause in over wash while crew secures conductor casing by
			chaining to rig. Screening at table: alpha = 40 cpm, beta & gamma
			= 75 cpm (both approximately equivalent to background).
	0950	1012	Resume over wash at 7.0 ft BGS. Additional washover pipe
			delivered; tally:
			4 pieces: 21.1 ft
			21.1 ft
			20.9 ft
			16.6 ft

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 6 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-8-93			Advance to 25 ft BGS.
(cont.)			
	1012	1122	Collect 0 to 25 ft sample. Description: Blocky shale of light brownish-gray coloration (10YR 3/2) with staining and partings colored very dark grayish-brown (10YR 3/2) to yellow (10YR 7/8). Approximately 4% of sample collected is comprised of a gritty, plastic clay of gray color (10YR 5/1). Minor metal shavings and several pale yellow (2.5Y 7/3) shale fragments are accessory. Screening at table: alpha = 20 cpm, beta & gamma = 70 cpm). Crew breaking loose subadapter to add washover pipe to string.
	1122	1128	Hydraulic hose to power tong wrench begins leaking. Spill control mats are used to control leak. Approximately 0.5 pint of hydraulic fluid spilled on ground. Absorbent mats were placed on spill.
	1128	1305	Rig down for repairs and crew lunch break.
	1305	1343	Crew resumes efforts to break loose subadapter. At table, beta & gamma = 80 cpm, BZA = 0.0 ppm.
	1343	1400	Crew rigging up second piece of washover pipe. Length = 21.1 ft. Total length of washover in string = 46.2 ft.
	1400	1425	Resume over wash, initial BZA = 0.0 ppm. Rapid advance to 45 ft BGS. Circulation water becoming blackish-green at 43 ft BGS. BZA at 43 ft = 2.0 ppm; at 45 ft = 0.0 ppm. Screening at table @ 45 ft: alpha = 20 cpm, beta & gamma = 75 cpm. Description of composited cuttings from 25 to 45 ft BGS: Shale fragments similar to 0 to 25 ft interval but coloration from light yellowish-brown (2.5Y 6/3) to grayish brown (2.5Y 5/2). Staining coloration similar also but slightly darker; to dark brown (7.5YR 3/3). Notably different is 1 to 2% of sample is finely layered friable siltstone;

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 7 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-8-93			unstained siltstone is pinkish white (7.5YR 8/2); stained coloration
(cont.)			ranges from reddish yellow (5YR 6/8) to very dark gray (5YR 3/1).
	1425	1503	Crew breaking loose subadapter to add third piece of washover
			pipe (21.1 ft length). New total length of washover pipe will be
			67.3 ft. BZA = 0.0 ppm.
	1503	1530	Resume over wash at 45 ft BGS, initial BZA = 0.0 ppm. Rapidly
			advance to 64 ft BGS. Collect 45 ft to 64 ft sample. Sample
			description is continuation of 25- to 45-ft interval. BZA @ 64 ft
			BGS = 0.0 ppm.
	1530	1600	Rig head is leaking. Approximately 2 pints of hydraulic fluid spilled
			on ground before spill control can take place. Crew will repair seal
			Monday morning . Secure site and depart.
4-12-93	0834	1007	At site. Randy Phillips (Highland) says crew will drain excess fluid
			and try to continue drilling down because head repairs will take
			several days. If leakage worsens, crew will stop for repairs. Crew
			draining hydraulic fluid from head into buckets. Spill controls in
			place.
	1007	1010	Resume over wash at 64 ft BGS. Table height = 2.0 ft. Screening
			at table: alpha = 20 cpm, beta & gamma = 70 cpm, and BZA =
			0.5 ppm. Advance to 65 ft BGS.
	1010	1029	Crew breaking loose subadapter to add fourth piece of washover
			pipe (20.9 ft length) for a total length of washover = 88.2 ft. Collect
			64 ft to 65 ft sample. Sample lithology is a continuation of 45 ft to
			64 ft interval.
	1029	1051	Rigging up 20.9 ft piece of washover pipe. BZA = 0.0 ppm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 8 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-12-93	1051	1118	Resume over wash at 65 ft BGS; initial BZA = 2.0 ppm lowering to
(cont.)			0.5 ppm as accumulated water is blown out. Advance to 75 ft BGS;
			BZA @ 75 ft BGS = 0.0 ppm.
	1118	1234	Head began leaking again and showed signs of leak rate increasing.
			Spill control mats were already in place. Rig shut down for repairs.
			Description of 65 to 75 ft BGS sample is a continuation of previous
			interval but contains 5% greenish black (5GY 2/1) to medium dark
			gray (N4) micaceous, calcareous, fine siltstone. Oversight departs.
4-19-93	0831	0911	Crew on site, rigging up.
	0911	1037	Rig on. Screening at table: alpha = 20 cpm, beta & gamma =
			70 cpm. BZA (initial) = 0.0 ppm. Crew changing drill head oil, spill
			controls in place, used oil contained in buckets to be taken off site.
	1037	1129	BZA = 2.0 ppm. Resume over wash at 75 ft BGS. Advance to 86 ft
			BGS. Collect 75 to 86 ft sample (continuation of previous interval).
			BZA at 85 ft BGS was 4.0 ppm due to dead formation oil (black)
			in returns (characteristic odor) dropping to 0.0 ppm at 86 ft BGS.
			Cutting pit enlarged by about 2 ft in width and length.
	1129	1230	Crew breaking out and rigging up fifth and final piece of washover
			pipe on site (16.0 ft length) for a total of 104.68 ft of tools.
	1230	1316	Lunch break.
	1316	1322	Resume breakout. After subadapter broken loose, casing is found
			to have slipped into hole.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 9 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-19-93	1322	1353	Top of casing tagged at approximately 36 ft BGS. Crew departs
(cont.)			to locate a mechanical packer of suitable size to fish up casing.
			Will resume in morning. Secure site and depart.
4-20-93	0841	0854	Crew arrives at site with a 6-in. diameter mechanical packer and
			tubing. Length of packer = 4 ft. Tubing is 2.38-in. OD, 2.0-in. ID
			swab tube.
	0854	0906	Crew rigs up packer and 22.7 ft of tubing and lowers into bore.
			Screen at table: alpha = 20 cpm, beta & gamma = 50 cpm. BZA =
			0.0 ppm.
	0906	0918	Packer set and casing raised.
	0918	0928	Dropped casing, trip packer back into bore.
	0928	0939	Crew goes to get additional short pieces of swab tube. 22.7 ft long
			piece doesn't allow casing to be raised high enough to secure.
	0939	0945	Crew rigs up 3, 4-ft long pieces of tube and one 8-ft piece for 20 ft
			total length. Add 4-ft long packer and trip back into bore.
	0945	1003	Set packer and raise casing.
	1003	1014	Casing secured while packer and tubing rigged down; BZA =
			0.0 ppm. Surface of casing screened: alpha = 20 cpm, beta &
			gamma = 80 cpm. Safe to cut casing.
	1014	1039	Extract 52.2 ft of 6.5-in. OD well casing in 3 pieces (21.4 ft, 29 ft,
			and 2.8 ft). Bottommost piece shows no evidence of ever being
			attached to any more casing. Casing installed appears to have
			been of inferior quality. Was installed pitted and poorly made at

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. 1033
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 10 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-20-93			foundry. No evidence of corrosion attributable to post installation
(cont.)			factors, other than minor oxidation/reduction of iron.
	1039	1238	Crew locates 6.5-in. diameter tricone bit, rigs up and trips in inside
			washover pipe to try and tag any additional casing.
	1238	1257	Trip into 98 ft BGS. No casing encountered. Trip out. BZA @ 98 ft
			BGS = 0.0 ppm.
	1257	1440	Crew tripping out washover pipe.
	1440	1523	Crew rigs up 10 5/8-in. diameter tricone roller bit and stabilizer
			(9.2 ft total length) to ream bore in morning. Grout delivery
			(2.5 cubic yds) ordered for 1200 hrs tomorrow. Secure site and
			depart.
4-21-93	0819	0849	Rig up to begin reaming. Table screen: alpha = 20 cpm, beta &
			gamma = 80 cpm, BZA = 0.0 ppm.
	0849	0854	Commence reaming. Table height = 2.4 ft. Advance to 31.8 ft
			BGS. BZA @ 31.8 ft = 0.0 ppm.
	0902	0905	Add 25 ft of drill rod. Resume reaming. Advance to 56.8 ft BGS.
			BZA @ 56.8 ft = 0.0 ppm.
	0905	0916	Add 25 ft of drill rod. Resume reaming. Advance to 81.8 ft BGS.
			BZA @ 81.8 ft = 1.0 ppm.
	0916	0938	Add 25 ft of drill rod. Resume reaming. Part of crew enlarging pit
			slightly. Advance to 92 ft BGS. Circulation of cuttings is poor.
			Steve Jones (HSE) gives permission to use minimal amount of
			Quik-Foam™.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. 1033
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 11 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-21-93	0938	0957	Trip bit up to 84 ft BGS. Part of crew goes to get Quik-Foam™.
(cont.)			
	0957	1010	Small amount of Quik-Foam™ added with no results.
	1010	1019	Part of crew departs to get fresh Quik-Foam™.
	1019	1030	Adding minor amount of Quik-Foam™.
	1030	1034	Foam is circulating but air pressure is building up and shutting off the rig compressor before any cuttings are blown out.
	1034	1047	Tripping in, no foam in circulation water. Advance to 92 ft BGS. At 86 ft BGS lose circulation. Pressure blow outs develop 30 ft northeast of rig (foam).
	1047	1104	Halt advance. Inform Steve Jones (HSE) that we cannot get circulation and cannot drill further without regaining circulation. He gives permission to use Hole Plug™ bentonite in 86 to 91 ft BGS interval and grout hole.
	1104	1152	Begin trip out. Bit and stabilizer hangs. All of circulation coming out blowout holes, none out of bore.
	1152	1245	Pull bit with difficulty up to 78.6 ft BGS. Part of crew departs for auxiliary compressor and water truck. Driller continues to try freeing bit.
	1245	1518	Manage to get bit to 66.6 ft BGS. Still stuck. Crew rigs up auxiliary compressor in an attempt to blow out obstructing material.
			Unsuccessful at attempt. Bit still hung. Shut down rig to consider alternatives. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 12 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-22-93	0816	0935	Crew resumes attempts to free bit. Tag rubble on top of bit and stabilizer at 33 ft BGS. Table screen: alpha = 0 cpm, beta & gamma = 50 cpm, BZA = 0.0 ppm. Oversight departs.
	1005	1057	Technical oversight assumed by T.J. Coffey (SAIC). Crew adding Quik-Foam™ directly into drill rod. Crew working tools up and down to attempt to free bit and stabilizer. Water pump on rig is apparently not working. No circulation from bore, all from blow-out vents.
	1057	1125	Continue working to free bit. Return of partial circulation.
	1125	1130	Shut down rig. Crew will attempt to over wash drill rods to free up.
	1130	1305	Crew departs to eat lunch and collect materials.
	1305	1315	Crew returns. Lowers drill bit as far as possible (84 ft BGS). Begins rigging up 6.0-in. OD, 5.0-in. ID washover pipe. Three pieces of washover pipe at site (15.2 ft, 24.7 ft and 24.7 ft) for a total of 64.6 ft. Subadapter = 1.8 ft length.
	1315	1325	Washover bit (6.0-in. dia.) will not fit over drill rods. Crew rigs down, some depart for additional washover pipe.
	1325	1345	Remaining crew repairing water pump on rig.
	1345	1440	Having found no additional bits which will fit this pipe, crew uses oxy-acetylene torch to cut off internal cutting nubs on existing bit.
	1440	1500	Pump repaired, washover bit modified. Trip washover pipe down bore over drill rods.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 13 of 14
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-22-93	1500	1513	Encounter rubble at 36.7 ft BGS. Over wash easily with
(cont.)			Quik-Foam™ to 41.7 ft BGS.
	1513	1544	Break out subadapter and additional washover pipe for tool length
			of 66.4 ft BGS.
	1544	1607	Resume over wash. Encounter difficult drilling at 53.1 ft BGS.
			Lose circulation at 53.3 ft BGS. Past 53.3 ft, advance easily to
			61.0 ft BGS. Hard drilling from 61.0 ft to 66.4 ft BGS. Circulation
			restored as large quantity of foam belches out of the borehole
			collar covering everything and everyone within 10 ft of the hole.
	1607	1748	Trip out and rig down washover pipe.
	1748	1848	Trip out drill rods and bit/stabilizer assembly. Secure site and
			depart.
4-23-93	0805	0847	Crew arrives. Rig down bit and stabilizer. Tag debris in bore at
			32.2 ft BGS. Shut down rig.
	0847	0900	Steve Jones (HSEA) gives permission to fill bore with Hole Plug™
			to water level (12.3 ft BGS).
	0900	0956	Pour 37, 50-lb sacks of Hole Plug™ into bore. Top of unhydrated
			bentonite at 24.6 ft BGS.
	0956	1026	Mobilize rig off site.
	1026	1044	Pour 10 more sacks of Hole Plug™ into bore. Top of unhydrated
			bentonite @ 18.7 ft BGS. Secure site and depart.

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1035</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-10-93</u>	
DRILLERS: <u>Steve Brown-Highland Drilling Co.</u>		FINISH: <u>5-17-93</u>	
HELPERS: <u>Greg Shillings-Highland Drilling Co.</u>		METHOD: <u>B</u>	
DRILL: <u>Ford 555B Backhoe with McMillan Digger-head auger motor</u>		LOGGED BY: <u>Timothy Coffey-SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-10-93	1231	1310	Arrive at 1035 site. Casing stickup = 2.0 ft. Water level is approximately 25 ft. below ground surface (BGS). Plan to plug open interval with Hole Plug™ (this is a deviation, previously approved by S. Jones-HSEA). Calculate the open-hole volume to base of casing of 14.1 cubic ft., equivalent to 20.5 sacks of Hole Plug™. Slowly pour 19 sacks (13.1 cubic ft.) of Hole Plug™ into the borehole while continuously tamping with a weighted tape to prevent bridging. Circulate water. Fill to 27.8 ft. BGS. Depart site.
5-11-93	0759	0807	Arrive at 1035 site. Tag hydrated Hole Plug™ level at 24.5 ft. BGS (Hole Plug™ swelled 3.3 ft.). Cut off 1.4 ft. of casing stick-up. Rig up an 8.0-in. inside diameter (ID), 12.0-in. outside diameter (OD) initial hollow-stem auger flight with a 13.0-in. diameter cutterhead; total length = 5.3 ft.
	0807	0923	Commence augering. Additional auger flights added sequentially at the end of each 5.0-ft. interval. Auger to 17.3 ft. BGS. Cuttings from 0.0 ft. to 8.0 ft. BGS consist of grayish-brown (5YR 3/2) to moderate brown (5YR 3/4), moist, clayey soil with common gravel fragments from near beginning of interval. No cuttings returned: 8.0 ft. to 10.0 ft. BGS. Augering appears to be becoming difficult at 9.5 ft. BGS. While adding auger flight at 10.0 ft. BGS, observed that casing has slipped down into borehole slightly. Water returned at 10.3 ft. BGS. Cuttings from 10.0 ft. to 17.3 ft. BGS consist of pale brown (5YR 3/2), moist (often

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1035</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-11-93	0807	0923	wet) clayey soil/residuum and light olive gray (5Y 5/2) weathered
(cont.)			shale with few fragments of white (N9) PVC casing.
	0923	0940	Auger refusal at 17.3 ft. BGS. Trip augers out of the borehole.
	0940	1035	All auger flights out of the ground, cutterhead is jammed with soil/ residuum, and a length of casing is hung within the bottom-most flight. Working to clear auger of casing and debris.
	1035	1043	Bottom-most auger cleared. Extract 9.0 ft. of PVC casing.
	1043	1120	Trip augers into borehole.
	1120	1127	At 17.3 ft. BGS. Continue augering. Auger from 17.3 ft. to 18.3 ft. BGS. No cuttings returned.
	1127	1140	Auger refusal at 18.3 ft. BGS. Trip augers out of the borehole. Extract an additional 3.0 ft. of casing. Total casing removed from borehole=13.4 ft. (includes 1.4 ft. of stick-up cut off prior to augering operations). Tag bottom of borehole at 17.0 ft. BGS (1.3 ft. of fill). Calculate a borehole volume to 4.0 ft. BGS of 10.3 cubic ft., equivalent to 7.5 sacks of 2% bentonite-cement grout.
	1140	1150	Pull out protective posts. Depart site.
5-14-93	1133	1207	At 1035 site. Mix and pour (bore is dry with little danger of bridging) 9 sacks (12.2 cubic ft.) of 2% bentonite-cement grout into borehole. Cement level to 2.0 ft. BGS.
	1207	1212	Clean up, secure site, and depart.

WELL NO. 1035

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1036</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-3-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>5-17-93</u>	
HELPERS: <u>Steve Brown/Greg Shillings - Highland</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-3-93	0805	0847	Arrive at 1036 site. Drill rig is set up over well location. Casing stickup = 0.5 ft. Tag bottom of well at 98.2 ft below ground surface (BGS). Wait on drill crew.
	0847	0852	Crew arrives and moves water truck onto location.
	0852	0856	Rig up with a 10 5/8-in. diameter tricone bit on a subadapter only; length = 4.6 ft, table height = 2.2 ft.
	0856	0859	Commence reaming casing and borehole with compressed air only. Ream to 2.4 ft BGS. Cuttings consist of moderate brown (5YR 4/4) to dusky brown (5YR 2/2), moist, loamy soil and white (N9) PVC fragments.
	0859	0903	At 2.4 ft BGS. Add drill rod.
	0903	0918	Continue reaming casing and borehole with compressed air only. Ream from 2.4 ft to 27.4 ft BGS. Strong odor of organic decay at 18.0 ft BGS: breathing zone analysis (BZA) = 0.0 ppm. Encounter water at 18.0 ft BGS (cuttings begin to ball up). Cuttings from 2.4 ft to 18.0 ft BGS consist of moderate brown (5YR 4/4) to light brown (5YR 5/6), dry to moist, clayey subsoil; medium light gray (N6) cement fragments; and white (N9) PVC fragments. Adding water. Cuttings from 18.0 ft to 27.4 ft BGS consist of light olive gray (5Y 5/2) to pale yellowish-brown (10YR 6/2), thinly laminated, weathered shale with minor very pale orange (10YR 8/2),

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1036</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-3-93			massive weathered micrite; and small amounts of white (N9) PVC
(cont.)			fragments. No cement fragments observed this interval.
	0918	0922	At 27.4 ft BGS. Add drill rod.
	0922	0932	Continue reaming casing and borehole with compressed air and
			water. Ream from 27.4 to 52.4 ft BGS. Cuttings from 27.4 to
			33.0 ft BGS consist of moderate yellowish-brown (10YR 5/4) to
			dark yellowish-brown (10YR 4/2), weathered shale and pale
			yellowish-brown (10YR 6/2), massive, weathered micrite. Interval
			contains minor PVC fragments, but no cement fragments. Ratty
			drilling at 33.0 ft BGS (fresh bedrock). Cuttings from 33.0 ft to
			52.4 ft BGS consist of predominantly medium dark gray (N3),
			thinly laminated shale; minor dark gray (N2), massive micrite with
			blebs of sparite; and pinkish-gray (5YR 8/1) granular calcite. No
			grout fragments observed this interval, and PVC fragments ceased
			returning at approximately 34.0 ft BGS. Foul odor at 38.0 ft BGS:
			BZA = 0.3 ppm.
	0932	0949	At 52.4 ft BGS. Clean out borehole. Add drill rod. Driller states he
			needs to use Quik-Foam™ to help circulate cuttings. Call to
			S. Jones (HSE) who grants approval to use Quik-Foam™.
	0949	0953	Continue reaming casing and borehole with compressed air,
			water, and Quik-Foam™. Ream from 52.4 ft to 77.4 ft BGS.
			Cuttings consist of medium dark gray (N3), thinly laminated shale;
			brownish-gray (5YR 4/1) to light olive gray (5Y 6/1), massive to
			laminated micrite; and pinkish-gray (5YR 8/1) granular calcite. No
			PVC fragments or cement fragments this interval. Begin to
			enlarge cuttings pit with the backhoe.
	0953	0957	At 77.4 ft BGS. Clean out borehole. Add drill rod.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. 1036
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-3-93	0957	1006	Continue reaming as above. Ream from 77.4 ft to 102.4 ft BGS.
(cont.)			Cuttings are the same as above with an increasing amount of calcite. Drilling rate decreases at 94.0 ft BGS.
	1006	1012	At 102.4 ft BGS. Clean out borehole.
	1012	1028	Trip out, rig down stabilizer. Tag bottom of borehole at 88.0 ft BGS (14.4 ft of fill). Any further cleaning will likely continue to fill bottom of hole with debris.
	1028	1053	Rig down drill rig, and move offsite. Calculate a borehole volume from 88.0 ft to 4.0 ft BGS of 51.7 cubic ft = 1.9 cubic yds. Cement (2.0 cubic yds) ordered for 1400 hrs.
	1053	1124	Run 8, 10.0-ft sections of 1.5-in. outside diameter (OD) PVC tremie pipe to 78.0 ft BGS. Note: The cuttings were collected in two composites: 1) the dry, soil cuttings obtained when reaming with air only (0.0 ft to 18.0 ft BGS), and 2) rock cuttings obtained when reaming with air, water, and Quik-Foam™ (18.0 ft to 102.4 ft BGS) and later dried. The headspace analysis of the dry cuttings (#1) was in excess of 200 ppm. Breathing Zone Analyses over same interval (at 4.0 ft and 18.0 ft BGS) read 0.0 ppm. Cuttings sample sealed again. Notify S. Jones (HSEA). Note: Second headspace analysis of dry cuttings yielded a reading of 160 ppm. Headspace analysis of rock cuttings measured 1.8 ppm. Crew breaks for lunch, oversight departs.
	1451	1530	Return to 1036 site as cement truck arrives. Gravity tremie entire load (2.0 cubic yds) into borehole. Circulate approximately 50% cement.
	1530	1542	Pull out tremie pipe. Clean up, secure site, and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1036</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-4-93	0809	0815	Arrive at 1036 site. Tag cement level at 33.5 ft BGS. Calculate a borehole volume to 4 ft BGS of 18.6 cubic ft = 0.7 cubic yds. Depart site.
5-5-93	0845	0853	Arrive at 1036 site the same time as cement truck. Cement truck having difficulty getting to well because of slick road. Crew uses dozer to scrap surface of road.
	0853	0911	Cement truck at well, gravity tremie neat, Type I Portland cement into borehole through 1.5-in. OD PVC tremie pipe at approximately 28 ft BGS. Circulate 100% cement.
	0911	0916	Pull out tremie pipe. Clean up, secure site, and depart.
5-6-93	0750	0759	Arrive at 1036 site. Tag cement level at 9.9 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 3.7 cubic ft, equivalent to 2.7 sacks of 2% bentonite-cement grout or 0.1 cubic yds of cement. Depart site.
5-7-93	1217	1223	At 1036 site, pour neat, Type I Portland cement from truck into borehole, fill to within 1 ft of ground surface. Depart site.
5-10-93	0805	0809	Arrive at 1036 site. Tag cement level at 2.5 ft BGS. Borehole is ready to be capped. Depart site.
5-17-93	0900	0930	Borehole 1036 is capped with clay soil.
			P&A of 1036 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1037</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-4-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>5-7-93</u>	
HELPERS: <u>Greg Shillings/Greg Anderson - Highland</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-4-93	0836	0853	Arrive at 1037 site. Driller onsite positioning rig over well. Casing stickup = 2.9 ft. Water level at 4.4 ft below ground surface (BGS). Tag bottom of well at 35.5 ft BGS. Note: The subsurface data base (Y/TS-881) reports the total depth (TD) of 1037 to be 45.0 ft BGS with the screen from 35.0 ft to 45.0 ft BGS. Rig up with a 10 5/8-in. diameter tricone bit on a subadapter only; length = 4.6 ft, table height = 2.4 ft.
	0853	0917	Fuel drill rig and move water truck onto location.
	0917	0921	Commence reaming of casing and borehole with compressed air only. Ream to 2.2 ft BGS. Cuttings consist of: moderate brown (5YR 4/4), moist, clayey soil; medium gray (N5) to medium light gray (N6) cement fragments; and white (N9) PVC fragments.
	0921	0925	At 2.2 ft BGS. Add drill rod.
	0925	0936	Continue reaming casing and borehole with compressed air only. Drill rig table height adjusted to 2.6 ft. Ream from 2.2 ft to 27.0 ft BGS. Encounter water at 4.0 ft BGS. Ratty drilling at 9.7 ft BGS (adding water). Bit drops from 10.3 ft to 11.7 ft BGS. Cuttings from 2.2 ft to 13.0 ft BGS consist predominantly of dark yellowish-orange (10YR 6/6) to grayish-orange (10YR 7/4), moist, clayey subsoil with dark yellowish-brown (10YR 4/2) to light olive gray (5Y 5/2) weathered shale; medium light gray (N6) cement fragments; and white (N9) PVC fragments. Abrupt lithology change

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1037</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-4-93			at 13.0 ft BGS. Cuttings from 13.0 ft to 27.0 ft BGS consist of very
(cont.)			dusky purple (5P 2/2) and dark gray (N3), thinly laminated shale
			with brownish-gray (5YR 4/1), pelletal biomicrite and massive
			micrite with sparite blebs. Interval still contains cement and PVC
			fragments. Driller observes a musty odor at 16.0 ft BGS: breathing
			zone analysis (BZA) = 0.4 ppm.
	0936	0942	At 27.0 ft BGS. Clean out borehole. Add drill rod.
	0942	1000	Continue reaming casing and borehole with compressed air and
			water. Ream from 27.0 ft to 47.3 ft BGS. Drilling becoming very
			hard/ratty at 31.5 ft BGS. Cuttings from 27.0 ft to 35.0 ft BGS
			consist of the same shale and limestone lithologies as previously,
			with minor amount of grayish-pink (10R 8/2), granular calcite.
			Interval still contains PVC and cement fragments. Cuttings from
			35.0 ft to 47.3 ft BGS are the same as above, including coarse,
			angular filter pack sand grains. Ratty drilling at 44.0 ft BGS.
	1000	1006	At 47.3 ft BGS. Clean out borehole.
	1006	1020	Trip out rig down stabilizer. Tag bottom of hole at 47.3 ft BGS. No
			evidence of slotted PVC fragments (screen) yet, also, are still
			returning cement fragments. Suspect that well may be deeper
			than reported in data base.
	1020	1030	Call to S. Jones (HSE) to report status and suspicions regarding
			depth of well casing. Steve states to continue reaming to 60 ft BGS
			and see if PVC casing continues.
	1030	1042	Start up drill rig and trip into borehole.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1037</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-4-93	1042	1044	At bottom of borehole (47.3 ft BGS). Continue reaming casing and
(cont.)			hole with compressed air and water. Ream to 52.0 ft BGS.
			Cuttings consist of the same shale and limestone lithologies of
			above with cement and PVC fragments continuing.
	1044	1048	At 52.0 ft BGS. Clean out borehole. Add drill rod.
	1048	1052	Continue reaming casing and borehole with air and water. Ream
			from 52.0 ft to 60.0 ft BGS. Cuttings consist primarily of very dusky
			purple (5P 2/2) and dark gray (N3), thinly laminated shale, brownish-
			gray (5YR 4/1) micrite with blebs of sparite and black (N1)
			pelmicrite. PVC fragments no longer returned at approximately
			52 ft BGS, cement fragments stopped at about 53 ft BGS.
	1052	1058	At 60.0 ft BGS. Clean out borehole.
	1058	1110	Trip out, rig down stabilizer. Tag bottom of borehole at 57.8 ft BGS
			(2.2 ft of fill in hole).
	1110	1203	Rig down and move rig offsite, get stuck in mud. Crew using dozer
			to pull rig off of location. Calculate a borehole volume to 4.0 ft BGS
			of 33.4 cubic ft = 1.2 cubic yards.
	1203	1300	Crew breaks for lunch, oversight departs.
	1300	1348	Return to 1037 site. Run 5, 10.0-ft sections of 1.5-in. outside
			diameter (OD) PVC tremie pipe into borehole to 49.0 ft BGS.
			Cement (1.25 yds) scheduled for 1300-1330 hrs. Wait on cement.
	1348	1412	Cement truck arrives. Gravity tremie entire load (1.25 cubic yds)
			into borehole. Circulate water.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1037</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 4 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-4-93	1412	1420	Pull out tremie pipe. Clean up, secure site, and depart.
(cont.)			
5-5-93	0744	0751	At 1037 site. Tag cement level at 19.8 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 9.8 cubic ft = 0.4 cubic yds. Depart site.
	0916	0918	Return to 1037 site. Run 2 sections of 1.5-in. OD PVC tremie pipe into borehole to 19.0 ft BGS.
	0918	0930	Gravity tremie cement from truck into borehole. Circulate cloudy water.
	0930	0932	Pull out tremie pipe. Clean up, secure site, and depart.
5-6-93	0743	0750	At 1037 site. Tag cement level at 5.8 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 1.1 cubic ft, equivalent to 0.8 sacks of 2% bentonite-cement grout. Depart site.
	1220	1234	Technical oversight by Victor Harness (SAIC). At 1037 site. Mix and pour 4 sacks (5.4 cubic ft) of 2% bentonite-cement grout into borehole. Cement to ground surface. Depart site.
5-7-93	0747	0753	Oversight resumed by Timothy Coffey (SAIC). Arrive at 1037 site.
			Tag cement level at 2.6 ft BGS. Borehole is ready to be capped.
			Depart site.
			Borehole 1037 capped with clay soil on 5-7-93.
			P&A of 1037 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1038</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-12-93</u>	
DRILLERS: <u>Steve Brown-Highland Drilling Co.</u> <u>Greg Shillings/Greg Anderson</u>		FINISH: <u>5-14-93</u>	
HELPERS: <u>Highland Drilling Co.</u> <u>Ford 555B Backhoe with McMillan</u>		METHOD: <u>C</u>	
DRILL: <u>Digger-head</u>		LOGGED BY: <u>Timothy Coffey-SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-12-93	0840	0905	Arrive at 1038 site. Remove continuous water level measuring device and box from wellhead. Casing stick-up=2.3 ft. Water level is approximately 3 ft below ground surface (BGS). Total depth of the well is reportedly 26.0 ft BGS. Beta and gamma scan of well site yields a background radiation reading of 60 cpm.
			Crew rigs up an 8.0-in. inside diameter (ID), 12.0-in. outside diameter (OD) initial hollow-stem auger flight with a 13.0-in. diameter cutter head; total length=5.3 ft.
	0905	1128	Commence augering. Additional auger flights added sequentially at the end of each 5.0-ft interval. Auger from 0.0 ft to 25.3 ft BGS. Encounter moisture at 7.0 ft BGS where cuttings begin to ball up. Cuttings from 0.0 ft to 10.0 ft BGS consist of grayish-brown (5YR 3/2) to dark yellowish-brown (10YR 4/2), dry, clayey soil containing light brown (5YR 5/6) fragments of thinly laminated weathered shale. Breathing zone analysis (BZA) at 7.0 ft BGS read 4.0 ppm momentarily, then dropped and levelled off at 0.6 ppm. At 13.0 ft BGS, augering becoming difficult, advance is slow. Also at 13.0 ft (and beyond), cuttings returns are sporadic. Encounter water at 16.0 ft BGS. Cuttings from 10.0 ft to 17.0 ft BGS generally consist of a pale brown (5YR 5/2) to a dark greenish-gray (5GY 4/1) slurry. Encounter additional water at 17.0 ft BGS. Cuttings from 17.0 ft to 25.3 ft BGS returned in a dusky yellowish-green (10GY 3/2) to a light olive gray (5Y 5/2) slurry. Observed a dark substance on the cuttings at 23.5 ft BGS, have observed a similar phenomenon that the drillers refer to as shale fines. BZA=0.0 ppm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1038</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-12-93	1128	1136	Auger refusal at 25.3 ft BGS (0.7 ft short of the reported well depth). Remove auger bell, and attempt to pull casing. Extract
(cont.)			26.3 ft of 6.5-in. OD PVC well casing. Along with the cut-off stick-
			up section, a total of 28.3 ft of casing is recovered.
	1136	1145	Begin tripping augers out of the borehole. Remove one auger
			flight.
	1145	1305	Break for lunch.
	1305	1331	Return to 1038 site. Continue tripping out augers.
	1331	1345	All auger flights out of the borehole, tag the bottom at 21.5 ft BGS
			(3.8 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 13.7
			cubic ft=0.5 cubic yds, or equivalent to 10.1 sacks of 2%
			bentonite-cement grout. Pull out protective posts. Clean up,
			secure site, and depart.
5-13-93	1430	1518	Arrive at 1038 site. Run 2, 10.0-ft sections of 1.5-in. OD PVC
			tremie pipe into the borehole to 19.0 ft BGS. Fill front bucket of
			backhoe with cement from cement truck and tremie into bore-
			hole. Circulate water.
	1518	1520	Circulate 100% cement. Pull out tremie pipe. Clean up, secure
			site, and depart.
5-14-93	0900	0905	At 1038 site. Tag cement level at 2.7 ft BGS. Borehole is ready
			to be capped.
			Borehole is capped with clay soil on 5-14-93.
			P&A of 1038 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1040</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u> DRILLERS: <u>Steve Brown - Highland Drilling Co.</u> HELPERS: <u>Greg Shillings/Greg Anderson - Highland</u> DRILL: <u>Ford 555 B Backhoe with McMillan Diggerhead</u> <u>auger motor</u>		DATE: START: <u>5-10-93</u> FINISH: <u>5-17-93</u> METHOD: <u>C</u> LOGGED BY: <u>Timothy Coffey - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-10-93	1311	1314	Arrive at 1040 site. Preliminary radiological scan of the 1040 site showed elevated readings (background of 80 cpm). One backhoe bucket of gravel has been spread around well head for shielding. Casing stick-up = 0.9 ft. Water level is approximately 10 ft below ground surface (BGS). Tag bottom of well at 22.2 ft BGS. Rig up an 8.0-in. inside diameter (ID), 12.0-in. outside diameter (OD) lead hollow-stem auger flight with a 13.0-in. diameter cutterhead; total length = 5.3 ft.
	1314	1426	Commence augering. Additional auger flights added sequentially at the end of each 5.0-ft interval. Auger from 0.0 ft to 23.0 ft BGS. Cuttings from 0.0 ft to 6.0 ft BGS consist of grayish-brown (5YR 3/2) to dark yellowish-brown (10YR 4/2), moist, clayey soil containing fragments of undifferentiated gravel, and weathered shale. Augering becoming difficult at 11.0 ft BGS. Additional moisture encountered at 12.0 ft BGS as cuttings begin to ball up. Cuttings from 6.0 ft to 12.0 ft BGS are the same as the 0.0 to 6.0 ft interval with increasing amount of weathered shale. Encountered water at 14.3 ft BGS, and again at 16.0 ft BGS. Cuttings from 12.0 ft to 23.0 ft BGS consist of pale brown (5YR 5/2), thinly laminated, weathered shale fragments in a moderate yellowish-brown (10YR 5/4) clayey slurry.
	1426	1451	Auger refusal at 23.0 ft BGS. Trip augers out of the borehole.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1040</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-10-93	1451	1455	All augers out of the ground. Casing came out of the borehole with
(cont.)			tools, but came loose and dropped back into the hole.
	1455	1500	Extract 16.5 ft of PVC well casing by hand (includes 0.9 ft of casing
			stickup). The remaining 5.6 ft of casing stays at the bottom of the
			borehole (the casing had broken). Tag the bottom of the borehole
			at 21.5 ft BGS (1.5 ft of fill). Calculate a borehole volume to 4.0 ft
			BGS of 13.7 cubic ft, equivalent to 10.1 sacks of 2% bentonite-
			cement grout.
	1500	1503	Pull out protective posts. Clean up, secure site, and depart.
5-13-93	1422	1426	Arrive at 1040 site. Run 2, 10.0-ft sections of 1.5-in. OD PVC
			tremie pipe into borehole to 19.0 ft BGS. Plan to fill front bucket
			of backhoe with cement from truck and tremie borehole.
	1426	1430	Tremie the equivalent of approximately 1 sack (1.4 cubic ft) of 2%
			bentonite-cement grout into borehole. Losing too much cement
			out of the backhoe bucket in transit. Will have to mix cement by
			hand. Pull out tremie pipe. Clean up, secure site, and depart.
5-14-93	0905	0911	At 1040 site. Tag cement level at 18.5 ft BGS. Calculate a
			borehole volume to 4.0 ft BGS of 11.3 cubic ft, equivalent to
			8.3 sacks of 2% bentonite-cement grout. Run 2 10.0-ft sections of
			1.5-in. OD PVC tremie pipe into borehole to 18.0 ft BGS.
	0911	0940	Mix and gravity tremie 8 sacks (10.9 cubic ft) of 2% bentonite-
			cement grout into borehole. Run out of water.
	0940	0953	Crew goes to get more water.

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1041</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-6-93</u>	
DRILLERS: <u>Steve Brown - Highland Drilling Co.</u>		FINISH: <u>5-17-93</u>	
HELPERS: <u>Greg Shillings/Jim Gallaher - Highland</u>		METHOD: <u>C</u>	
DRILL: <u>Ford 555B Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-6-93	0840	0908	Arrive at 1041 site. Crew onsite attaching McMillan Diggerhead
			auger motor to backhoe boom. Casing stickup = 3.5 ft. Water
			level at 10.2 ft below ground surface (BGS). Tag well bottom at
			29.6 ft BGS.
	0908	0915	Cut off casing stickup flush with ground surface. Rig up lead
			auger flight; 8.0-in. inside diameter (ID) hollow-stem auger,
			13.0-in. outside diameter (OD) cutting picks, length = 5.3 ft.
	0915	0932	G. Shillings (Highland) departs to get tools that they do not have.
	0932	1124	Commence augering. Additional auger flights added sequentially
			at the end of each 5.0-ft interval. Auger from 0.0 ft to 30.0 ft BGS.
			Cuttings from 0.0 ft to 6.0 ft BGS consist of light brown (5YR 5/6),
			moist, clayey soil with fragments of undifferentiated gravel.
			Cuttings from 6.0 ft to 16.8 ft BGS consist of moderate yellowish-
			brown (10YR 5/4) to dark yellowish-orange (10YR 6/6), moist to
			wet, clayey subsoil with fragments of light olive gray (5Y 5/2),
			weathered, thinly laminated shale. Encounter water at 10.5 ft
			BGS (cuttings balling up). Water flowing out of borehole at 16.8 ft
			BGS. Cuttings becoming fewer. Cuttings from 16.8 ft to 30.0 ft
			BGS consist of dark yellowish-orange (10YR 6/6), wet, clayey
			subsoil with weathered shale fragments as above. Augering
			becoming difficult at 28.5 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1041</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-6-93	1124	1130	Auger refusal at 30.0 ft BGS. Remove auger bell. Attempt to pull
(cont.)			out casing by hand - unable to.
	1130	1250	Crew breaks for lunch, oversight departs.
	1250	1258	Return to 1041 site. Attempt to pull casing with ratchet clamp and chain. Clamp is tearing up casing.
	1258	1323	Trip augers out of the borehole.
	1323	1340	Pull out a total of 33.9 ft of 6.5-in. OD PVC casing (0.8 ft more than reported casing plus stickup). Bottom of the well may have been at 30.4 ft BGS. Tag bottom of the borehole at 28.5 ft BGS (1.5 ft of fill). Calculate a borehole volume to 4.0 ft BGS (using a borehole diameter of 12.0-in.) of 19.2 cubic ft = 0.7 cubic yds.
	1340	1345	Pull out protective posts. Clean up, secure site, and depart.
5-7-93	1145	1156	Arrive at 1041 site with cement truck. Run 2, 10.0-ft sections of 1.5-in. OD PVC tremie pipe into the borehole to 19.0 ft BGS.
	1156	1211	Gravity tremie neat Type I Portland cement into the borehole. Circulate 100% cement.
	1211	1216	Pull out tremie pipe. Clean up, secure site, and depart.
5-10-93	0803	0809	Arrive at 1041 site. Tag cement level at 4.9 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 0.6 cubic ft, equivalent to 0.4 sacks of 2% bentonite-cement grout. Depart site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1043</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-9-93</u>	
FOREMAN: <u>Greg Shillings - Highland Drilling</u>		FINISH: <u>2-12-93</u>	
HELPERS: <u>Paul McCormick/James Gallaher - Highland</u>		METHOD: <u>B</u>	
DRILL: <u>Ford 555 Backhoe</u>		LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-9-93	1404	1415	Arrive at 1043 site. This well has a float type of continuous water level recording device attached to the wellhead. Remove device.
			Well is open, scan for organic vapors anyway: 0.0 ppm. Scan wellsite with rad meters: beta & gamma = 60 cpm, alpha = 0 cpm.
			Measure water level at 29.5 ft below top of casing (BTOC) = 27.1 ft below ground surface (BGS). Tag bottom of well at 154.2 ft
			BTOC = 151.8 ft BGS. Note: the Subsurface Database reports the total depth (TD) of 1043 to be 150.0 ft. Calculate a well volume to 4 ft BGS of 29.0 cubic ft, equivalent to 42.0 sacks of Hole Plug™.
	1415	1432	Slowly pour 21 sacks (14.5 cubic ft) of Hole Plug™ into 1043 well casing. Organic vapor scan at well collar detects 1.6 ppm while pouring Hole Plug™ into well casing.
	1432	1436	Tag Hole Plug™ level at 84.1 ft BTOC = 81.7 ft BGS.
2-10-93	1003	1030	Arrive at 1043 site. Tag hydrated Hole Plug™ level at 79.8 ft BGS (Hole Plug™ swelled 1.9 ft). Scan wellsite with rad meters: alpha = 0 cpm, beta & gamma = 50 cpm. Calculate a well volume to 4 ft BGS of 14.9 cubic ft, equivalent to 10.9 sacks of 2% bentonite-cement grout.
	1320	1330	Return to 1043 site. Run 7, 10 ft joints of 1.5-in. outside diameter (OD) PVC tremie pipe into well to 67.0 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1043</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-10-93	1330	1405	Mix and gravity tremie 5 sacks (6.8 cubic ft) of 2% bentonite-
(cont.)			cement grout (first batch) into well. Continue to scan wellsite: beta
			& gamma = 70 cpm, alpha = 0 cpm. Remove one, 10 ft section of
			tremie pipe.
	1405	1450	Mix and gravity tremie an additional 5 sacks (6.8 cubic ft) of 2%
			bentonite-cement grout into the well. No water circulation. Water
			level was observed to rise while cement was running, then fell
			when cement stopped. Water appeared at ground surface outside
			of well casing (weep hole?) during tremie of last sack of cement.
	1450	1459	Remove tremie pipe and clean up.
2-11-93	1300	1310	Tag cement level in well at 21.3 ft BGS. Calculate a well volume
			to 4 ft BGS of 3.4 ft, equivalent to 2.5 sacks of 2% bentonite-
			cement grout.
2-12-93	1000	1038	Arrive at well 1043 site. Using backhoe, excavate a pit around the
			well. While excavating, the top 3.5 ft of well casing simply fell off
			- it had not been threaded securely to the last piece of casing (the
			lack of water circulation out of the well collar during grouting
			operations was the result of water escaping from this poorly
			secured casing joint). Pull out 3 protective posts with excessive
			concrete anchors. Screening soil and excavation: organic vapors
			= less than 1.0 ppm, alpha = 0 cpm, beta & gamma = 90 cpm (a
			small area of soil at about 1.5 ft BGS read a maximum of 900 cpm).
	1038	1040	Tag level inside well casing at 8.0 ft BTOC or 9.1 ft BGS (apparently
			mud and soil dropped into the well during excavation of the pit).
			Beta & gamma scan of excavation = 100 cpm.

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1048</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 5
LOCATION: <u>Oil Landfarm Functional Area</u>		DATE: START: <u>5/12/93</u>	
DRILLERS: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>5/25/93</u>	
HELPERS: <u>R. Phillips, G. Anderson - Highland</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll-Rand XL 750 Drillmaster</u>		LOGGED BY: <u>D. Hollon (SAIC) V. Harness (SAIC)</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5/12/93	0739	0800	Arrive on site. Scan drill site with radiation meters. Beta/gamma scan reads 50 to 80 cpm; background reads 50 cpm. Alpha scan of the site reads 0 cpm; background reads 0 cpm. Measure bit and stabilizer rod to be 4.6 ft in length.
	0800	0847	Crew: H. Hall and R. Phillips on site. S. Jones (HSEA) present to inspect the site. States that the crew has permission to use Quick Foam™ as needed, and that there is no need for a pit. Steve Jones leaves the site. Bottom of the hole tagged at 99.6 ft below ground surface (BGS). Table height is 3.1 ft. Will be using a 10 5/8-in. outer diameter (OD) tricone bit to ream a 6.5 -in. OD PVC casing in a 7.5-in. OD hole.
	0847	0900	Commence drilling. Water level is at 9.0 ft BGS. HNu survey of the breathing zone reads 0.2 ppm from 1.5 ft to 11.5 ft BGS.
	0900	0906	Drill to 26.5 ft BGS and make connection. Beta/gamma scan of the cuttings from 1.5 to 11.5 ft BGS and 11.5 to 20 ft BGS reads 50 to 60 cpm. Alpha scan reads 0 cpm. Weathered, moderate yellowish brown to light brown (10YR 5/4 - 5YR 5/6) shale and light brown soil. PVC cuttings present.
	0906	0910	Top of fresh bedrock at 30.5 ft BGS. HNu survey of the breathing zone reads 0.2 ppm. Drillhole is producing approximately 20 gallons per minute of water. Noticed intermittent sheen on the return water.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. 1048
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
05/12/93	0910	0919	HNu survey of the breathing zone at 36.5 ft BGS reads 0.2 ppm.
(cont.)			Small void system from 43.5 ft to 45.5 ft BGS. Made connection
			at 51.5 ft BGS. Lithology: 26.5 ft to 30.5 ft BGS is weathered
			shale, medium gray to dark greenish gray (N5-5GY 4/1). 30.5 ft
			to 51.5 ft BGS is unweathered shale, dark greenish gray, greenish
			black, and medium bluish gray (5G 4/1, 5GY 2/1, 5B 5/1), friable
			and fissile with minor staining on the cuttings and fractures. Minor
			PVC fragments present.
	0919	0957	H. Hall believes that Quick Foam TM is needed to clean out the
			cuttings from the hole. Stopped drilling operations to have
			R. Phillips to go and get the Quick Foam TM at the pipeyard.
			Beta/gamma scan of the cuttings from 20 ft to 51.5 ft BGS reads
			50 to 90 cpm. Alpha scan reads 0 cpm.
	0957	1007	Asked S. Jones what needs to be done about the observance of
			an intermittent sheen on the return water. Was told to monitor for
			Health and Safety parameters and continue drilling.
	1007	1018	Quick Foam TM added to drilling water. H. Hall cleans out the
			borehole. Hole is producing 20 to 30 gallons per minute when
			using the compressed air from the drill rig.
	1018	1021	Hole cleaned out to 51.5 ft BGS.
	1021	1039	Resume drilling. HNu survey of the breathing zone at 56 ft BGS
			is 1 ppm. The alcohol from the Quick Foam TM can easily be
			detected. Hard drilling zone at 66.5 ft BGS. HNu survey of the
			breathing zone reads 0.4 ppm at 70 ft BGS. Connection made at
			76.5 ft BGS. Cuttings from 51.5 ft to 76.5 ft BGS reads 50 to
			90 cpm; background reads 50 cpm. Alpha scan reads 0 cpm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1048</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
05/12/93 (cont.)	1039	1047	Connection made and drilling resumes. Hard drilling zone at 79.5 ft BGS. HNu survey from 81 ft to 88 ft BGS reads 0.2 to 0.4 ppm.
	1047	1051	HNu survey of the breathing zone from 90 ft to 96 ft BGS reads 0.8 ppm. Drilling ends at 101.5 ft BGS; 1.5 ft below the original well depth of 100 ft BGS. Beta/gamma scan of the cuttings from 76 ft to 101.5 ft BGS reads 50 to 90 cpm. Alpha scan reads 0 to 10 cpm. Lithology: Shale, greenish black to dark greenish gray to bluish gray (5G 4/1-5GY 2/1-5B 5/1). Pelmicrite and intramicrite interbeds, medium gray to medium dark gray (N5-N4). Weathering and fractures present on some cuttings. Very minor amounts of PVC.
	1051	1110	Clean out the borehole. Driller reported approximately 6 ft of fill was in the hole after letting the hole sit for a few minutes without circulating. Says that the hole is as clean as it is ever going to be.
	1110	1115	Pulling the tools out of the hole.
	1115	1248	Hydraulic line to the rig breaks, operations stop. Absorbent spill pads used to contain spilled fluid on drill rig and ground surface. Crew assesses the impact of the broken hose. R. Phillips does not believe that plugging and abandoning operations can be completed today. HNu survey of the headspace is 0.2 ppm. The pH of the water reads 7.5. Will tag the bottom of the hole tomorrow to see how much fill has accumulated into it. Plans are made for cement to be on the site in the morning. Depart the site.
5/13/93	0816	0828	Arrive at 1048. H. Hall on the site. R. Phillips and G. Anderson arrive on the site at 0825 hr. The rig is repaired and the crew plans to tag the top of the fill and then determine if the hole needs to be cleaned out further or if grouting operations can begin.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1048</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 4 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5/13/93	0828	0830	Rig is started and the crew begins lowering the drill rods into the borehole.
(cont.)			
	0830	0857	Crew can not get the drill rod to unthread from the drilling head. The crew breaks a 16-in. pipe-wrench before deciding to get a burning permit to heat up the drill rods and help them to break the connection. R. Phillips leaves to get a burning permit.
	0857	0941	R. Phillips returns with a burning permit and the crew begins to unseize the connection. Connection between the drilling head and the drill rod was finally broken at 0925 hr. Crew trips into the borehole to 97.3 ft BGS, where the bit stops at the top of fill.
	0941	0946	Called T. Coffey (SAIC) to inquire if the amount of fill in the hole (4.2 ft) was suitable so that grouting operations could begin. Explained to him that additional cleaning of the hole would probably cause an increase of washout in the hole due to the soft shale. He agreed and stated for crew to begin grouting operations.
	0946	1123	Crew rigs down and moves the water truck and drill rig from the site. R. Phillips (Highland) orders 2.5 cubic yards of cement for the hole. Calculation 2.3 cubic yards of cement required to fill borehole to 4 ft BGS. H. Hall and G. Anderson install 1.5-in. OD PVC tremie pipe to 89.5 ft BGS.
	1123	1206	Cement truck arrives. Gravity tremie cement into borehole. Water circulation attained throughout.
	1206	1230	Tremie pipe removed. Secure site and depart.
5/14/93	0805	0828	Arrive at 1048. Tag top of cement at 22.4 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 11.4 cubic ft = 0.4 cubic yds.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1049</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5/14/93</u>	
DRILLERS: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>5/21/93</u>	
HELPERS: <u>G. Anderson - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll-Rand XL 750 Drillmaster</u>		LOGGED BY: <u>D. Hollon - SAIC</u> <u>T. Coffey - SAIC</u> <u>V. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5/14/93	0828	0847	Arrive at 1049. Drill rig positioned over the well. H. Hall and G. Anderson (both of Highland) are on the site and getting the rig ready to drill.
	0847	0850	Measure the bottom of the hole to be at 16.5 ft below ground surface (BGS); water level approximately 7 ft BGS. Will be using a 10 5/8-in. outer diameter (OD) tricone bit to ream a 6.5 -in. OD PVC casing in a 7.5-in. OD hole; total length = 4.6 ft.
	0850	0852	Table height = 2.3 ft. Reaming operations begin.
	0852	0855	HNu survey of the breathing zone reads 0.2 ppm at approximately 2.3 ft above the ground surface.
	0855	0903	Drilling connection made. Water at 6.0 ft BGS. Drilled to 22.3 ft BGS. Possible cavities at approximately 14 ft to 18 ft BGS (the bit dropped faster than expected through this interval). Drilling rate decreased (hard rock) at about 22 ft BGS. HNu survey of the breathing zone reads 0.0 ppm. Lithology 0 ft to 7.3 ft BGS: Reddish brown soil. Weathered, friable and fissile shale, pale brown (5YR 5/2), grout and PVC fragments.
	0903	0959	Driller cleans out the hole. Trip out, rig down stabilizer. Move the rig offsite. Beta and gamma scan of the drill cuttings reads 50 to 90 cpm; background reads 50 cpm. Alpha scan reads 0 cpm. Lithology 7.3 ft to 22.3 ft BGS: Weathered shale, grayish olive

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1049</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5/14/93			green to dusky brown (5GY 3/2 - 5YR 2/2). White (N9) quartz
(cont.)			sandpack and PVC fragments present.
	0959	1020	The pH of the cuttings composite reads 9.9. The HNu survey of the
			headspace reads 0.6 ppm. Bottom of hole 20 ft BGS (2.3 ft of fill).
			Calculate a borehole volume to 4.0 ft BGS of 9.9 cubic ft, equivalent
			to 7.2 sacks of 2% bentonite-cement grout. Cement delivery
			scheduled for approximately 1430 hrs. Clean up and depart site.
	1145	1200	Return to 1049 site. Drillers install 2 10.0-ft sections of 1 5-in. OD
			PVC tremie pipe to 19 ft BGS. Depart site.
	1502	1517	T. Coffey (SAIC) assumes technical oversight. Return to 1049 site
			with cement truck. Tremie cement into the borehole. Circulate water.
	1517	1530	Cement truck empty. Circulate approximately 50% cement. Clean-
			up site and pull out tremie pipe. Depart site.
5/17/93	1306	1311	At 1049 site. Tag cement level at 5.5 ft BGS. Calculate a borehole
			volume to 4.0 ft BGS of 0.9 cubic ft, equivalent to 0.7 sacks 2%
			bentonite-cement grout.
5/18/93	1300	1400	V. Harness (SAIC) assumes technical oversight. G. Shillings and
			S. Brown (both of Highland) mix and pour one sack (1.4 cubic ft) of
			2% bentonite-cement grout into the borehole.
5/21/93	0908	0917	Tag cement at 2.9 ft BGS.
	0917	1000	G. Shillings and S. Brown (both of Highland) cap the borehole with
			clay soil.
			P&A of 1049 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1050</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			Alt. Names: YGMW-19 OD-03 No. 10 PAGE 1 of 4
LOCATION: <u>Oil Landfarm Functional Area</u>		DATE: START: <u>5-17-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>5-25-93</u>	
HELPERS: <u>Steve Brown, Randy Phillips</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-17-93	0808	0822	Technical oversight provided by V.R. Harness (SAIC). Arrive at site, awaiting crew.
	0822	0909	Crew arrives with backhoe, begin excavating cuttings pit. Beta/gamma survey of excavated soil = 60 cpm = background (BCK), alpha = 0 cpm = BCK, Breathing Zone Analysis (BZA) = 0.0 ppm.
			Casing stickup = 1.85 ft above ground, casing is PCV/#80 6.5-in. OD sewer pipe. Protective posts have no grout to anchor them.
	0909	0938	Cuttings pit is finished at 8 ft long x 6 ft wide x 10 ft deep. Well is in Maynardville Fm and large units of water are expected. At a depth of approximately 9 ft below ground surface (BGS) saprolitic shaly clay becomes greenish gray (5GY 6/1) with indistinct gray (5Y 5/1) mottling to 1 cm diameter.
	0938	0947	Start drilling rig. Rigging up 10 5/8-in. diameter tricone roller bit without stabilizer. Length of bit and subadapters = 4.6 ft.
	0947	0952	Commence drilling stickup. Table height = 2.6 ft. Advance to 2 ft BGS with compressed air only. BZA = 0.0 ppm.
	0952	1005	Add 25 ft of drilling rod to string. Resume drilling and advance to 23 ft BGS using water. Top of fresh rock at 20 ft BGS. Void in weathered rock from 15 to 19 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1050</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-17-93			Description of 0 to 2 ft BGS cuttings:
(cont.)			
			Moist yellowish-brown silty loam with PVC cuttings.
			Description of 2 to 23 ft BGS cuttings:
			80% (by volume) = dark gray (N3), slightly dolomitic limestone to
			dolostone, finely crystalline with no primary textures preserved.
			15% pale yellow (2.5Y 7/4) to light olive brown (2.5Y 5/4) stiff silty
			clay. 5% light olive gray (5Y 5/2) to light olive brown (2.5Y 5/4)
			shale containing visible micaceous component and red (10R 5/8)
			iron oxide staining.
	1005	1038	Drill head begins leaking oil. Rig shut down, spill controls de-
			ployed.
	1038	1118	Crew changes rig head oil.
	1118	1124	Trip back in, encounter water at 18 ft BGS. Head still leaking oil.
			Shut down for lunch and repairs.
	1318	1329	Rig back up and resume drilling at 23 ft BGS.
	1329	1334	Advance to 27 ft BGS. Void from 25 ft to 26.5 ft BGS. Clean bore,
			add 25 ft of drilling rod and resume drilling.
	1334	1422	Receive permission to use minimal amount of Quick Foam™ to
			facilitate drilling from Bruce McMaster (HSE representative). Ad-
			vance to 52 ft BGS. Mud filled voids from 30 to 32 ft BGS, voids
			from 37 to 37.5 ft BGS, and 39 to 40 ft BGS. Drilling becoming hard
			at 43 ft BGS. Head begins leaking slightly again at 49.5.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1050</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-17-93			Description of 23 to 45 ft BGS cuttings:
(cont.)			
			50% (by volume) of sample is dark gray (N3) finely crystalline
			dolomitic limestone which has been largely silicified. 25% of sample
			is dark yellowish-brown (10YR 4/2) to moderate brown (5YR 3/4)
			finely crystalline dolomitic limestone with blebs and surfaces of fine
			subhedral quartz. 25% of sample is light olive gray shale similar to
			0 to 23 ft interval.
	1422	1437	Crew attempts to control leak and continue drilling so that repairs
			can be moved off site. Advanced to 65 ft BGS after adding 25 ft drill
			rod.
	1437	1520	At 65 ft BGS. Unable to contain leak. Shut down rig for repairs. 45
			to 65 ft sample similar to 23 to 45 ft sample. Secure site and depart.
			Highland will contact SAIC when rotation motor has been replaced.
5-18-93	1402	1409	Receive notification from Highland Drilling. Arrive at site.
	1409	1416	Rig on, trip back into hole.
	1416	1514	Resume drilling at 65 ft BGS. Advance to 90 ft BGS (target depth)
			wash out bore, trip out. Cuttings are a continuation of the 45 to 65 ft
			interval.
	1514	1553	Mobilize rig offsite. Crew inserts 80 ft of 1.5-in. OD PVC tremie pipe
			to 77 ft BGS. Secure site and depart.
5-19-93	0858	0905	Tag bore around tremie line at 80 ft BGS. Bore has large pieces of
			PVC casing coming loose from sides providing partial obstruction.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1050</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-19-93	1145	1215	Grout delivery at well. Tremie 2 cubic yds into bore with grout not visible at surface. Secure site and depart.
(cont.)			
5-20-93	0848	0850	Grout tagged at 36.2 ft BGS. Depth verified by 3 separate measurements. All voids observed during drilling were above 37.5 ft BGS. Received permission from Steve Jones (HSE) to use Hole Plug™ bentonite to plug hole from 36.2 to 15 ft BGS where all voids were located. Depart.
	1020	1032	Poured 21, 50-lb sacks of 3/8-in. diameter Shur-Plug™ bentonite. Top of unhydrated bentonite tagged with tremie pipe at approximately 16 ft BGS. Lost 20 ft of fiberglass tape and stainless steel weight in well at 26 ft BGS. Hydrate bentonite with 50 gals. of potable water. Depart.
5-21-93	0917	0934	Tag top of hydrated bentonite at 15.3 ft BGS. Depart.
	1000	1030	Grout delivered to well and poured. 0.5 cubic yd. fills bore to surface. Depart.
5-24-93	0943	0947	Tag grout at 4.6 ft BGS. Depart.
	1300	1400	Crew mixes and pours 1 sack of neat grout into well. Depart.
5-25-93	0914	0919	Tag grout at 2.2 ft BGS. Depart.
	0925	0930	Cuttings pit filled and bore capped with clay. Depart.
			P&A of 1050 complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1051</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Oil Land Farm Functional Area</u>		DATE: START: <u>5/14/93</u>	
DRILLERS: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>5/21/93</u>	
HELPERS: <u>G. Anderson - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll-Rand XL 750 Drillmaster</u>		LOGGED BY: <u>D. Hollon, T. Coffey, V. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5/14/93	1020	1047	Drill rig moved onto the 1051 site. Crew prepares the rig to drill.
			Measured the bottom of the hole at 25.0 ft below ground surface
			(BGS), obvious sediment accumulation. Subsurface Data Base
			(Y/TS-881) reports the well TD of 28.0 ft BGS.
	1047	1048	Rig is leveled up, the bottom hole assembly consisting of a bit on
			a subadapter (total length = 4.6 ft) is attached to the drilling head,
			and the table height is 3.1 ft. Will be using a 10 5/8-in. outside
			diameter (OD) tricone bit to ream 6.5 -in. OD PVC casing in a
			7.5-in. diameter hole.
	1048	1104	Drilling commences. Drill from 0.0 ft to 26.5 ft BGS. HNu surveys
			of the breathing zone read 0.4 ppm from 7 ft to 10 ft BGS; 0.4 ppm
			from 15 ft to 20 ft BGS; 0.4 ppm from 20 ft to 26 ft BGS. Beta/
			gamma scan of the cuttings from 0 ft to 20.5 ft BGS reads 50 cpm;
			background reads 30 cpm. Lithology: 0 ft to 1.5 ft BGS is reddish
			brown clay; 1.5 ft to 11.5 ft BGS is weathered grayish brown to
			greenish gray (5YR 3/2 - 5 GY 6/1) shale, bentonite, and PVC;
			11.5 ft to 20.5 ft BGS is weathered grayish brown to greenish gray
			(5YR 3/2 - 5 GY 6/1) shale, and PVC fragments.
	1104	1107	Connection made. Drilled to 29.5 ft BGS. Top of unweathered
			rock at 29.0 ft BGS. HNu survey of the breathing zone reads
			0.4 ppm. The drill hole is producing approximately 25 to 30 gallons
			of water per minute when using the compressed air from the drill
			rig. Lithology: Weathered, friable, fissile grayish brown, dusky

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1051</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
05/14/93			brown and dusky green (5YR 3/2, 5YR 2/2, 5G 3/2) shale.
(cont'd)			medium gray (N5) micrite, and PVC. No grout or sand pack encountered in the drillhole.
	1107	1131	Driller cleans the hole. Trip out, rig down bit and stabilizer. Rig is moved offsite. Beta/gamma scan of the cuttings from 20.5 ft to 29.5 ft BGS reads 60 cpm; background reads 50 cpm. Alpha scan of the cuttings from 0 to 29.5 ft BGS reads 0 to 10 cpm.
	1131	1145	R. Phillips (Highland) notices that the hole has collapsed at the top. Install 30 ft of 1.5-in. OD PVC tremie pipe to 25 ft BGS.
	1145	1234	HNu survey of the composite headspace analysis reads 0.4 ppm.
	1346	1415	Arrive at Biology Building to perform pH test on the cuttings. The pH of the cuttings from well 1051 is 5.3.
	1415	1457	T. Coffey (SAIC) assumes technical oversight. Calculate a borehole volume to 4.0 ft BGS of 12.9 cubic ft, equivalent to 9.5 sacks of 2% bentonite-cement grout. Cement truck arrives onsite. Tremie cement into the borehole. Circulate muddy water.
	1457	1502	Circulate 100% cement. Pull out tremie pipe. Clean-up, secure site, and depart.
5/17/93	1303	1306	At 1051 site. Tag cement level at 4.8 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 0.5 cubic ft, equivalent to 0.4 sacks of 2% bentonite-cement grout.
5/18/93	1300	1400	V. Harness (SAIC) providing technical oversight. G. Shillings and S. Brown (both of Highland) mix and pour one sack (1.4 cubic ft) of 2% bentonite-cement grout into the borehole.

[illegible]

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1052</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-19-93			Description of 0 to 23 ft cuttings:
(cont.)			
			90% (by volume) is silty shale to shaly siltstone. Silty shale
			coloration ranges from light olive gray (5Y 5/2) to dark gray
			(5Y 4/1). Shaly siltstone coloration ranges from olive (5Y 5/3) to
			olive gray (5Y 4/2) with some strong brown (7.5YR 5/8) iron oxide
			staining. 10% of sample is comprised of large PVC cuttings and
			some stiff, silty clay ranging from white (5Y 8/2) or pale yellow
			(5Y 8/3) to reddish yellow (7.5YR 7/8).
	1022	1131	Awaiting grout delivery.
	1131	1140	Grout arrives. 1 cubic yd of neat, Type I Portland cement poured
			into 1052 bore. Circulate grout. Secure site and depart.
5-20-93	0850	0852	Tag cement at 13 ft BGS. Depart site.
5-21-93	1130	1200	Crew pours 0.25 cubic yds into bore. Secure site and depart.
5-24-93	0941	0943	Tag cement at 5 ft BGS, depart.
	1300	1400	Crew mixes and pours 1 sack of cement into 1052, secures site
			and departs.
5-25-93	0910	0919	Tag cement at 2.7 ft BGS, depart.
	0925	1000	Crew caps 1052 with clay soil.
			P&A of 1052 complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1071</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-12-93</u>	
DRILLERS: <u>Steve Brown - Highland Drilling Co.</u>		FINISH: <u>5-14-93</u>	
HELPERS: <u>Greg Shillings/Greg Anderson - Highland</u>		METHOD: <u>C</u>	
DRILL: <u>Ford 555B Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-12-93	1351	1400	Arrive at 1071 site. Scan of location with beta & gamma meter indicates background to be 150 cpm. Position backhoe over well.
			Casing stick-up=2.3 ft. Water level is at approximately 7.0 ft below ground surface (BGS). Rig up the 8.0-in. inside diameter (ID), 12.0-in. outside diameter (OD) initial hollow-stem auger flight with 13.0-in. diameter cutterhead; total length=5.3 ft. Cut off 1.4 ft of casing stick-up.
	1400	1404	Commence augering. Auger from 0.0 ft to 5.0 ft BGS. Cuttings consist of moderate brown (5YR 4/4), moist, clayey soil with weathered shale fragments. Begin to see PVC fragments at 5.0 ft BGS.
	1404	1417	At 5.0 ft. BGS. Pull out initial auger flight, section of casing jammed in end of flight. Remove 3.2 ft. of 6.5-in. OD PVC casing from auger. Trip back into borehole. Add auger flight.
	1417	1545	Resume augering. Additional auger flights added sequentially at the end of each 5.0-ft interval. Auger from 5.0 ft to 22.0 ft BGS. Hard augering at 6.0 ft BGS (suspect that cutterhead is breaking up the well casing). Encounter a small amount of water at 8.0 ft BGS as cuttings begin to ball up. Observe a sewage-like odor at approximately 9.0 ft BGS, breathing zone analysis (BZA)=0.0 ppm. Cuttings from 5.0 ft to 10.0 ft BGS are the same as the 0.0 to 5.0 ft interval. No cuttings returned from 10.0 ft to 12.5 ft BGS. Cuttings sporadic to end of boring. Cuttings from 12.5 ft BGS to

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1071</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-12-93	1417	1545	end of borehole consist primarily of dark yellowish-orange (10YR 6/6) to moderate yellowish-brown (10YR 5/4), wet, clayey, soil (slurry) and weathered shale. Frequently observe sewage odor to end of boring, BZA never exceeds 0.5 ppm.
(cont.)			
	1545	1604	At 22.0 ft BGS (1.0 ft deeper than well bore). Stop augering. Trip augers out of the borehole.
	1604	1610	All auger flights out of the borehole. Tag borehole bottom at 17.0 ft BGS (5.0 ft of fill). Calculate a borehole volume to 4.0 ft. BGS of 10.2 cubic ft=0.4 cubic yds, equivalent to 7.5 sacks of 2% bentonite-cement grout. Clean up, secure site, and depart.
5-13-93	1520	1525	At 1071 site. Run 1, 10.0-ft section of 1.5-in. OD PVC tremie pipe into borehole to 9.0 ft BGS.
	1525	1609	Fill front bucket of backhoe with cement from cement truck and tremie into borehole. Circulate water.
	1609	1631	Circulate 100% cement. Pull out tremie pipe. Clean up, secure site, and depart.
5-14-93	0945	0950	At 1071 site. Tag cement level at 1.4 ft BGS. Borehole is ready to be capped.
			Borehole is capped with clay soil on 5-14-93.
			P&A of 1071 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1088</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			P GE 1 of 3
LOCATION: <u>Oil Landfarm Functional Area</u>		DATE: START: <u>6-8-93</u>	
DRILLERS: <u>Greg Shillings - Highland Drilling Co.</u>		FINISH: <u>6-15-93</u>	
HELPERS: <u>Steve Brown/James Gallaher - Highland</u>		METHOD: <u>B</u>	
DRILL: <u>Not Applicable</u>		LOGGED BY: <u>V. Harness/T. Coffey-SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-8-93	0908	0925	Technical oversight by V. Harness (SAIC). Arrive at 1088 site. Well site is such that positioning an air rig over the well is impossible. HSE personnel have directed that plugging and abandonment of the well will consist of: filling/sealing open interval and casing with cement grout, cutting off casing below ground surface (BGS), and capping with clay soil. The protective posts will be cut off flush with the ground surface. Tag bottom of well at 115.4 ft BGS. Note: The subsurface data base (Y/TS-881) reports the total depth of 1088 at 117.7 ft BGS. Calculate a well volume of 9.4 cubic ft, equivalent to 6.9 sacks of 2% bentonite-cement grout.
	0925	0950	Crew arrives. Run 10, 10.0-ft sections of 1.5-in. outside diameter (OD) PVC tremie pipe into the well to 98.0 ft BGS.
	0950	1145	Mix and tremie 7 sacks (8.3 cubic ft) of neat, Type I Portland cement into the well using diaphragm hand pump. Pump pressures up. Crew removes 30 ft of tremie pipe and continues tremie of cement from 68.0 ft BGS. No circulation of cement or water.
	1145	1154	Pull out tremie pipe. Clean up and depart site.
6-11-93	0831	0840	Technical oversight by T. Coffey (SAIC). Arrive at 1088 site. Tag cement level/bottom of well at 124.7 ft BGS. No explanation for well now being 9.3 ft deeper than prior to the commencement of P&A activities. Noted that surface casing is 4.0-in. OD, 3.5-in. inside diameter (ID) not 6.5-in. OD as reported in the subsurface data base

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1088</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-11-93	00831	0840	(Y/TS-881). Calculate an open-interval volume to 25.0 ft BGS
(cont.)			(assumed approximate depth of surface casing) at 4.9 cubic ft,
			equivalent to 7.1 sacks of Hole Plug™. Depart site.
6-14-93	0830	0908	Arrive at 1088 site. G. Shillings (Highland) onsite. Slowly pour 6
			sacks (4.1 cubic ft) of Hole Plug™ into the well while continuously
			tamping with a weighted tape to prevent bridging. Fill well to 21.7
			ft BGS. Hole Plug™ to hydrate a minimum of 4 hrs. Depart site.
	1539	1557	Return to 1088 site. Tag hydrated Hole Plug™ level at 21.6 ft (Hole
			Plug™ swelled 0.1 ft). Calculate a casing volume to 4.0 ft BGS of
			0.9 cubic ft, equivalent to 0.6 sack of 2% bentonite-cement grout.
			Wait on crew.
	1557	1600	Crew arrives. Run 2, 10.0-ft sections of 1.5-in. OD PVC tremie
			pipe into the well to 19.0 ft BGS.
	1600	1613	Mix and gravity tremie 1 sack (1.4 cubic ft) of 2% bentonite-cement
			grout. Circulate water, then 100% cement.
	1613	1619	Pull out tremie pipe. Clean up and depart site.
6-15-93	0732	0736	At 1088 site. Tag cement level at 3.2 ft below top of casing = 2.6
			ft BGS. Depart site.
	1440	1457	Return to 1088 site with the crew and backhoe. Crew cuts off
			protective posts flush with the ground surface.
	1457	1512	With the backhoe, excavate a pit around the surface casing to a
			depth of approximately 2.5 ft BGS.

WELL NO. 1088

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1130</u>
WELL PLUGGING and ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>12/2/92</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling</u>		FINISH: <u>12/15/92</u>	
HELPERS: <u>Scott Gilbert/Steve Brown - Highland Drilling</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u> <u>Michael Klidzejs - SAIC</u>	
DRILL: <u>Ingersoll Rand XL-750</u>			

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/2/92	1340	1423	Arrive at 1130 site. Crew working to clear brush and fallen trees from around well head. Crew pulls out protective posts (3), and removes concrete pad and well head protection.
	1423	1450	Move drill rig onto site, position over well. Begin setting up site. Raise mast on drill rig. Measure water level in well at 6.1 ft below ground surface (BGS). Tag bottom of well at 24.0 ft BGS.
	1450	1528	Move bit and stabilizer to site and begin rigging up with 10 5/8-in. diameter tri-cone bit and stabilizer; length = 9.2 ft. Continue to set up drill rig.
	1528	1600	Waiting for steam cleaner.
	1600	1633	Having trouble getting decent stream of water out of steam cleaner - nozzle appears to be plugged. Cleaned. Steam clean stabilizer and drill rig.
	1633	1655	Winterize drill rig, secure site, and depart.
12/3/92	0905	0930	Arrive at 1130 site, drill crew arrives immediately afterwards. Start up drill rig. Finish rigging up bit and stabilizer; table height = 3.2 ft. Rig up water system to drill rig.
	0930	0939	Add 1 drill rod to rig carousel.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1130</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/2/92	0939	1010	Commence reaming with air only. Will mill PVC well casing, and
(cont.)			ream bore to fresh rock in one operation. Ream from 0.0 ft to 6.0 ft
			BGS. Encounter a small amount of water at 2.5 ft BGS (mud
			surging out of bore). Cuttings consist of: Light brown (5 YR 5/6)
			to dusky brown (5 YR 2/2), moist, clayey soil/residuum with pale
			yellowish-orange (10 YR 8/6) residual chert fragments; medium
			gray (N5) cement fragments; white (N9) PVC fragments. Organic
			vapors in breathing zone = 0.2 ppm (jumps to 2.0 ppm at hole collar
			due to alcohol antifreeze use in drill rig).
	1010	1014	At 6.0 ft BGS, add drill rod.
	1014	1025	Continue reaming with air only. Ream from 6.0 ft to 8.5 ft BGS.
			Cuttings this interval consist of: Light brown (5 YR 5/6) to
			moderate brown (5 YR 4/4), moist, clayey soil with pale yellowish-
			orange (10 YR 8/6) to grayish black (N2) residual chert fragments.
			Cement fragments are rare in this interval. Detect a strange odor
			emanating from bore - smells like burning plastic. Organic vapor
			reading at hole collar is jumpy, but reads up to 5.0 ppm. The odor
			comes and goes.
	1025	1051	Trying to get rod bushings into the rig table (the stabilizer may be
			starting to deviate out of the well).
	1051	1107	Continue reaming. Adding water to help circulate cuttings. Ream
			from 8.5 ft to 25.0 ft BGS. Cuttings consist of: Light brown
	1107	1126	(5 YR 5/6) to moderate brown (5 YR 4/4), clayey soil with pale
			yellowish-orange (10 YR 8/6), grayish-black (N2), and moderate
			reddish-brown (10 R 4/6) residual chert fragments.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1130</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 3 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/3/92	1126	1145	At 25.0 ft BGS. Clean out borehole. Trip out and rig down bit and
(cont.)			stabilizer. Tag bottom of bore at 22.5 ft BGS. Calculate hole
			volume of 12.7 cubic ft, equivalent to 10.8 sacks neat cement.
	1145	1206	Lower mast on drill rig. Clean up site.
	1423	1433	Run 2 sections of 1.5-in. outside diameter (OD) PVC tremie pipe
			into the bore, bottom at 18.4 ft BGS. Depart site, move to next
			location.
	1433	1445	Technical oversight by Mike Klidzejs - SAIC. Cement truck
			arrives at 1130 site, begins pouring cement into trough at well
			head.
	1445	1449	Pump cement from trough through tremie pipe into well bore.
			Circulate 50% cement out of the bore.
	1350	1352	Pull out tremie pipe. Clean up and secure site. Depart site.
			Note: Headspace and pH readings exceeding the action levels
			due to alcohol used as anti-freeze in drilling rig and high cement
			content in the cuttings, respectively. Steve Jones (HSEA)
			informed of the readings.
12/4/92	1350	1352	Oversight resumed by Timothy Coffey - SAIC. Tag cement level
			in 1130 at 5.0 ft BGS. Report findings to S. Jones.
12/15/92	1624	1626	Mike Klidzejs - SAIC inspects 1130. Hole filled to ground surface
			with soil.
			P&A of 1130 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1131</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>Hubert Hall - Highland Drilling</u> HELPERS: <u>Steve Brown - Highland Drilling</u> DRILL: <u>Ingersoll Rand XL-750</u>		DATE: START: <u>12/3/92</u> FINISH: <u>12/15/92</u> LOGGED BY: <u>Timothy Coffey - SAIC Michael Klidzejs - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/3/92	1214	1232	Technical oversight by Timothy Coffey. Arrive at 1131 site. Crew removes pad, posts, and wellhead protection. Crew using backhoe to prepare site for drill rig.
	1232	1337	Wait for steam cleaner.
	1337	1405	Steam clean drill rig and stabilizer. Measure water level in 1131 at 9.8 ft below ground surface (BGS). Tag bottom of well at 27.5 ft BGS (feels like an accumulation of sediment).
	1405	1418	Move drill rig onto site, position rig over 1131 wellhead. Prepare to drill. P&A of 1131 will be in the same manner as well 1130. Removal of well and reaming of bore into fresh material will be done at the same time.
	1418	1423	Rig up with a 10 5/8-in. diameter tricone bit and stabilizer; length = 9.2 ft, table height = 2.6 ft.
	1423	1501	Commence reaming with air only. Ream from 0.0 ft to 6.4 ft BGS. Cuttings from 0.0 to 2.0 ft BGS consist of predominantly medium gray (N5) to dark gray (N3) cement fragments with abundant white (N9) PVC fragments. At 2.0 ft BGS, cuttings are of: moderate yellowish-brown (10 YR 5/4), dry soil continuing with cement and PVC fragments.
	1501	1504	At 6.4 ft BGS, add drill rod.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1131</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/3/92	1504	1518	Continue reaming with air only. Ream from 6.4 ft to 9.4 ft BGS.
(cont.)			Cuttings in this interval are the same as the 2.0 to 6.4 ft. interval.
	1518	1526	Driller attempts to add water. Unable to push water through the drill rig air/water system. Air is leaking around miss-matched plug in air tank.
	1526	1552	Shut off drill rig. It is unsafe to continue with incorrect plug in air tank. Driller looks for a correct size plug in tool kits. Screen cuttings from 0.0 to 9.4 ft BGS.
	1552	1600	Unable to find plug, will stop here for the day. Winterize drill rig. Clean up, secure site, and depart. Note: Cuttings sample registered a pH reading of 12.1 due to the cement fragments in the sample. Notified S. Jones - HSE of results.
12/4/92	0753	0824	Technical oversight assumed by Michael Klidzejs. Oversight arrives on site. Highland crew arrives on site at 0815 and prepares to drill. Air tank plug replaced.
	0824	0854	Rig is started. Table height is measured at 2.6 ft. Breathing zone surveyed: HNu - giving erratic readings from 0.2 to 15 ppm due to presence of alcohol-based antifreeze from drill rig. Beta and gamma background = 50 - 60 cpm. Alpha background = 10 cpm.
	0824	0854	Drilling is delayed due to clogged air port on tri-cone bit. Stabilizer and bit are tripped out and the air exhaust ports are cleaned. Trip back down and add rod. Notice strong alcohol smell from antifreeze left in system. Blow hole clean.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1131</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/4/92	0854	0915	Begin drilling at 9.4 ft BGS. Cuttings from 9.4 to 11.4 ft BGS consist
(cont.)			of predominant cement and PVC fragments, some minor light gray
			micritic limestone also present. Cuttings samples collected at
			16.4, 21.0, and 27 ft BGS. All similar. Organic vapors in breathing
			zone at 11.4 ft BGS reads 0.0 ppm. Beta and gamma = 70 cpm.
			Reach TD of 31.6 ft BGS.
	0915	1010	Blow hole clean. Tag bottom at 31.8 ft BGS. Cuttings prepared
			for screening. Alpha emission rate of cuttings composite = 0 cpm.
			Beta and gamma = 60 cpm. Cuttings composite placed under foil
			for head space analysis at 1003.
	1010	1136	Scott Gilbert-Highland leaves site to fill water tank. Head space of
			1131 cuttings composite reads 2.4 ppm. pH = 9.6.
	1136	1154	Scott Gilbert returns with water tank. Rig, stabilizer, bit and
			equipment decontaminated. Rig moved off of hole.
12/7/92	0900	0910	Technical oversight assumed by Tim Coffey. Arrive at 1131 site.
			Cement truck and drill crew arrive at site.
	0910	0930	Attempt to pump cement/grout from trough to bore by tremie.
			Pump appears to be frozen. Working to thaw same.
	0930	0946	Begin to tremie cement/grout into 1131. Cement level to ground
			surface.
	0946	0948	Pull up tremie. Grout allowed to cure until next day.
12/9/92	0805	0807	Michael Klidzejs tags cement level at 5.0 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1132</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>12/4/92</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling</u>		FINISH: <u>12/15/92</u>	
HELPERS: <u>Steve Brown - Highland Drilling</u>		Timothy Coffey - SAIC Michael Klidzejs - SAIC	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: _____	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/4/92	1118	1241	Technical oversight by Michael Klidzejs. Gravel truck arrives and dumps gravel at 1132 site. Crew spreads gravel over site with back-hoe blade. Rig moved into position over well. Rig up with 10 5/8 in. diameter tricone bit and stabilizer, length = 9.2 ft, table height = 3.7 ft. Casing stick-up of unknown length removed by Highland Drilling Company during site preparation on 12-3-92 before stick-up length could be measured. Casing stick-up, as reported in the subsurface data base (Y/TS-881), is 2.4 ft.
	1241	1305	Begin drilling. Beta and gamma around rig = 70 cpm (background = 30 cpm) Alpha = 10 cpm (background = 5 cpm). Table height is adjusted to 3.9 ft. Advance stabilizer and bit to 5.3 ft BGS. Cutting sample of 0-4 ft BGS interval collected. Sample consists of medium gray (N5) cement fragments and white (N9) PVC fragments. Trip up, add rod.
	1305	1412	Continue drilling. Advance to 30.3 ft BGS. Health and safety screenings taken in breathing zone at 6.3, 11, 19.3, and 26 ft BGS. Greatest values observed: organic vapors = 0.2 beta and gamma = 60 cpm. Five cuttings samples taken during drilling all contained medium gray (N5) cement fragments and white (N9) PVC fragments. Two samples taken at 28.3 and 30.3 ft BGS consisted of filter pack sand in mud.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1132</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/4/92	1412	1530	Crew decontaminates rig, stabilizer, bit and tools. Tag bottom of
(cont.)			hole at 30.3 ft BGS. Screen cuttings samples; Beta and gamma
			= 60 cpm, alpha = 20 cpm. Composite of cuttings placed under foil
			for head space analysis.
	1530	1545	Headspace analysis of cuttings composite = 0.0 ppm, pH = 10.3.
			Crew places 3, 10-ft. sections of tremie pipe down hole. Stick-up
			of tremie pipe = 2 ft. Crew and oversight depart.
12/7/92	0948	0953	Tim Coffey provides technical oversight. Pump set up at 1132 site.
	0953	1010	Cement/grout pumped into tremie pipe. Cement level to ground
			surface.
	1010	1025	Tremie pipe removed. Site is cleaned and secured. Oversight
			departs.
12/8/92	1139	1142	Michael Klidzejs tags cement level at 6.9 ft BGS.
12/11/92	Appx.		Additional cement poured into 1132 opening to bring level above
	1345		4 ft BGS.
12/14/92	0821	0830	Cement level tagged at 1.6 ft BGS by Michael Klidzejs.
12/15/92	1443	1500	Steve Brown - Highland fills 1132 with soil by back-hoe blade.
	1626	1628	Michael Klidzejs inspects 1132. Hole filled to ground surface with
			soil
			P&A of 1132 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1133</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>3/3/93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>3/18/93</u>	
HELPERS: <u>Greg Shillings - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>Victor R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/3/93	1004	1020	Crew rigs up 10 5/8-in. diameter tricone roller bit. Bit and stabilizer = 9.2 ft long. Table ht = 2.7 ft. Riser stickup and surface protective casing removed previously. Summary of items removed: 4.5-in. outside diameter (OD), 4.0-in. inside diameter (ID) PVC riser removed to 3.5 ft below ground surface (BGS) and 5 ft lengths of 6-in. protective casing with hinged lid. Begin drilling/reaming.
	1020	1030	Advance to 5 ft BGS, air only. Breathing zone analysis near table = 4 ppm. This level of organic vapors attributable to alcohol based antifreeze used to winterize water lines on rig. Beta/Gamma at table = 50 cpm, alpha = 30 cpm. Crew added 25 ft drill rod.
	1030	1104	Resume drilling/reaming. Advance to 25 ft BGS. Cuttings = grout fragments, PVC shavings and few chert fragments in reddish-brown stiff clay. Approximately 5% of returns is pea gravel.
	1104	1122	Crew trips out tools, inserts 20 ft of 1.5-in. OD PVC tremie pipe to 16 ft BGS. Secure site and rig down to await grout delivery.
	1253	1314	Grout delivery here. Pump tremie approximately 0.5 yds ³ into bore. Circulate grout. Secure site and depart.
3/4/93	1243	1249	Tag grout level at 2.5 ft BGS. Deviation of depth to grout from 4.0 ft BGS. Approved by Steve Jones (HSEA). Depart site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 13
LOCATION: <u>SPAD Landfill Functional Area</u>		DATE: START: <u>5-27-93</u>	
DRILLERS: <u>Hubert Hall-Highland Drilling Co.</u>		FINISH: <u>6-16-93</u>	
HELPERS: <u>Steve Brown, Randy Phillips - Highland</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>T.J. Coffey - SAIC V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-27-93	0825	0916	Technical Oversight provided by V.R. Harness (SAIC). Awaiting crew. Rig is set up. Protective posts have been removed and PVC riser stick up has been cut off. Remaining stick-up heights are: 4.0-in. outside diameter (OD) PVC riser = 0.6 ft, steel surface casing = 0.8 ft.
	0916	1035	Crew arrives. Rig up 7 5/8-in. tricone roller bit and stabilizer assembly of 20.8 ft length. Excavating cuttings pit with backhoe. Background screening values are: alpha = 0 cpm, beta/gamma = 60 cpm, organic vapors = 0 ppm.
	1035	1043	Breathing zone analysis (BZA) at table = 0.0 ppm. Begin drilling out PVC riser. Table height = 2.8 ft. Advance to 5 ft below ground surface (BGS).
	1043	1057	Begin using water in drilling. Advance to 18 ft BGS. Add 25 ft drilling rod. Resume drilling.
	1057	1110	Advance to 43 ft BGS. Circulation is good. Returns are predominantly PVC cuttings and fragments of the annulus filler which is brittle, friable, and of (N8) white coloration. Randy Phillips (Highland) remarks that material resembles Cal-Seal™ or a similar gypsum based, lost-circulation additive. However, in this situation, it has apparently been placed into the well annulus undiluted.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-27-93	1057	1110	Beta/gamma measurement of composited cuttings from 18 to 43 ft
(cont.)			BGS = 40 cpm and the same value was measured in composited
			cuttings from 0 to 18 ft BGS.
	1110	1139	Advance to 68 ft BGS. Advance rate has been smooth and rapid.
			BZA = 0.0 ppm.
	1139	1157	Advance to 93 ft BGS. Begin using auxiliary compressor to
			maintain circulation. At 90 ft BGS begin getting fragments of
			dolostone in cuttings, 90 ft appears to be bottom of surface casing.
			Advance to 93 ft BGS. Approximately 20%, by volume, of cuttings
			are medium dark gray (N4-N5) Knox Fm with banding and layering.
	1157	1216	Add 25 ft of drill rod. Bit hung, but circulation still good.
	1216	1300	Lunch Break.
	1300	1457	Resume efforts to free tools.
	1457	1603	Tools unstuck. Crew trips up tools to remove stabilizer from drill
			string. Because they have no subadaptor that will thread the bit to
			the drill rods, they rig back up with a 6-in. diameter tricone roller bit.
			Secure site and depart.
5-28-93	0757	0841	Awaiting crew.
	0841	1022	Crew arrives. Crew has found a sub-adaptor for 7 5/8-in. diameter
			bit: subadaptor must be broken out of existing assembly and a
			check valve added. In the mean time they will drill out well with 6-in.
			bit and then dress hole with 7 5/8-in. dia. bit.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 3 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-28-93	1022	1045	Trip in and clean bore with 6-in. bit to 93 ft BGS. Resume drilling.
(cont.)			
	1045	1054	Advance to 100 ft BGS. Cuttings are PVC and (N4) medium dark gray dolostone. Circulation good.
	1054	1105	Advance to 125 ft BGS. Table Height = 2.4 ft. Voids encountered: 102 to 104 ft BGS, 104.5 to 125 ft BGS. Circulation still good. Have gained 5-10 gal. per minute of water. Returns include Cal Seal™.
	1105	1114	Resume drilling. Void from 104.5 to 125 ft BGS continues. Encounter rock again at 142 ft BGS (Total void = 104.5 to 142 ft BGS). At 135 ft BGS, returned hydrated bentonite. Advance to 150 ft BGS. Another void begins at 143.5 ft BGS and continues to 150 ft BGS.
	1114	1126	Circulation at 150 ft still good and contains hydrated bentonite. Advance to 174.5 ft BGS. Voids encountered: 155 to 160 ft BGS and 163 ft to 168 ft BGS. (Lost circulation at 163 ft BGS with ratty drilling). Void from 169 ft to 174.5 ft BGS. Regain circulation at 174.5 ft BGS.
	1126	1151	Resume drilling at 174.5 ft BGS with normal circulation. Advance to 190 ft BGS. Encountered little resistance to advance. Lost circulation at 190 ft BGS.
	1151	1208	Tripping out 6-in. diameter bit. Will finish hole to target depth of 192 ft BGS with 7 5/8-in. dia. bit. Circulation of much debris as tripping out, including sand from filter pack.
	1208	1340	Lunch Break.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 4 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-28-93	1314	1326	Crew exchanging 7 5/8-in. bit for 6-in. diameter bit. Unable to
(cont.)			reach Steve B. Jones (HSEA) yesterday to notify of high cuttings
			pH (11.0), reached him by telephone. He advises to proceed.
	1326	1340	Have rigged up 7 5/8-in. dia. tricone roller bit with subadapter and
			check valve, entire assembly = 4.4 ft. Tripping in.
	1340	1446	Resume drilling with 7 5/8-in. dia. bit at 94 ft BGS. Ream bore to
			192 ft BGS. Encountered void from 102 to 127 ft BGS: Many small
			breaks from 127 ft to 177 ft BGS;
			Description of 94 to 192 ft Reaming cuttings:
			80 % (by volume) of composited sample = grayish orange
			(10YR 7/4) to dark greenish gray (5 GY 4/1) dolostone with
			grayish black (N2) chert. Grayish orange fraction has a porous,
			silty texture, greenish gray portion is dense. 15% of sample = PVC
			cuttings and 5% of sample is filter pack sand.
	1446	1555	Trip out to 125 ft BGS. Secure site and depart.
6-1-93	0912	0924	At site. Trip in and clean out bore to 192 ft BGS. Only 0.5 ft of
			debris in bottom of bore. No circulation.
	0924	1044	Insert 180 ft of 1.5-in. OD PVC tremie pipe to 177 ft BGS. Awaiting
			grout delivery.
	1044	1101	Grout delivery arrives. Tremie 1.5 cubic yds of neat, Type I
			Portland cement into bore.
	1101	1136	Extract tremie pipe. Clean and secure site. All depart to allow
			grout to cure a minimum of 24 hrs before any additional drilling.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. 1134
WELL PLUGGING AND ABANDONMENT ACTIVITY PROGRESS REPORT continued			PAGE 5 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-1-93	1345	1400	Tag liquid grout at 170 ft BGS, water at 100 ft BGS. Depart site.
(cont.)			
6-2-93	1150	1248	Tag top of grout at 168.9 ft BGS. Receive permission from Kevin Jago (HSE) to fill bore to top of first reported void below surface casing with quartzite pea gravel. Crew arrives with 4.5 tons of gravel.
	1248	1304	Pour 1.5 tons of pea gravel into bore. Bring top of gravel to 101.5 ft BGS.
	1304	1313	Pour three 50 lb sacks of Shur-Plug™ 3/8 in. diameter bentonite into bore. Tag top of unhydrated bentonite at 93.5 ft BGS. Sufficient water exists in bore to hydrate bentonite.
	1313	1326	Insert 80 ft of 1.5-in. OD PVC tremie to 76 ft BGS. Mix and tremie two 94-lb. sacks of neat, Type I Portland cement into bore.
	1326	1340	Secure site and depart.
6-3-93	0820	0921	Tag grout at 85.3 ft BGS. Crew unloading washover pipe. Dimensions are 13.5-in. OD, 13-in. inside diameter (ID). First piece of washover pipe with bit = 22.75 ft long. In addition there are three 20-ft lengths and one 10-ft length of washover pipe.
	0921	0952	Rig up first piece of washover.
	0952	1144	Begin over wash of steel surface casing. Table height = 2.0 ft. Advance to 17 ft BGS. Stop to refuel rig and get a load of water before resuming. BZA at 2.5 ft BGS was 0.0 ppm. Cuttings from 0.0 ft to 17.0 ft BGS consist predominantly of medium light gray (N6) cement fragments with minor amounts of white (N9) PVC fragments and very light gray (N8) to very pale orange (10YR 8/2)

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 6 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-3-93			angular and punky or oolitic residual chert in a light brown
(cont.)			(5YR 5/6) clayey soil.
	1144	1202	Lunch break.
	1202	1425	Technical oversight assumed by T. Coffey (SAIC). Arrive at
			1134 site. Waiting for the rest of the crew to return with the water
			truck.
	1425	1524	Water truck at site. Continue over wash. Over wash casing from
			17.0 ft to 22.0 ft BGS. Washover pipe binding on casing (stops
			frequently) at approximately 19.3 ft BGS. Adjust jacks (tilt mast)
			over washing improves. Cuttings from 17.0 ft to 22.0 ft BGS are
			the same as the 0.0 to 17.0 ft interval and include metal shavings.
			Also, some chert is banded; medium gray (N5) to brownish black
			(5YR 2/1).
	1524	1612	At 22.0 ft BGS disconnect washover pipe from drive head in order
			to attempt to pull surface casing: Unsuccessful.
	1612	1644	Add a second section of 13.0-in. ID, 13.5-in. OD steel washover
			pipe; length = 20.0 ft. Total length of tools (including subadapter)=
			46.3 ft. connection made, will continue over wash on 6-4-93.
			Depart site.
6-4-93	0813	0845	Technical oversight assumed by V.R. Harness (SAIC). Arrive at
			site, awaiting crew.
	0845	0855	Crew arrives, fueling rig.
	0855	1056	Resume over wash at 22 ft BGS. Table height = 2.0 ft. Advance
			to 42.0 ft BGS. BZA at 23.5 ft BGS = 0.0 ppm. Surface around

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 7 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-4-93			washover pipe washed out 3 to 4 ft across.
(cont.)			Description of 22 to 40.5 ft BGS over wash cuttings:
			60% (by volume) iron oxide stained chert fragments, dark yellowish
			orange (10YR 6/6) to unstained white (N9). 20% PVC fragments
			(washed down from surface). 20% medium light gray (N6) grout
			fragments with accessory metal shavings. Beta/gamma of
			composite sample = 50 cpm, alpha=0 cpm.
	1056	1138	Crew breaks out sub.
	1138	1240	Lunch break
	1240	1326	Crew leaves and returns with 3 ft length of 16.5-in. OD, 16.0-in. ID
			steel conductor pipe and inserts to 2.2 ft BGS around washover
			pipe in ground.
	1326	1405	Before resuming drilling, crew must fill washed out area around
			table to maintain circulation and rig stability. Pour 50-lbs of 3/8-in.
			diameter Shur-Plug™ bentonite around base of protruding
			conductor pipe. Hydrate bentonite with 5-gals. potable water.
	1405	1426	Mix five 94-lb. sacks of neat, Type I Portland cement and pour into
			washed out area around conductor casing.
	1426	1500	Will allow grout to cure overnight. Secure site and depart.
6-7-93	0815	0835	Arrive at 1134 site. Wait on crew.
	0835	0906	Crew arrives. Add a third section of 13.0-in. ID, 13.5-in. OD steel
			washover pipe; length = 20.0 ft. Total length of tools (including
			subadaptor) = 66.3 ft. Connection made.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 8 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-7-93	0906	0927	Place sod under rig, around borehole collar to prevent further washout around rig jacks.
(cont.)			
	0927	1134	Commence over wash. Table height = 3.0 ft. Over wash casing from 42.0 ft to 50.0 ft BGS. Ratty drilling at 47.5 ft BGS, lose circulation. Cuttings from 42.0 ft to 47.5 ft BGS. consist of medium light gray (N6) to light olive gray (5Y6/1) cement fragments; medium light gray (N6) to light brownish-gray (5YR 6/1) translucent chert; very pale orange (10YR 8/2) to pale yellowish-orange (10YR 8/6) punky chert in light brown (5 YR 5/6) to dark yellowish-orange (10YR 6/6) residuum. Interval also yields abundant metal shavings, and rare white (N9) PVC fragments. Circulation (very muddy) restored at 48.5 ft BGS. Cuttings from 48.5 ft to 50.0 ft BGS are the same as above. Ratty drilling continues to end of interval.
	1134	1144	Out of water. Depth of washover pipe is 50.0 ft BGS. Shut off rig. Wait for water truck.
	1144	1207	Second water truck arrives onsite. Transfer water to onsite water truck.
	1207	1210	Continue over wash. No returns, ratty drilling continues.
	1210	1248	Break for lunch.
	1248	1407	Continue over wash. Over wash casing from 50.0 ft to 61.8 ft BGS. Circulation returns at 50.6 ft BGS. Rate of advance increases at 55.5 ft BGS. Relatively smooth drilling from 58.0 ft BGS. Circulation lost again between 59.8 ft and 60.3 ft BGS. Penetration rate decreases at 60.5 ft BGS. Cuttings from 50.5 ft to 61.8 ft BGS consist primarily of olive gray (5Y 4/1) cement fragments, medium light gray (N6) translucent and pale yellowish-orange (10YR 8/6)

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 9 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-7-93			oolitic chert fragments, and metal shavings. No longer observe
(cont.)			PVC fragments in returns.
	1407	1420	At 61.8 ft BGS. Clean out borehole. Pull washover bit off bottom.
			Break subadaptor of washover pipe.
	1420	1428	Attempt to pull casing: unsuccessful.
	1428	1448	Add a fourth section of 13.0-in. ID, 13.5-in. OD steel washover
			pipe; length=20.0 ft. Total length of tools (including
			subadaptor)=86.3 ft. Connection made.
	1448	1540	Continue over wash. Table height =2.6 ft. Over wash casing from
			61.8 ft to 69.5 ft BGS. Ratty drilling from 64.0 ft to 64.6 ft BGS, and
			from 66.5 ft to 69.2 ft BGS. Cuttings from 61.8 ft to 69.5 ft BGS are
			a continuation of the 50.5 to 61.8 ft interval.
	1540	1546	At 69.5 ft BGS. Clean out borehole. Pull bit off bottom. Shut off rig.
	1546	1617	Clean up. Screen cuttings composite, secure site, and depart.
6-8-93	0834	0921	Arrive at 1134 site just ahead of drill crew. Fuel drill rig and auxiliary
			air compressor.
	0921	1105	Commence over wash. Table height remains at 2.6 ft. Over wash
			casing from 69.5 ft to 82.2 ft BGS. Encounter a rough spot
			(wash-over pipe stops frequently) from 71.7 ft to 72.2 ft BGS. Rate
			of advance decreases at 72.7 ft BGS, and then again at 76.3 ft
			BGS. Encounter another rough spot at 78.7 ft BGS, then penetration
			rate increases markedly. Relatively smooth drilling from this point
			on. Encounter yet another rough spot between 81.5 ft and 81.9 ft
			BGS. Drilling is very hard at 81.9 ft BGS (suspect weathered

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 10 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-8-93			bedrock surface). Cuttings from 69.5 ft to 81.9 ft BGS are the same
(cont.)			as the 61.8 ft to 69.5 ft interval plus very pale orange (10YR 8/2)
			massive dolomite. Interval yields rare metal shavings.
	1105	1115	At 82.2 ft BGS. Clean out borehole. Disconnect subadapter.
	1115	1205	An attempt to pull out the casing is unsuccessful. Add a fifth section
			of 13.0-in. ID. 13.5-in. OD steel washover pipe; length = 10.0 ft.
			Total length of tools (including subadapter)=96.3 ft. Connection
			made.
	1205	1235	Transfer a load of water to the onsite water truck.
	1235	1326	Break for lunch.
	1326	1545	Continue over wash. Table height 1.8 ft. Over wash casing from
			82.2 to 85.7 ft BGS. Ratty drilling at beginning of interval, becoming
			smoother at 83.9 ft BGS. Appear to occasionally be returning more
			water than what is being put into the borehole. Pit is nearly full of
			water. Enlarge cuttings pit. Encounter a rough spot at 85.3 ft BGS,
			pipe stuck momentarily. Extremely hard drilling beyond 85.3 ft
			BGS (suspect fresh bedrock surface). Cuttings from 81.9 ft to
			85.7 ft BGS consist of medium light gray (N6) cement fragments;
			very pale orange (10YR 8/2), massive dolostone; and light brown
			(5YR 5/6), to dark yellowish-orange (10YR 6/6), massive, fine-
			grained, friable sandstone.
	1545	1553	At 85.7 ft BGS. Clean out borehole.
	1553	1607	Shut off drill rig. Clean up, secure site, and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 11 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-9-93	0816	0832	Technical oversight assumed by V.R. Harness - SAIC. Rig up.
			Resume over wash at 85.7 ft BGS.
	0832	1200	Advance to 88 ft BGS. Slow advance. Circulation limited to several
			periodic eruptions of mud and cuttings as hole pressures up.
	1200	1223	Lunch break.
	1223	1350	Resume over wash. Advance to 88.5 ft BGS. Tools become hung.
	1350	1551	Resume over wash. Advance very slowly to 89 ft BGS. No
			circulation. Secure site and depart
6-10-93	0807	0853	Awaiting crew.
	0853	1034	Resume over wash at 89 ft BGS. Advance slowly to 89.9 ft BGS.
			No circulation.
	1034	1110	Crew disconnects subadaptor.
	1110	1259	Extract 86 ft of 8.75-in. OD, 8.25-in. ID steel surface casing, cut into
			five pieces with torch.
	1259	1330	Crew begins removing washover from the borehole.
	1330	1430	Awaiting delivery of extra links for power tong before trip out can
			continue.
	1430	1615	All washover pipe out. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. 1134
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 12 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-11-93	1017	1035	Technical oversight by T. Coffey (SAIC). Arrive at 1134 site. Crew has finished tripping washover pipe out of the borehole. Tag bottom of borehole at 89.4 ft BGS (0.4 ft of fill) Borehole is dry. Calculate a borehole volume (assume borehole diameter of 14-in.) to 4.0 ft BGS of 91.3 cubic ft = 3.4 cubic yds. Cement (4 1/2 cubic yds) ordered for 1400 hrs. Depart site.
	1333	1442	Return to 1134 site. Wait on cement truck.
	1442	1513	Cement truck arrives, pour 4 1/2 yds of neat, Type I Portland cement into the borehole.
	1513	1530	Did not circulate cement. Tape depth to liquid cement at 77.5 ft BGS. Cement obviously taken into voids/cavities.
	1530	1542	Call to K. Jago (HSEA) to report disappearance of cement. Kevin directs to fill up the majority of borehole (including voids) with pea gravel, then construct a cement plug near the collar. Depart site.
6-14-93	1251	1353	Arrive at 1134 site. Tag cement level at 79.12 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 68.5 cubic ft = 2.5 cubic yds. Wait on pea gravel delivery.
	1353	1406	J. Gallaher (Highland) arrives with a load of pea gravel. Pour five tons of gravel into borehole. Tag gravel level at 43.8 ft BGS.
	1406	1449	J. Gallaher goes to get another load of gravel.
	1449	1459	Second load of pea gravel arrives (7 tons). Pour approximately 4 1/2 tons into borehole. Pea gravel level at 14.1 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1134</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 13 of 13
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
	1459	1519	Pour 2 sacks (1.4 cubic ft) of Hole Plug™ bentonite into borehole to act as a plug on top of pea gravel. Pour potable water into borehole to hydrate the Hole Plug™. Depart site.
6-15-93	0754	0800	Arrive at 1134 site. Tag hydrated Hole Plug™ bentonite level at 13.4 ft BGS (thickness of Hole Plug™ seal is 0.7 ft). Calculate a borehole volume to 4.0 ft BGS of 10.0 cubic ft equivalent to 7.4 sacks of 2% bentonite - cement grout.
	0800	0858	Wait on crew.
	0858	0914	Crew arrives and begins preparing to cement borehole.
	0914	0958	Mix and pour 13 sacks (17.7 cubic ft) of 2% bentonite - cement grout into the borehole. Cement level to approximately 2 ft BGS.
	0958	1020	Clean up, secure site and depart.
6-16-93	0712	0715	Arrive at 1134 site. Tag cement level at 3.8 ft BGS. Borehole is ready to be capped. Depart site.
	1030	1100	Borehole is capped with clay soil.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-030</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u> FOREMAN: <u>Greg Shillings - Highland Drilling</u> HELPERS: <u>Paul McCormick - Highland Drilling</u> DRILL: <u>Ford 555 Backhoe</u>		DATE: START: <u>2-8-93</u> FINISH: <u>2-10-93</u> METHOD: <u>A</u> LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-8-93	1046	1100	Arrive at GW-030 site. Well is located at the edge of a steep cut-bank. The protective casing is exposed below the ground surface. Remove cap, scan for organic vapors: 0.0 ppm. Scan well site with rad meters: beta & gamma = 30 cpm, alpha = 0 cpm. Measure water level at 22.3 ft below top of casing (BTOC) = 19.3 ft below ground surface (BGS). Tag bottom of well at 41.9 ft BTOC = 38.9 ft BGS. Note: Subsurface Database (Y/TS-881) reports total depth (TD) of GW-030 to be 40.0 ft. Calculate a well volume to 4 ft BGS of 0.8 cubic ft, equivalent to 1.1 sacks of Hole Plug™.
	1155	1203	Pour approximately 1/2 sack (0.3 cubic ft) of Hole Plug™ into GW-030 (until Hole Plug™ level is above the water level). Tag Hole Plug™ level at 12.2 ft BGS.
2-9-93	0848	0900	Arrive at GW-030 site. Tag Hole Plug™ level at 12.2 ft BGS (No change in Hole Plug™ level). Calculate a well volume to 4 ft BGS of 0.2 cubic ft, equivalent to 0.2 sacks neat cement. Scan well site with rad meters: alpha = 0 cpm, beta & gamma = 50 cpm (background). Run 1, 10 ft joint of 1.5-in. OD PVC Tremie pipe into well to 6.1 ft BGS.
	0900	0912	Mix and gravity tremie approximately 1/2 sack (0.6 cubic ft) of neat Type I Portland cement. Fill to top of casing. Remove tremie pipe and clean up. Cement to cure for approximately 24 hrs.

WELL NO. GW-030

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-031</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-8-93</u>	
FOREMAN: <u>Greg Shillings - Highland Drilling</u>		FINISH: <u>2-10-93</u>	
HELPERS: <u>Paul McCormick - Highland Drilling</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 555 Backhoe</u>		LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-8-93	1100	1120	Arrive at GW-031 site. Top of casing has been torn from well.
			Organic vapors at wellhead = 0.0 ppm. Scan well site with rad
			meters: beta & gamma = 30 cpm, alpha = 0 cpm. Note: well GW-
			031 had been installed as a "twin" to GW-030 with both wells
			having the approximately same ground elevation. Post-installation
			erosion along with excavation adjacent to the wells has
			resulted in lowering the ground surface elevation at GW-031 by
			approximately 12.5 ft. Measure water level at 12.8 ft below top of
			casing (BTOC) = 8.7 ft below ground surface (BGS). Well casing
			contains a dedicated bailer which is impossible to remove. Wire
			on bailer is cut, bailer drops to bottom of the well. Tag bottom of
			well at 56.3 ft BTOC = 52.2 ft BGS (64.7 ft below original ground
			surface). Note: Subsurface Database (Y/TS-881) reports total
			depth (TD) of GW-031 to be 70.0 ft. Calculate a well volume to 4
			ft BGS of 1.1 cubic ft, equivalent to 1.5 sacks of Hole Plug™.
	1203	1230	Begin pouring Hole Plug™ into the well. Tag Hole Plug™ level
			after pouring less than 1/2 sack into well at 4.5 ft BGS, suspect
			that Hole Plug™ may have bridged in well casing. Attempt to push
			Hole Plug™ into well with PVC tremie pipe. Unable to get tremie
			pipe past kink in casing at 3.8 ft BTOC.
	1406	1416	Cut off 4.0 ft of casing stick-up. Attempt to push Hole Plug™ down
			further into well with PVC tremie pipe: Hole Plug™ level dropped
			about 1.0 ft.

WELL NO. GW-031

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-032</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-8-93</u>	
FOREMAN: <u>Greg Shillings - Highland Drilling</u>		FINISH: <u>2-12-93</u>	
HELPERS: <u>Paul McCormick/James Gallaher - Highland</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 555 Backhoe</u>		LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-8-93	1544	1549	Arrive at GW-032 site. Note: well bore GW-032 was drilled at an angle of approximately 40° below horizontal to intersect the subsurface strata perpendicularly. Remove cap, scan for organic vapors: 0.0 ppm. Scan well site with rad meters: beta & gamma = 50 cpm, alpha = 0 cpm. Attempt to measure water level in well. Unable to get water level indicator probe beyond about 1.0 ft below top of casing (BTOC) due to obstruction of some type.
	1549	1553	Well has dedicated bailer inside. Unable to recover. Cut wire and let drop to bottom of well. Begin pouring Hole Plug™ into well casing. Casing fills up immediately, suspect that well casing may be pinched. Conclude work, depart site.
2-9-93	1456	1505	Arrive at GW-032 site. Organic vapors at wellhead = 0.0 ppm. Cut off approximately 1.2 ft of the 4-in. diameter protective casing, then the well casing in attempt to get below obstruction. Scan wellsite with rad meters: alpha = 0 cpm, beta & gamma = 70 cpm (background = 60 cpm).
	1505	1517	Well casing is crumpled or pinched, almost flat in places. Visible in the annular cement is the cylindrical external mold of the well casing. Annular grout is intact and undamaged. The well casing appears to have been drawn in (by some suction force) sometime after installation. Further work at this well will require excavating below the ground surface and cutting of the casings below the pinched interval.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-032</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-11-93	1516	1525	Arrive at GW-032 site. Scan with beta & gamma meter: 80 cpm (no alpha scan - raining). Organic vapors at wellhead = 0.0 ppm.
			Using backhoe, dig shallow (1.0 to 1.5 ft) pit around well.
	1525	1545	Continue to screen excavation: beta & gamma = 80 cpm. Cut off an additional 1.3 ft of protective casing and well casing. Cut is made nearly to bottom of damaged interval. Try to open well casing collar with torch, run out of acetylene. Hole at well collar is not quite large enough to accept PVC tremie pipe. Depart.
2-12-93	0907	0920	Arrive at GW-032 site. Organic vapors at wellhead = less than 1 ppm. With torch, enlarge well casing collar. Scan wellsite with rad meters: beta & gamma = 80 cpm (background), alpha = 0 cpm.
			Since well is installed in 40° angle hole, it is doubtful that sounding tape will travel all the way to bottom. Will use Subsurface Database (Y/TS-881)-reported TD (54.1 ft) for calculation. Calculate a well volume to 4 ft BGS of 1.1 cubic ft, equivalent to 0.7 sacks of 4% bentonite-cement grout (mix 4% bentonite to prevent excessive amount of cement from seeping out of well screen into formation).
	0920	0923	Run 5, 10 ft sections of 1.5-in. outside diameter (OD) PVC tremie pipe into well to 49.0 ft BGS.
	0923	0953	Mix and gravity tremie 1 sack (1.5 cubic ft) of 4% bentonite-cement grout into the well. Tremie rate is slow using the thick grout. Circulate water almost immediately, circulate approximately 50% cement at end of tremie. Scan of displaced water: beta & gamma = 90 cpm.
	0953	1000	Pull out tremie pipe and clean up.

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-035</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-12-93</u>	
FOREMAN: <u>Greg Shillings - Highland Drilling</u>		FINISH: <u>2-16-93</u>	
HELPERS: <u>Paul McCormick - Highland Drilling</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 555 Backhoe</u>		LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-12-93	1539	1615	Arrive at GW-035 site. The location of the well (which is missing) is marked by a stake located by surveyors using the as-built coordinates of the well. The plan is to dig a pit with a 5-ft radius from the stake, 4.5 ft deep to look for evidence that the well has been decommissioned. Begin excavating the pit with the backhoe. Weathered bedrock is exposed in the edges of the pit within 0.5 ft of the ground surface. Screening soil/weathered bedrock and excavation: organic vapors = <1.0 ppm, beta & gamma = 100 ppm, alpha = 0 cpm. Between about 1 ft BGS and 3 ft BGS, fragments of annular grout are unearthed. Below approximately 3 ft BGS, very near to the staked well location, the backhoe bucket encounters a metal object that turns out to be the GW-035 stainless-steel well casing. The top of the well casing is bent over from the backhoe bucket with the top approximately 3.5 ft missing presumed removed at an earlier time. A minor amount of hand digging reveals that the well is open and contains free water. Plans are made to P&A the well on 2-16-93. Continued screening of the soil during excavation yields: organic vapors = 0.0 ppm, beta & gamma = 90 cpm, and alpha = 0 cpm.
2-16-93	0806	0825	Arrive at Walk-in Pits site. Crew, G. Schillings and P. McCormick (Highland), onsite and waiting. T. Coffey (SAIC) technical oversight and Site Health & Safety Officer. Don protective clothing.
	0825	0827	Arrive at GW-035 site. The excavation has caved slightly and rainwater accumulation covers the well casing.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-035</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-16-93	0827	0850	Enlarge the excavation with the backhoe to drain the accumulated
(cont.)			water and further expose the well casing. Screen soil and
			excavation: beta & gamma = 120 cpm.
	0850	0900	Excavate by hand to clear debris and annular grout. Scan
			excavation with rad meters: beta & gamma = 120 cpm, alpha =
			0 cpm.
	0900	0906	Cut off bent casing stick-up (0.5 ft). Top of casing is now 4.0 ft
			below ground surface (BGS). Use torch to open up hole further.
			Wire from dedicated bailer is visible in well, but unreachable.
	0906	0908	Tag bottom of well at 53.2 ft below top of casing (BTOC) = 57.2 ft
			BGS (Feels solid, on top of bailer?). Note: Subsurface Database
			(Y/TS-881) reports TD of GW-035 at 62.0 ft. Calculate well volume
			to top of casing at 1.2 cubic ft, equivalent to 1.7 sacks of Hole
			Plug™.
	0908	0916	Slowly pour Hole Plug™ into the well. Hole Plug™ begins to bridge
			off in casing. Run 3, 10 ft sections of PVC tremie pipe into well to
			push Hole Plug™ down. Continue slowly pouring Hole Plug™ into
			well. After 1 sack (.7 cubic ft), the Hole Plug™ bridges again and
			all attempts to push to bottom fail. Bridge may have occurred on
			bailer wire.
	0916	0930	Gather errant post from GW-036 and place in pit along with
			annular cement fragments. Begin filling in the pit.
	0930	1000	Continue to fill in pit. B. McMaster (HSE) onsite, but outside of
			radiation area as Energy Systems representative. Rad scan of site
			ground surface yields: beta & gamma = 70 cpm, alpha = 0 cpm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-036</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-8-93</u>	
FOREMAN: <u>Greg Shillings - Highland Drilling</u>		FINISH: <u>2-11-93</u>	
HELPERS: <u>Paul McCormick/James Gallaher - Highland</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 555 Backhoe</u>		LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-8-93	1447	1453	Arrive at GW-036 site. Remove cap, scan for organic vapors: 0.0 ppm. Scan wellsite with rad meters: beta & gamma = 60 cpm, alpha = 0 cpm. Well has dedicated stainless-steel bailer inside.
			Remove bailer. Measure water level at 32.0 ft below top of casing (BTOC) = 28.6 ft below ground surface (BGS). Tag bottom of well at 43.0 ft BTOC = 39.6 ft BGS. Note: Subsurface Database (Y/TS-881) reports total depth (TD) of GW-036 at 39.1 ft. Calculate a well volume to 4 ft BGS of 0.8 cubic ft, equivalent to 1.1 sacks of Hole Plug™.
	1453	1458	Pour approximately 1/2 sack (0.3 cubic ft) of Hole Plug™ into GW-036 (until the Hole Plug™ level is above the water level). Tag Hole Plug™ level at 25.5 ft BGS.
2-9-93	1256	1301	Arrive at GW-036 site. Tag Hole Plug™ level at 25.5 ft BGS (no change in Hole Plug™ level). Rad scan of site: beta & gamma = 70 cpm (background), alpha = 0 cpm. Calculate a well volume to 4 ft BGS of 0.5 cubic ft, equivalent to 0.4 sacks neat cement.
	1301	1303	Run 2, 10 ft joints of 1.5-in. outside diameter (OD) tremie pipe into the well to 15.5 ft BGS.
	1303	1312	Mix and gravity tremie 1/2 sack (0.6 cubic ft) of neat Type I Portland cement into GW-036. Fill to 2.3 ft BGS.
	1312	1315	Pull out tremie pipe and clean up.

WELL NO. GW-036

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-037</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-8-93</u>	
FOREMAN: <u>Greg Shillings - Highland Drilling</u>		FINISH: <u>2-11-93</u>	
HELPERS: <u>Paul McCormick/James Gallaher - Highland</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 555 Backhoe</u>		LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-8-93	1504	1517	Arrive at GW-037 site. Remove cap, scan for organic vapors:
			0.0 ppm. Scan wellsite with rad meters: beta & gamma = 50 cpm,
			alpha = 0 cpm. Measure water level at 42.2 ft below top of casing
			(BTOC) = 39.4 ft below ground surface (BGS). Tag bottom of well
			at 71.8 ft BTOC = 69.0 ft BGS. Note: Subsurface Database
			(Y/TS-881) reports total depth (TD) of GW-037 at 70.0 ft. Calculate
			a well volume to 4.0 ft BGS of 1.4 cubic ft, equivalent to 2.1 sacks
			of Hole Plug™. Dedicated stainless-steel bailer found onsite in
			brush.
	1517	1527	Pour approximately 1.3 sacks (0.9 cubic ft) of Hole Plug™ into
			GW-037 (until the Hole Plug™ level is above the water level). Tag
			Hole Plug™ level at 31.4 ft BGS.
2-9-93	1315	1320	Arrive at GW-036 site. Tag Hole Plug™ level at 31.2 ft BGS (Hole
			Plug™ swelled 0.2 ft upon hydration). Calculate a well volume to
			4 ft BGS of 0.6 cubic ft, equivalent to 1/2 sack of neat cement. Scan
			wellsite with rad meters: alpha = 0 cpm, beta & gamma = 70 cpm.
	1320	1322	Run 2, 10 ft joints of 1.5-in. OD PVC tremie pipe into GW-037 to
			16.0 ft BGS.
	1322	1333	Mix and gravity tremie 1/2 sack (0.6 cubic ft) of neat Type I Portland
			cement into well GW-037. Fill to approximately 1.6 ft BGS.
	1333	1336	Pull out tremie pipe and clean up.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-037</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-10-93	0952	0956	Tag cement level in GW-037 at 3.3 ft BGS. Scan wellsite with rad meters: alpha = 20 cpm, beta & gamma = 60 cpm. Well is ready for final P&A activities.
2-11-93	1335	1403	Arrive at GW-037 site. Using backhoe, begin excavating pit around well. Begin extracting protective posts (2) with excessively large concrete anchors. Observe weathered bedrock in pit. Screening soil/bedrock fragments and pit: organic vapors = 0.0 ppm, beta & gamma = 90 cpm, alpha = 0 cpm. Excavate pit to approximately 3.3 ft BGS. Break off well casing below protective casing.
	1403	1409	Push casings, posts (2), and bailer into pit for onsite burial as per waste management plan. Fill in pit. Continue to screen soil and bedrock: organic vapors = 0.0 ppm, beta & gamma = 90 cpm, (alpha not measured due to rainfall).
	1409	1424	Dress up site with tractor's loading bucket. Screen site: organic vapors = 0.0 ppm, and beta & gamma = 100 cpm. Scanned wellsite at completion of P&A activities: organic vapors = 0.0 ppm, beta & gamma = 100 cpm.
			P&A of GW-037 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-038</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-8-93</u>	
FOREMAN: <u>Greg Shillings - Highland Drilling</u>		FINISH: <u>2-11-93</u>	
HELPERS: <u>Paul McCormick/James Gallaher - Highland</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 555 Backhoe</u>		LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-8-93	1527	1535	Arrive at GW-038 site. Remove well wizard™ submersible pump and tubing. Scan for organic vapors: 0.0 ppm. Scan wellsite with rad meters: beta & gamma = 70 cpm, alpha = 0 cpm. Measure water level at 49.7 ft below top of casing (BTOC) = 47.5 ft below ground surface (BGS). Tag bottom of well at 54.7 ft BTOC = 52.5 ft BGS. Calculate a well volume to 4 ft BGS of 1.1 cubic ft, equivalent to 1.5 sacks of Hole Plug™.
	1535	1540	Begin pouring Hole Plug™ into GW-038. Hole Plug™ level above the water level almost immediately. Poured less than 0.2 sack of Hole Plug™ into the well. Tag Hole Plug™ level at 44.5 ft BGS.
2-9-93	1336	1339	Arrive at GW-038 site. Tag Hole Plug™ level at 44.5 ft BGS. Calculate a well volume to 4 ft BGS of 0.9 cubic ft, equivalent to 0.7 sacks of neat cement. Scan wellsite with rad meters: alpha = 0 cpm, beta & gamma = 80 cpm (background).
	1339	1342	Run 4, 10 ft joints of 1.5-in. outside diameter (OD) PVC tremie pipe into the well to 37.0 ft BGS.
	1342	1356	Mix and gravity tremie approximately 3/4 sack (0.9 cubic ft) of neat Type I Portland cement into the well. Circulate 100% cement.
	1356	1404	Pull out tremie pipe. Cement level drops to greater than 1.0 ft BTOC. Clean up.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-038</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-10-93	0956	1003	Tag cement level at 8.5 ft BGS. Scan wellsite with rad meter: alpha
(cont.)			= 0 cpm, beta & gamma = 80 cpm. Calculate a well volume to 4 ft
			BGS of 0.1 cubic ft, equivalent to 0.1 sacks of neat cement.
			Cement level must be within 4 ft of the ground surface (as per
			procedures) prior to capping.
	1459	1503	Mix and pour approximately 0.1 sack (0.1 cubic ft) of neat Type I
			Portland cement into well. Clean up.
2-11-93	1255	1300	Tag cement level in well at 1.1 ft BGS. Well is ready for final P&A
			activities.
	1429	1458	Return to GW-038 site. Using backhoe, begin excavating pit
			around well. Begin extracting protective posts (2). Posts have
			excessive concrete anchors. Screening soil and excavation: beta
			& gamma = 120 cpm (OVA and alpha meter not used due to heavy
			rains). Excavate pit to approximately 3.0 ft BGS. Break off well
			casing below protective casing.
	1458	1512	Push posts (2), casings, and submersible pump and tubing into pit
			for onsite burial (as per waste management plan) and fill in.
			Screen soil at surface: beta & gamma = 120 cpm.
			P&A of GW-038, is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-063</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 5
LOCATION: <u>Oil Landfarm Functional Area</u>		DATE: START: <u>3/25/93</u>	
DRILLERS: <u>Hubert Hall-Highland Drilling Co.</u>		FINISH: <u>4/7/93</u>	
HELPERS: <u>Greg Shillings/Steve Brown/Mark Baker</u>		METHOD: <u>A</u>	
DRILL: <u>Ingersol Rand XL-750</u>		LOGGED BY: <u>Tim Coffey - SAIC V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/25/93	1335	1441	Crew arrives at site to excavate cuttings pit and erect erosion controls. Technical oversight provided by Victor R. Harness (SAIC). Stickup of 2.37-in. outside diameter (OD) stainless steel (SS) riser is 3 ft. Top of 6-in. OD protective casing is 2.3 ft above ground surface. Protective posts previously cut off at ground with acetylene torch. Backhoe (Ford 555) used to excavate a 10 ft x 6 ft x 8 ft deep cuttings pit approximately 20 ft downslope of well, 55 ft from SS2 spring, and 42 ft south of Bear Creek Valley Road right of way (ROW). Secure site and depart.
3/26/93	0833	0913	Awaiting crew. Crew mobilizing rig.
	0913	0957	Crew arrives. One post anchor with excessive grout was removed by backhoe to facilitate set up. Siltation fencing installed around 3/4 of the perimeter of excavation.
	0957	1022	Crew installs plastic sheeting under rig and flags perimeter of entire site including pit. Backhoe excavates 1 ft deep by 2 ft wide cuttings drainage ditch between well and cuttings pit.
	1022	1032	Crew secures a drill rod that came loose in the carousel prior to raising mast.
	1032	1052	Mast raised. Drill table opened. Crew secures protective casing with chain and unsuccessfully tries to pull up well.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-063</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/26/93 (cont'd)	1052	1253	Crew departs to get a section of 7.0-in. OD, 6.25-in. inside diameter (ID) washover pipe to over wash 6.0-in. OD protective casing. Washover pipe must be steam cleaned. Lunch break.
	1253	1321	Crew returns with 24.8 ft length of 7.0-in. OD washover pipe (with bit). Subadapter attached (length = 5.6 ft). Rig up washover pipe and subadapter.
	1321	1355	Breathing zone analysis at table = 0.0 ppm. Radiation emissions at table are: alpha = 0 cpm (= background), beta/gamma = 50 cpm (background = 40 cpm). Table height = 3 ft.
	1355	1359	Begin over wash with compressed air only. Returned preliminary cuttings consist of light gray (Munsel N7-N8) grout mixed with dark yellowish-brown, gritty loam and clay.
	1359	1404	Advance to 2 ft below ground surface (BGS). Begin to use water in drilling.
	1404	1408	Halt drilling to free hydraulic hoses, which are bending in mast. Resume over wash.
	1408	1448	Advance to 17.5 ft BGS. Losing majority of circulation to a multitude of small pressure blowouts that are located on eastern side of well as far as 25 ft away from table. No noticeable impact to adjacent surface waters.
	1448	1553	Advance to 21.5 ft BGS. Encounter rock. Trip out tools. Casing has settled into the bore approximately 6 ft BGS. Bore is audibly caving in. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-063</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/29/93	0740	0810	Technical oversight provided by T. J. Coffey (SAIC). Awaiting crew's arrival.
	0810	0850	Crew arrives and rig mast is lowered. Crew departs to get backhoe.
	0850	0939	Crew returns with backhoe and extracts remaining 2.9 ft of protective casing (total length of protective casing = 5 ft) and 7.3 ft of stainless riser (total length removed = 9.9 ft). The riser came apart at a threaded point.
	0939	1030	Attempt to retrieve casing.
	1030	1041	Move rig approximately 3/4-in. forward. Raise mast. Trip in tools.
	1041	1115	Trip out. Unable to see casing. Trip in tools and clean bore. A new hole may have to be drilled.
	1115	1123	Advance to 18 ft BGS. Unsuccessfully attempted to remove washover subadapter.
	1123	1138	Heat joint with acetylene torch, and break it loose.
	1138	1155	Rig down washover pipe.
	1155	1308	Lunch.
	1308	1326	Crew returns with water truck. Steve Jones (HSE) gives permission to drill out remaining casing. Rig up a 10 5/8-in. diameter tricone roller bit (Bit and stabilizer = 9.2 ft length).
	1326	1333	Trip in. Table Ht = 2.4 ft. Commence reaming bore.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-063</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/29/93	1333	1337	Advance to 22.2 ft BGS. Table Ht = 3.0 ft.
(cont'd.)			
	1337	1401	Advance to 23.5 ft BGS. Bit hung. Trip out. Rotation motor on drill head broke. Rig off.
	1401	1554	Crew inspects malfunction, and removes rotation motor. Approximately 200 ml of hydraulic fluid spilled on ground around bore. Bore is covered with straw bale, and rig down until repairs can be made. Secure site and depart.
3/30/93	1445	1535	Technical oversight resumed by V.R. Harness (SAIC). Repairs completed to rig. Trip in with 10 5/8-in. diameter bit. Advance to 23.2 ft BGS. Lose circulation. No cuttings received at surface.
	1547	1640	Encounter a series of small voids and ratty drilling at 24.2 ft to 26.2 ft BGS. Advance to 30 ft BGS. Water truck empty. Secure site and depart. No cuttings.
3/31/93	0821	0845	Awaiting crew's arrival.
	0845	0902	Crew arrives with water truck. Trip tools back in bore hole, and resume reaming at 30 ft BGS.
	0902	0957	Ratty drilling advance to 36 ft BGS. Grout delivery arrives.
	0957	1014	Trip out tools. Pour two 50 lb-buckets of bentonite pellets in bore. Depth of bore before bentonite tagged at 30 ft BGS (hole caving). Top of unhydrated bentonite tagged at 29 ft BGS.
	1014	1041	Insert 20 ft of 1.5-in. OD PVC tremie pipe to 17 ft BGS. Prepare to gravity tremie. Steve Jones (HSEA) stops grouting, requests that

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-063</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 5 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3/31/93			bore be filled with Hole Plug™ to a level above the voids
(cont'd)			(20 ft BGS).
	1041	1137	Crew pours fifteen sacks of Hole Plug™ bentonite into bore. Top of unhydrated bentonite = 19 ft BGS.
	1137	1202	Pour 25 gallons of potable water into bore to facilitate hydration of bentonite. Secure site and depart.
4/1/93	1133	1138	Tag hydrated bentonite at 18.7 ft BGS.
	1138	1203	Crew prepares for grout delivery.
	1203	1210	Grout delivery arrives. Pour 0.3 cubic yds of neat, Type I Portland cement into bore. Liquid grout to 1 ft BGS. Secure site and depart.
4/2/93	1202	1208	Tag cured grout at 4.2 ft BGS.
4/5/93	0856	0902	Crew mixes and pours a fraction of a sack of Portland Type I cement into bore.
4/6/93	0839	0848	Top of cured grout at 3.8 ft BGS.
4/7/93	1458	1500	Clay cap installed on bore. P&A of GW-63 complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-088</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>4-27-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>5-5-93</u>	
HELPERS: <u>Randy Phillips, Greg Anderson, Steve Brown</u>		METHOD: <u>A</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>V.R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-27-93	0900	1036	Technical oversight provided by V.R. Harness - SAIC. Three dump trucks of coarse gravel are delivered to site and crew uses backhoe to create an area for rig to set up on GW-088.
	1036	1219	Riser stick-up at GW-088 = 2.9 ft of 2.37-in. outside diameter (OD), 2.0-in. inside diameter (ID) #304 stainless steel (SS) casing. Also 2.1 ft stick-up of 5-in. OD steel protective casing. Crew removes all 5 ft length of 5-in. protective casing and all 2.37-in. OD SS riser stick-up using backhoe and oxyacetylene torch.
	1219	1250	Rig is mobilized onto site and set up. Protective posts are extracted.
	1250	1256	Rig up 16.9 ft long section of 6-in. OD, 5.25-in. ID washover pipe and bit.
	1256	1301	Begin over wash. Breathing zone analyses (BZA) at table = 0.0 ppm, background (BCK) BZA = 0.0 ppm. Radiation: alpha = 20 cpm = BCK; beta/gamma = 120 cpm (BCK = 80 cpm). Table ht = 2.3 ft.
	1301	1308	Advanced to 14.6 ft below ground surface (BGS). BZA = 0.0 ppm, beta/gamma = 80 cpm. SS casing comes out of hole with washover pipe.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-088</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-27-93	1308	1322	Crew secures casing and extracts 23.7 ft of riser (+2.9 ft stick-up
(cont.)			= 26.6 ft) subtended by 5.1 ft of spiral wound SS screen subtended
			by 1.2 ft of SS silt trap. Total well length with screen, cap, riser, and
			stick up = 32.9 ft.
	1322	1331	Crew breaks out washover pipe and rigs up with 9.2 ft long,
			10 5/8-in. diameter tricone roller bit and stabilizer assembly.
			Description of 0 to 14.6 ft BGS cuttings:
			Sample comprised of 90% (by volume) white (N8) grout fragments
			with 10% light olive brown (2.5Y 5/4) clay with silty shale fragments.
	1331	1334	Begin reaming hole with 10 5/8-in. diameter bit. Advance to 7 ft
			BGS compressed air only.
	1334	1353	Begin using water to drill, advanced to 32 ft BGS.
	1353	1405	Trip out tools, rig down and secure site. 1 cubic yd of grout ordered
			for delivery 4-28-93. Depart site.
			Description of 0-32 ft BGS reaming cuttings:
			Sample is comprised of 90% (by volume) grayish black (N2) silty
			shale, 9% dark yellowish brown (10YR 4/2) silty shale with 1% dark
			greenish gray (5GY 4/1) shale fragments.
4-28-93	0817	0842	Arrive at site, awaiting grout delivery.
	0842	0910	Grout delivery arrives. Bore has collapsed, crew cleans out bore
			with 10 5/8-in. diameter bit. Trip out tools.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-234</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>4-26-93</u>	
DRILLERS: <u>Hubert Hall • Highland Drilling Co.</u>		FINISH: <u>5-5-93</u>	
HELPERS: <u>Randy Phillips/Jim Gallaher • Highland</u>		METHOD: <u>A</u>	
DRILL: <u>Ingersoll Rand XL-750</u>		LOGGED BY: <u>Timothy Coffey • SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-26-93	1206	1232	Arrive at GW-234 site. Drill rig is already positioned over well.
			Crew is rigging up a section of 5.0-in. inside diameter (ID), 6.0-in. outside diameter (OD) washover pipe modified with tungsten carbide chips brazed onto one end to perform as the bit; length = 15.2 ft, total length (includes drilling sub) = 17.0 ft, table height = 4.2 ft. Well casing stickup = 3.5 ft.
	1232	1303	Crew breaks for lunch. S. Jones (HSE) onsite with T. McDermott (SMS, Inc.) who will be observing the P&A operations.
	1303	1314	Commence over washing the casing with air only. Over wash casing from 0.0 ft to 10.9 ft below ground surface (BGS). Sporadic circulation between 2.0 ft and 3.5 ft BGS. Cuttings consist of dark yellowish-brown (10YR 4/2) to grayish-brown (5YR 3/2), moist, clayey soil with increasing amounts of light gray (N7) cement fragments. Drilling becomes more difficult at 3.5 ft BGS. Washover pipe dropped rapidly from 5.0 ft to approximately 7.0 ft BGS, then circulation was lost. Washover pipe appears to be binding on the casing beginning at 9.0 ft BGS.
	1314	1320	At 10.9 ft BGS. Halt over wash; no circulation since 7.0 ft BGS. Should be below any annular cement, will try to pull casing. Break washover pipe loose and rig down. Conductor casing and well casing wedged into washover pipe.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-234</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-26-93	1320	1333	Remove a total of 5.0 ft of 4.0-in. OD steel conductor casing (it had
(cont.)			been bent) from washover pipe. A total of 5.6 ft of 2.37-in. OD
			stainless-steel well casing encased within the conductor casing.
			Stainless-steel well casing had sheared off at the base of the
			conductor casing.
	1333	1336	Rig up with a 10 5/8-in. diameter tricone roller bit and stabilizer;
			length = 9.2 ft, table height remains at 4.2 ft.
	1336	1339	Commence reaming with air only. Ream to 5.0 ft BGS. Circulation
			is spotty.
	1339	1343	At 5.0 ft BGS. Add drill rod.
	1343	1410	Continue reaming with air and water. Ream from 5.0 ft to 17.5 ft
			BGS. Lose circulation entirely at 6.8 ft BGS. Ratty drilling
			throughout most of the interval (well casing remaining in hole).
	1410	1419	At 17.5 ft BGS (no circulation since 6.8 ft BGS). Trip out, rig down
			stabilizer. Tag bottom of hole at 15.2 ft BGS (2.3 ft of fill). Calculate
			a borehole volume to 4.0 ft BGS of 6.9 cubic ft, equivalent to 5.1
			sacks of 2% bentonite-cement grout.
	1419	1445	Waiting for crew to bring cementing supplies and equipment to
			site.
	1445	1450	Crew arrives. Run 1, 10.0-ft section of 1.5-in. OD PVC tremie pipe
			into borehole to 9.5 ft BGS. Due to lost circulation, suspect
			washout of borehole. If so, and if cement does not fill hole,
			S. Jones (HSE) gives approval to use Hole Plug™ instead.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-234</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-26-93	1450	1512	Mix and tremie 5 sacks (6.8 cubic ft) of 2% bentonite-cement grout
(cont.)			into borehole. Did not circulate water or cement.
	1512	1523	Pull out tremie pipe. Clean up, secure site, and depart.
4-27-93	0830	0840	Technical oversight by Victor Harness (SAIC). Arrive at GW-234
			site. Tag cement level at 11.7 ft BGS. A large void is suspected
			below 7 ft BGS (cause/result of lost circulation). Plan to use Hole
			Plug™ to bring borehole sealant level to 7.0 ft BGS. Calculate a
			minimum borehole volume from 11.7 to 4 ft BGS of 2.8 cubic ft,
			equivalent to 4.2 sacks of Hole Plug™.
	0840	0855	Crew goes to pipeyard for Hole Plug™.
	0855	0904	Crew returns with six sacks of Hole Plug™ (all they had at
			pipeyard). Pour the six sacks (4.1 cubic ft) of Hole Plug™ into the
			borehole. Tag Hole Plug™ level at 9.0 ft BGS (level rose only
			2.7 ft). Depart site.
4-30-93	1334	1350	Arrive at GW-234 site. Pour 12 sacks (8.3 cubic ft) of Hole Plug™
			into borehole. Tag Hole Plug™ level at 8.0 ft BGS. Depart site.
	1451	1500	Return to GW-234 site. Pour an additional 11 sacks (7.6 cubic ft)
			of Hole Plug™ into borehole. Tag Hole Plug™ level at 3.0 ft BGS.
			Depart site.
5-3-93	0755	0800	Oversight resumed by Timothy Coffey (SAIC). Arrive at GW-234
			site. Tag Hole Plug™ level at 4.7 ft BGS. Calculate a borehole
			volume to 4.0 ft of 0.4 cubic ft, equivalent to 0.3 sacks 2%
			bentonite-cement grout. Depart site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-502</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-8-93</u>	
FOREMAN: <u>Greg Shillings - Highland Drilling</u>		FINISH: <u>2-11-93</u>	
HELPERS: <u>Paul McCormick - Highland Drilling</u>		METHOD: <u>B</u>	
DRILL: <u>Ford 555 Backhoe</u>		LOGGED BY: <u>T.J. Coffey/T.J. Long - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-8-93	1024	1042	Arrive at GW-502 site. Remove well cap, scan for organic vapors:
			0.0 ppm. Scan ground surface with rad meters: beta & gamma
			= 50 cpm, alpha = 0 cpm. Measure water level at 31.2 ft below top
			of casing (BTOC) = 28.7 ft below ground surface (BGS). Tag
			bottom of well at 261.4 ft BTOC = 258.9 ft BGS. Note: Subsurface
			Database (Y/TS-881) reports total depth (TD) of GW-502 to be
			260.0 ft. Calculate a well volume to 4 ft BGS of 50.0 cubic ft,
			equivalent to 72.5 sacks of Hole Plug™.
	1042	1055	Slowly pour 12 sacks (8.3 cubic ft) of Hole Plug™ into GW-502.
			Organic vapors at well collar = 0.0 ppm. Beta & gamma scan =
			30 cpm.
	1139	1155	Slowly pour an additional 9 sacks (6.2 cubic ft) of Hole Plug™ into
			the well. Continue to scan casing collar for organic vapors:
			0.0 ppm. Water rises to the top of the well casing. Tag Hole
			Plug™ level: tape stops at 183.5 ft BGS.
	1346	1406	Arrive at GW-502 site. Water level in well casing has dropped 0.5
			ft. Rad scan of water in casing: beta & gamma = 30 cpm. Pour
			an additional 14 sacks (9.7 cubic ft) of Hole Plug™ into the well.
			Circulate water onto ground surface. Tag unhydrated Hole
			Plug™ level at 135.5 ft BGS.
2-9-93	0912	0915	Arrive at GW-502 site. Tag hydrated Hole Plug™ level at 134.7 ft
			BGS (Hole Plug™ swelled 3.3 ft).

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-502</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-9-93	0915	0932	Slowly pour 15 sacks (10.4 cubic ft) of Hole Plug™ into GW-502.
(cont.)			Circulate water entire time. Tag Hole Plug™ level at 78.0 ft BGS.
	0932	0948	Pour an additional 10-1/2 sacks (7.2 cubic ft) of Hole Plug™ into
			GW-502. Continue to scan site, beta & gamma = 50 cpm; alpha
			= 0 cpm. Circulate water. Tag Hole Plug™ level at 34.7 ft BGS.
			A total of 60.5 sacks (41.7 cubic ft) of Hole Plug™ used in GW-502.
	0948	0951	Clean up site.
2-10-93	0826	0833	Arrive at GW-502 site. Tag hydrated Hole Plug™ level at 34.6 ft
			BGS (Hole Plug™ swelled 0.1 ft). Rad scan of site: beta & gamma
			= 50 cpm, alpha = 20 cpm. Calculate a well volume to 4 ft BGS of
			6.0 cubic ft, equivalent to 4.4 sacks of 2% bentonite-cement grout.
			Run 3, 10 ft joints of 1.5-in. outside diameter (OD) PVC tremie pipe
			into the well to 27.0 ft BGS.
	0833	0904	Mix and gravity tremie 4 sacks (5.4 cubic ft) of 2% bentonite-
			cement grout. Begin circulating water almost immediately. Rad
			scan of displaced water: beta & gamma = 50 cpm. Tremie system
			slows up, remove 1, 10 ft joint of tremie pipe and continue tremie
			of approximately the last sack of cement from 17.0 ft BGS.
			Circulate 50% cement.
	0904	0915	Pull out tremie and clean up. Cement to cure for a minimum of
			24 hrs.
2-11-93	0828	0834	Arrive at GW-502 site. Tag cement level at 5.5 ft BTOC = 3.0 ft
			BGS.
	0834	0908	Position backhoe to remove 1 remaining protective post from well
			GW-030 (post to be buried in pit at GW-502). Post came loose and

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-502

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 10
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>Rob Tillery - Law Engineering Co.</u> <u>Hubert Hall - Highland Drilling Co.</u> HELPERS: <u>Mel Wagner - Law Engineering Co.</u> <u>Steve Brown, Greg Shillings - Highland Drilling Co.</u> DRILL: <u>CME Model 75 Ingersoll-Rand XL-750</u>		DATE: START: <u>12-2-92</u> FINISH: <u>1-6-93</u> METHOD: <u>D</u> LOGGED BY: <u>Victor Harness - SAIC</u> <u>Mike Klidzejs - SAIC</u> <u>Susan Abston - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-2-92	1332	1423	Technical oversight by Victor Harness - SAIC. Crew and rig by Law Engineering. Crew removes fitting from 1.0-in. tube. HNu screen of tube interior = 0.4 ppm. Crew cuts stickup off on 1.0-in pipe at 1.5 ft above ground. Concrete pad broken up with rig hammer.
	1423	1450	Rig up shoe bit on 5-ft piece of HQ drill rod. Bit = 0.3 ft length. Crew departs to get water truck.
	1450	1517	Crew stacks 10-ft drill rods on racks, hooks up water truck.
	1517	1526	Begin drilling with HQ (3.79-in. outside diameter) diameter core rods using water. 1-in. pipe twists off flush with annular grout surface and ground surface. Remove 1.6 ft of 1-in. pipe. Plug 1-in. pipe to prevent loss of drilling fluids and to maintain circulation.
	1526	1549	Resume drilling. Threads on female end of 5-ft drill rod cracked and leaking circulation water. Advance to 2 ft below ground surface (BGS) and stop to remove 5-ft piece of drill rod.
	1549	1613	Add 10-ft rod to bit. Resume drilling.
	1613	1620	At 5.5 ft BGS, stop to allow water flow from truck tank to feed tank to catch up. Resume drilling.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 10
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-2-92			Advance to 6.5 ft BGS. Shut down for day. Crew secures site.
(cont'd)			Depart.
12-3-92	0741	0805	Awaiting drill crew.
	0805	0856	Crew arrives. Warming drill rig. Crew supplement rod shoe used yesterday with a 0.86-ft long reaming shell. Slightly larger diameter than rod shoe shell still HQ size. Shell and bit length = 1.26 ft: Crew rigging up tools.
	0856	0922	Begin drilling. Advance to 12 ft BGS. Drill rod bends.
	0922	1021	Drilling has cut 1.0-in. pipe and was apparently set at an angle when grouted. Crew drills through 1.0 in. pipe fragment, which has fallen into bore. Abundant metal shavings in returns. Pause to allow flow of water from truck to catch up with rate of use.
	1021	1045	Resume drilling. Advance to 52.8 ft BGS. Pause to allow water flow to catch up and fill feed tank.
	1045	1112	Resume drilling. Advance to 62.8 ft BGS. Await water recharge to feed tank.
	1112	1138	Resume drilling. Advance to 72.8 ft BGS. Shut off rig to allow recharge of feed tank and break for lunch.
	1138	1239	Lunch.
	1239	1417	Resume drilling, advance to 101 ft BGS. Slowing of advance rate near end of interval.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 10
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-3-92	1417	1453	Trip out of hole; rod shoe bit is worn out. Remove bit and replace
(cont.)			with HQ core bit. Bit and reaming sleeve = 1.4 ft long. Crew
			departs to get a fresh load of water.
	1453	1641	Awaiting return of crew.
	1641	1654	Crew returns, securing site. All depart.
12-4-92	0801	0810	Awaiting crew.
	0810	0931	Law crew arrives. Trip rods back in. Bore partially filled with water.
	0931	1015	Resume drilling. Stop before advance to allow cuttings pit to be
			made. Pit will allow cuttings to settle and allow re-use of drilling
			water. This hopefully will lessen frequency of downtime periods to
			refill water tank.
	1015	1110	Resume drilling. Very slow advance, bore pressuring up.
			Temporarily lose circulation at 107 ft BGS and at 109 ft BGS.
			Advance to 111.4 ft BGS. Trip out.
	1110	1215	Trip out. Having to remove 1.0-inch outside diameter (OD) pipe
			from inside drill rod. Have removed a total of 107.3 ft of 1.0-in. OD
			pipe since beginning. Also remove fragments of packer. Break for
			lunch and to get a load of water.
	1437	1615	Scott Gilbert (Highland) returns with load of water for Law crew.
			Tripping down. Resume drilling, advance to 145.9 ft BGS. Bore
			dressed. Crew secures rig. Depart.
12-7-92	0728	0806	Awaiting crew.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 4 of 10
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-7-92	0806	0849	Crew arrives. Calculate five sacks of Type I cement grout required to fill bore. Tag bore and confirm depth of 145.9 ft BGS.
(cont.)			
	0849	0901	Crew departs to get equipment to tremie.
	0936	1024	Awaiting grout delivery. Crew will tremie through HQ rod using rig pump. Tremie elevation will be 30 ft above bottom of bore or 115.9 ft BGS.
	1024	1123	Grout delivery arrives. Crew pumps 80 gal of neat, Type I cement grout into bore. No circulation from bore. Trip out, no grout seen on drill rods. Crew cleans equipment. Depart site.
	1358	1405	At site. Unable to get weighted tape past 59 ft BGS. Weight has bentonite on it when removed. Depart.
12-8-92	0835	0844	Tag bottom of bore at 74.6 ft BGS. Bentonite on weight of tape. Depart.
12-10-92	0753	0804	Tag firm surface at 67.7 ft BGS. Encounter water at 66 ft BGS. Some bentonite on weight.
12-16-92	1303	1351	Tag grout in bore at 67.7 ft BGS. Awaiting Highland Crew. Ingersoll-Rand XL-750 set up on boring.
	1351	1412	Crew steam-cleaning and rigging up first piece of 9-in. OD, 8.5-in. ID washover pipe, 20.1-ft length.
	1412	1443	Begin over wash. Advance to 20 ft BGS. Met no resistance between 17 and 20 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 5 of 10
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-16-92	1443	1554	Unable to add next piece of washover pipe until a means of clamping and holding washover in bore is found. Secure site and depart.
12-17-92	0944	1020	Technical oversight assumed by Michael Kildzejs (SAIC). Crew, Bruce McMaster (HSE) and Susan Abston (SAIC), present. Crew prepares to over wash. Rig up with second washover pipe, 20.7 ft in length. Table height is 2.2 ft.
	1020	1041	Continue over wash at 21.0 ft BGS. Organic vapors in breathing zone at 29.0 ft BGS = 5.2 ppm. Attribute this to alcohol in rig water pipes to prevent overnight freezing. Beta and gamma = 60 cpm (background = 50-60 cpm). Collect and rinse cuttings sample of 21 to 35 ft interval. Sample consists of fine to fairly large cuttings of medium gray cement and minor angular chert fragments. Organic vapors in breathing zone at 40 ft BGS = 2.2 ppm. Beta and gamma = 50 cpm. Reach 41.0 ft BGS. Stop to add third washover pipe section.
	1041	1121	Decontaminate third washover pipe and rig up. Third pipe is 21.0 ft in length.
	1121	1222	Rig stopped. Crew is waiting for 1130 scheduled cement shipment.
	1222	1246	Crew returns to GW-551 site and unloads washover pipe delivered to site by Scott Gilbert (Highland). Crew, Bruce McMaster, and oversight depart for lunch.
	1342	1402	Crew, oversight, Bruce McMaster, and Steve Fields (HSE) onsite. Rig is started and the hole is blown clean.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 6 of 10
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-17-92	1402	1431	Continue over wash at 41 ft BGS. Organic vapors in breathing zone
(cont.)			at 44 ft BGS = 0.2 ppm. Beta and gamma = 30 cpm. Cuttings
			sample of 36 to 46 ft BGS interval collected. Sample consists
			predominantly of fine, light brownish gray (5YR 6/1) cement cuttings
			with minor white chert. Notice grinding noise from rig at 49 ft BGS.
			Beta and gamma around rig at 56 ft BGS = 60 cpm. Reach 61 ft
			BGS. Stop to add fourth washover pipe.
	1431	1515	Crew prepares to add fourth washover pipe; has difficulty breaking
			loose pipe joints. Cuttings sample of 46 to 61 ft BGS interval
			collected. Sample consists predominantly of fine dark gray (N3) to
			grayish orange (10YR 7/4) cement cuttings. Medium gray (N5) to
			white (N9) chert, and minor metal shavings also observed. Bruce
			McMaster leaves site; Steve Fields remains as PHSO. Fourth
			washover pipe, 21.0 ft in length rigged up.
	1515	1600	Continue over wash at 61.0 ft BGS. Organic vapors in breathing
			zone at 65.0 ft BGS = 0.4 ppm. Beta and gamma = 65 cpm. Organic
			vapors at 76.0 ft BGS = 0.6 ppm. Cuttings sample of 61 to 82 ft BGS
			interval collected. Sample is continuation of 46 to 61 ft BGS
			interval. Reach TD at 82.7 ft BGS. Blow hole clean.
	1600	1627	Crew begins removing adapter from washover pipe. Adapter is
			removed, exposing the casing.
	1627	1644	Crew secures site and departs. Oversight departs.
12-18-92	0828	0922	Crew and oversight arrive at site. Driller reports that the cement-
			filled, overwashed casing must be drilled out to enable removal.
			Call Steve Jones and inform him of plan. Crew goes to the GW-561
			site to pick up a stabilizer and bit. Crew returns. Driller leaves site
			to obtain geo-fabric. Steve Jones arrives onsite. Driller returns.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 7 of 10
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-18-92	0922	0956	Geo-fabric is placed outside of the washover pipe for stabilization.
(cont.)			Used Tyvek™ coveralls are placed between overwash pipe and casing for stabilization and to prevent cement cuttings from going
			down annulus. Crew rigs up with 6.25 in. diameter bit and
			stabilizer, total length, 2.3 ft; and one rod. Table height = 2.3 ft
			BGS.
	0956	1007	Begin drilling cement inside of casing with air only. Stop drilling
			to check progress and continue down. Organic vapors in breathing
			zone at 10 ft BGS = 0.2 ppm. Beta and gamma = 40 cpm
			(background = 20 to 30 cpm). Alpha = 0 cpm. Reach 25 ft BGS
			and end of rod. Add second rod.
	1007	1013	Continue drilling at 25 ft BGS. Greg Shillings (Highland) arrives
			onsite. Organic vapors in breathing zone at 40 ft BGS and end of
			second rod. Add third rod.
	1013	1033	Continue drilling at 50.0 ft BGS. Organic vapors in breathing zone
			at 57 ft BGS = 0.2 ppm. Get wet cement cuttings and water at 66 ft
			BGS. Reach 75 ft BGS and end of third rod. Add fourth rod.
	1033	1044	Continue drilling at 75 ft BGS. Organic vapors in breathing zone
			at 80.0 ft BGS, erratic from 0.2 to 2.2 ppm. Beta and gamma =
			40 cpm. Get muddy water in returns with cement cuttings at 82
			ft BGS. Notice high pitched noise and vibration at 97 ft BGS,
			probably indicating bottom of casing. Drilling ends of 97.0 ft BGS.
	1044	1117	Pull rods, stabilizer, and bit out. Rig stopped. Organic vapors at
			opening of bored casing erratic, from 0.2 to 3.0 ppm.
	1117	1210	Crew attempts to pull casing. Determine that casing cannot be
			pulled, and must over wash further. Crew rigs up with an

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 8 of 10
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-18-92			additional section of washover pipe.
(cont.)			
	1210	1317	Break for lunch.
	1317	1356	Begin over wash at 82.7 ft BGS. Organic vapors in breathing zone at 84.7 ft BGS = 0.0 ppm. Beta and gamma = 60 cpm. Washover pipe sticks at 90.4 ft BGS. End overwash.
	1356	1615	Collect cuttings sample of 82.7 to 90.4 ft BGS interval. Sample consists of cement and minor yellowish gray (5Y 8/1) chert and medium light gray (N6) dolomite. Sample set to dry. Crew attempts to pull washover pipe. Crew unable to break joints. Will continue attempt in the morning. Crew, Bruce McMaster, and oversight depart.
12-21-92	0810	0950	Oversight, Bruce McMaster, and crew arrive at site. Crew continues attempt to break joint. The joint is broken and the first (uppermost) washover pipe section is removed, exposing the well casing. Scan first washover pipe section for rad: beta and gamma = 60 cpm (background = 40 cpm), alpha = 10 cpm (background = 5 cpm). Bruce McMaster leaves site to obtain cutting/welding permit, then returns.
	0950	1040	Crew begins removal of casing. Organic vapors in breathing zone = 0.2 ppm. Casing string is raised to top of the mast, clamped at the table, and cut with cutting torch. Uppermost section lowered to the ground surface. Process is repeated until entire string is removed. Beta and gamma of casing = 80 cpm. Alpha = 0 cpm.
			Total length of 6.5-in. OD steel casing string recovered = 91.1 ft.
	1040	1205	Washover pipe is pulled out, with minor difficulties.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-551</u> PAGE 9 of 10
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-21-92	1205	1320	Break for lunch.
(cont.)			
	1320	1410	Crew prepares to ream hole. Stabilizer and bit are decontaminated.
			Bit diameter = 10 5/8-in. Total length of stabilizer and bit = 9.2 ft.
			Rig up with rod, stabilizer, and bit. Table height = 2.9 ft.
	1410	1414	Scan washover pipes for rad: beta and gamma = 80 cpm, alpha = 0 cpm.
	1414	1422	Begin reaming with air only. Get frothy return water. Reach 31.3 ft BGS and end of first rod. Add second rod.
	1422	1427	Continue reaming at 31.3 ft BGS. Organic vapors in breathing zone at 46.0 ft BGS = 0.6 ppm. Reach 56.3 ft BGS and end of rod. Add third rod.
	1427	1510	Continue reaming at 56.3 ft BGS. Stop getting returns at 58.0 ft BGS. Rig is stopped. Tighten bolts on rig air compartment. Determine that bit is clogged. Begin pulling rods out to clear bit. Bit is unclogged. Trip back down. Table height adjusted to 3.2 ft.
	1510	1530	Continue reaming. Now getting good returns. Organic vapors in breathing zone at 71.0 ft BGS = 1.0 ppm. Ratty drilling between 76 and 81 ft BGS. Reach 81 ft BGS and end of rod. Add fourth rod.
	1530	1600	Continue reaming at 81 ft BGS. Beta and gamma in breathing zone at 83 ft BGS = 50 cpm. Reach 92.0 ft BGS, stop reaming and blow hole clean. Trip out, and begin pulling rods. Collect cuttings sample of 20 to 92 ft BGS interval. Sample is rinsed and set to dry. Screen sample for beta and gamma, alpha and place under foil for headspace analysis (see cuttings field screening/disposal sheet).

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-553</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 7
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>Rob Tillery - Law Engineering</u> <u>Hubert Hall - Highland Drilling Co.</u> HELPERS: <u>Mel Wagner - Law Engineering</u> <u>Jim Gallaher/Steve Brown - Highland</u> DRILL: <u>CME M-75/Ingersoll Rand XL-750</u>		DATE: START: <u>12/8/92</u> FINISH: <u>3/18/93</u> METHOD: <u>D</u> S.L. Abston - SAIC LOGGED BY: <u>V.R. Harness - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/8/92	1314	1345	Technical oversight by V.R. Harness (SAIC). Crew using backhoe (Ford 555 tractor) to cut recirculation pit for CME M-75 core rig (Law Engineering). Rob Tillery and Mel Wagner (Law Engineering) set up rig.
	1345	1416	Rig up CME with HQ core bit to over drill 1.0-in. outside diameter (OD) tube in well. (Well is a core hole converted by use of packer into a well.) HQ core bit is 3.79-in. OD and 2.5-in. inside diameter (ID). Core bit and rod used to fit inside 4.5-in. OD, 4.0-in. ID casing. Nylon packer inflation tube clogs bit, driller places crushed glass into hole to facilitate cutting. Bit and reaming shell length = 1.4 ft. Reaming shell OD = 3.672 in.
	1416	1424	Advance to 1.0 ft below ground surface (BGS). Driller having to use 5-ft section of HQ drill rod first to make room to mount 10-ft rod on chuck. Female end of 5-ft rod is cracked, so driller packs threads with teflon tape to seal circulation.
	1424	1435	Resume overdrilling. Advance to 5 ft BGS. Background radiation = 40 cpm beta/gamma and 20 cpm alpha emissions.
	1435	1535	Halt advance, exchange 5-ft long rod for 10-ft long rod. 8.8 ft of 1-in. tube comes out during exchange. Resume drilling. Breathing zone analysis (BZA) for organic vapors at table = background = 0 ppm. Cuttings composition = 90% fine grout fragments plus 10% metal shavings, glass fragments, and fragments of nylon

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 7			
DATE	TIME		ACTIVITY/COMMENTS			
	START	FINISH				
12/8/92			nylon packer inflation tubing.			
(cont.)						
	1535	1602	Advance to 12.6 ft BGS. Cuttings sample composition = 75% metal shavings (magnetized) + 25% grout chips. Radiation screening of cuttings:			
				Interval	alpha	beta/gamma
				0-5 ft	40 cpm	50 cpm
				5-12.6 ft	40 cpm	30 cpm
	1602	1613	Extracted a 6-ft piece of twisted and sheared 1.0-in. OD pipe. Resumed over drilling.			
	1613	1712	Advance to 18 ft BGS. Halt for day. Secure site. Depart.			
12/9/92	0803	0818	Awaiting crew.			
	0818	0827	Law Engineering crew arrives. Resume over drilling with HQ drill rod.			
	0827	0859	Advance to 22.6 ft BGS. Crew trips out tools to unclog debris from inside. Description of 12.6 to 22.6 ft sample: 90% metal shavings, 10% grout chips.			
	0859	1009	Resume over drilling. Advance to 32.6 ft BGS. Cuttings from 22.6 ft to 32.6 ft BGS comprised of 90% metal shavings and 10% fragments of Nylon packer inflation tube.			
	1009	1023	Crew trips out to clear nylon tubing from bit. Upon tripping out, crew discovers uppermost two (10-ft long each) pieces of drill rod are warped badly. In light of this unforeseen damage, crew shuts down to confer with Sam Wilkinson (Law). Bit is also worn out.			

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/9/92	1023	1125	Problem is discussed between HSE personnel, Highland
(cont.)			personnel, and Law Engineering. Y-12 photographer arrives to
			take photographs.
	1125	1138	The 4.5-in. OD steel casing can be rotated with a pipe wrench.
			Crew's attempt to pull same is unsuccessful with 10,000 lb of
			pressure.
	1138	1205	Scott Gilbert (Highland) to bring acetylene torch to cut any casing
			we pull from bore. Crew continues attempts to free 4.5-in. OD
			casing. Break for lunch.
	1314	1401	Cut pull holes in 4.5-in. OD stickup. A steel pin is inserted across
			casing, and a pull attempt using the Kelly bar hydraulics is
			unsuccessful (30,000 lb pull).
	1401	1412	Receive permission from Bill Thedford (HSE) to unthread 4.5-in.
			OD casing. Crew begins unthreading and removing casing.
	1412	1641	Crew extracts part of the 4.5-in. OD steel casing and part of the
			1.0-in. OD black steel tubing inside it. The following is a tally of
			casing and tubing extracted.
			4.5-in. OD casing = 101.0 ft cut into 5 pieces
			1.0-in. OD tubing = 152.0 ft in 8 pieces
	1641	1651	Secure site and depart.
12/10/92	0817	0830	Tag 94 ft BGS in hole left by casing extraction.
	0830	0907	Crew trips down drill rod to bottom of open bore. Rig shut down
			while crew gets a load of potable water.

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12/10/92	0907	0951	Old water truck breaks down on way out to road.
(cont.)			
	0951	1248	Move old water truck back to drill site, and begin pumping water from new truck to old truck.
	1248	1401	Transfer of water complete between tank trucks.
	1401	1454	Resume drilling at 94 ft BGS. Advance to 111.3 ft BGS. Crew unable to advance bit further due to caving in the bore. Highland, Law, and HSE conferring. Law will rig down and move off.
	1454	1506	Secure site, depart.
2/16/93	0934	1027	Highland Drilling crew setting up Ingersoll Rand XL-750 on borehole to begin over wash of 6.5-in. OD steel casing.
	1027	1045	Rig up 22 ft-long piece of 9.0-in. OD, 8.5-in. ID washover pipe and bit. Second piece of washover on ground is 21.1 ft long.
	1045	1131	Begin over wash of 6.5-in. OD steel casing. Table height = 2.4 ft. Advance to 20 ft BGS. Break for lunch.
	1259	1401	Crew uses acetylene torch to break out subadapter and add second piece of washover pipe. First piece of washover with bit slips down hole due to absence of annular grout.
	1401	1459	Retrieving and threading first piece to second piece of washover pipe.
	1459	1516	Unable to reach washover pipe down hole without additional section of washover pipe. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-553</u> PAGE 5 of 7
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/17/93	0840	1053	Awaiting backhoe and additional pieces of washover.
	1053	1103	Backhoe arrives with two pieces of 9-in. OD washover pipe, both 21 ft long. Rigging up third piece of washover for a string length of 65 ft.
	1103	1142	Tripping in, contacted top of first piece of washover at 62 ft BGS, threaded it into string. Bottom of tools at 85 ft BGS. Annulus surrounding 6.5-in OD casing apparently was poorly grouted. Lunch break.
	1308	1330	Rigging up fourth piece of washover for a total of 86 ft of tools.
	1330	1357	Resume over wash. Annulus empty from approximately 19-20 ft BGS to 77.5 ft BGS. No returns. Advance to 86 ft BGS.
	1357	1540	Cuttings from 77.5 to 86 ft BGS are grout chips with metal shavings. Crew believes casing is loose and will trip out washover pipe to attempt a pull. Must wait for D. Hewitt (Highland) to deliver torch to heat washover joints for breakout and to cut casing.
	1540	1642	D. Hewitt (Highland) arrives with acetylene torch. Crew extracts 93.4 ft of 6.5-in. OD steel casing in four pieces. Crew begins tripping out washover.
	1642	1715	All washover pipe out. Secure rig and depart.
2/18/93	0815	0850	Awaiting crew.
	0850	0900	Crew arrives and departs to fill water tank truck.
	0900	1106	Awaiting return of crew with water.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-553</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 6 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/18/93	1106	1138	Crew rigging up 10 5/8-in. tricone roller bit onto stabilizer to ream bore made by casing. Over wash stabilizer and bit = 9.2 ft long.
(cont.)			
	1138	1205	Technical oversight provided by Susan L. Abston (SAIC). Crew still breaking out hole opener bit to fit 10 5/8-in. bit onto stabilizer.
	1205	1225	Begin reaming bore. Table height = 2.4 ft. Water lines on rig frozen. Stop drilling. Awaiting Janet Sitzler (HSE) to issue cutting permit so crew can heat and thaw water lines.
	1225	1255	J. Sitzler (HSE) arrives. Heat frozen water lines with propane torch.
	1255	1310	Resume reaming bore. No cuttings returned. Advance to 37.7 ft BGS. Breathing zone analysis at table = 0.4 ppm (background), and radiation emission at table = 40 cpm beta/gamma (= background).
	1310	1425	Advance to 94 ft BGS. Begin to trip out. Cuttings are reddish-brown clay with chert fragments. Break for lunch.
	1440	1510	Crew preparing to move rig away from borehole. Awaiting grout delivery.
	1510	1610	Grout delivery arrives (3 yds ³). Pump tremie Type I Portland cement into bore through 1.5-in. OD PVC tremie pipe.
	1610	1625	All grout in, no circulation, no grout at surface. Secure site and depart.
2/19/93	0825	0905	Tagged cement level at 58 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-553

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 15
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>12-31-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>03-18-93</u>	
HELPERS: <u>Steve Brown, Greg Shillings - Highland Drilling</u>		METHOD: <u>D</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Michael Klidzejs - SAIC Victor Harness - SAIC Tim Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-31-93			Crew decontaminates rig off site and moves it into position over GW-556. Steve Jones (HSE) present for oversight.
1-4-93	1308	1411	Technical oversight provided by Michael Klidzejs (SAIC). Steve Jones and Bill Thedford both of (HSE) on site. Crew prepares to over wash. Rig up with first washover pipe with bit and adapter, total length = 25.9 ft. Table height = 2.0 ft.
	1411	1417	Begin over wash with air only. Organic vapors in breathing zone at 1.0 ft below ground surface (BGS) = 0.2 ppm. Beta and gamma = 30 cpm (background = 30 cpm). Alpha = 10 cpm (background = 10 cpm).
	1417	1432	Washover pipe stickup = 1 ft BGS. Begin over wash with water.
	1432	1433	Over wash stopped to inspect positioning. Position appears OK.
	1433	1456	Continue over wash. Steve Jones and Bill Thedford (both of HSE) leave site. Note that over wash is proceeding very slowly. Inspect cuttings and find abundant metal shavings.
	1456	1521	Stop over wash to inspect hole again. Notice collar in path of washover pipe at about 2 ft BGS. Bill Thedford (HSE) returns to site.

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-4-93	1521	1538	Continue over wash. Organic vapors in breathing zone at 2.5 ft BGS = 0.2 ppm. Beta and gamma = 30 cpm.
(cont.)			
	1538	1627	Appears that over wash has proceeded through collar. Over wash going faster. Collect cuttings sample at 0.0 ft to 6.0 ft BGS interval. Sample consists of medium dark gray (N4) cement fragments and abundant metal shavings. Organic vapors in breathing zone at 10 ft BGS = 0.2 ppm. Beta and gamma = 30 cpm.
	1627	1636	Heavy rain begins; decide to stop for the day. Have advanced to 14 ft BGS. Rig is stopped. Bill Thedford (HSE) and crew depart. Leave site.
1-5-93	0820	0850	Arrive at GW-556 site, crew present. Crew prepares to over wash.
	0850	0948	Trip down and resume over wash at 14 ft BGS. Organic vapors in breathing zone at 14.3 ft BGS = 0.2 ppm. Beta and gamma = 60 cpm (background = 60 cpm). Bill Thedford (HSE) arrives on site. Reach 19.3 ft BGS and end of first washover pipe.
	0948	1053	Crew rigs up with second washover pipe (21.0 ft in length). Collect cuttings sample of 6.0 ft to 19.3 ft BGS interval. Sample consists of very light gray (N8) to medium dark gray (N4) cement cuttings and abundant metal shavings.
	1053	1200	Resume over wash at 19.3 ft BGS. Organic vapors in breathing zone at 23.3 ft BGS = 0.2 ppm. Beta and gamma = 40 cpm.
	1200	1453	Break for lunch. Crew leaves site to fill water truck.
	1453	1617	Continue over wash at 24.3 ft BGS. Organic vapor in breathing zone at 24.7 ft BGS = 0.0 ppm. Beta and gamma = 30 cpm. Reach

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-5-93 (cont.)			24.8 ft BGS and stop for the day. Collect cuttings sample at 19.3 ft to 24.8 ft BGS interval. Cuttings consist of medium light gray cement and metal shavings. Crew secures rig. Crew and oversight depart site.
1-6-93	0826	0840	Arrive at site. Crew is present, preparing to over wash. Trip washover pipe down.
	0840	1141	Resume over wash at 24.8 ft BGS. Organic vapors in breathing zone at 25 ft BGS = 0.3 ppm - 3.8 ppm. Beta and gamma = 30 cpm (background = 30 cpm). Over wash producing grinding noise. Bill Thedford (HSE) on site.
	1141	1243	Continue over wash. Monitoring breathing zone: 0.0 ppm. Beta & gamma scan yields 40 cpm (max.). D. Wright (Highland) brings spare washover bit to site. Crew returns from lunch.
	1243	1320	Crew fuels rig.
	1320	1600	Continue over wash at 32.2 ft BGS. Over wash casing from 32.2 ft to 36.0 ft BGS. Cuttings consist primarily of metal shavings with minor medium gray (N5) cement fragments. Continue to monitor breathing zone: organic vapors = 0.0 ppm. Beta and gamma scan = 40 cpm (max.).
	1600	1617	Raise washover pipe to top of the mast, secure rig. Clean up, depart site.
1-7-93	0827	0902	Arrive at GW-556 site. Start drill rig, begin to trip out to inspect bit. Having difficulty breaking joint loose. May have to use torch to heat joints.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-7-93	0902	0920	Stand by until B. Thedford (HSE) arrives to issue welding/cutting permit.
(cont.)			
	0920	1034	Continue trip out.
	1034	1139	Washover bit out of the ground. Bit is in excellent condition. Cut hole in casing. Unsuccessfully attempt to pull casing. Plan to continue over wash of casing.
	1139	1145	T. Coffey (SAIC) arrives to provide technical oversight. Get status information from M. Klidzejs (SAIC).
	1145	1212	Start drill rig, and trip in washover pipe. Length of two washover pipe sections and bit = 40.2 ft, length including sub = 45.9 ft, table height = 2.1 ft. Fuel drill rig.
	1212	1355	Crew departs for lunch and to get a load of water.
	1355	1413	Crew returns. Start drill rig, complete tripping in to bottom while turning washover pipe.
	1413	1607	At bottom (36.0 ft BGS), resume over wash. Over wash casing from 36.0 ft to 37.2 ft BGS. Monitor organic vapors in the breathing zone: 0.0 ppm. Washover pipe still appears to be binding inside the surface casing. Cuttings consist of: medium light gray (N6) cement fragments with scattered white (N9) to pale yellowish-orange (10YR 8/6) residual chert fragments and wirey metal shavings.
	1607	1620	Trip washover pipe to top of mast and clean up. Depart site.
1-8-93	0819	0827	Arrive at GW-556 site, crew on site warming up equipment.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 5 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-8-93	0827	0830	Trip into hole while turning washover pipe.
(cont.)			
	0830	0910	At bottom (37.2 ft BGS). Resume over wash. Washover pipe continues to bind inside the surface casing. Advance rate is extremely slow.
	0910	0918	Interrupt over wash to add soap to try to lubricate washover pipe inside casing [deviation pre-approved by K. Jago and S. Jones, (both of HSE)].
	0918	0954	Continue over wash. Monitor organic vapors in breathing zone: 0.0 ppm. Beta and gamma scan of rig area = 40 cpm, background = 30 cpm. Over wash casing to 39.4 ft BGS. Cuttings consist of medium light gray (N6) to yellowish-gray (5Y 8/1) cement fragments with white (N9) to pale yellowish-orange (10YR 8/6) residual chert and wirey iron millings (37.2 ft to 38.0 ft only). Note: After washing over casing for nearly 1 ft, the driller lowered the front-end jacks which seemed to reduce the binding on the washover pipe. The advance rate also improved at this point.
	0954	1039	Rig up with third section of washover pipe; length = 20.7 ft; total length of tools including sub = 66.4 ft; table height = 1.9 ft.
	1039	1208	Continue over wash from 39.4 ft to 48.0 ft BGS. Monitor organic vapors in breathing zone: 0.4 ppm (max.). Beta and gamma scans of rig area yielded 50 to 60 cpm (max.) background = 30 cpm. Cuttings consist of light olive gray (5Y 5/2) to (5Y 6/1) cement fragments with rare metal shavings and chert fragments. Advance rate appeared to have slowed at approximately 47.5 ft BGS. Crew fueling drill rig.
	1208	1308	Crew leaves site for lunch.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 6 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-8-93	1308	1326	Fuel drill rig. Start drill rig and trip into hole.
(cont.)			
	1326	1600	At bottom (48.0 ft BGS), continue over wash of casing. Over wash to 53.7 ft BGS. Monitor organic vapors in breathing zone = 0.0 ppm. Beta and gamma scans of rig area = 40 cpm. Cuttings are the same as the 39.4 ft to 48.0 ft interval, except that chert fragment content begins to increase just below 50 ft BGS, and the metal content increases such that the last 1 ft of the overwashed interval is almost exclusively metal shavings.
	1600	1616	Trip out washover pipe to top of mast. Crew cleans up. Secure site and depart.
1-11-93	0806	0840	Arrive at GW-556 site, part of crew on site. Notify S. Jones (HSE) of elevated headspace and pH readings taken on 1-8-93. Elevated pH is due to cement fragments in returns, but no explanation for headspace hit is found. Agree to an experiment: try headspace of soapy drilling water sample.
	0840	0906	Driller and rest of crew arrive. Crew departs for load of water; driller starts drill rig.
	0906	1230	Trip into hole while turning washover pipe. Table height = 2.0 ft. At bottom (53.7 ft BGS), resume over wash. Continue to use soap to lubricate the washover pipe inside the surface casing. Headspace analysis of soapy drilling water = 5.0 ppm. Report findings to S. Jones (HSE). Monitor organic vapors in breathing zone = 0.2 ppm. Drilling rate appeared to increase at 54.5 ft BGS, then decrease again at 56.8 ft BGS. Fuel drill rig while drilling. Over wash casing to 57.8 ft BGS. Cuttings consist of medium gray (N5) to medium light gray (N6) cement fragments with abundant light brownish-gray (5YR 6/1) dolostone fragments with white

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 7 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-11-93			(N9) to pale yellowish-orange (10YR 8/6) chert and wirey metal
(cont.)			shavings and metal fragments with blue burn stains.
	1230	1235	Trip out washover pipe to top of drill rig. Shut off drill rig.
	1235	1320	Crew leaves site for lunch.
	1320	1606	Start up drill rig, trip into hole. At bottom (57.8 ft BGS), resume over
			wash of casing. Rate of advance continues to be very slow.
			Monitor organic vapors in breathing zone = 0.2 ppm. Over wash
			casing to 59.9 ft BGS. Cuttings are the same as the 53.7 to
			57.8 ft interval, with increasing amounts of medium light gray (N6)
			to light brownish-gray (5YR 6/1) dolostone with medium light gray
			(N6) oomicrite.
	1606	1646	Clean out hole and break joint. Remove sub. Attempt to pull out
			intermediate casing with tools in the hole. Three attempts fail - not
			enough room to attach big lifting hook adequately.
	1646	1655	Fuel drill rig, and clean up. Secure and depart site.
1-12-93	0845	1137	Technical oversight provided by Mike Klidzejs (SAIC). Rig up 21.0
			ft piece of washover pipe. Resume over wash at 57.8 ft BGS.
	1137	1241	Break for lunch.
	1241	1707	Resume over wash. Advance to 69.6 ft BGS. Survey of breathing
			zone near table indicates 0.2 ppm organic vapors. Radioactive
			emissions near table: alpha=20 cpm, beta and gamma = 40 cpm.
			Cuttings from 57.8 ft to 69.6 ft BGS are very light gray (Munsell
			N4) to medium light gray dolostone with minor amounts of light
			gray chert fragments, metal shavings and yellowish-brown (Munsell

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 8 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-12-93			10YR 5/4) mud. Crew secures rig. Oversight and crew depart.
(cont.)			
1-13-93	0820	0846	Technical oversight provided by Victor Harness - SAIC. Crew trips washover pipe back into bore. Resume over wash at 69.6 ft BGS. Table height = 2 ft.
	0846	1301	Advance to 72 ft BGS. Rate of advance very slow. Halt advance.
	1301	1410	Trip out one section of 9-in. OD washover pipe. Casings have slipped down into bore approximately 4 ft BGS.
	1410	1520	Rig engine has developed oil leak attributable to malfunctioning water pump. Rig down for engine repairs. Oversight departs site.
1-14-93	1219	1400	Arrive at site. Crew finishing repairs to rig engine.
	1400	1510	Resume trip out of washover pipe.
	1510	1705	All washover pipe out. Crew hoists casings. Total lengths of casings removed:
			1-in. OD pipe removed = 69.3 ft
			4.5-in. OD casing removed = 68.8 ft
			6.5-in. OD casing removed = 70.3 ft
	1705	1719	Crew torches hoisting holes in 11.75-in. OD casing. Tag bottom of bore firm at 71.7 ft BGS, or 72.0 ft below top of casing (BTOC) from top of 11.75-in. OD casing. Secure and depart site.
1-15-93	0843	0917	Crew awaiting delivery of a full tank of water. Rig up with 10-5/8-in. diameter tricone roller bit. Bit and stabilizer length = 9.2 ft.
			Oversight assumed by T.J. Coffey (SAIC).

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 9 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-15-93	0917	1039	Water tank arrives. Commence reaming bore left by 9-in. OD
(cont.)			washover with 10 5/8-in. bit. Advance to 73.0 ft BGS easily. Surge
			and clean bore. Trip out.
	1039	1053	Tag soft bottom of bore at 70.2 ft BGS. Depart site until grout
			delivery.
	1405	1441	Arrive at GW-556 site. Driller is on site, has already run seven
			10-ft joints of 1.5-in. OD PVC tremie pipe into bore to 66 ft BGS.
			Calculated 0.55 cubic yds of cement needed to grout hole to
			bottom of surface casing (50 ft BGS), equivalent to 111 gallons of
			grout. Plan to use 55-gallon drum to gauge cement volumes.
	1441	1447	Cement truck arrives, begins pouring cement into 55-gallon drum.
	1447	1458	Tremie 110 gallons of cement grout into bore from 55-gallon drum
			using hand-powered diaphragm pump.
	1458	1508	Clean up, secure site, and depart.
1-18-93	0843	0850	Arrive at GW-556 site. Crew on site. Tag cement level at 40.5 ft
			BGS.
	0850	0922	Start drill rig. Crew unsuccessfully attempts to pull surface casing.
			Crew to gather big washover pipe and bit. Depart site.
	1035	1103	Return to GW-556 site. Drillers have rigged up with a 10 5/8-in.
			diameter tricone bit and stabilizer; length = 9.2 ft, table height
			= 2.2 ft. Start drill rig. Trip into hole, adding drill rods.
	1103	1105	Begin drilling in cement at 40.4 ft BGS. Drill to 51.5 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 10 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-18-93	1105	1113	Clean out borehole. Begin tripping out of the hole. Rod comes
(cont.)			loose from head of drill rig at top of mast.
	1113	1117	Drill from 51.5 ft to 57.0 ft BGS (end of rod) to make breaking the
			joints easier.
	1117	1128	Tighten joint at rig head, and trip out.
	1128	1150	Add clevis and chain, and unsuccessfully attempt to pull out
			surface casing. Top of casing appears to move slightly, but it is
			doubtful that casing can be pulled.
	1150	1200	Shut off drill rig. Driller would like to rig up some way to turn the
			surface casing, to see if it can be loosened that way.
	1200	1305	Depart site for lunch.
	1305	1322	Return to site. Driller departs to gather materials to construct
			device to twist casing.
	1322	1350	Crew arrives with big washover pipe.
	1350	1430	Driller returns with materials. D. Hewitt (Highland) assists driller in
			constructing device (which consists of a piece of 7-in. casing with
			two holes burned in each end).
	1430	1445	Rig up device to drill rig by running a pin (a short section of pipe)
			through the clevis and the two holes in top of device. The device
			slips down into the surface casing where another pin is run through
			holes in bottom of device and in surface casing.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 11 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-18-93	1445	1513	Attempt to turn/pull surface casing. Each attempt results in one of
(cont.)			the pins being bent and/or sheared. Will have to over wash the
			surface casing.
	1513	1540	Begin rigging up washover pipe. A 1.7-ft subadapter is threaded
			into first section of washover pipe (21.4 ft in length). Having
			difficulty threading bit to washover pipe, will try with washover in
			rig.
	1540	1622	Cannot drop washover pipe directly over surface casing. Move
			drill rig ahead slightly. Remove clevis.
	1622	1625	Thread 13.0-in ID, 14.5-in OD, 4.1-ft long washover bit into
			washover pipe. Plan to begin over wash on 1-19-93.
	1625	1641	Clean up, secure drill rig. Depart.
1-19-93	0902	1024	Oversight provided by V. Harness (SAIC). Crew awaiting return
			of water truck.
	1024	1034	Water truck arrives. Commence over wash of 11.75-in. OD casing
			with 13.0-in. ID, 14.5-in. OD washover pipe. Advance to 2 ft BGS.
	1034	1209	Driller corrects attitude of drill mast to match casing. Resume over
			wash. Advance to 25 ft BGS. Stop to break out.
	1209	1217	Washover is broken loose from subadapter. Will attempt to pull
			11.75-in. OD casing before adding second piece of washover
			pipe. Break for lunch.
	1315	1624	Unable to pull casing with rig or winch truck. Secure site, depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
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DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-20-93	0846	1019	Rig up second piece of 13.0-in. ID, 14.5-in. OD washover pipe. Length = 19.7 ft. New total length of washover and bit = 44.2 ft.
	1019	1053	Resume over wash at 25 ft BGS. Advance to 44 ft BGS. Surge and clean bore.
	1053	1150	Break loose washover pipe from subadaptor. Unable to pull 11.75-in. OD casing. Break for lunch.
	1237	1307	Renew attempts to pull casing with rig. Unsuccessful.
	1307	1441	Move rig. Attempts to pull casing with winch truck are unsuccessful. Must quit until more washover pipe is ordered and shipped. Secure site and depart.
2-8-93	0809	0832	Oversight provided by Mike Klidzejs (SAIC). Awaiting crew's arrival.
	0832	0900	Crew arrives, and sets up rig over bore. Background radiation: beta and gamma = 50 cpm, alpha = 20 cpm, breathing zone analysis (at table) = 0.0 ppm.
	0900	1022	Crew departs site for potable water.
	1022	1106	Crew returns. Adding next piece of washover pipe to tools left in bore. New piece of washover = 8.0 ft long.
	1106	1200	Resume over wash with water and Quik-Foam™. Advance 3.4 ft. Halt. Break for lunch.
	1220	1247	Oversight provided by Victor R. Harness (SAIC). Awaiting crew's arrival.

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 13 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-8-93	1247	1302	Crew returns. Resume over wash. Unable to advance further at
(cont.)			47 ft BGS. Stop advance to attempt to pull 11.75-in. OD casing.
	1302	1508	Unable to break loose threaded joints in washover pipe. Acetylene
			torch used for heating joint needs new tip. Must have new tip to
			continue. Secure site, depart.
2-9-93	0818	0846	Awaiting crew.
	0846	0908	Crew arrives, unable to start until a welding permit is issued.
			Awaiting arrival of Bill Thedford (HSE).
	0908	1043	B. Thedford (HSE) arrives. Resume breaking loose joints in
			washover pipe.
	1043	1112	Uppermost 8-ft piece of washover pipe is removed. Attempt to pull
			11.75-in. OD casing is unsuccessful. Crew rigs up washover pipe.
	1112	1149	Resume over wash. Advance to 46.7 ft BGS. Halt advance. Break
			for lunch.
	1239	1503	Resume over wash. Advance to 50 ft BGS. Cuttings are N4 grey
			chert fragments, grout fragments, and minor shavings of casing.
	1503	1559	Trip out uppermost 8-ft piece of washover pipe. Attempt to pull
			11.75-in. OD casing is unsuccessful. Casing full of water from over
			wash.
	1559	1618	Crew trips in drill rod to remove water from casing with compressed
			air.
	1618	1704	Still unable to pull 11.75-in. OD casing. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT			
ACTIVITY/PROGRESS REPORT - continued			PAGE 14 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-10-93	0900	1030	Crew unable to break loose subadapter and uppermost 8-ft piece of washover. Resume over wash to situate joint to table level to break.
	1030	1209	Advance to 50.5 ft BGS. Begin attempts to remove washover pipe. Break for lunch.
	1330	1533	Joint between subadapter and uppermost 8-ft piece of washover pipe is loose. Use pick-up truck to pull washover pipe away from rig. Burn up clutch. Must await arrival of backhoe to continue trip-out. Raise washover pipe and break next joint.
	1533	1549	Secure site and depart.
2-11-93	0832	1055	Backhoe at site. Crew break out and remove remaining washover pipe.
	1055	1353	Crew attempts to twist casing loose with rig head. Crew moves rig away from hole to allow winch truck access.
	1353	1517	Awaiting winch truck arrival.
	1517	1644	Three attempts to pull casing with large winch truck are unsuccessful. Secure site and depart. Receive permission from W. K. Jago (HSE) to twist off or unthread casing.
2-12-93	0810	1040	Crew moves rig back onto bore and attempts to twist off or unthreading 11.75-in. OD casing.
	1040	1129	Crew uses rig to successfully unthread and remove 22.1 ft of 11.75-in. OD casing. Break for lunch.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-556</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 15 of 15
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-12-93	1210	1247	Bore is approximately 17-in. in diameter, water in bore is at 15 ft
(cont.)			BGS, and maximum sounding depth of 53 ft BGS.
	1247	1311	Awaiting grout delivery.
	1311	1359	Pump tremie 2.5 cubic yds through 50 ft of 1.5-in. OD PVC tremie
			pipe at a depth of 47 ft BGS.
	1359	1430	Clean and secure site. Depart.
2-16-93	0803	0806	Tag 5 ft BGS to water and 16 ft BGS to top of grout.
3-3-93	1234	1240	Poured approximately 0.5 cubic yds of neat, Type I Portland
			cement into bore while circulating water.
3-4-93	1230	1240	Tag grout at 10 ft BGS, water to surface.
	1401	1405	Pour approximately 0.5 cubic yds of neat, Type I Portland cement
			into bore while circulating grout.
3-9-93	0824	0830	Tag grout at 3.7 ft BGS.
3-18-93	1050	1110	Clay cap installed. P&A of GW-556 complete

WELL NO. GW-561

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DATE: START: 12-11-92

FINISH: 12-23-92

METHOD: A

LOGGED BY: Michael A. Klidzejs - SAIC

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-11-92	1500	1516	Circulation is lost at 11.0 ft BGS. Washover pipe is pushed down
(cont.)			to 15 ft BGS with little resistance. Sample of 6 to 15 ft BGS interval
			cuttings collected. Cuttings show continuation of 0 to 6 ft interval.
	1516	1532	Crew rigs up with second washover pipe 14.6 ft in length.
	1532	1543	Continue over wash with minor resistance and little circulation.
			Reach 29.4 ft BGS and end of washover pipe. Collect cuttings
			sample of 15 to 29.4 ft BGS interval. Sample consist of fine
			cement cuttings with minor chert and PVC.
	1543	1601	Crew antifreezes rig and prepares to leave site. Cuttings are
			scanned for rad and placed under foil for head space (see Well
			Cuttings Field Screening/Disposal Sheet). Crew and oversight
			leave site.
12-14-92	0808	1003	Oversight arrives at site. Crew arrives, then departs to get water
			truck. Crew returns and rigs up with third washover pipe, 24.9 ft
			in length. Table height = 2.2 ft.
	1003	1030	Resume over wash at 29.4 ft BGS. Organic vapors in breathing
			zone at 34.4 ft BGS = 0.4 ppm. Beta and gamma = 40 cpm.
			Advance to 54.3 ft BGS. Crew rigs up with fourth washover pipe,
			24.9 ft in length. Collect cuttings sample of 29.4 to 54.3 ft BGS
			interval. Sample consists of small cuttings of cement grout, minor
			limestone, and chert pebbles.
	1030	1105	Continue over wash at 54.3 ft BGS with fourth washover pipe.
			Advance to 58.0 ft BGS. Organic vapors in breathing zone =
			0.4 ppm. Beta and gamma = 50 cpm. Advance to 79.2 ft BGS.
			Collect cuttings sample of 54.3 to 79.2 ft BGS interval. Cuttings
			show continuation of 29.4 to 54.3 ft interval. Rig is stopped.

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-14-92	1105	1121	Steve Jones (HSEA) grants permission to attempt to pull casing
(cont.)			without over washing the entire length of casing. A chain is
			attached to the casing and the casing and washover pipe are
			pulled up easily, indicating that casing can be pulled.
	1121	1210	Crew prepares to pull casing. Cuttings samples screened and
			placed under foil for head space analysis (see Cuttings Field
			Screening/Disposal Sheet).
	1210	1515	Uppermost washover pipe section is removed. Bill Thedford and
			Steve Jones (HSE) arrive on site. Casing is extracted. Organic
			vapors in breathing zone = 0.0 ppm. Remaining washover pipe
			sections are removed from hole.
	1515	1542	Crew rigs up with 10 5/8-in. tricone bit and stabilizer, total length
			= 9.2 ft. Rig is winterized. Site is secured. Crew and oversight
			depart.
12-15-92	0815	0918	Oversight arrives at site. Scan of casing and washover pipe
			pulled out of hole: Alpha = 30 cpm, Beta and gamma = 60 cpm.
			Crew arrives and prepares to ream. Table height = 3.0 ft.
	0918	0930	Begin reaming with 10 5/8-in. bit and stabilizer. Advance to 4.0 ft
			BGS. Organic vapors in breathing zone = 3.2 ppm. Stop reaming
			at 6.2 ft BGS to add rod.
	0930	0941	Continue reaming. Advance to 26.2 ft BGS. Organic vapors in
			breathing zone = 0.0 ppm, beta and gamma = 50 cpm. Reach
			31.2 ft BGS and end of first rod. Add second rod.
	0941	0950	Continue reaming at 31.2 ft BGS. Advance to 46 ft BGS. Organic
			vapors in breathing zone = 1.6 ppm, beta and gamma = 30 cpm.

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WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-15-93			Collect cuttings sample of 31.2 to 56.2 ft BGS interval. Sample
(cont.)			consists of predominantly white (N9) chert pebbles. Reach end
			of rod at 56.2 ft BGS. Add third rod.
	0950	1016	Continue reaming at 56.2 ft BGS. Rig begins to chatter at 58 ft
			BGS, and reaming seems to be progressing more slowly. Advance
			to 66 ft BGS. Organic vapors in breathing zone = 0.0 ppm. Beta
			and gamma = 50 cpm. Reach end of rod at 81.2 ft BGS. Add
			fourth rod.
	1016	1030	Continue reaming. Rig bounces vigorously at 87.7 ft BGS. Driller
			believes bedrock is encountered at this point. Sample of cuttings
			of 56.2 to 88.0 ft interval collected. Sample shows continuation
			of above interval. Advance to 89 ft BGS. Organic vapors in
			breathing zone = 1.2 ppm. Reaming stops at 92.0 ft BGS. Hole
			is cleaned.
	1030	1110	Trip out. Plastic material and string found at joint of third and
			fourth rods. Stabilizer and bit removed from hole. Rad scan of
			stabilizer and bit: beta and gamma = 40 cpm, alpha = 0 cpm.
			Attempt to tag bottom of reamed hole. Mud in hole prevents
			accurate measurement. Apparently some of the borehole wall
			has caved into the hole accumulating at the bottom.
	1110	1330	Break to allow drillers to repair truck tire, pick up water and
			washover pipe. Oversight departs.
	1330	1630	Oversight returns to site. Crew arrives at 1437 with water truck.
			Screen cuttings samples from reaming and place under foil for
			headspace analysis (see Cuttings Field Screening/Disposal
			Sheet). Rig, washover pipe, stabilizer bit, and equipment decon-
			taminated. Rig is moved to offsite. Crew returns to

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-561</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 5 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-15-92			GW-561 site to winterize rig. Oversight departs.
(cont.)			
12-16-92	1116	1210	Cement truck arrives at GW-561 site with 2.5 cu. yds cement.
			Five, 10 ft sections of 1.5-in. OD PVC tremie pipe are inserted to
			47 ft BGS (3 ft stick-up). Crew begins hand-pumping cement
			down tremie pipe. One 10 ft section of tremie pipe is removed.
			Continue pumping cement. Water is circulated out of hole. Stop
			pumping cement. Cement level is below ground surface.
			Cement truck departs.
	1551	1554	Tag cement level at 21.0 ft BGS.
12-17-92	1222	1236	Cement truck arrives at site. Cement poured into hole until
			cement reaches level of ground surface. Cement truck leaves
			site.
12-18-92	1045	1050	Cement level tagged at 17.5 ft BGS.
	1532	1548	Cement truck arrives. Bruce McMaster (HSEA) supervises
			cementing. He reports GW-561 filled with cement to ground
			surface. Cement truck departs.
12-21-92	0933	0935	Bruce McMaster reports that cement level in GW-561 is at 5.0 ft
			BGS. Steve Jones (HSEA) grants permission to cap hole with
			cement level at 5.0 ft.
12-23-93			Soil cap emplaced.
			P&A completed.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-565</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>N27,363 E58,174</u>		DATE: START: <u>1-21-93</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u>		FINISH: <u>2-1-93</u>	
HELPERS: <u>Greg Shillings, Bob Bowers</u>		METHOD: <u>A</u>	
DRILL: <u>Ingersoll Rand XL-750 Drillmaster</u>		LOGGED BY: <u>Victor Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-21-93	0800	0839	Technical oversight by V.R. Harness (SAIC). Awaiting drill crew.
	0839	1023	Stickup of 4.5-in. outside diameter (OD), 4.25-in. inside diameter (ID) stainless steel riser = 2.6 ft above ground surface. Height of concrete pad = 0.5 ft. Height of protective steel casing (10.75-in OD, 10.25-in. ID) = 3.5 ft. Crew removes pad, protective casing and all but 0.3 ft stickup of stainless steel riser. Bottom of casing = 57.3 ft below ground surface (BGS). Rig moved onto well.
	1023	1034	Crew rigging up 6.0-in. OD, 5.5-in. ID washover pipe with shoe bit and subadapter. Total length of pipe and shoe = 22.4 ft. Length of subadapter = 2 ft. Table ht = 2.2 ft.
	1034	1110	Commence over wash of 4.5-in. OD, 4.25-in. ID riser with washover pipe. Advance to 22 ft BGS. Cuttings from 0 to 22 ft BGS = reddish-brown stiff clay with chert grit, grout fragments and minor amounts of stainless steel (SS) shavings.
	1110	1150	Add second piece of 20.1 ft long washover pipe. Advance to 42 ft BGS. Annulus open from 35 to 42 ft BGS. Lithology same as 0-22 ft BGS interval. Break for lunch.
	1300	1413	Trip out washover pipe. Extract 59.2 ft of 4.5-in. OD, 4.25-in. ID stainless steel screen and riser. Total casing removed with stickup = 61.5 ft.

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WELL NO. GW-565

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-566</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 7
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u> <u>Randy Phillips - Highland Drilling Co.</u> HELPERS: <u>Steve Brown, Greg Shillings, Lecil Jones - Highland Drilling Co.</u> DRILL: <u>Ingersoll-Rand XL-750</u>		DATE: START: <u>2-22-93</u> FINISH: <u>3-18-93</u> METHOD: <u>A</u> LOGGED BY: <u>S.L. Abston - SAIC</u> <u>Mike Klidzejs - SAIC</u> <u>Victor Harness - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-22-93	1040	1117	Technical oversight provided by M. Klidzejs (SAIC). Awaiting arrival of crew. Tag water level in well at 96.9 ft below ground surface (BGS). Stainless steel (SS) riser has been cut off at 0.3 ft above ground.
	1117	1133	Crew arrives. Rig up 22.3-ft long washover pipe. Washover pipe = 6-in. outside diameter (OD) and 5.5-in. inside diameter (ID). Table ht = 2.2 ft. Breathing zone analyses (BZA) near table reveals 0.0 ppm organic vapors.
	1133	1145	Begin over wash of 4.0-in. OD, 3.75-in. ID SS riser. Advance 2 ft BGS. Compressed air blow-outs around rig. The 11.75-in. OD conductor casing is loose. Crew secures conductor to rig jackfoot with chain.
	1145	1157	Continue over wash. Circulation coming from around conductor casing and through multiple blowout holes in adjacent soil. No circulation from around washover pipe. Advance to 6.0 ft BGS. Radiation emissions at table are: alpha = 40 cpm (= background). Cuttings consist of medium dark gray cement fragments.
	1157	1207	Advance to 21.1 ft BGS. Cuttings similar to 0 ft to 6 ft BGS interval.
	1207	1255	Lunch break.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-566</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-22-93	1255	1439	Crew breaking out subadapter and adding second 20.2 ft long piece of washover pipe.
(cont'd)			
	1439	1442	Resume over wash. Advance to 26 ft BGS. BZA at table yields 0.0 ppm organic vapors. Radiation emissions at table: beta and gamma = 40 cpm, alpha = 50 cpm.
	1442	1512	Advance to 41.6 ft BGS. Cuttings same as 6 ft to 21.1 ft BGS interval. Stop over wash until more sections of washover pipe can be located. Water truck needs refilling also.
	1512	1544	Secure site and depart.
2-23-93	0827	0904	Awaiting crew.
	0904	0920	Crew arrives. Resume attempts to break loose the subadapter to add more washover pipe.
	0920	1026	Adding third (20.3 ft long) piece of washover pipe. Fuel rig.
	1026	1034	Water truck arrives. Crew hooks up hoses.
	1034	1100	Resume over wash at 41.6 ft BGS. BZA = 0.0 ppm. Radiation at table: beta + gamma = 40 cpm (= background), alpha = 50 cpm (background = 40 cpm). Circulation of cuttings is poor. Advance to 62.6 ft BGS. No returns.
	1100	1122	Halt advance. Break loose the subadapter to add fourth piece of washover pipe.
	1122	1128	Fourth piece of washover pipe attached (20.2 ft long). Resume over wash.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-566</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-23-93	1128	1157	Advance to 81.5 ft BGS. Circulation poor. Cuttings consist of light
(cont.)			grayish brown clay with cement and chert fragments. BZA at 67 ft
			BGS = 0.0 ppm organic vapors. Radiation emissions at table:
			alpha = 30 cpm, beta + gamma = 30 cpm.
	1157	1307	Lunch break.
	1307	1334	Crew breaking out subadapter.
	1334	1405	Add fifth piece of washover pipe to string (length = 20.15 ft).
			Resume over wash at 81.5 ft BGS. Advance to 101.7 ft BGS.
			Cuttings same as from 62.6 ft to 81.5 ft interval. BZA at 91.5 ft BGS
			= 0.0 ppm.
	1405	1433	Breaking out subadapter. Adding sixth piece of washover pipe
			(= 20.2 ft long).
	1433	1442	Resume over wash. Very quick rate of advance, loose circulation
			at 108 ft BGS. BZA at 112 ft BGS = 0.0 ppm. Radiation
			measurement at table: beta + gamma = 40 cpm, alpha = 40 cpm.
			Advance to 115 ft BGS. Cuttings same as previous interval.
	1442	1457	D. Wright (Highland) arrives. Shut down rig. Water truck is needed
			elsewhere. Crew secures site and departs.
2-24-93	0837	0927	Safety Meeting called by Bill Thedford (HSE), attended by Highland
			and SAIC project personnel.
	0927	1137	Arrive at site. Crew waiting on arrival of water truck.
	1137	1142	Steam cleaner arrives. Will use its water tank for potable water
			source.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-566</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-24-93	1142	1221	Resume over wash. Advance to 121.9 ft BGS. Cuttings consist
(cont.)			of medium light gray to light gray dolostone with some light gray
			to light brown chert fragments.
	1221	1305	Lunch break.
	1305	1340	Adding seventh piece of washover pipe (= 20.3 ft long). Resume
			over wash.
	1340	1402	Unable to circulate cuttings and mud. Will require water truck for
			sufficient amount of water to keep hole clean. Stop rig.
	1402	1508	Crew returns with steam cleaner; unable to get water truck.
	1508	1522	Rig back on.
	1522	1527	Resume over wash at 121.9 ft BGS. BZA at 121.9 ft BGS =
			0.0 ppm. Radiation measurement at table: beta + gamma =
			40 cpm, and alpha = 20 cpm.
	1527	1541	Advance to 142.5 ft BGS. Halt advance, clean hole. Cuttings
			same as last interval.
	1541	1615	Crew breaks loose subadaptor. Riser pipe is not visible; has been
			cut and subsequently subsided.
	1615	1715	Crew begins tripping out washover pipe. Secure site and depart.
2-25-93	0847	0924	Technical oversight assumed by V.R. Harness (SAIC). Awaiting
			crew.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-566</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 5 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-25-93	0924	0936	Crew arrives. Resume tripping out washover pipe. Because
(cont'd)			casing was cut during last 20 ft of over wash and the riser
			subsided, HSE and Highland decided to try to pull casing out, then
			ream hole.
	0936	1207	All of washover pipe out of bore. Casing not visible from surface.
	1207	1245	Break for lunch.
	1245	1518	Driller believes he has located riser approximately 20 ft BGS.
			Crew awaiting delivery of a taper tap device to extract casing.
	1518	1556	Scott Gilbert (Highland) arrives with taper tap. Crew rigs up taper
			tap to 25 ft piece of drill rod and begins fishing for casing.
	1556	1614	Attempts so far unsuccessful. Will resume in morning. Secure
			site and depart.
2-26-93	0822	0854	Awaiting crew.
	0854	0910	Crew arrives. Resume attempts to fish out casing.
	0910	1047	Driller extracts a 9.9 ft long piece of SS 4.0-in. OD casing.
	1047	1110	Receive permission from Bill Thedford (HSE) to pull out all the
			casing we can, ream bore as deep as we can, and abandon
			remainder of well in place. Crew resumes fishing.
	1110	1457	Crew extracts 2 more pieces (24.5 ft long and 25.9 ft long: total
			63.8 ft) out of bore. Total of all retrieved pieces of riser plus stick-
			up cut off = 65.9 ft of 4.0-in. OD SS riser removed.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-566</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 6 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-26-93	1457	1510	Crew pulls 4.0 ft long conductor pipe out of ground (10.75-in. OD).
(cont'd)			
	1510	1528	Crew rigs up 10 5/8-in. diameter tricone roller bit to ream bore. Bit
			+ stabilizer = 9.2 ft long. Will ream Monday. Secure site and
			depart.
3-1-93	0830	1057	Susan Abston (SAIC) providing technical oversight. Crew reams
			bore to 32 ft BGS with 10 5/8-in diameter tricone roller bit.
			Cuttings consist of cement grout fragments and angular chert
			fragments.
	1057	1137	Technical oversight resumed by Victor R. Harness (SAIC). Crew
			installing new check valve in subassembly prior to resuming
			reaming.
	1137	1211	Resume reaming at 32 ft BGS. Goal is to ream to 174 ft BGS, or
			as far as possible. Advance to 80 ft BGS. Cuttings so far are
			comprised of 10% grout fragments and 90% yellowish-brown
			stained chert fragments. A small fraction of chert fragments are
			translucent and pale gray (Munsell N6).
	1211	1239	Adding drill rod to string (25 ft long) and resuming reaming.
	1239	1256	Advance to 90 ft BGS to the first real resistance to advance.
			Advance to 95 ft BGS with a much-reduced rate of advance.
	1256	1328	Unable to advance beyond 95 ft BGS. Bill Thedford (HSE) gives
			permission to halt reaming at 95 ft BGS. Cuttings from 80 ft to
			95 ft BGS similar to previous interval but average fragment size
			of returns increased to approximately 0.75-in.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-566

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-571</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 5
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>Hubert Hall - Highland Drilling</u> HELPERS: <u>Steve Brown, Greg Shilling - Highland</u> DRILL: <u>Ingersoll-Rand XL-750</u>		DATE: START: <u>12-29-92</u> FINISH: <u>1-5-93</u> METHOD: <u>A</u> LOGGED BY: <u>Susan Abston</u> <u>Michael A. Klidzejs - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-29-92	0849	1001	Susan Abston (SAIC) providing technical oversight. Oversight arrives at site. Helpers excavating soil around well to allow rig access. Janet Sitzler (HSEA) arrives at site.
	1001	1250	Three truck loads of 2 in. gravel dumped and spread over site. NOTE: GW-571 is located within a topographic depression which collects water and is therefore very muddy.
	1250	1330	Break for lunch.
	1330	1605	Drill rig moved onto GW-571 site; is centered over well, and leveled. Crew removes casing from GW-572 from inside of washover pipe. Washover pipe is decontaminated and transported to GW-571 site. Crew and oversight depart.
12-30-92	0845	0902	Oversight arrives at GW-571 site. Highland crew and Victor Harness (SAIC) present. Crew rigs up drill with 5.75 in. outside diameter 15.2 ft washover pipe and 1.8 ft adapter. Table height = 2.4 ft.
	0902	1040	Begin overwash. Organic vapors in breathing zone = 2.1 ppm. Beta and gamma = 40-50 cpm (background = 40 cpm) overwash to approximately 15 ft below ground surface (BGS). Collect cuttings sample of 0 to 15 ft BGS interval. Sample consists of angular fragments of grout, chert, gray silt, and some metal shavings. Beta and gamma of cuttings sample = 50-60 cpm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-571</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-30-92	1040	1110	Rig up with second washover pipe, 24.7 ft in length.
(cont.)			
	1110	1208	Crew and oversight leave site to break for lunch.
	1208	1214	Oversight responsibilities assumed by Michael Klidzejs (SAIC).
			Crew returns from lunch. Rig is started and hole is blown clean.
	1214	1227	Continue overwash at 15 ft BGS. Organic vapors in breathing zone at 20 ft BGS = 1.2 ppm. Beta and gamma = 60 cpm.
	1227	1239	Driller notices that return water is scouring soil from beneath rig supports. Overwash stops. Backhoe is used to dig trench from washover hole to cuttings pit to divert water away from rig.
	1239	1256	Continue overwash. Collect cuttings sample of 15 to 22 ft BGS interval. Sample consists of grayish orange (10YR 7/4) stained cuttings of white (N9) chert and very pale orange (10YR 8/2) dolostone. Also abundant fine gravel consisting of grout, chert and dolostone fragments. Organic vapors in breathing zone at 32 ft BGS = 0.0 ppm. Beta and gamma = 60 cpm. Reach 39 ft BGS and end of second washover pipe. Cuttings sample of 22 to 39 ft BGS interval collected. Sample shows continuation of 15 to 22 ft interval, but contains minor steel shavings.
	1256	1321	Crew begins to add third washover pipe section. Driller reports that casing is not visible within washover pipe, and he believes that casing is being pushed and crumpled down hole by the washover pipe.
	1321	1333	Call Steve Jones to inform him of the situation. He is not available.
			Call Kevin Jago. Kevin Jago grants permission to drill casing out with 10 5/8-in. tricone bit.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-571</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-30-92	1333	1408	Crew begins removing washover pipe. Steve Jones calls and is
(cont.)			informed of the situation and Kevin Jago's suggestion. He
			concurs.
	1408	1418	Crew rigs up with 10 5/8-in. diameter tricone bit and stabilizer,
			9.2 ft. in length.
	1418	1433	Begin drilling with air only. Table height is adjusted to 3.0 ft. Reach
			6.2 ft BGS and end of stabilizer and bit. Stop drilling to add rod.
	1433	1449	Continue drilling. Organic vapors in breathing zone at 16 ft BGS
			= 3.4 ppm. Beta and gamma = 30 cpm. Table height is adjusted
			to 2.7 ft BGS. Reach 31.5 ft BGS and end of first rod. Stop drilling
			to add second rod.
	1449	1501	Continue drilling 31.5 ft BGS. Organic vapors in breathing zone at
			36 ft BGS = 1.0 ppm. Ratty drilling around 40 ft BGS. Reach
			56.5 ft BGS and end of rod. Stop drilling to add third rod.
	1501	1520	Continue reaming at 56.5 ft BGS. Organic vapors in breathing
			zone at 71.5 ft BGS = 0.4 ppm. Beta and gamma = 40 cpm. Ratty
			drilling around 79 ft BGS. Reach end of rod at 81.5 ft BGS.
	1520	1552	Crew begins to trip out and remove rods. Collect cuttings sample
			of 42.0 to 81.5 ft interval. Sample consists primarily of small
			cuttings of chert, grout, and dolostone, and some larger chert and
			dolostone fragments. Beta and gamma = 40 cpm, alpha = 20 cpm,
			headspace analysis = 3.8 cpm (cuttings field screening/disposal
			sheet).
	1552	1605	Rig is moved away from the hole. Inspect reamed hole and
			observe that casing is visible at 3 ft BGS in the center of the reamed

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-571</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-30-92			hole. Casing was not visible after extraction of the washover pipe.
(cont.)			Washover pipe may have cut through casing during first 3 ft of
			overwash, and then advanced beside casing.
	1605	1630	Backhoe is used to excavate soil around reamed hole to access
			casing. Chain is attached from casing to backhoe bucket and an
			attempt is made to extract the casing. Casing cannot be pulled.
	1630	1635	Crew winterizes rig and cleans up. Crew and oversight depart.
12-31-92	0839	0911	Oversight arrives at site, crew is present. Make another attempt
			to pull casing with backhoe. Attempt is unsuccessful. Steve Jones
			is onsite. It is decided that the drill rig will have to be brought back
			in to pull the casing. Surface casing will have to be installed to
			prevent soil from filling reamed hole.
	0911	1035	Crew leave the site to pick up surface casing.
	1035	1121	Crew and Steve Jones return to site. Steve Jones reports that
			winch truck will be brought in on 1-4-93 to remove casing.
			Oversight departs.
1-4-93	0826	0950	Oversight arrives at site. Crew is present. Stand by for winch
			truck. Bill Thedford arrives onsite.
	0950	1125	Scott Gilbert and David Wright (Highland) arrive onsite with winch
			truck. Truck is moved into position and chain is attached from the
			casing to the winch cable. On the third attempt the casing is pulled
			up approximately 10 ft. Organic vapors in breathing zone at
			casing surveyed = 0.0 ppm. The casing is cut with a cutting torch.
			Remainder of casing (73.3 ft) is removed in segments cut with
			torch. Entire casing and screen string removed. Rad scan of

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-572</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>12-23-92</u>	
DRILLERS: <u>Hubert Hall - Highland Drilling</u>		FINISH: <u>1-5-93</u>	
HELPERS: <u>Steve Brown, Greg Shillings - Highland Drilling</u>		METHOD: <u>A</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Susan L. Abston/ Michael A. Klidzejs - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-23-92	1000	1055	Oversight onsite (Susan Abston-SAIC), crew preparing GW-572 site for drill rig.
	1055	1258	Janet Sitzler (HSEA) arrives onsite, continue preparing site for drill rig.
	1258	1315	Setting rig up into position over GW-572.
	1315	1327	Crew rigs up with a 5 3/4-in. diameter, 15.2 ft long washover pipe with a 1.8 ft adapter over a 2-in. stainless steel casing. Table height = 2.5 ft above ground surface.
	1327	1355	Beginning over wash of casing. Organic vapors in breathing zone at 3.0 ft BGS = 3.1 ppm. Beta and gamma = 60 cpm (background 60 cpm). Drilled to 12.7 below ground surface (BGS).
	1355	1420	Breaking steel casing apart to add additional section of washover pipe of 24.7 ft length, collected sample of cuttings from 0-12.7 ft interval. Sample consists of small pieces of cement with some larger reddish brown to tan fragments of chert. Beta and gamma = 60 cpm.
	1420	1435	Resume over wash. Organic vapors in breathing zone at 15 ft BGS = 2.1 ppm. Beta gamma = 30 cpm. Drilled to 29.9 ft until tank ran out of water.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-572</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 2 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-23-92	1435	1448	Collected sample of cuttings from 12.7-29.9 ft BGS interval.
(cont.)			Sample consists of small angular pieces of cement with some
			large reddish brown to tan chert fragments. Beta and
			gamma = 50 cpm. Drillers preparing to winterize rig and leave
			site.
	1448	1456	Drillers depart site. Alpha scan on composite sample of
			cuttings = 0-10 cpm. Headspace analysis of 9.1 ppm probably
			due to residual anti-freeze in rig water system. Oversight departs,
			site secured.
12-28-92	0847	0928	Oversight and crew onsite. Crew warming up rig and preparing
			to drill. Water truck arrives at site.
	0928	1001	Started over wash at 29.9 ft. Organic vapors in breathing zone at
			32 ft = 2.8 ppm. Beta and gamma = 40 cpm. Background beta
			and gamma = 40 cpm. Drilled to 39.9 ft and added another section
			of washover pipe.
	1001	1015	Collected sample of cuttings from 29.9 ft to 39.9 ft interval BGS.
			Sample consists of angular fragments of grout (cement) and more
			rounded fragments of chert stained with orangish-red clay, and
			some metal shavings.
	1015	1031	Janet Sitzler (HSE) onsite. Cannot see casing in hole. Called
			Steve Jones (HSE) and reported progress at GW-572. Pull
			washover pipe and check to see if casing has been cut by
			washover. If cut, to ream hole to 39.9 ft and grout hole.
	1031	1130	Drillers pulled washover pipe out of hole. Casing balled up inside
			of washover pipe.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-572</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-28-92	1130	1135	Report situation to Steve Jones. He gave permission to ream hole
(cont.)			to 39.9 ft.
	1135	1240	Oversight and crew leave site for lunch.
	1240	1329	Steve Jones (HSEA) onsite, drill crew preparing drill for reaming, steam clean bit and stabilizer = 5.4 ft. (Sub = 2.2 ft and adapter = 1.5 ft). Reaming bit = 10 5/8-in. in diameter.
	1329	1346	Start drilling. Organic vapors in breathing zone at 6 ft BGS 3.0 ppm, beta and gamma = 40 cpm. Drill to 31.6 ft BGS.
	1346	1459	Stop drilling to dig a trench for drill water to divert it from the roadway. Water truck goes to refill.
	1459	1524	Drill second rod to 39.9 ft BGS with reaming bit.
	1524	1625	Collect sample of cuttings from 0-39.9 ft BGS interval. Cuttings consist primarily of tan chert fragments. Beta and gamma = 40 cpm. Alpha = 10 cpm. Drillers prepare to leave and secure site. Oversight leaves site.
12-29-92	0849	1208	Oversight and crew onsite. Crew steam cleaning rig. Janet Sitzler (HSEA) onsite.
	1208	1250	Cement truck arrived and tremied with diaphragm pump approximately 1-1/4 cubic yds of cement into GW-572.
1-4-93	0830	0832	Technical oversight by Mike Klidzejs - SAIC. Tag cement level at 8.6 ft BGS. Depart site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-573D</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>John Voekel - Law Environmental</u> HELPERS: <u>Jason Smith - Law Environmental</u> DRILL: <u>CME Model 55</u>		DATE: START: <u>2/2/93</u> FINISH: <u>3/18/93</u> METHOD: <u>A</u> LOGGED BY: <u>Michael Klidzeis - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/2/93	0930	0944	Rig is moved over GW-573D casing. 5.1 ft stick-up of casing is chiseled off at approximately 1.0 ft above ground surface. Crew rigs up with first auger flight and bit; total length = 5.2 ft. Inside diameter (ID) of auger is 6 1/4-in., outside diameter (OD) is 10 5/8-in. Each additional auger flight is 5.0 ft in length.
	0944	1132	Begin augering. Auger flights are added sequentially at end of each 5 ft interval. Cuttings grab samples are collected periodically. Returns consist of pale yellowish-brown (10YR 6/2) clayey silt with some cement. Encounter water at 24.0 ft below ground surface (BGS), resulting in soupy, very pale orange (10YR 8/2) to pale yellowish-brown (10YR 6/2) mud returns. Greatest reading of organic vapors in breathing zone is 0.1 ppm. Maximum reading of beta/gamma at borehole is 60 cpm, alpha is 20 cpm. Auger to 49.6 ft BGS.
	1132	1332	Crew breaks for lunch.
	1332	1435	Rig is started and augering continues. Auger begins to stick in borehole due to thick mud, causing rig engine to bog. Two auger flights are tripped out and removed. The string is raised and spun to clear mud from borehole. The auger flights are re-added and augering continues. Augering continues to 70 ft BGS.
	1435	1524	Casing string is pulled up with rig winch. Casing sections removed, section by section. Cuttings grab samples are prepared for

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-573D</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/2/93			screening (see Cutting Field Screening/Disposal Sheet).
(cont.)			
	1524	1619	Crew leaves site to clean augers needed to complete P&A. Casing and screen removed from borehole. Beta/gamma is 50 cpm. Alpha is 20 cpm. Note that complete screen and casing has been removed from hole. Total length of extracted casing is 94.02 ft.
	1619	1646	Drillers return to site. Augering continues. Auger to 90.2 ft BGS, TD.
	1646	1740	Auger flights are removed from string until auger is out of the borehole. Crew loads equipment and departs. Oversight departs.
2/3/93	1313	1457	Crew and oversight arrive at site to prepare for cementing. Eight 10-ft, 2-in. diameter PVC tremie pipe sections are inserted down hole. Stick-up of tremie pipe is 7.0 ft, bottom at 73.0 ft BGS.
	1457	1554	Cement truck arrives on site with 2.5 cubic yards of cement. Cement is pumped into borehole by use of the rig pump. Cement is circulated out of the borehole. The tremie pipe is removed from the borehole and cleaned. The cement truck leaves the site. Crew and oversight depart.
2/4/93	0755	0855	Tag cement level in bore at 12.6 ft BGS. Calculate bore volume to 4 ft BGS of 5.3 cubic ft, equivalent to 3.9 sacks of 2% bentonite-cement grout needed to bring cement level to within 4 ft of the ground surface.
3/12/93	1010	1035	Mixed and poured 4 bags of cement w/bentonite into borehole.
3/16/93	1552	1600	Grout tagged at 3.8 ft BGS.
3/18/93	1312	1338	Clay cap installed. P&A of GW-573D complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-573S</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>John Voekel - Law Environmental</u> HELPERS: <u>Jason Smith - Law Environmental</u> DRILL: <u>CME Model 55</u>		DATE: START: <u>2/2/93</u> FINISH: <u>3/18/93</u> METHOD: <u>A</u> LOGGED BY: <u>Michael Klidzejs - SAIC</u>	
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2/2/93	0818	0827	Arrive at GW-573 site. Crew is present. Rig is already set up over casing in GW-573S and rigged up with first auger flight and bit. Total length of first flight with bit is 5.2 ft. Inside diameter (ID) of auger is 6 1/4-in., outside diameter (OD) is 10 5/8-in. Additional auger flights are 5.0 ft.
	0827	0843	Begin augering. Auger flights added sequentially at each 5 ft interval. Organic vapors in breathing zone at 8 ft below ground surface (BGS) = 0.0 ppm. Beta and gamma around borehole - 80 cpm (background = 40-50 cpm). Alpha = 0 cpm (background = 0 cpm). Cuttings returned consist of pale yellowish-brown clayey silt (soil). Cuttings become moist around 7 ft BGS. Encounter grayish-white to very light gray clay at 14 ft BGS. Grab samples of soil collected throughout augered interval. Reach total depth of 16 ft BGS and stop augering.
	0843	0930	Crew removes auger flights from borehole. Casing not visible in borehole; groundwater in borehole at 8 ft BGS; 5.5 ft section of casing is lodged in bottom auger flight. Remainder of casing may be below the water level or balled up. Bottom of augered hole is tagged at 16.0 ft BGS. Notify Bill Thedford (HSR) and David Wright (Highland) that a section of casing remains in the hole. David Wright and Scott Gilbert (Highland) report at 1019 hr that Kevin Jago (HSE) has given permission to grout hole with casing still present.

WELL NO. GW-573S

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-580</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 5
LOCATION: <u>SPAD Landfill Site</u> DRILLERS: <u>Hubert Hall - Highland Drilling Co.</u> <u>Greg Shilling/Steve Brown/</u> HELPERS: <u>Jim Gallaher - Highland Drilling Co.</u> DRILL: <u>Ingersoll-Rand XL-750</u>		DATE: START: <u>12-8-92</u> FINISH: <u>12-18-92</u> METHOD: <u>A</u> LOGGED BY: <u>Michael A. Klidzejs - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-8-92	0900	0947	Arrive at GW-580 site. Hubert Hall (Highland) and Victor Harness (SAIC) already present. Bottom of hole is tagged at 73.4 ft below ground surface (BGS). Drill rig rigged up with 5-3/4 in. diameter, 15.2 ft washover pipe, and 1.8 ft adapter. Table height = 1.6 ft. Driller's helper, Jim Gallaher, arrives.
	0947	1000	Rig is started. Begins over wash. Organic vapors in breathing zone at 7 ft BGS = 15 ppm. High level attributed to alcohol in anti-freeze earlier expelled from rig. Rig is stopped. Crew has to get backhoe to dig a trench to prevent return water from scouring soil from below rig jacks. Crew leaves site.
	1000	1154	On standby until crew returns. Bill Thedford (HSEA) reports at 1046 that crew was delayed by logging activities, then backhoe ran out of gas. Oversight tags cement levels in wells 1131 and 1132. Crew returns to site with backhoe at 1148 and digs cuttings/water trench.
	1154	1303	Rig is restarted. Continues over wash. Organic vapors in breathing zone = 4.2 ppm. Beta and gamma = 60 cpm (background = 20 cpm). Reach end of first washover pipe at 15.0 ft BGS (0.2 ft stick-up). Collect cuttings sample of 0 to 14 ft interval. Cuttings consist of predominantly small grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2) cement-grout fragments. Rig up with second washover pipe, 24.7 ft in length.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-580</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-8-92	1303	1438	Continues over wash. Organic vapors at 20.0 ft BGS = 2.0 ppm.
(cont'd)			Beta and gamma = 40 cpm. Collect cuttings samples of 15 ft to
			25 ft and 25 ft to 30 ft BGS intervals. Both samples consist of
			cuttings similar to 0 to 14 ft intervals. Minor steel shavings found
			in 25 to 39 ft interval sample. Reach 39.0 ft BGS. Rig up with
			third washover pipe, 24.7 ft in length.
	1438	1512	Continues over wash. Organic vapors at 44 ft BGS in breathing
			zone = 0.2 ppm. Beta and gamma = 40 cpm. Collect cuttings
			sample of 40 to 50 ft BGS interval. Cuttings as in above intervals
			with no steel shavings. Water truck empty. End drilling activities
			for day at 51.5 ft BGS.
	1512	1540	Cuttings samples screened for radioactivity and placed under
			foil for head space analysis. (See Cuttings Field Screening/
			Disposal Sheet.) Crew circulates antifreeze through rig piping
			and hoses to prevent freezing overnight. Crew leaves site.
			Oversight departs.
12-9-92	0801	0951	Oversight arrives at GW-580 site. Crew arrives and prepares to
			washover. Table height adjusted to 2.0 ft. Continue washover.
			Organic vapors in breathing zone = 0.0 ppm. Beta and gamma
			= 40 cpm. Collect cuttings sample of 56.7 to 63 interval. Sample
			consists of thin to medium cuttings of light gray (N7) to moderate
			yellowish brown (10YR 5/4) cement/grout. Reach 65 ft BGS and
			end of washover pipe.
	0951	1036	Determine that both HNu and beta and gamma meter are
			malfunctioning. Oversight departs to replace equipment. Bill
			Thedford (HSEA) remains on site as health and safety over-
			sight. Oversight returns to site at 1024. Crew rigs up with fourth
			washover pipe, 14.6 ft in length.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-580</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-9-92	1036	1114	Continues overwash. Organic vapors in breathing zone at 69 ft
(cont'd)			BGS = 9.8 ppm. Beta and gamma = 90 cpm (background =
			50 cpm). Washover to 79.6 ft BGS. Collect cuttings sample of 69
			to 79.6 ft interval. Sample is similar to 56.7 to 63 ft interval but also
			contains abundant filter pack sand.
	1114	1344	Extract washover pipe from hole. Organic vapors in breathing
			zone = 0.4 ppm. Cuttings samples screened for radioactivity and
			head space (see Field Cuttings Field Screening/Disposal Sheet).
	1344	1355	Attempt to tag bottom of hole. Tape sticks in mud at 76 ft BGS.
			Crew prepares to depart. Crew and oversight leave site.
12-10-92	0800	0935	Oversight arrives at site. Crew arrives at 0845 and prepares to
			pull casing. Casing not visible in hole during first inspection. Crew
			assumes that original hole was deviated and casing was sheared
			during first few feet of washover. Steve Jones (HSEA) and Scott
			Gilbert (Highland) notified of situation.
	0935	1036	On standby awaiting Scott Gilbert. Crew cleans site during
			standby.
	1036	1130	Scott Gilbert arrives on site and inspects hole. He notices a small
			portion of the casing sticking out of overwash hole wall at
			approximately 3 ft BGS. He recommends digging a pit to expose
			casing.
	1130	1225	Backhoe is used to dig a 3.5 ft deep pit which exposes the casing.
			Chain is attached from drill sub to the casing, and an attempt to
			pull the casing is made. Tension causes casing to compress and
			the chain slips off.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-580</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			
			PAGE 4 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-10-92	1225	1315	Break for lunch.
(cont'd)			
	1315	1415	Backhoe is used to deepen the pit to approximately 4.5 ft to expose casing further. Re-attach chain and attempt to pull casing again.
			Casing breaks. Call Steve Jones and inform him that attempts to pull casing have failed. Steve Jones will come to site.
	1415	1447	On standby.
	1447	1554	Steve Jones, Scott Gilbert, David Wright on site. Steve Jones decides that since original hole was probably deviated and additional washover would not achieve anything, casing cannot be pulled and should be filled with grout in place. D. Wright and S. Gilbert leave site. Crew moves rig off of the hole. Rig and equipment decontaminated. Site secured. Crew, Steve Jones, and oversight depart.
12-11-92	0811	1135	Backhoe is used to widen pit over GW-580, to facilitate grouting.
			The hole around the casing is opened with a shovel and the steam cleaner. Kevin Jago (HSEA) and David Wright (Highland) on site from approximately 1020 to 1040. Two 10 ft tremie sections inserted down hole to 20 ft BGS (stick-up above bottom of pit is approximately 4 ft). Cement scheduled for 1300 hrs. Depart site.
	1257	1326	Cement truck arrives on site. Approximately 250 gallons cement/grout is pumped into tremie pipe until cement circulates out of hole.
			An additional 250 gallons of cement/grout is poured into the pit (around hole collar) over the borehole in the hope that the cement would settle in the borehole, bringing the level to within 4 ft of the ground surface. Tremie pipe is pulled and decontaminated.
12-14-92	0808	0812	Cement in hole tagged at 10.4 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-580

**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-607</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 7
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>1-27-93</u>	
DRILLERS: <u>Scott Gilbert/Hubert Hall - Highland Drilling</u>		FINISH: <u>3-18-93</u>	
HELPERS: <u>Greg Shillings - Highland Drilling</u>		METHOD: <u>A</u>	
DRILL: <u>Ingersoll Rand XL-750 Drillmaster</u>		LOGGED BY: <u>Susan L. Abston - SAIC</u> <u>V. R. Harness - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-27-93	0845	0906	Technical oversight by V.R. Harness (SAIC). Crew setting up rig.
			Protective pad and posts previously removed. Stickup of 10.75-in.
			outside diameter (OD), 10.25-in. inside diameter (ID) surface
			casing = 0.5 ft. Excavation of cuttings pit will be done to keep
			metal cuttings out of access road. 4.5-in. OD, 4.0-in. ID stainless
			steel riser stickup previously removed = 3.12 ft height.
	0906	0938	Crew begins drilling out stainless-steel (SS) riser within 10.75-in.
			OD surface casing using a 9.5-in. diameter tricone bit and
			stabilizer (length = 9.2 ft). Table Ht = 2 ft. Advance to 7 ft below
			ground surface (BGS) with air only. Returns are grout chips with
			no SS cuttings yet.
	0938	1029	Broke power-tong wrench during break out to install check valve
			at sub. No break in drilling. Cuttings pit excavation now made
			approximately 10 ft x 6 ft x 3.5 ft deep. Composition of cuttings
			from 0 to 7 ft BGS = 99% grout fragments and 1% small SS
			shavings. Begin using water at 7 ft BGS.
	1029	1103	Advance to 26.2 ft BGS. Drilling rate slows as riser is gradually
			compacted by bit and eases as crumpled masses are cut up. Hit
			stagnant water in riser at 18.7 ft BGS, visible dark humic contri-
			bution to circulation waters noted. To prevent binding, crew adds
			liquid soap (Palmolive™ dishwashing liquid) to drill waters.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-607</u>		
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 7		
DATE	TIME		ACTIVITY/COMMENTS		
	START	FINISH			
1-27-93	1103	1211	Advance to 40 ft BGS, clean bore. Collect 27 to 40 ft BGS cuttings		
(cont.)			composite. Crew breaks for lunch.		
	1321	1532	Resume drilling. Advance to 90.2 ft BGS. Collected 40 to 57 ft		
			BGS and 57 to 80 ft BGS cuttings composites earlier.		
	1532	1648	Advance to 105.2 ft BGS. Collect 80 to 101 ft BGS cuttings		
			composite. Screening radioactivity of cuttings:		
			Sample interval	Alpha	Beta/gamma
			0-27 ft	20 cpm	40 cpm
			27-57 ft	0 cpm	45 cpm
			57-80 ft	0 cpm	50 cpm
			80-101 ft	(damp)	45 cpm
			Cuttings fining in size with depth. Composition of returned cuttings		
			= 25% ≤ 1 cm grout fragments, 25% ≤ 3 cm SS fragments (not		
			shavings), and 50% tan colored dolomite fragments with a		
			saccharoidal or silty appearance.		
	1648	1715	Advance to 107 ft BGS. Bit is now immediately below bottom of		
			surface casing. Collect 101 to 107 ft BGS cuttings sample. Secure		
			site. Depart site.		
1-28-93	0813	0928	Two 25-ft pieces of extra drill rods delivered. Site and cuttings pit		
			separately flagged. Trip down tools, resume drilling.		
	0928	1039	Rate of advance essentially stopped, lowering of bit to cutting		
			surface repeatedly causing binding of tools. Advance to 118.2 ft		
			BGS. Collect 107 to 118.2 ft composite of cuttings.		

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-607</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-28-93	1039	1120	Scott Gilbert arrives with 9 7/8-in. diameter tricone roller bit. Crew
(cont.)			suspects that 9.5-in. diameter bit is worn out. Crew begins to trip
			tools out to exchange bits. Description of 107 to 118.2 ft cuttings:
			75% SS cuttings ≤5 cm, 25% grout fragments with minor amounts
			of angular chert fragments. Lunch break.
	1240	1254	Resume trip out of tools. Crew repairing power tong and water
			truck dispatched to refill.
	1254	1408	Awaiting return of water truck.
	1408	1522	Water truck returns. Trip down tools with 9 7/8-in. diameter bit
			attached. The 9.5-in bit was worn out. Resume drilling using Quik-
			Foam™. Unable to advance bit without hanging up below 117.7ft
			BGS.
	1522	1553	Tools hang-up, attempting to free.
	1533	1623	Tripping out and rigging down. Secure site. Depart.
1-29-93	0840	1028	Scott Gilbert (Highland) replaces Hubert Hall as driller. Verify that
			9.5-in diameter tricone bit used to advance to 118.2 ft BGS was
			worn out. Tripping out 9 7/8-in diameter bit, was unable to advance
			yesterday.
	1028	1053	Receive permission from Kevin Jago (HSE) to abandon effort to
			drill out any more SS riser, and instead over wash 10.75-in. OD
			surface casing as an approved deviation.
	1130	1430	Crew retrieving washover pipe.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-607</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
1-29-93	1430	1518	Crew arrives with 13.5-in. OD, 12.25-in. ID washover pipe in two
(cont.)			pieces. First piece with shoe bit is 22.7 ft long. Shoe bit portion
			of this is 2.7 ft long. Subadapter (not included above) is 3 ft long.
			Second piece of washover pipe = 20 ft long. Rigging up first piece
			with bit.
	1518	1606	Begin over wash of 10.75-in. OD, 10.25-in. ID surface casing.
			Table height = 2 ft. Advance to 22 ft BGS. Collect 0 to 22 ft BGS
			composited cuttings sample. Composition predominantly ≤ 2 cm
			rounded quartz pebbles (pea gravel). Awaiting return of D. Wright
			(Highland) with alcohol for antifreezing rig pipes and hoses.
	1606	1623	Alcohol antifreeze arrives. Crew securing site. Depart site.
2-1-93	0901	1011	Awaiting crew. Hubert Hall (Highland) returns as driller.
	1011	1032	Crew arrives with additional washover pipe (13.5-in OD,
			12.25-in. ID).
	1032	1108	Backhoe arrives. Crew discovers power tong hydraulic hose is
			leaking. Down for replacement. Unable to add washover pipe
			without power-tong. Depart for lunch.
	1229	1252	Replacement hose arrives, replacement made.
	1252	1412	Crew torches pulling holes in 10.75-in. OD casing. Unload new
			washover pipe tally:
			3, 20 ft long pieces
			1, 10 ft long piece
			Counted with original delivery of washover now at site, total tally
			is:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-607</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 5 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-1-93			4, 20 ft long pieces
(cont.)			1 22.7 ft long piece (with bit)
			1, 10 ft long piece
			Total 112.7 ft
			Crew rigs up 2nd, 20 ft long piece into string.
	1412	1505	Resume over wash. Table height = 2 ft. Advance to 42 ft BGS.
			Collect 22 to 42 ft BGS composite cuttings sample. Composition:
			70% quartz pea gravel, 20% 0.1 to 1 cm grout fragments, 10%
			chert fragments and residual stainless steel fragments that have
			fallen into bore from surface.
	1505	1537	Crew rigging 3rd piece of washover pipe.
	1537	1656	Resume over wash. Advance to 62 ft BGS. Collect 42 to 62 ft
			composite cuttings sample. Clean bore, washover pipe becomes
			stuck.
	1656	1710	Washover unstuck, trip up. Crew secures rig. Depart.
2-2-93	0824	0827	Awaiting crew.
	0827	1033	Trip in tools. Adding 20 ft piece of washover pipe.
	1033	1224	Resume over wash. Advance to 82 ft BGS. Collect 62 to 82 ft BGS
			composited cuttings sample. Composition = 95% grout fragments,
			5% chert fragments with minor pea gravel. Depart for lunch.
	1250	1622	Crew adding 20 ft piece of washover and awaiting return of water
			truck with fresh load of water.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-607</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 6 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-2-93	1622	1740	Water truck arrives. It broke down enroute and had to be repaired
(cont.)			before proceeding. Resume over wash. Advance to 91 ft BGS.
			Collect 82 to 91 ft BGS composited cuttings sample. Crew
			secures rig. Depart.
2-3-93	1209	1325	Trip in tools. Resume over wash. Advance to 102 ft BGS. Collect
			91 to 102 ft BGS composited cuttings sample. Composition =
			95% grout fragments, 5% chert fragments.
	1325	1426	Crew adding 10 ft piece of washover pipe, following an unsuccessful
			attempt to pull 10.75-in. OD surface casing.
	1426	1503	Resume over wash. Advance to 107.1 ft BGS. Collect 102 to
			107 ft BGS composited sample. Composition similar to 91 to 102
			ft interval.
	1503	1545	Crew cleaning bore, washover pipe hangs.
	1545	1615	Washover pipe freed. Secure site. Depart site.
2-4-93	0830	1032	Crew moving attachment tab for P-long to a higher position to
			facilitate trip-out.
	1032	1124	Changes complete. Trip out topmost 10 ft of washover pipe
			casing. Begin removal of 10.75-in. OD surface casing.
	1124	1440	Extract 107.2 ft of 10.75-in. OD surface casing in five pieces.
			Acetylene torch used to cut casing in manageable pieces.
	1440	1712	Crew remove all washover pipe from bore. Crew secures site.
			Depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-607</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 7 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-5-93	0824	0956	Crew rigs up 15-in. diameter hole opener and stabilizer. Distance from tip bit to reaming cones = 1.5 ft. Table Height = 2 ft. Ream to 110.5 ft BGS. Can advance no further with hole opener.
	0956	1054	Trip out. Mobilize rig from hole to decontaminate. Tag mud in bore at 63 ft BGS.
	1054	1140	Grout delivery arrives (2.5 cubic yds). Crew inserts 90 ft of 1.5-in. OD PVC tremie pipe to 87 ft BGS. Tremie all of grout into bore (neat, Type I Portland cement). No grout visible at surface. To allow grout to cure overnight. Depart.
2-8-93	1247	1302	D. Wright (Highland) reports tagged bottom of bore at 32 ft BGS and that we've received permission from Bill Thedford and Kevin Jago (HSE) to use Hole Plug™ to prevent bore from taking excessive grout. Two bags of Hole Plug™ poured into bore.
2-16-93	0806	0815	Tag top of hydrated bentonite at 25 ft BGS.
3-3-93	1322	1359	Crew inserts 20 ft of 1.5-in. OD PVC tremie pipe to 17 ft BGS. Tremie 2.0 cubic yds of neat, Type I Portland cement into bore. Circulate grout at surface. Clean and depart site.
3-4-93	1240	1243	Tag grout level at 4.0 ft BGS.
3-18-93	1120	1200	Greg Shillings and Steve Brown (Highland) use backhoe to place 4.0 ft clay cap on bore to bring level to ground surface.

APPENDIX B
Plugging and Abandonment Diagrams

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>PZ-12</u>																				
WELL PLUGGING AND ABANDONMENT DIAGRAM																						
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>3/10/93</u>																				
COORDINATES: <u>N27175 E59740</u>		FINISH: <u>3/18/93</u>																				
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>V.R. Hamess-SAIC</u>																				
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>																				
DRILLER: <u>Hubert Hall</u> HELPER: <u>Mark Baker</u>																						
REASON FOR P&A: <u>Well is obstructing construction of landfill.</u>																						
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Cap depth is 0.5 ft BGS rather than 4.0 ft BGS. Deviation approved by Steve Jones - HSEA.</u>																						
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>The diagram shows a vertical cross-section of the well. From top to bottom, the components are: Borehole (hatched), Filler (hatched), Casing with screen (hatched), Seal (hatched), Filter pack (hatched), Screen (hatched), and Total Depth (70.5 ft). Each component is labeled with its type and dimensions.</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: right;">BOREHOLE DIA.: <u>Unknown</u></td> <td style="text-align: left;">TOP <u>0.0 ft</u> BOTTOM <u>Unknown</u></td> </tr> <tr> <td style="text-align: right;">FILLER: <u>Cement</u></td> <td></td> </tr> <tr> <td style="text-align: right;">CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>2.0-in. OD</u></td> <td style="text-align: left;">TOP <u>+2.5 ft</u> BOTTOM <u>70.5 ft</u></td> </tr> <tr> <td style="text-align: right;">SEAL: <u>Unknown</u></td> <td style="text-align: left;">TOP <u>Unknown</u> BOTTOM <u>Unknown</u></td> </tr> <tr> <td style="text-align: right;">FILTER PACK: <u>Unknown</u></td> <td style="text-align: left;">TOP <u>Unknown</u> BOTTOM <u>Unknown</u></td> </tr> <tr> <td style="text-align: right;">SCREEN TYPE: <u>Unknown</u> DIA: <u>Unknown</u></td> <td style="text-align: left;">TOP <u>Unknown</u> BOTTOM <u>Unknown</u></td> </tr> <tr> <td style="text-align: right;">TOTAL DEPTH: <u>70.5 ft</u></td> <td></td> </tr> </table> <p>NOT TO SCALE</p>		BOREHOLE DIA.: <u>Unknown</u>	TOP <u>0.0 ft</u> BOTTOM <u>Unknown</u>	FILLER: <u>Cement</u>		CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>2.0-in. OD</u>	TOP <u>+2.5 ft</u> BOTTOM <u>70.5 ft</u>	SEAL: <u>Unknown</u>	TOP <u>Unknown</u> BOTTOM <u>Unknown</u>	FILTER PACK: <u>Unknown</u>	TOP <u>Unknown</u> BOTTOM <u>Unknown</u>	SCREEN TYPE: <u>Unknown</u> DIA: <u>Unknown</u>	TOP <u>Unknown</u> BOTTOM <u>Unknown</u>	TOTAL DEPTH: <u>70.5 ft</u>		<p>REAMED DIA: <u>10.63-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>73.5 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay</u></p> <div style="text-align: center; margin-top: 20px;"> <p>The diagram shows a vertical cross-section of the well plug and cap. The cap is at the top, followed by the plug (hatched), and the total depth is 73.5 ft.</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: right;">CAP</td> <td style="text-align: left;">← DEPTH <u>0.5 ft</u></td> </tr> <tr> <td style="text-align: right;">PLUG</td> <td style="text-align: left;">← DIA <u>10.63-in.</u></td> </tr> <tr> <td></td> <td style="text-align: left;">← DEPTH <u>73.5 ft</u></td> </tr> </table> </div>	CAP	← DEPTH <u>0.5 ft</u>	PLUG	← DIA <u>10.63-in.</u>		← DEPTH <u>73.5 ft</u>
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	← DEPTH <u>73.5 ft</u>																					

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>PZ-14</u>																										
WELL PLUGGING AND ABANDONMENT DIAGRAM																												
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2-3-93</u>																										
COORDINATES: <u>N26175 E60212</u>		FINISH: <u>3-18-93</u>																										
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Timothy Coffey-SAIC</u>																										
DRILLING COMPANY: <u>Law Engineering</u>		DRILL: <u>CME 55</u>																										
DRILLER: <u>John Voekel/Jason Smith</u>		HELPER: <u>Jason Smith/Matthew Guyman</u>																										
REASON FOR P&A: <u>Well location impedes construction of new landfill.</u>																												
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Drill over casing</u> <u>with hollow stem augers, reaming hole at the same time. Cement column to 4.5 ft BGS.</u>																												
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>The diagram shows a vertical cross-section of the well. From top to bottom, it includes: a conductor hole, a surface conductor, a borehole, a casing with screen, a seal, a filter pack, and a screen. Each component is labeled with its type, diameter, and depth. The total depth is indicated as 97.0 ft.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>CONDUCTOR HOLE DIA: <u>-NA-</u></td> <td>DEPTH <u>-NA-</u></td> </tr> <tr> <td>SURFACE CONDUCTOR TYPE: <u>-NA-</u> DIA: <u>-NA-</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td>BOREHOLE DIA.: <u>8.0-in.</u></td> <td>TOP <u>0.0 ft</u> BOTTOM <u>97.0 ft</u></td> </tr> <tr> <td>Bentonite Slurry/ FILLER: <u>Cement</u></td> <td>3.0 ft Above Ground Surface</td> </tr> <tr> <td>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>2.0-in.</u></td> <td>TOP <u>Surface</u> BOTTOM <u>-97.0 ft</u></td> </tr> <tr> <td>SEAL: <u>Bentonite</u></td> <td>TOP <u>75.0 ft</u> BOTTOM <u>77.0 ft</u></td> </tr> <tr> <td>FILTER PACK: <u>Sand</u></td> <td>TOP <u>77.0 ft</u> BOTTOM <u>97.0 ft</u></td> </tr> <tr> <td>SCREEN TYPE: <u>PVC</u> DIA: <u>2.0-in.</u></td> <td>TOP <u>87.0 ft</u> BOTTOM <u>97.0 ft</u></td> </tr> <tr> <td colspan="2">TOTAL DEPTH: <u>97.0 ft</u></td> </tr> </table>		CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>	SURFACE CONDUCTOR TYPE: <u>-NA-</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	BOREHOLE DIA.: <u>8.0-in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>97.0 ft</u>	Bentonite Slurry/ FILLER: <u>Cement</u>	3.0 ft Above Ground Surface	CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>2.0-in.</u>	TOP <u>Surface</u> BOTTOM <u>-97.0 ft</u>	SEAL: <u>Bentonite</u>	TOP <u>75.0 ft</u> BOTTOM <u>77.0 ft</u>	FILTER PACK: <u>Sand</u>	TOP <u>77.0 ft</u> BOTTOM <u>97.0 ft</u>	SCREEN TYPE: <u>PVC</u> DIA: <u>2.0-in.</u>	TOP <u>87.0 ft</u> BOTTOM <u>97.0 ft</u>	TOTAL DEPTH: <u>97.0 ft</u>		<p>REAMED DIA: <u>10 5/8-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>93.6 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Soil</u></p> <p>The diagram shows a vertical cross-section of the well plug. It includes a cap at the top, followed by a plug material, and a screen at the bottom. The depth of the cap is 4.5 ft, and the depth of the plug is 93.6 ft. The total depth is 97.0 ft.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>CAP</td> <td>DEPTH: <u>4.5 ft</u></td> </tr> <tr> <td>PLUG</td> <td>DIA: <u>10 5/8-in.</u></td> </tr> <tr> <td>SCREEN</td> <td>DEPTH: <u>93.6 ft</u></td> </tr> <tr> <td colspan="2">TOTAL DEPTH: <u>97.0 ft</u></td> </tr> </table>	CAP	DEPTH: <u>4.5 ft</u>	PLUG	DIA: <u>10 5/8-in.</u>	SCREEN	DEPTH: <u>93.6 ft</u>	TOTAL DEPTH: <u>97.0 ft</u>	
CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>																											
SURFACE CONDUCTOR TYPE: <u>-NA-</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																											
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Bentonite Slurry/ FILLER: <u>Cement</u>	3.0 ft Above Ground Surface																											
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SEAL: <u>Bentonite</u>	TOP <u>75.0 ft</u> BOTTOM <u>77.0 ft</u>																											
FILTER PACK: <u>Sand</u>	TOP <u>77.0 ft</u> BOTTOM <u>97.0 ft</u>																											
SCREEN TYPE: <u>PVC</u> DIA: <u>2.0-in.</u>	TOP <u>87.0 ft</u> BOTTOM <u>97.0 ft</u>																											
TOTAL DEPTH: <u>97.0 ft</u>																												
CAP	DEPTH: <u>4.5 ft</u>																											
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SCREEN	DEPTH: <u>93.6 ft</u>																											
TOTAL DEPTH: <u>97.0 ft</u>																												

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. PZ-24

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 2-9-93

COORDINATES: N26908 E60400

FINISH: 3-18-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: S.L. Abston-SAIC

DRILLING COMPANY: Law Engineering DRILL: CME 55

DRILLER: John Voekel HELPER: Shawn Smith

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: C DEVIATIONS FROM METHOD: Drill over casing
with hollow stem augers, reaming hole at the same time.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.

DRILLED/REAMED

DEPTH: 52 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Soil/Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. PZ-32

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 1-22-93

COORDINATES: N27586 E58886

FINISH: 2-1-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: V.R. Hamess-SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPER: Bob Bowers

REASON FOR P&A: Well is obstructing construction of landfill.

P&A: METHOD: C DEVIATIONS FROM METHOD: Depth of Cap is 6 ft BGS instead of 4 ft BGS. Deviation approved by Steve Jones - HSEA.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8 in.
DRILLED/REAMED
DEPTH: 73.7 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. PZ-34

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 2-10-93

COORDINATES: N26627 E60887

FINISH: 3-18-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: S.L. Abston-SAIC

DRILLING COMPANY: Law Engineering

DRILL: CME 55

DRILLER: John Voekel

HELPER: Shawn Smith

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: C DEVIATIONS FROM METHOD: Drill over casing with hollow-stem augers; ream hole at the same time. Top of cement at 6.0 ft BGS.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
DRILLED/REAMED DEPTH: 48.0 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Soil/Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>SB-12</u>																
WELL PLUGGING AND ABANDONMENT DIAGRAM																		
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>1-26-93</u>																
COORDINATES: <u>N27783 E59490</u>		FINISH: <u>2-1-93</u>																
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>V.R. Hamess-SAIC</u>																
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>																
DRILLER: <u>Hubert Hall</u> HELPER: <u>Bob Bowers</u>																		
REASON FOR P&A: <u>Well is obstructing construction of SPAD landfill.</u>																		
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Cap depth = 5.6 ft</u> <u>instead of 4 ft. Deviation approved by Steve Jones - HSEA.</u>																		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">FILLER: <u>Cement</u></td> <td style="text-align: right; padding: 2px;">TOP <u>0.0 ft</u> BOTTOM <u>2.0 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">BOREHOLE DIA.: <u>8.0-in.</u></td> <td style="text-align: right; padding: 2px;">TOP <u>0.0 ft</u> BOTTOM <u>19.9 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">FILLER: <u>Bentonite Slurry</u></td> <td style="text-align: right; padding: 2px;">TOP <u>2.0 ft</u> BOTTOM <u>6.0 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">CASING (WITH SCREEN) TYPE: <u>PVC</u> DIA: <u>2.0-in. OD</u></td> <td style="text-align: right; padding: 2px;">TOP <u>3.1 ft</u> BOTTOM <u>19.9 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SEAL: <u>Bentonite Pellets</u></td> <td style="text-align: right; padding: 2px;">TOP <u>6.0 ft</u> BOTTOM <u>8.0 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">FILTER PACK: <u>Sand</u></td> <td style="text-align: right; padding: 2px;">TOP <u>8.0 ft</u> BOTTOM <u>19.9 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SCREEN TYPE: <u>PVC</u> DIA: <u>2.0-in. OD</u></td> <td style="text-align: right; padding: 2px;">TOP <u>9.9 ft</u> BOTTOM <u>19.9 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">TOTAL DEPTH: <u>19.9 ft</u></td> <td></td> </tr> </table>		FILLER: <u>Cement</u>	TOP <u>0.0 ft</u> BOTTOM <u>2.0 ft</u>	BOREHOLE DIA.: <u>8.0-in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>19.9 ft</u>	FILLER: <u>Bentonite Slurry</u>	TOP <u>2.0 ft</u> BOTTOM <u>6.0 ft</u>	CASING (WITH SCREEN) TYPE: <u>PVC</u> DIA: <u>2.0-in. OD</u>	TOP <u>3.1 ft</u> BOTTOM <u>19.9 ft</u>	SEAL: <u>Bentonite Pellets</u>	TOP <u>6.0 ft</u> BOTTOM <u>8.0 ft</u>	FILTER PACK: <u>Sand</u>	TOP <u>8.0 ft</u> BOTTOM <u>19.9 ft</u>	SCREEN TYPE: <u>PVC</u> DIA: <u>2.0-in. OD</u>	TOP <u>9.9 ft</u> BOTTOM <u>19.9 ft</u>	TOTAL DEPTH: <u>19.9 ft</u>		<p>REAMED DIA: <u>10 5/8-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>20.7 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay</u></p> <div style="text-align: center; margin-top: 20px;"> </div>
FILLER: <u>Cement</u>	TOP <u>0.0 ft</u> BOTTOM <u>2.0 ft</u>																	
BOREHOLE DIA.: <u>8.0-in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>19.9 ft</u>																	
FILLER: <u>Bentonite Slurry</u>	TOP <u>2.0 ft</u> BOTTOM <u>6.0 ft</u>																	
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TOTAL DEPTH: <u>19.9 ft</u>																		

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>SB-14</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2-8-93</u>
COORDINATES: <u>N26580 E60323</u>		FINISH: <u>3-18-93</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>S.L. Abston-SAIC</u>
DRILLING COMPANY: <u>Law Engineering</u>		DRILL: <u>CME 55</u>
DRILLER: <u>John Voekel</u>		HELPER: <u>Shawn Smith</u>
REASON FOR P&A: <u>Well location impedes construction of new landfill.</u>		
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Drill over casing</u> <u>with hollow steam augers; ream hole at the same time.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Diagram showing the well construction from the surface down to the total depth of 44.0 ft. The well is shown as a vertical shaft with various components labeled: CONDUCTOR HOLE, SURFACE CONDUCTOR, BOREHOLE, BENTONITE SLURRY/FILLER, CASING (WITH SCREEN), SEAL, FILTER PACK, and SCREEN. The total depth is indicated as 44.0 ft.</p>		<p>REAMED DIA: <u>10 5/8-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>45.0 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Soil</u></p>
<p>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>-NA-</u> DIA: <u>-NA-</u> TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>BOREHOLE DIA.: <u>8.0-in.</u> TOP <u>0.0 ft</u> BOTTOM <u>44.0 ft</u></p> <p>Bentonite Slurry/ FILLER: <u>Cement</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC</u> TOP <u>3.0 ft Above Ground Surface</u> DIA: <u>2.0-in.</u> BOTTOM <u>44.0 ft</u></p> <p>SEAL: <u>Bentonite</u> TOP <u>22.0 ft</u> BOTTOM <u>24.0 ft</u></p> <p>FILTER PACK: <u>Sand</u> TOP <u>24.0 ft</u> BOTTOM <u>44.0 ft</u></p> <p>SCREEN TYPE: <u>PVC</u> TOP <u>34.0 ft</u> DIA: <u>2.0-in.</u> BOTTOM <u>44.0 ft</u></p> <p>TOTAL DEPTH: <u>44.0 ft</u></p>		<p>CAP ← DEPTH: <u>1.2 ft</u></p> <p>PLUG ← DIA: <u>10 5/8-in.</u></p> <p>← DEPTH: <u>45.0 ft</u></p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. SB-24

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 2-17-93

COORDINATES: N26099 E60728

FINISH: 3-18-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: S.L. Abston-SAIC

DRILLING COMPANY: Law Engineering DRILL: CME 55

DRILLER: John Voekel HELPER: Shawn Smith

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: C DEVIATIONS FROM METHOD: Pull 24.2 ft of PVC casing prior to augering; condition hole with augers. Top of cement at 5.8 ft BGS.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
DRILLED/REAMED
DEPTH: 22.0 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Soil/Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. SB-34

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 2-11-93

COORDINATES: N26253 E61150

FINISH: 3-18-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: S.L. Abston-SAIC

DRILLING COMPANY: Law Engineering

DRILL: CME 55

DRILLER: John Voekel

HELPER: Shawn Smith

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: C DEVIATIONS FROM METHOD: Drill over casing with hollow-stem augers; ream hole at the same time. Cement level less than 1 ft BGS.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 42.0 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Soil/Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. SB-44B

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 2-12-93

COORDINATES: N26655 E61235

FINISH: 3-18-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: S.L. Abston-SAIC

DRILLING COMPANY: Law Engineering

DRILL: CME 55

DRILLER: John Voekel

HELPER: Shawn Smith

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: C DEVIATIONS FROM METHOD: Drill over casing
with hollow-stem augers; ream hole at the same time.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
DRILLED/REAMED DEPTH: 40.0 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Soil/Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. SB-54

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 2-16-93

COORDINATES: N25702 E60296

FINISH: 3-18-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: S.L. Abston-SAIC

DRILLING COMPANY: Law Engineering

DRILL: CME 55

DRILLER: John Voekel

HELPER: Shawn Smith

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: C DEVIATIONS FROM METHOD: Pull out PVC well casing prior to augering. Ream borehole with augers. Cement level at 5.1 ft BGS.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 22.0 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay/Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. SB-72a

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 3/8/93

COORDINATES: N26750 E59397

FINISH: 3/18/93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: D. Hollon-SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750 Drillmaster

DRILLER: Rick Mayberry

HELPER: Paul McCormick

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: C DEVIATIONS FROM METHOD: None.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 98.3 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay

-NA-: Not Applicable

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1003

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S-3 Ponds Functional Area

DATE: START: 5-20-93

COORDINATES: N29939 E51595

FINISH: 5-24-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: V.R. Hamess - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPERS: Greg Anderson, Steve Brown

REASON FOR P&A: Well security compromised, substandard construction.

P&A: METHOD: C DEVIATIONS FROM METHOD: Well abandoned in place from 27 ft to 48 ft due to instability of bore. Removal drilling and reaming conducted in one pass.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.

DRILLED/REAMED

DEPTH: 27 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1007</u>																								
WELL PLUGGING AND ABANDONMENT DIAGRAM																										
LOCATION: <u>S-3 Ponds Functional Area</u>		DATE: START: <u>5-25-93</u>																								
COORDINATES: <u>N29995 E52310</u>		FINISH: <u>5-27-93</u>																								
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>V.R. Hamess - SAIC</u>																								
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Altec Auger Truck</u>																								
DRILLER: <u>Hubert Hall</u>		HELPER: <u>Greg Anderson</u>																								
REASON FOR P&A: <u>Well security compromised, well construction substandard.</u>																										
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Removal drilling and reaming performed in one pass.</u>																										
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Diagram showing the well construction layers from the surface down to the total depth of 18.1 ft. The layers are: Conductor Hole, Conductor Casing, Borehole, Filler (Cement), Casing (with Screen), Seal, Filter Pack, and Screen.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>CONDUCTOR HOLE DIA: <u>-NA-</u></td> <td>DEPTH <u>-NA-</u></td> </tr> <tr> <td>CONDUCTOR CASING TYPE: <u>-NA-</u> DIA: <u>-NA-</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td>BOREHOLE DIA.: <u>Unknown</u></td> <td>TOP <u>0.0 ft</u> BOTTOM <u>18.0 ft</u></td> </tr> <tr> <td>FILLER: <u>Cement</u></td> <td></td> </tr> <tr> <td>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u></td> <td>TOP <u>+2.1 ft</u> BOTTOM <u>18.1 ft</u></td> </tr> <tr> <td>SEAL: <u>Unknown</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>7.0 ft</u></td> </tr> <tr> <td>FILTER PACK: <u>Sand</u></td> <td>TOP <u>7.0 ft</u> BOTTOM <u>18.1 ft</u></td> </tr> <tr> <td>SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u></td> <td>TOP <u>8.0 ft</u> BOTTOM <u>18.1 ft</u></td> </tr> <tr> <td colspan="2">TOTAL DEPTH: <u>18.1 ft</u></td> </tr> </table>		CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>	CONDUCTOR CASING TYPE: <u>-NA-</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	BOREHOLE DIA.: <u>Unknown</u>	TOP <u>0.0 ft</u> BOTTOM <u>18.0 ft</u>	FILLER: <u>Cement</u>		CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u>	TOP <u>+2.1 ft</u> BOTTOM <u>18.1 ft</u>	SEAL: <u>Unknown</u>	TOP <u>-NA-</u> BOTTOM <u>7.0 ft</u>	FILTER PACK: <u>Sand</u>	TOP <u>7.0 ft</u> BOTTOM <u>18.1 ft</u>	SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u>	TOP <u>8.0 ft</u> BOTTOM <u>18.1 ft</u>	TOTAL DEPTH: <u>18.1 ft</u>		<p>REAMED DIA: <u>12.0-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>20 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay</u></p> <p>Diagram showing the well cap and plug. The cap is 3.0 ft deep and 12.0-in. in diameter. The plug is 20.0 ft deep and 12.0-in. in diameter.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>CAP</td> <td>DEPTH: <u>3.0 ft</u></td> </tr> <tr> <td>PLUG</td> <td>DIA: <u>12.0-in.</u></td> </tr> <tr> <td colspan="2">DEPTH: <u>20.0 ft</u></td> </tr> </table>	CAP	DEPTH: <u>3.0 ft</u>	PLUG	DIA: <u>12.0-in.</u>	DEPTH: <u>20.0 ft</u>	
CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>																									
CONDUCTOR CASING TYPE: <u>-NA-</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																									
BOREHOLE DIA.: <u>Unknown</u>	TOP <u>0.0 ft</u> BOTTOM <u>18.0 ft</u>																									
FILLER: <u>Cement</u>																										
CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u>	TOP <u>+2.1 ft</u> BOTTOM <u>18.1 ft</u>																									
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PLUG	DIA: <u>12.0-in.</u>																									
DEPTH: <u>20.0 ft</u>																										

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1010

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S3 Ponds Functional Area

DATE: START: 5-21-93

COORDINATES: N30556 E52206

FINISH: 5-27-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: V.R. Hamess - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Attec Auger Truck

DRILLER: Hubert Hall

HELPER: Greg Anderson, Steve Brown

REASON FOR P&A: Well security compromised, substandard construction.

P&A: METHOD: C

DEVIATIONS FROM METHOD: Cap to 0.5 ft of gravel to blend with surrounding area.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 12-in.

DRILLED/REAMED

DEPTH: 24.0 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Gravel

-NA- = not applicable, not available

*Database indicated 20 ft hole depth, screen from 10 to 20 ft and pack from 9 to 20 ft

NOT TO SCALE

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1011

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S3 Ponds Functional Area

DATE: START: 5-24-93

COORDINATES: N29981 E52016

FINISH: 5-25-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: V.R. Hamess - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Altec Auger Truck

DRILLER: Hubert Hall

HELPER: Greg Anderson, Steve Brown

REASON FOR P&A: Well security compromised, substandard construction.

P&A: METHOD: C DEVIATIONS FROM METHOD: None.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 12-in.

DRILLED/REAMED

DEPTH: 12.0-in.

PLUG MATERIAL: Cement

CAP MATERIAL: Clay

-NA- = not applicable, not available

*Database claims TD=22.5 ft, filter pack 11 to 22 ft BGS and screen from 12 to 22 ft BGS.

NOT TO SCALE

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1013

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S3 PondsDATE: START: 8-4-93COORDINATES: N31611 E51496FINISH: 8-10-93REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey- SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750
Ingersoll-Rand T4WDRILLER: Hubert HallHELPER: S. Brown/R. JonesREASON FOR P&A: Loss of well security.P&A: METHOD: D DEVIATIONS FROM METHOD: None

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 6 1/8-in./10 7/8-in.DRILLED/REAMED
DEPTH: 47.2 ft/30.8 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

N/A: Not Applicable/ Not Available

* Y/TS-881 database reports TD as 42.0 ft. Actual measurement of TD prior to drilling was 44.9 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1014

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S3 Ponds Functional AreaDATE: START: 7-15-93COORDINATES: N31759 E51522FINISH: 7-27-93

S.L. Abston - SAIC

REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: V.R. Harness - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: Hubert HallHELPER: Steve Brown/Rick ThomasREASON FOR P&A: Well security compromised; substandard well construction.P&A: METHOD: BDEVIATIONS FROM METHOD: None

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 9.5-in./6 1/8-in.DRILLED/REAMED DEPTH: 36 ft/48.5 ftPLUG MATERIAL: CementCAP MATERIAL: Clay/Soil

* Y/TS-881 Database reports bottom of casing at 36.0 ft BGS.

Bottom of casing as measured was 36.5 ft BGS.

** Y/TS-881 Database reports TD as 46.4 ft BGS. Actual measurement revealed TD was 46.5 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMWELL NO. 1017**WELL PLUGGING AND ABANDONMENT DIAGRAM**LOCATION: S3 Ponds Functional AreaDATE: START: 7-20-93COORDINATES: N31683 E51399FINISH: 8-10-93REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey- SAICDRILLING COMPANY: Highland Drilling Company DRILL: Ingersoll-Rand XL-750DRILLER: Hubert Hall HELPER: Steve Brown/Randy Phillips/David HewittREASON FOR P&A: Loss of well security.P&A: METHOD: B DEVIATIONS FROM METHOD: None**WELL CONSTRUCTION SUMMARY****P&A SUMMARY**

REAMED DIA: 9 7/8-in./6 1/8-in.
 DRILLED/REAMED DEPTH: 31.0 ft/47.5 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay/Soil

-NA:: Not Applicable or Not Available

* Y/TS-881 reports TD = 44.4 ft BGS. Actual measurement of depth = 4.5 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1022</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>S3 Ponds Functional Area</u>	DATE: START: <u>7-13-93</u>	
COORDINATES: <u>N31280 E51512</u>	FINISH: <u>7-27-93</u>	
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>	PREPARED BY: <u>V.R. Hamess- SAIC</u>	
DRILLING COMPANY: <u>Highland Drilling Company</u>	DRILL: <u>Ingersoll-Rand XL-750</u>	
DRILLER: <u>Hubert Hall</u>	HELPER: <u>Steve Brown/Mark Baker</u>	
REASON FOR P&A: <u>Well security compromised, substandard well construction.</u>		
P&A: METHOD: <u>S</u> DEVIATIONS FROM METHOD: <u>None</u>		
WELL CONSTRUCTION SUMMARY	P&A SUMMARY
<div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CONDUCTOR HOLE DIA: <u>- NA -</u></div> <div style="margin-left: 20px;">DEPTH <u>- NA -</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CONDUCTOR CASING TYPE: <u>None</u> DIA: <u>- NA -</u></div> <div style="margin-left: 20px;">TOP <u>- NA -</u> BOTTOM <u>- NA -</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">BOREHOLE DIA.: <u>8.0-in.</u></div> <div style="margin-left: 20px;">TOP <u>0.0 ft</u> BOTTOM <u>Unknown</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">FILLER: <u>backfill/grout</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CASING TYPE: <u>Steel</u> DIA: <u>6.5-in. OD</u></div> <div style="margin-left: 20px;">TOP <u>0.0 ft</u> BOTTOM <u>30.0 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">OPEN HOLE DIA.: <u>Unknown</u></div> <div style="margin-left: 20px;">TOP <u>30.0 ft</u> BOTTOM <u>48.0 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">TOTAL DEPTH: <u>48.0 ft</u></div> </div>	<div style="margin-bottom: 10px;"> REAMED DIA: <u>9 7/8-in./6 1/8-in.</u> DRILLED/REAMED DEPTH: <u>31.0 ft/49.6 ft</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Clay/Soil</u> </div> <div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CAP</div> <div style="margin-left: 20px;">DEPTH: <u>2.0 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">PLUG</div> <div style="margin-left: 20px;">DIA: <u>9 7/8-in.</u></div> </div> <div style="margin-top: 10px;"> <div style="margin-left: 20px;">DEPTH: <u>31.0 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="margin-left: 20px;">DIA: <u>6 1/8-in.</u></div> </div> <div style="margin-top: 10px;"> <div style="margin-left: 20px;">DEPTH: <u>49.6 ft</u></div> </div> </div>	

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1024</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>S3 Ponds</u>		DATE: START: <u>8-18-93</u>
COORDINATES: <u>N31681 E51703</u>		FINISH: <u>8-20-93</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Timothy Coffey - SAIC</u>
DRILLING COMPANY: <u>Highland Drilling</u>		DRILL: <u>Ingersoll-Rand T4W</u>
DRILLER: <u>Hubert Hall</u>		HELPER: <u>Steve Brown/Randy Phillips</u>
REASON FOR P&A: <u>Loss of well security/substandard well construction.</u>		
P&A: METHOD: <u>B</u> DEVIATIONS FROM METHOD: <u>None</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <p>CONDUCTOR HOLE DIA: <u>None</u></p> <p>CONDUCTOR CASING TYPE: <u>None</u> DIA: <u>-NA-</u></p> <p>BOREHOLE DIA.: <u>8.0-in.</u></p> <p>FILLER: <u>Backfill</u></p> <p>CASING TYPE: <u>Steel</u> DIA: <u>6.5-in. OD</u></p> <p>OPEN HOLE DIA: <u>-NA-</u></p> <p>TOTAL DEPTH: <u>40.0 ft</u></p> </div> <div> <p>DEPTH <u>-NA-</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>20.0 ft</u></p> <p>TOP <u>+0.3 ft</u> BOTTOM <u>20.0 ft</u></p> <p>TOP <u>20.0 ft</u> BOTTOM <u>40.0 ft</u></p> </div> </div>		<p>REAMED DIA: <u>6 1/8-in./9.5-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>43.2 ft/22.5 ft.</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> <div style="margin-top: 20px;"> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <p>CAP</p> <p>PLUG</p> </div> <div> <p>DEPTH: <u>3.0 ft</u></p> <p>DIA: <u>9.5 in.</u></p> <p>DEPTH: <u>22.5 ft</u></p> <p>DIA: <u>6 1/8 in.</u></p> <p>DEPTH: <u>43.2 ft</u></p> </div> </div> </div>

-NA- Not Available/Not Applicable

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1025

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S3 Ponds Functional AreaDATE: START: 7-26-93COORDINATES: UnknownFINISH: 8-10-93REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey- SAICDRILLING COMPANY: Highland Drilling Company DRILL: Ingersoll-Rand XL-750DRILLER: Russell Jones/Hubert Hall HELPER: Steve Brown/Randy PhillipsREASON FOR P&A: Loss of well security.P&A: METHOD: B DEVIATIONS FROM METHOD: Overwash bore not reamed due to depth being approximately equal to grout in open interval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 9.5-in./6.25-in.DRILLED/REAMED DEPTH: 30 ft/51.5 ftPLUG MATERIAL: CementCAP MATERIAL: Clay/Soil

-NA-: Not Applicable or Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1025A

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S3 PondsDATE: START: 8-6-93COORDINATES: UnknownFINISH: 8-10-93REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey- SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand T4WDRILLER: Hubert HallHELPER: Steve Brown/Russell JonesREASON FOR P&A: Loss of well security.P&A: METHOD: B DEVIATIONS FROM METHOD: None

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 6 1/8-in./10 5/8-in.DRILLED/REAMED
DEPTH: 44.6 ft/30.3 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

N/A: Not Applicable/ Not Available

*: Assumed to be 8.0-in. as were all similar wells in this group

**: Assumed to be 27.6 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMWELL NO. 1027**WELL PLUGGING AND ABANDONMENT DIAGRAM**LOCATION: Y-12 Burial GroundsDATE: START: 4-28-93COORDINATES: N30663 E44309FINISH: 5-5-93REFERENCE POINT FOR MEASUREMENTS: Ground surfacePREPARED BY: Tim J. Coffey-SAIC
V.R. Hamess-SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: Hubert HallHELPERS: Greg Anderson, Jim GallaherREASON FOR P&A: Well security compromised, substandard construction.P&A: METHOD: B DEVIATIONS FROM METHOD: Approved use of Quik-Foam™. Removal drilling and reaming performed simultaneously. Open interval not grouted prior to removal of surface casing.**WELL CONSTRUCTION SUMMARY****P&A SUMMARY**

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 101.5 ft
 PLUG MATERIAL: cement
 CAP MATERIAL: clay

*Stick-up missing at time of Plugging and Abandonment
 -NA- Not applicable/not available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1028

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 5-6-93

COORDINATES: N29427 E45511

FINISH: 5-17-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: T. Coffey-SAIC

DRILLING COMPANY: Highland Drilling Co.

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPERS: Greg Anderson

REASON FOR P&A: Loss of well security/substandard construction

P&A: METHOD: C DEVIATIONS FROM METHOD: Mill casing and ream borehole to 10 5/8-in. diameter in one operation.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8 in.
DRILLED/REAMED
DEPTH: 30.2 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Clay Soil

- NA -: Not Applicable/Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1029</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-5-93</u>
COORDINATES: <u>N29502 E44102</u>		FINISH: <u>5-7-93</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Timothy Coffey - SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>
DRILLER: <u>Hubert Hall</u> HELPER: <u>Greg Anderson</u>		
REASON FOR P&A: <u>Loss of well security/substandard well construction.</u>		
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Casing milled and borehole reamed to 10 5/8-in. diameter in one operation.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>CONDUCTOR HOLE DIA: <u>None</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>None</u></p> <p>BOREHOLE DIA.: <u>7.5-in.</u></p> <p>FILLER: <u>Soil</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u></p> <p>SEAL: <u>- NA -</u></p> <p>FILTER PACK: <u>Sand</u></p> <p>SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u></p> <p>TOTAL DEPTH: <u>18.5 ft</u></p> </div> <div style="width: 45%;"> <p>DEPTH <u>- NA -</u></p> <p>TOP <u>- NA -</u> BOTTOM <u>- NA -</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>18.5 ft</u></p> <p>TOP <u>+1.0 ft</u> BOTTOM <u>5.0 ft</u></p> <p>TOP <u>- NA -</u> BOTTOM <u>5.0 ft</u></p> <p>TOP <u>5.0 ft</u> BOTTOM <u>18.5 ft</u></p> <p>TOP <u>5.0 ft</u> BOTTOM <u>18.5 ft</u></p> </div> </div>		<p>REAMED DIA: <u>10 5/8-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>19.5 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay Soil</u></p>
<p style="text-align: center;">- NA -: Not Applicable</p>		<div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>CAP</p> <p>PLUG</p> <p>COLLAPSE</p> </div> <div style="width: 45%;"> <p>DEPTH: <u>2.2 ft</u></p> <p>DIA: <u>10 5/8-in.</u></p> <p>DEPTH: <u>19.0 ft</u></p> <p>DEPTH: <u>19.5 ft</u></p> </div> </div>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1032

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 5-5-93

COORDINATES: N29243 E43748

FINISH: 5-7-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPER: Greg Anderson

REASON FOR P&A: Loss of well security/substandard well construction.

P&A: METHOD: C DEVIATIONS FROM METHOD: Casing milled and borehole reamed to 10 5/8-in. diameter in one operation.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 59.0 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay Soil

- NA -: Not Applicable/Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1033</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		ALTERNATE NAMES: <u>YGMW-11, BG-07</u>
LOCATION: <u>Y-12 Burial Grounds</u>		DATE: START: <u>4-5-93</u>
COORDINATES: <u>N 30016 E 42899</u>		FINISH: <u>4-27-93</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Victor Harness-SAIC</u> <u>Tim Coffey-SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>
DRILLER: <u>Hubert Hall</u>		HELPERS: <u>Jim Gallaher, Steve Brown, Mark Baker</u>
REASON FOR P&A: <u>Well design obsolete. Construction allows groundwater communication.</u>		
P&A: METHOD: <u>D</u> DEVIATIONS FROM METHOD: <u>Use of bentonite from 32.2 ft to 18.4 ft BGS, cap depth of 1.9 ft BGS, and abandonment of caved section from 100 ft to 32.2 ft approved by Steve Jones - HSEA.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<div style="position: absolute; left: 240px; top: 605px; border: 1px solid black; padding: 2px;">BOREHOLE DIA: <u>Unknown</u></div> <div style="position: absolute; left: 240px; top: 645px; border: 1px solid black; padding: 2px;">FILLER: <u>Backfill</u></div> <div style="position: absolute; left: 240px; top: 685px; border: 1px solid black; padding: 2px;">CASING TYPE: <u>Steel/gal</u> DIA: <u>6.5-in. OD</u></div> <div style="position: absolute; left: 240px; top: 775px; border: 1px solid black; padding: 2px;">OPEN HOLE DIA: <u>Unknown</u></div> <div style="position: absolute; left: 240px; top: 875px; border: 1px solid black; padding: 2px;">TOTAL DEPTH: <u>160.0 ft</u></div> <div style="position: absolute; left: 460px; top: 710px;"> TOP <u>+1.91 ft</u> BOTTOM <u>52.2 ft*</u> </div> <div style="position: absolute; left: 460px; top: 775px;"> TOP <u>52.2 ft*</u> BOTTOM <u>160.0 ft</u> </div>		REAMED DIA: <u>10-5/8 in./6.5-in.</u> DRILLED/REAMED DEPTH: <u>92 ft/160 ft</u> PLUG MATERIAL: <u>Bentonite/Grout</u> CAP MATERIAL: <u>Clay</u>
<div style="text-align: right; padding-right: 20px;"> TOP <u>+1.91 ft</u> BOTTOM <u>52.2 ft*</u> </div> <div style="text-align: right; padding-right: 20px;"> TOP <u>52.2 ft*</u> BOTTOM <u>160.0 ft</u> </div>		<div style="position: absolute; left: 650px; top: 575px; border: 1px solid black; padding: 2px; text-align: center;">CAP</div> <div style="position: absolute; left: 650px; top: 625px; border: 1px solid black; padding: 2px; text-align: center;">PLUG</div> <div style="position: absolute; left: 650px; top: 665px; border: 1px solid black; padding: 2px; text-align: center;">+ + + BENTONITE + + +</div> <div style="position: absolute; left: 650px; top: 705px; border: 1px solid black; padding: 2px; text-align: center;">O O O CAVED O O O</div> <div style="position: absolute; left: 650px; top: 825px; border: 1px solid black; padding: 2px; text-align: center;">PLUG</div> <div style="position: absolute; left: 750px; top: 600px;">DEPTH: <u>1.9 ft</u></div> <div style="position: absolute; left: 750px; top: 635px;">DIA: <u>10-5/8 in.</u></div> <div style="position: absolute; left: 750px; top: 650px;">DEPTH: <u>18.4 ft</u></div> <div style="position: absolute; left: 750px; top: 685px;">DEPTH: <u>32.2 ft</u></div> <div style="position: absolute; left: 750px; top: 725px;">DEPTH: <u>92 ft</u></div> <div style="position: absolute; left: 750px; top: 755px;">DEPTH: <u>100 ft</u></div> <div style="position: absolute; left: 750px; top: 785px;">DIA: <u>6.5 in.</u></div> <div style="position: absolute; left: 750px; top: 900px;">DEPTH: <u>160.0 ft</u></div>

*Database records originally indicated bottom of casing and top of open hole at 110 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1035

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 5-10-93

COORDINATES: N31011 E42430

FINISH: 5-17-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Co.

DRILL: Ford 555B Backhoe with
McMillan Diggerhead auger motor

DRILLER: Steve Brown

HELPERS: Greg Shillings/Greg Anderson

REASON FOR P&A: Loss of well security/substandard well construction

P&A: METHOD: B DEVIATIONS FROM METHOD: Open interval plugged
with Hole Plug™. Portion of casing grouted in place.

WELL CONSTRUCTION SUMMARY

- NA -: Not Applicable/Available

P&A SUMMARY

REAMED DIA: 12.0 in.

DRILLED/REAMED
DEPTH: 18.3 ft

Cement/
PLUG MATERIAL: Hole Plug™

CAP MATERIAL: Clay Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1036

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 5-3-93

COORDINATES: N30197 E42173

FINISH: 5-17-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPERS: Steve Brown/Greg Shillings

REASON FOR P&A: Loss of well security/substandard well construction.

P&A: METHOD: B DEVIATIONS FROM METHOD: Casing milled and borehole reamed to 10 5/8-in. diameter in one operation. Used Quik-Foam™ to raise cuttings.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 102.4 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay Soil

- NA -: Not Applicable

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1037</u>																										
WELL PLUGGING AND ABANDONMENT DIAGRAM																												
LOCATION: <u>Bear Creek Burial Grounds</u>	DATE: START: <u>5-4-93</u>																											
COORDINATES: <u>N29731 E41185</u>	FINISH: <u>5-7-93</u>																											
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>	PREPARED BY: <u>Timothy Coffey - SAIC</u>																											
DRILLING COMPANY: <u>Highland Drilling Company</u>	DRILL: <u>Ingersoll-Rand XL-750</u>																											
DRILLER: <u>Hubert Hall</u>	HELPER: <u>Greg Shillings/Greg Anderson</u>																											
REASON FOR P&A: <u>Loss of well security/substandard well construction.</u>																												
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Casing milled and borehole reamed to 10 5/8-in. diameter in one operation. Reamed borehole 15 ft deeper than reported well depth because of suspected erroneous data base entry.</u>																												
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Diagram showing a cross-section of the well with various components labeled: CONDUCTOR HOLE, SURFACE CONDUCTOR, BOREHOLE, FILLER, CASING (WITH SCREEN), SEAL, FILTER PACK, SCREEN, and TOTAL DEPTH.</p> <table border="0" style="width: 100%; margin-top: 10px;"> <tr> <td style="width: 40%;">CONDUCTOR HOLE DIA: <u>None</u></td> <td style="width: 60%;">DEPTH <u>- NA -</u></td> </tr> <tr> <td>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>None</u></td> <td>TOP <u>- NA -</u> BOTTOM <u>- NA -</u></td> </tr> <tr> <td>BOREHOLE DIA.: <u>8.0 in.</u></td> <td>TOP <u>0.0 ft</u> BOTTOM <u>45.0 ft</u></td> </tr> <tr> <td>FILLER: <u>Cement</u></td> <td></td> </tr> <tr> <td>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u></td> <td>TOP <u>+2.9 ft</u> BOTTOM <u>35.0 ft</u></td> </tr> <tr> <td>SEAL: <u>Not Available</u></td> <td>TOP <u>Not Available</u> BOTTOM <u>Not Available</u></td> </tr> <tr> <td>FILTER PACK: <u>Sand</u></td> <td>TOP <u>Not Available</u> BOTTOM <u>45.0 ft</u></td> </tr> <tr> <td>SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u></td> <td>TOP <u>35.0 ft</u> BOTTOM <u>45.0 ft</u></td> </tr> <tr> <td colspan="2">TOTAL DEPTH: <u>45.0 ft</u></td> </tr> </table> <p style="text-align: center; margin-top: 10px;">- NA -: Not Applicable</p>		CONDUCTOR HOLE DIA: <u>None</u>	DEPTH <u>- NA -</u>	SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>None</u>	TOP <u>- NA -</u> BOTTOM <u>- NA -</u>	BOREHOLE DIA.: <u>8.0 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>45.0 ft</u>	FILLER: <u>Cement</u>		CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u>	TOP <u>+2.9 ft</u> BOTTOM <u>35.0 ft</u>	SEAL: <u>Not Available</u>	TOP <u>Not Available</u> BOTTOM <u>Not Available</u>	FILTER PACK: <u>Sand</u>	TOP <u>Not Available</u> BOTTOM <u>45.0 ft</u>	SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u>	TOP <u>35.0 ft</u> BOTTOM <u>45.0 ft</u>	TOTAL DEPTH: <u>45.0 ft</u>		<p>REAMED DIA: <u>10 5/8-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>60.0 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay Soil</u></p> <div style="margin-top: 20px;"> <p>Diagram showing the well cap and plug details with labels: CAP, PLUG, COLLAPSE, and DEPTH.</p> <table border="0" style="width: 100%; margin-top: 10px;"> <tr> <td style="width: 40%;">CAP</td> <td style="width: 60%;">DEPTH: <u>2.6 ft</u></td> </tr> <tr> <td>PLUG</td> <td>DIA: <u>10 5/8-in.</u></td> </tr> <tr> <td></td> <td>DEPTH: <u>57.8 ft</u></td> </tr> <tr> <td>COLLAPSE</td> <td>DEPTH: <u>60.0 ft</u></td> </tr> </table> </div>	CAP	DEPTH: <u>2.6 ft</u>	PLUG	DIA: <u>10 5/8-in.</u>		DEPTH: <u>57.8 ft</u>	COLLAPSE	DEPTH: <u>60.0 ft</u>
CONDUCTOR HOLE DIA: <u>None</u>	DEPTH <u>- NA -</u>																											
SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>None</u>	TOP <u>- NA -</u> BOTTOM <u>- NA -</u>																											
BOREHOLE DIA.: <u>8.0 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>45.0 ft</u>																											
FILLER: <u>Cement</u>																												
CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u>	TOP <u>+2.9 ft</u> BOTTOM <u>35.0 ft</u>																											
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FILTER PACK: <u>Sand</u>	TOP <u>Not Available</u> BOTTOM <u>45.0 ft</u>																											
SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u>	TOP <u>35.0 ft</u> BOTTOM <u>45.0 ft</u>																											
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PLUG	DIA: <u>10 5/8-in.</u>																											
	DEPTH: <u>57.8 ft</u>																											
COLLAPSE	DEPTH: <u>60.0 ft</u>																											

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1038

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 5-12-93

COORDINATES: N31111 E42810

FINISH: 5-14-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ford 555B Backhoe with
McMillan Diggerhead auger motor

DRILLER: Steve Brown

HELPERS: Greg Shillings/Greg Anderson

REASON FOR P&A: Loss of well security/substandard well construction

P&A: METHOD: C DEVIATIONS FROM METHOD: Auger over casing
and ream borehole in one operation. Borehole not reamed to 1.0 ft greater than well depth.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 12.0 in.
DRILLED/REAMED
DEPTH: 25.3 ft

PLUG MATERIAL: Cement
CAP MATERIAL: Clay Soil

- NA -: Not Applicable/Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1040

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 5-10-93

COORDINATES: N30766 E42331

FINISH: 5-17-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Company DRILL: Ford 555B Backhoe with
McMillan Diggerhead auger motor

DRILLER: Steve Brown HELPERS: Greg Shillings/Greg Anderson

REASON FOR P&A: Loss of well security/substandard well construction

P&A: METHOD: C DEVIATIONS FROM METHOD: Did not ream beyond
bottom of well casing. Portion of casing grouted in place.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 12.0 in.
DRILLED/REAMED
DEPTH: 23.0 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Clay Soil

- NA -: Not Applicable

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1041</u>																														
WELL PLUGGING AND ABANDONMENT DIAGRAM																																
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-6-93</u>																														
COORDINATES: <u>N30313 E42185</u>		FINISH: <u>5-17-93</u>																														
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Timothy Coffey - SAIC</u>																														
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ford 555B Backhoe with McMillan Diggerhead</u>																														
DRILLER: <u>Steve Brown</u>		HELPERS: <u>Greg Shillings/Jim Gallaher</u>																														
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P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Auger over casing and ream borehole in one operation.</u>																																
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
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CONDUCTOR HOLE DIA: <u>None</u>	DEPTH <u>- NA -</u>																															
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BOREHOLE DIA.: <u>7.5-in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>29.6 ft</u>																															
FILLER: <u>Unknown</u>																																
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SEAL: <u>Unknown</u>	TOP <u>- NA -</u> BOTTOM <u>- NA -</u>																															
FILTER PACK: <u>Sand</u>	TOP <u>5.0 ft</u> BOTTOM <u>29.6 ft</u>																															
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	COLLAPSE																															
	DEPTH: <u>30.0 ft</u>																															
	DEPTH: <u>30.4 ft</u>																															

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1043

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds, Walk-in Pits

DATE: START: 2-9-93

COORDINATES: N30434 E42887

FINISH: 2-12-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ford 555 Backhoe

DRILLER: Greg Shillings

HELPERS: Paul McCormick/James Gallaher

REASON FOR P&A: To proceed with closure of the Walk-in Pits site. Well hinders construction activities.

P&A: METHOD: B DEVIATIONS FROM METHOD: Well casing sealed with Hole Plug™ and 2% bentonite-cement grout to 1.1 ft BGS. Deviations approved by Steve Jones-HSEA.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: - NA -
 DRILLED/REAMED DEPTH: - NA -
 PLUG MATERIAL: Cement
 CAP MATERIAL: Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1048</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Bear Creek Burial Grounds</u> COORDINATES: <u>N30288 E47771</u> REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		DATE: START: <u>5-12-93</u> FINISH: <u>5-25-93</u> PREPARED BY: <u>D. Hollon (SAIC)</u> <u>V. Harness (SAIC)</u>
DRILLING COMPANY: <u>Highland Drilling Company</u> DRILLER: <u>H. Hall (Highland)</u>		DRILL: <u>Ingersoll-Rand XL-750</u> HELPERS: <u>R. Phillips and G. Anderson</u>
REASON FOR P&A: <u>Loss of well security and substandard construction.</u> P&A: METHOD: <u>B</u> DEVIATIONS FROM METHOD: <u>Quick Foam™ used.</u> <u>Mill casing and ream borehole to 10 5/8-in. diameter in one operation.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Diagram showing well construction layers from surface to 100.0 ft depth. Labels include: CONDUCTOR HOLE (None), SURFACE CONDUCTOR (None), BOREHOLE DIA. (7.5 in.), FILLER (Not Available), CASING (WITH SCREEN) (PVC/#40, 6.50 in.), OPEN HOLE DIA. (6.0), and TOTAL DEPTH (100.0 ft).</p>		REAMED DIA: <u>10 5/8 in.</u> DRILLED/REAMED DEPTH: <u>101.5 ft. BGS</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Clay Soil</u>
<p>CONDUCTOR HOLE DIA: <u>None</u> DEPTH <u>N/A</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> TOP <u>N/A</u> DIA: <u>N/A</u> BOTTOM <u>N/A</u></p> <p>BOREHOLE DIA.: <u>7.5 in.</u> TOP <u>0.0 ft</u> BOTTOM <u>31.5 ft</u></p> <p>FILLER: <u>Not Available</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> TOP <u>+1.9 ft</u> DIA: <u>6.50 in.</u> BOTTOM <u>30.0 ft</u></p> <p>OPEN HOLE DIA.: <u>6.0</u> TOP <u>30.0 ft</u> BOTTOM <u>100.0 ft</u></p> <p>TOTAL DEPTH: <u>100.0 ft</u></p> <p style="text-align: right;">N/A: Not Applicable</p>		<p>CAP DEPTH: <u>2.6</u></p> <p>PLUG DIA: <u>10 5/8 in.</u></p> <p>DEPTH: <u>97.3</u></p> <p>COLLAPSE</p> <p>DEPTH: <u>101.5</u></p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1049</u>																										
WELL PLUGGING AND ABANDONMENT DIAGRAM																												
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-14-93</u>																										
COORDINATES: <u>N29883 E47387</u>		FINISH: <u>5-21-93</u>																										
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>D. Hollon - SAIC</u>																										
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>																										
DRILLER: <u>H. Hall</u>		HELPERS: <u>G. Anderson</u>																										
REASON FOR P&A: <u>Loss of well security and substandard well construction</u>																												
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Casing milled and borehole reamed to 10 5/8-in. diameter in one operation.</u>																												
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">CONDUCTOR HOLE DIA: <u>N/A</u></td> <td style="text-align: right;">DEPTH <u>N/A</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SURFACE CONDUCTOR TYPE: <u>N/A</u> DIA: <u>N/A</u></td> <td style="text-align: right;">TOP <u>N/A</u> BOTTOM <u>N/A</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">BOREHOLE DIA.: <u>8 in.</u></td> <td style="text-align: right;">TOP <u>0.0 ft</u> BOTTOM <u>20.0 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">FILLER: <u>Cement</u></td> <td></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u></td> <td style="text-align: right;">TOP <u>+1.6 ft</u> BOTTOM <u>20.0 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SEAL: <u>Not present</u></td> <td style="text-align: right;">TOP <u>N/A</u> BOTTOM <u>N/A</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">FILTER PACK: <u>Sand</u></td> <td style="text-align: right;">TOP <u>10.0 ft</u> BOTTOM <u>20.0 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SCREEN TYPE: <u>PVC/Slotted</u> DIA: <u>6.5-in. OD</u></td> <td style="text-align: right;">TOP <u>10.0 ft</u> BOTTOM <u>20.0 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">TOTAL DEPTH: <u>20.0 ft</u></td> <td></td> </tr> </table> <p style="text-align: right; margin-top: 10px;">N/A: Not Applicable</p>		CONDUCTOR HOLE DIA: <u>N/A</u>	DEPTH <u>N/A</u>	SURFACE CONDUCTOR TYPE: <u>N/A</u> DIA: <u>N/A</u>	TOP <u>N/A</u> BOTTOM <u>N/A</u>	BOREHOLE DIA.: <u>8 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>20.0 ft</u>	FILLER: <u>Cement</u>		CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u>	TOP <u>+1.6 ft</u> BOTTOM <u>20.0 ft</u>	SEAL: <u>Not present</u>	TOP <u>N/A</u> BOTTOM <u>N/A</u>	FILTER PACK: <u>Sand</u>	TOP <u>10.0 ft</u> BOTTOM <u>20.0 ft</u>	SCREEN TYPE: <u>PVC/Slotted</u> DIA: <u>6.5-in. OD</u>	TOP <u>10.0 ft</u> BOTTOM <u>20.0 ft</u>	TOTAL DEPTH: <u>20.0 ft</u>		<p>REAMED DIA: <u>10 5/8 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>22.3 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay Soil</u></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">CAP</td> <td style="text-align: right;">← DEPTH: <u>2.9 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">PLUG</td> <td style="text-align: right;">← DIA: <u>10 5/8 in.</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">COLLAPSE</td> <td style="text-align: right;">← DEPTH: <u>20.0 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;"></td> <td style="text-align: right;">← DEPTH: <u>22.3 ft</u></td> </tr> </table>	CAP	← DEPTH: <u>2.9 ft</u>	PLUG	← DIA: <u>10 5/8 in.</u>	COLLAPSE	← DEPTH: <u>20.0 ft</u>		← DEPTH: <u>22.3 ft</u>
CONDUCTOR HOLE DIA: <u>N/A</u>	DEPTH <u>N/A</u>																											
SURFACE CONDUCTOR TYPE: <u>N/A</u> DIA: <u>N/A</u>	TOP <u>N/A</u> BOTTOM <u>N/A</u>																											
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FILLER: <u>Cement</u>																												
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FILTER PACK: <u>Sand</u>	TOP <u>10.0 ft</u> BOTTOM <u>20.0 ft</u>																											
SCREEN TYPE: <u>PVC/Slotted</u> DIA: <u>6.5-in. OD</u>	TOP <u>10.0 ft</u> BOTTOM <u>20.0 ft</u>																											
TOTAL DEPTH: <u>20.0 ft</u>																												
CAP	← DEPTH: <u>2.9 ft</u>																											
PLUG	← DIA: <u>10 5/8 in.</u>																											
COLLAPSE	← DEPTH: <u>20.0 ft</u>																											
	← DEPTH: <u>22.3 ft</u>																											

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1050

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Oil Landfarm Functional Area

DATE: START: 5-17-93

COORDINATES: N29370 E46969

FINISH: 5-25-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: V.R. Hamess - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll Rand XL-750

DRILLER: Hubert Hall

HELPER: Steve Brown, Randy Phillips

REASON FOR P&A: Well security compromised, substandard construction

P&A: METHOD: C DEVIATIONS FROM METHOD: Use of Quik Foam™, part of plug is bentonite, removal drilling and reaming performed in one pass.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
DRILLED/REAMED DEPTH: 90 ft
Bentonite/
PLUG MATERIAL: cement
CAP MATERIAL: Clay

*Database gives TD as 22 ft BGS.
Before P&A, well was tagged at 89 ft BGS.

NOT TO SCALE

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1051

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 5-14-93

COORDINATES: N29797 E47777

FINISH: 5-21-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: D. Hollon

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: H. Hall

HELPERS: G. Anderson

REASON FOR P&A: Loss of well security and substandard well construction

P&A: METHOD: C DEVIATIONS FROM METHOD: Casing milled and borehole reamed to 10 5/8-in. diameter in one operation.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8 in.
 DRILLED/REAMED DEPTH: 29.5 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1052

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Oil Landfarm Functional Area

DATE: START: 5-19-93

COORDINATES: N29968 E45400

FINISH: 5-25-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: V.R. Hamess - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPER: Randy Phillips, Greg Anderson

REASON FOR P&A: Well security compromised, substandard construction

P&A: METHOD: C

DEVIATIONS FROM METHOD: Removal drilling and

reaming done in one pass.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.

DRILLED/REAMED

DEPTH: 23.0 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Clay

NA = not applicable, not available

NOT TO SCALE

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1071</u>																										
WELL PLUGGING AND ABANDONMENT DIAGRAM																												
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-12-93</u>																										
COORDINATES: <u>N30961 E42826</u>		FINISH: <u>5-14-93</u>																										
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>T. Coffey-SAIC</u>																										
DRILLING COMPANY: <u>Highland Drilling Company</u> DRILL: <u>Ford 555B Backhoe with McMillan Diggerhead auger motor</u>																												
DRILLER: <u>Steve Brown</u> HELPERS: <u>Greg Shillings/Greg Anderson</u>																												
REASON FOR P&A: <u>Loss of well security/substandard construction</u>																												
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Auger over casing and ream borehole to 12.0-in. diameter in one operation. Casing from 2.3 ft. BGS to end of well assumed ground up by augers.</u>																												
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<table style="width: 100%; margin-top: 10px;"> <tr> <td>CONDUCTOR HOLE DIA: <u>None</u></td> <td>DEPTH <u>- NA -</u></td> </tr> <tr> <td>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>None</u></td> <td>TOP <u>- NA -</u> BOTTOM <u>- NA -</u></td> </tr> <tr> <td>BOREHOLE DIA: <u>7.5 in.</u></td> <td>TOP <u>0.0 ft</u> BOTTOM <u>21.0 ft</u></td> </tr> <tr> <td>FILLER: <u>- NA -</u></td> <td></td> </tr> <tr> <td>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u></td> <td>TOP <u>+2.3 ft</u> BOTTOM <u>5.0 ft</u></td> </tr> <tr> <td>SEAL: <u>- NA -</u></td> <td>TOP <u>- NA -</u> BOTTOM <u>5.0 ft.</u></td> </tr> <tr> <td>FILTER PACK: <u>Sand</u></td> <td>TOP <u>5.0 ft.</u> BOTTOM <u>20.0 ft.</u></td> </tr> <tr> <td>SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u></td> <td>TOP <u>5.0 ft</u> BOTTOM <u>20.0 ft</u></td> </tr> <tr> <td colspan="2">TOTAL DEPTH: <u>21.0 ft</u></td> </tr> </table> <p style="text-align: center; margin-top: 10px;">- NA - : Not Applicable/Available</p>		CONDUCTOR HOLE DIA: <u>None</u>	DEPTH <u>- NA -</u>	SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>None</u>	TOP <u>- NA -</u> BOTTOM <u>- NA -</u>	BOREHOLE DIA: <u>7.5 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>21.0 ft</u>	FILLER: <u>- NA -</u>		CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>6.5-in. OD</u>	TOP <u>+2.3 ft</u> BOTTOM <u>5.0 ft</u>	SEAL: <u>- NA -</u>	TOP <u>- NA -</u> BOTTOM <u>5.0 ft.</u>	FILTER PACK: <u>Sand</u>	TOP <u>5.0 ft.</u> BOTTOM <u>20.0 ft.</u>	SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u>	TOP <u>5.0 ft</u> BOTTOM <u>20.0 ft</u>	TOTAL DEPTH: <u>21.0 ft</u>		<p>REAMED DIA: <u>12.0 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>22.0 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay Soil</u></p> <div style="margin-top: 20px;"> <table style="width: 100%; margin-top: 10px;"> <tr> <td>CAP</td> <td>DEPTH: <u>1.4 ft</u></td> </tr> <tr> <td>PLUG</td> <td>DIA: <u>12.0 in.</u></td> </tr> <tr> <td></td> <td>DEPTH: <u>17.0 ft</u></td> </tr> <tr> <td>COLLAPSE</td> <td>DEPTH: <u>22.0 ft</u></td> </tr> </table> </div>	CAP	DEPTH: <u>1.4 ft</u>	PLUG	DIA: <u>12.0 in.</u>		DEPTH: <u>17.0 ft</u>	COLLAPSE	DEPTH: <u>22.0 ft</u>
CONDUCTOR HOLE DIA: <u>None</u>	DEPTH <u>- NA -</u>																											
SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>None</u>	TOP <u>- NA -</u> BOTTOM <u>- NA -</u>																											
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FILLER: <u>- NA -</u>																												
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SEAL: <u>- NA -</u>	TOP <u>- NA -</u> BOTTOM <u>5.0 ft.</u>																											
FILTER PACK: <u>Sand</u>	TOP <u>5.0 ft.</u> BOTTOM <u>20.0 ft.</u>																											
SCREEN TYPE: <u>PVC/sl</u> DIA: <u>6.5-in. OD</u>	TOP <u>5.0 ft</u> BOTTOM <u>20.0 ft</u>																											
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	DEPTH: <u>17.0 ft</u>																											
COLLAPSE	DEPTH: <u>22.0 ft</u>																											

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1088</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Oil Landfarm Functional Area</u>		DATE: START: <u>6-8-93</u>
COORDINATES: <u>N29342 E49162</u>		FINISH: <u>6-15-93</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Timothy Coffey - SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Not Applicable</u>
DRILLER: <u>Greg Shillings</u>		HELPERS: <u>Steve Brown/James Gallaher</u>
REASON FOR P&A: <u>Loss of well security/substandard well construction.</u>		
P&A: METHOD: <u>B</u> DEVIATIONS FROM METHOD: <u>Top 2.9 ft of casing removed, remainder of casing sealed with Hole Plug™/grouted in place.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>-NA-</u> TOP <u>-NA-</u> DIA: <u>None</u> BOTTOM <u>-NA-</u></p> <p>BOREHOLE DIA: <u>-NA-</u> TOP <u>0.0 ft</u> BOTTOM <u>-NA-</u></p> <p>FILLER: <u>-NA-</u></p> <p>CASING TYPE: <u>Steel</u> TOP <u>+0.6 ft</u> DIA: <u>4.0-in. OD*</u> BOTTOM <u>-NA-</u></p> <p>OPEN HOLE DIA: <u>2.98-in.</u> TOP <u>-NA-</u> BOTTOM <u>117.7 ft</u></p> <p>TOTAL DEPTH: <u>117.7 ft</u></p>		<p>REAMED DIA: <u>-NA-</u></p> <p>DRILLED/REAMED DEPTH: <u>-NA-</u></p> <p>Hole Plug™/ PLUG MATERIAL: <u>cement</u></p> <p>CAP MATERIAL: <u>Clay Soil</u></p>
<p>* Actual dimension. Subsurface data base reports 6.5-in. OD casing.</p> <p>- NA -: Not Available/Not Applicable</p>		<p>CAP DEPTH: <u>2.6 ft</u></p> <p>CEMENT</p> <p>DEPTH: <u>21.6 ft</u></p> <p>HOLE PLUG™</p> <p>DEPTH: <u>124.7 ft</u></p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1130</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>12-2-92</u>
COORDINATES: <u>N26, 314 E59, 972</u>		FINISH: <u>12-15-92</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Timothy Coffey</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>
DRILLER: <u>Hubert Hall</u>		HELPERS: <u>Scott Gilbert/Steve Brown</u>
REASON FOR P&A: <u>Well location impedes construction of new landfill.</u>		
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Cement/grout level to 5.0 ft. BGS.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<div style="display: flex; flex-direction: column; gap: 10px;"> <div> CONDUCTOR HOLE DIA: <u>N/A</u> DEPTH <u>N/A</u> </div> <div> SURFACE CONDUCTOR TYPE: <u>N/A</u> TOP <u>N/A</u> DIA: <u>N/A</u> BOTTOM <u>N/A</u> </div> <div> BOREHOLE DIA.: <u>9.63 in.</u> TOP <u>0.0 ft</u> BOTTOM <u>23.5 ft</u> </div> <div> FILLER: <u>Neat Cement</u> </div> <div> CASING (WITH SCREEN) TYPE: <u>#40 PVC</u> TOP <u>+2.2 ft</u> DIA: <u>4.0 in.</u> BOTTOM <u>23.5 ft</u> </div> <div> SEAL: <u>Bentonite</u> TOP <u>9.0 ft</u> BOTTOM <u>11.0 ft</u> </div> <div> FILTER PACK: <u>Sand</u> TOP <u>11.0 ft</u> BOTTOM <u>23.5 ft</u> </div> <div> SCREEN TYPE: <u>0.02 slot PVC</u> TOP <u>13.0 ft</u> DIA: <u>4.0 in.</u> BOTTOM <u>23.5 ft</u> </div> <div> TOTAL DEPTH: <u>23.5 ft</u> </div> </div>		REAMED DIA: <u>10 5/8 in.</u> DRILLED/REAMED DEPTH: <u>25.0 ft</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Soil</u>
		<div style="display: flex; flex-direction: column; gap: 10px;"> <div> CAP DEPTH: <u>5.0 ft</u> </div> <div> PLUG DIA: <u>10 5/8 in.</u> </div> <div> DEPTH: <u>25.0 ft</u> </div> </div>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1131</u>																		
WELL PLUGGING AND ABANDONMENT DIAGRAM																				
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>12-3-92</u>																		
COORDINATES: <u>N26.834 E60.036</u>		FINISH: <u>12-15-92</u>																		
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Timothy Coffey</u>																		
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>																		
DRILLER: <u>Hubert Hall</u> HELPERS: <u>Steve Brown</u>																				
REASON FOR P&A: <u>Well location impedes construction of new landfill.</u>																				
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>None</u>																				
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<table style="margin-left: 20px;"> <tr> <td>CONDUCTOR HOLE DIA: <u>N/A</u></td> <td>DEPTH <u>N/A</u></td> </tr> <tr> <td>SURFACE CONDUCTOR TYPE: <u>N/A</u> DIA: <u>N/A</u></td> <td>TOP <u>N/A</u> BOTTOM <u>N/A</u></td> </tr> <tr> <td>BOREHOLE DIA.: <u>9.63 in.</u></td> <td>TOP <u>0.0 ft</u> BOTTOM <u>30.0 ft</u></td> </tr> <tr> <td>FILLER: <u>Neat Cement</u></td> <td></td> </tr> <tr> <td>CASING (WITH SCREEN) TYPE: <u>#40 PVC</u> DIA: <u>4.0 in.</u></td> <td>TOP <u>+3.1 ft</u> BOTTOM <u>30.0 ft</u></td> </tr> <tr> <td>SEAL: <u>Bentonite</u></td> <td>TOP <u>15.0 ft</u> BOTTOM <u>17.5 ft</u></td> </tr> <tr> <td>FILTER PACK: <u>Sand</u></td> <td>TOP <u>17.5 ft</u> BOTTOM <u>30.0 ft</u></td> </tr> <tr> <td>SCREEN TYPE: <u>0.02 slot PVC</u> DIA: <u>4.0 in.</u></td> <td>TOP <u>19.5 ft</u> BOTTOM <u>30.0 ft</u></td> </tr> <tr> <td colspan="2">TOTAL DEPTH: <u>30.0 ft</u></td> </tr> </table>		CONDUCTOR HOLE DIA: <u>N/A</u>	DEPTH <u>N/A</u>	SURFACE CONDUCTOR TYPE: <u>N/A</u> DIA: <u>N/A</u>	TOP <u>N/A</u> BOTTOM <u>N/A</u>	BOREHOLE DIA.: <u>9.63 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>30.0 ft</u>	FILLER: <u>Neat Cement</u>		CASING (WITH SCREEN) TYPE: <u>#40 PVC</u> DIA: <u>4.0 in.</u>	TOP <u>+3.1 ft</u> BOTTOM <u>30.0 ft</u>	SEAL: <u>Bentonite</u>	TOP <u>15.0 ft</u> BOTTOM <u>17.5 ft</u>	FILTER PACK: <u>Sand</u>	TOP <u>17.5 ft</u> BOTTOM <u>30.0 ft</u>	SCREEN TYPE: <u>0.02 slot PVC</u> DIA: <u>4.0 in.</u>	TOP <u>19.5 ft</u> BOTTOM <u>30.0 ft</u>	TOTAL DEPTH: <u>30.0 ft</u>		REAMED DIA: <u>10 5/8 in.</u> DRILLED/REAMED DEPTH: <u>31.8 ft</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Soil</u>
CONDUCTOR HOLE DIA: <u>N/A</u>	DEPTH <u>N/A</u>																			
SURFACE CONDUCTOR TYPE: <u>N/A</u> DIA: <u>N/A</u>	TOP <u>N/A</u> BOTTOM <u>N/A</u>																			
BOREHOLE DIA.: <u>9.63 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>30.0 ft</u>																			
FILLER: <u>Neat Cement</u>																				
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SEAL: <u>Bentonite</u>	TOP <u>15.0 ft</u> BOTTOM <u>17.5 ft</u>																			
FILTER PACK: <u>Sand</u>	TOP <u>17.5 ft</u> BOTTOM <u>30.0 ft</u>																			
SCREEN TYPE: <u>0.02 slot PVC</u> DIA: <u>4.0 in.</u>	TOP <u>19.5 ft</u> BOTTOM <u>30.0 ft</u>																			
TOTAL DEPTH: <u>30.0 ft</u>
		<p style="text-align: right;">CAP ← DEPTH: <u>2.5 ft</u> ← DIA: <u>10 5/8 in.</u> PLUG ← DEPTH: <u>31.8 ft</u></p>																		

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. 1132

LOCATION: SPAD Landfill Site

COORDINATES: N27.243 E60.134

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

DATE: START: 12-4-92

FINISH: 12-15-92

Timothy Coffey

PREPARED BY: Mike Klidzeis - SAIC

DRILLING COMPANY: Highland Drilling

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPERS: Steve Brown

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: C

DEVIATIONS FROM METHOD: None

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8 in.
 DRILLED/REAMED DEPTH: 30.3 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1133</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>3/3/93</u>
COORDINATES: <u>N27.423 E59.147</u>		FINISH: <u>3/18/93</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>V.R. Hamess-SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>
DRILLER: <u>Hubert Hall</u>		HELPER: <u>Greg Shillings</u>
REASON FOR P&A: <u>Well obstructs construction of landfill.</u>		
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Cap depth of 2.5 ft instead of 4 ft approved by Steve Jones - HSEA.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>-NA-</u> TOP <u>-NA-</u> DIA: <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>BOREHOLE DIA: <u>9.63-in.</u> TOP <u>0.0 ft</u> BOTTOM <u>24.0 ft</u></p> <p>FILLER: <u>Cement</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> TOP <u>+1.53 ft</u> DIA: <u>4.0-in. OD</u> BOTTOM <u>24.0 ft</u></p> <p>SEAL: <u>bentonite</u> TOP <u>Unknown</u> BOTTOM <u>11.3 ft</u></p> <p>FILTER PACK: <u>pea gravel</u> TOP <u>11.3 ft</u> BOTTOM <u>24.0 ft</u></p> <p>SCREEN TYPE: <u>PVC/s/V.02</u> TOP <u>13.3 ft</u> DIA: <u>4.0-in. OD</u> BOTTOM <u>24.0 ft</u></p> <p>TOTAL DEPTH: <u>24 ft</u></p>		<p>REAMED DIA: <u>10.63-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>25 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay</u></p> <p>CAP ← DEPTH: <u>2.5 ft</u></p> <p>← DIA: <u>10.63-in.</u></p> <p>PLUG</p> <p>← DEPTH: <u>25 ft</u></p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMWELL NO. 1134**WELL PLUGGING AND ABANDONMENT DIAGRAM**LOCATION: SPAD Landfill Functional AreaDATE: START: 5-27-93COORDINATES: N26814 E58819FINISH: 6-16-93REFERENCE POINT FOR MEASUREMENTS: Ground surfacePREPARED BY: Tim J. Coffey-SAIC
V.R. Harness-SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll Rand XL-750DRILLER: Hubert HallHELPERS: Greg Anderson, Jim GallaherREASON FOR P&A: Damaged well screenP&A: METHOD: C DEVIATIONS FROM METHOD: Use of Pea gravel and bentonite to fill large lost circulation zones.**WELL CONSTRUCTION SUMMARY****P&A SUMMARY**

NOT TO SCALE

REAMED DIA.: 13.5-in./7 5/8-in.
 DRILLED/REAMED DEPTH: 89.8 ft/192.0 ft
 Cement/Pea Gravel
 PLUG MATERIAL: Bentonite
 CAP MATERIAL: Clay Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-030

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds, Walk-in Pits

DATE: START: 2-8-93

COORDINATES: N30235 E43108

FINISH: 2-10-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ford 555 Backhoe

DRILLER: Greg Shillings

HELPERS: Paul McCormick

REASON FOR P&A: To proceed with closure of the Walk-in Pits site. Well hinders construction activities.

P&A: METHOD: A DEVIATIONS FROM METHOD: Well casing sealed entirely with Hole Plug™ and cement-grout, deviation approved by Steve Jones - HSE.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: - NA -
 DRILLED/REAMED DEPTH: - NA -
 PLUG MATERIAL: Hole Plug™/Cement
 CAP MATERIAL: Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-031

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds, Walk-in Pits

DATE: START: 2-8-93

COORDINATES: N30240 E43109

FINISH: 2-10-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Company DRILL: Ford 555 Backhoe

DRILLER: Greg Shillings HELPERS: Paul McCormick

REASON FOR P&A: To proceed with closure of the Walk-in Pits site. Well hinders construction activities.

P&A: METHOD: A DEVIATIONS FROM METHOD: Well casing sealed to ground surface with Hole Plug™ and cement-grout, deviation approved by Steve Jones - HSE.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: -NA-
 DRILLED/REAMED DEPTH: -NA-
 PLUG MATERIAL: Cement
 CAP MATERIAL: Soil

* - Missing/destroyed

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. GW-032

LOCATION: Bear Creek Burial Grounds, Walk-in Pits

DATE: START: 2-8-93

COORDINATES: N30388 E42850

FINISH: 2-12-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ford 555 Backhoe

DRILLER: Greg Shillings

HELPERS: Paul McCormick/James Gallaher

REASON FOR P&A: To proceed with closure of the Walk-in Pits site. Well hinders construction activities.

P&A: METHOD: A DEVIATIONS FROM METHOD: Well casing sealed to 4.0 ft BGS with a 4% bentonite cement-grout. Deviations approved by Steve Jones - HSE.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: -NA-
 DRILLED/REAMED DEPTH: -NA-
 Hole Plug™
 PLUG MATERIAL: Cement
 CAP MATERIAL: Soil

*Hole drilled on angle of 40° below horizontal.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-035

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds, Walk-in Pits

DATE: START: 2-12-93

COORDINATES: N30712 E43183

FINISH: 2-16-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Company DRILL: Ford 555 Backhoe

DRILLER: Greg Shillings HELPERS: Paul McCormick

REASON FOR P&A: To proceed with closure of the Walk-in Pits site. Well hinders construction activities.

P&A: METHOD: A DEVIATIONS FROM METHOD: Well casing sealed to 4.0 ft BGS with Hole Plug™, deviation approved by Steve Jones - HSE.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: -NA-
 DRILLED/REAMED DEPTH: -NA-
 PLUG MATERIAL: Hole Plug™
 CAP MATERIAL: Soil

*Wellhead destroyed. Top found approx. 3.5 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-036</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>	DATE: START: <u>2-8-93</u>	
COORDINATES: <u>N30778 E43262</u>	FINISH: <u>2-11-93</u>	
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>	PREPARED BY: <u>Timothy Coffey-SAIC</u>	
DRILLING COMPANY: <u>Highland Drilling Company</u>	DRILL: <u>Ford 555 Backhoe</u>	
DRILLER: <u>Greg Shillings</u>	HELPERS: <u>Paul McCormick/James Gallaher</u>	
REASON FOR P&A: <u>To proceed with closure of the Walk-in Pits site. Well hinders construction activities.</u>		
P&A: METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Well casing sealed to 3.6 ft BGS with Hole Plug™ and cement-grout, deviation approved by Steve Jones - HSE.</u>		
WELL CONSTRUCTION SUMMARY	P&A SUMMARY
<p>CONDUCTOR HOLE DIA: <u>Unknown</u> DEPTH <u>Unknown</u></p> <p>SURFACE CONDUCTOR TYPE: <u>Steel</u> TOP <u>+2.9 ft</u> DIA: <u>6.62-in. OD</u> BOTTOM <u>2.1 ft</u></p> <p>BOREHOLE DIA.: <u>6.0-in.</u> TOP <u>0.0 ft</u> BOTTOM <u>39.1 ft</u></p> <p>FILLER: <u>Cement</u></p> <p>CASING (WITH SCREEN) TYPE: <u>SS/#304</u> TOP <u>+3.4 ft</u> DIA: <u>2.37-in. OD</u> BOTTOM <u>34.9 ft</u></p> <p>SEAL: <u>Unknown</u> TOP <u>Unknown</u> BOTTOM <u>8.5 ft</u></p> <p>FILTER PACK: <u>Unknown</u> TOP <u>8.5 ft</u> BOTTOM <u>39.1 ft</u></p> <p>SCREEN TYPE: <u>SS/SW0.01</u> TOP <u>34.9 ft</u> DIA: <u>2.37-in. OD</u> BOTTOM <u>36.9 ft</u></p> <p>TOTAL DEPTH: <u>39.1 ft</u></p>	<p>REAMED DIA: <u>-NA-</u></p> <p>DRILLED/REAMED DEPTH: <u>-NA-</u></p> <p>Hole Plug™/ PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Soil</u></p> <p>CAP ← DEPTH: <u>3.6 ft</u></p> <p>CEMENT</p> <p>DEPTH: <u>25.5 ft</u></p> <p>HOLE PLUG™</p>	

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. GW-037

LOCATION: Bear Creek Burial Grounds, Walk-in Pits

COORDINATES: N30685 E43346

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DATE: START: 2-8-93

FINISH: 2-11-93

DRILLING COMPANY: Highland Drilling Company

DRILL: Ford 555 Backhoe

DRILLER: Greg Shillings

HELPERS: Paul McCormick/James Gallaher

REASON FOR P&A: To proceed with closure of the Walk-in Pits site. Well hinders construction activities.

P&A: METHOD: A DEVIATIONS FROM METHOD: Well casing sealed

to 3.3 ft BGS with Hole Plug™ and cement-grout, deviation approved by Steve Jones - HSE.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: -NA-

DRILLED/REAMED

DEPTH: -NA-

Hole Plug™

PLUG MATERIAL: Cement

CAP MATERIAL: Soil

DEPTH: 3.3 ft

CEMENT

DEPTH: 31.2 ft

HOLE PLUG™

CONDUCTOR HOLE
DIA: Unknown

SURFACE CONDUCTOR
TYPE: Steel
DIA: 6.62-in. OD
TOP: +2.3 ft
BOTTOM: 2.7 ft

FILLER: Cement

CASING (WITH SCREEN)
TYPE: SS/#304
DIA: 2.37-in. OD
TOP: +2.8 ft
BOTTOM: 64.5 ft

SEAL: Unknown

FILTER PACK: Unknown

SCREEN
TYPE: SS/SW/0.01
DIA: 2.37-in. OD
TOP: 64.5 ft
BOTTOM: 66.5 ft

TOTAL DEPTH: 70.0 ft

DEPTH: Unknown

TOP: +2.3 ft
BOTTOM: 2.7 ft

TOP: 0.0 ft
BOTTOM: 70.0 ft

TOP: +2.8 ft
BOTTOM: 64.5 ft

TOP: Unknown
BOTTOM: 42.0 ft

TOP: 42.0 ft
BOTTOM: 68.7 ft

TOP: 64.5 ft
BOTTOM: 66.5 ft

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-038</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Bear Creek Burial Grounds, Walk-in Pits</u>		DATE: START: <u>2-8-93</u>
COORDINATES: <u>N30533 E43373</u>		FINISH: <u>2-11-93</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Timothy Coffey-SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ford 555 Backhoe</u>
DRILLER: <u>Greg Shillings</u>		HELPERS: <u>Paul McCormick/James Gallaher</u>
REASON FOR P&A: <u>To proceed with closure of the Walk-in Pits site. Well hinders construction activities.</u>		
P&A: METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Well casing sealed to 1.1 ft BGS with Hole Plug™ and cement-grout, deviation approved by Steve Jones - HSE.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>CONDUCTOR HOLE DIA: <u>Unknown</u> DEPTH <u>Unknown</u></p> <p>SURFACE CONDUCTOR TYPE: <u>Steel</u> TOP <u>+1.7 ft</u> DIA: <u>6.62-in. OD</u> BOTTOM <u>3.3 ft</u></p> <p>BOREHOLE DIA.: <u>6.0-in.</u> TOP <u>0.0 ft</u> BOTTOM <u>52.5 ft</u></p> <p>FILLER: <u>Cement</u></p> <p>CASING (WITH SCREEN) TYPE: <u>SS/#304</u> TOP <u>+2.2 ft</u> DIA: <u>2.37-in. OD</u> BOTTOM <u>41.2 ft</u></p> <p>SEAL: <u>Unknown</u> TOP <u>Unknown</u> BOTTOM <u>38.9 ft</u></p> <p>FILTER PACK: <u>Unknown</u> TOP <u>38.9 ft</u> BOTTOM <u>52.4 ft</u></p> <p>SCREEN TYPE: <u>SS/SW0.01</u> TOP <u>41.2 ft</u> DIA: <u>2.37-in. OD</u> BOTTOM <u>51.2 ft</u></p> <p>TOTAL DEPTH: <u>52.5 ft</u></p>		<p>REAMED DIA: <u>-NA-</u></p> <p>DRILLED/REAMED DEPTH: <u>-NA-</u></p> <p>Hole Plug™/ PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Soil</u></p>
		<p>CAP DEPTH: <u>3.0 ft</u></p> <p>CEMENT</p> <p>DEPTH: <u>44.5 ft</u></p> <p>HOLE PLUG™</p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-063

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Oil Landfarm Functional Area

DATE: START: 3/25/93

COORDINATES: N29016 E48257

FINISH: 4/7/93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Tim J. Coffey-SAIC
V.R. Harness-SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPER: Greg Shillings/Steve Brown/Scott Gilbert

REASON FOR P&A: Well is obstructed by hung bailer and is damaged.

P&A: METHOD: A DEVIATIONS FROM METHOD: Casing from 18 ft BGS to bottom reamed out. Bore is plugged from 30 ft to 18.9 ft BGS with Hole Plug™ (deviations approved by Steve Jones - HSEA).

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 36 ft
 PLUG MATERIAL: Cement/Hole Plug™
 CAP MATERIAL: Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-088

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 4-27-93

COORDINATES: N30578 E43768

FINISH: 5-5-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: V.R. Hamess - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPER: Randy Phillips, Greg Anderson, Steve Brown

REASON FOR P&A: Well security compromised, substandard well construction

P&A: METHOD: A

DEVIATIONS FROM METHOD: None

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 32.0 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-234

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds

DATE: START: 4-26-93

COORDINATES: N30620 E43621

FINISH: 5-5-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersol Rand XL-750

DRILLER: Hubert Hall

HELPER: Randy Phillips/Jim Gallaher

REASON FOR P&A: Well is damaged.

P&A: METHOD: A DEVIATIONS FROM METHOD: Bottom 14.6 ft of well casing sealed in borehole. Hole Plug™ used to seal portion of borehole.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
 DRILLED/REAMED DEPTH: 17.5 ft
 PLUG MATERIAL: Cement/Hole Plug™
 CAP MATERIAL: Clay Soil

- NA -: Not Applicable

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-502

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial Grounds, Walk-in Pits

DATE: START: 2-8-93

COORDINATES: N30269 E43114

FINISH: 2-11-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey-SAIC

DRILLING COMPANY: Highland Drilling Company DRILL: Ford 555 Backhoe

DRILLER: Greg Shillings HELPERS: Paul McCormick

REASON FOR P&A: To proceed with closure of the Walk-in Pits site. Well hinders construction activities

P&A: METHOD: B DEVIATIONS FROM METHOD: Well casing sealed to 3.0 ft BGS with Hole Plug™ and bentonite-cement grout. Deviation approved by Steve Jones - HSE.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: -NA-
 DRILLED/REAMED DEPTH: -NA-
 Hole Plug™/
 PLUG MATERIAL: Cement
 CAP MATERIAL: Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-551

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 12-2-92

COORDINATES: E 60,263 N 27,299

FINISH: 1-6-93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Susan L. Abston-SAIC
Victor Hamess-SAIC
Michael Kildzejs-SAIC

DRILLING COMPANY: Law Engineering Co.
Highland Drilling Co.

CME Model 75
DRILL: Ingersoll-Rand XL-750

DRILLER: Rob Tillery - Law Engineering
Hubert Hall - Highland

Mel Wagner - Law Engineering
HELPERS: Steve Brown, Greg Shillings - Highland

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: D DEVIATIONS FROM METHOD: Cap depth of 2.4 ft.,
Permission from Steve Jones (HSE).

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10-5/8 in./6.25-in./3.79-in.
DRILLED/REAMED DEPTH: 92.0 ft/97.0 ft/145.9 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-553

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 12/8/92

COORDINATES: N26.363 E61.047

FINISH: 3/18/93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

S.L. Abston - SAIC
PREPARED BY: V.R. Harness - SAIC

DRILLING COMPANY: Law Engineering/Highland Drilling DRILL: CME M-75/Ingersoll Rand XL-750

DRILLERS: Rob Tillery/Hubert Hall HELPERS: Mel Wagner/Jim Gallaher and Steve Brown

REASON FOR P&A: Well is obstructing construction of Landfill.

P&A: METHOD: D DEVIATIONS FROM METHOD: Abandonment of well casing appliances below 111.3 ft BGS in place approved by Bill Thedford (HSE), cap depth of 4.4 ft instead of 4.0 ft BGS approved by Steve Jones (HSE).

WELL CONSTRUCTION SUMMARY

NOT TO SCALE

NOTE: SAND FILLER USED TO BRIDGE CAVITY

P&A SUMMARY

REAMED DIA. 10.6-in./9.0-in./3.79-in.

DRILLED/REAMED
DEPTH 94.0 ft/101.0 ft/111.3 ft

PLUG MATERIAL Cement

CAP MATERIAL Clay

NOT TO SCALE

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. GW-556

LOCATION: SPAD Landfill Site

DATE: START: 12/31/92

COORDINATES: N27.359 E58.159

FINISH:

V.R. Hamess - SAIC

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

M. Klidzejs - SAIC

PREPARED BY: T. J. Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll Rand XL-750

DRILLER: Hubert Hall

HELPERS: Steve Brown/Greg Shillings

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: D DEVIATIONS FROM METHOD: Deviation of leaving portion of original well in ground approved by W. K. Jago (HSE).

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 14.5-in/10.63-in.

DRILLED/REAMED DEPTH: 50.5 ft/73.0 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Clay

5 of 6

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-561</u>																																																																		
WELL PLUGGING AND ABANDONMENT DIAGRAM																																																																				
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>12-11-92</u>																																																																		
COORDINATES: <u>NFT 59,323</u> <u>NFT 27,811</u>		FINISH: <u>12-23-92</u>																																																																		
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Michael A. Klidzejs-SAIC</u>																																																																		
DRILLING COMPANY: <u>Highland Drilling Co.</u>		DRILL: <u>Ingersoll-Rand XL-750</u>																																																																		
DRILLER: <u>Hubert Hall</u>		HELPERS: <u>Steve Brown, Greg Shilling</u>																																																																		
REASON FOR P&A: <u>Well location impedes construction of new landfill.</u>																																																																				
P&A: METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Final cement plug level at 5.0 ft BGS, approved by HSEA.</u>																																																																				
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<table style="margin-left: auto; margin-right: auto;"> <tr><td colspan="2">FILLER: <u>Grout</u></td></tr> <tr><td>TOP</td><td>GS</td></tr> <tr><td>BOTTOM</td><td>12.00 ft</td></tr> <tr><td colspan="2">PIEZOMETER</td></tr> <tr><td colspan="2">TYPE: <u>PVC/S1/.01</u></td></tr> <tr><td colspan="2">DIA: <u>1 in.</u></td></tr> <tr><td>TOP</td><td>N/A</td></tr> <tr><td>BOTTOM</td><td>27.05 ft</td></tr> <tr><td colspan="2">FILTER PACK: <u>Sand Pack</u></td></tr> <tr><td>TOP</td><td>14.00 ft</td></tr> <tr><td>BOTTOM</td><td>28.00 ft</td></tr> <tr><td colspan="2">BOREHOLE DIA.: <u>9.5 in.</u></td></tr> <tr><td colspan="2">FILLER: <u>Concrete/Gravel</u></td></tr> <tr><td>TOP</td><td>28.00 ft</td></tr> <tr><td>BOTTOM</td><td>35.00 ft</td></tr> <tr><td colspan="2">CAVE IN</td></tr> <tr><td>TOP</td><td>35.00 ft</td></tr> <tr><td>BOTTOM</td><td>56.40 ft</td></tr> <tr><td colspan="2">FILLER: <u>Concrete</u></td></tr> <tr><td>TOP</td><td>56.40 ft</td></tr> <tr><td>BOTTOM</td><td>63.80 ft</td></tr> <tr><td colspan="2">SEAL: <u>Bentonite</u></td></tr> <tr><td>TOP</td><td>63.80 ft</td></tr> <tr><td>BOTTOM</td><td>67.05 ft</td></tr> <tr><td colspan="2">FILTER PACK: <u>Sand Pack</u></td></tr> <tr><td>TOP</td><td>67.05 ft</td></tr> <tr><td>BOTTOM</td><td>89.90 ft</td></tr> <tr><td colspan="2">SCREEN</td></tr> <tr><td colspan="2">TYPE: <u>SS/SW/.01</u></td></tr> <tr><td colspan="2">DIA: <u>4.0 in. OD</u></td></tr> <tr><td>TOP</td><td>79.90 ft</td></tr> <tr><td>BOTTOM</td><td>89.90 ft</td></tr> <tr><td colspan="2">TOTAL DEPTH: <u>91.0 ft</u></td></tr> </table>		FILLER: <u>Grout</u>		TOP	GS	BOTTOM	12.00 ft	PIEZOMETER		TYPE: <u>PVC/S1/.01</u>		DIA: <u>1 in.</u>		TOP	N/A	BOTTOM	27.05 ft	FILTER PACK: <u>Sand Pack</u>		TOP	14.00 ft	BOTTOM	28.00 ft	BOREHOLE DIA.: <u>9.5 in.</u>		FILLER: <u>Concrete/Gravel</u>		TOP	28.00 ft	BOTTOM	35.00 ft	CAVE IN		TOP	35.00 ft	BOTTOM	56.40 ft	FILLER: <u>Concrete</u>		TOP	56.40 ft	BOTTOM	63.80 ft	SEAL: <u>Bentonite</u>		TOP	63.80 ft	BOTTOM	67.05 ft	FILTER PACK: <u>Sand Pack</u>		TOP	67.05 ft	BOTTOM	89.90 ft	SCREEN		TYPE: <u>SS/SW/.01</u>		DIA: <u>4.0 in. OD</u>		TOP	79.90 ft	BOTTOM	89.90 ft	TOTAL DEPTH: <u>91.0 ft</u>		REAMED DIA: <u>10 5/8 in.</u> DRILLED/REAMED DEPTH: <u>92.0 ft BGS</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Soil/Clay</u>
FILLER: <u>Grout</u>																																																																				
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NOT TO SCALE		<p style="text-align: right;">CAP ← DEPTH: <u>5.0 ft</u></p> <p style="text-align: right;">PLUG ← DIA: <u>10 5/8 in.</u></p> <p style="text-align: right;">← DEPTH: <u>92.0 ft</u></p>																																																																		

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMWELL NO. GW-565**WELL PLUGGING AND ABANDONMENT DIAGRAM**LOCATION: SPAD Landfill SiteDATE: START: 1-21-93COORDINATES: N27,363 E58,174FINISH: 2-1-93REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: V.R. Hamess-SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll Rand XL-750DRILLER: Hubert HallHELPERS: Greg Shillings, Bob BowersREASON FOR P&A: Well is obstructing landfill construction.P&A: METHOD: A DEVIATIONS FROM METHOD: Grout plug at 4.7 ft BGS instead of 4.0 ft BGS; approved by Steve Jones - HSE.**WELL CONSTRUCTION SUMMARY** **P&A SUMMARY**

REAMED DIA: 10 5/8-in.
DRILLED/REAMED
DEPTH: 62.0 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-566</u>				
WELL PLUGGING AND ABANDONMENT DIAGRAM						
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2-22-93</u>				
COORDINATES: <u>N 26,360 E61060</u>		FINISH: <u>3-18-93</u> Susan L. Abston-SAIC				
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Victor Harness-SAIC</u> <u>Michael Klidzejs-SAIC</u>				
DRILLING COMPANY: <u>Highland Drilling Co.</u>		DRILL: <u>Ingersoll-Rand XL-750</u>				
DRILLER: <u>Randy Phillips / Hubert Hall</u> HELPERS: <u>Steve Brown, Greg Shillings, Lecil Jones</u>						
REASON FOR P&A: <u>Well is obstructing construction of landfill.</u>						
P&A: METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Portions of well abandoned in situ (approved by Bill Thedford - HSE).</u>						
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Diagram showing the well construction from the surface down to 188.0 ft. The well consists of several sections: a surface conductor (steel, 10.75-in. OD), a borehole (9.5 in. dia), a casing (SS #304, 4.0-in. OD) with a screen at the bottom, and a filter pack of sand. The well is filled with cement. The total depth is 188.0 ft.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>CONDUCTOR HOLE DIA: <u>UNKNOWN</u></p> <p>SURFACE CONDUCTOR TYPE: <u>STEEL</u> DIA: <u>10.75-in. OD</u></p> <p>BOREHOLE DIA: <u>9.5 in.</u></p> <p>FILLER: <u>CEMENT</u></p> <p>CASING (WITH SCREEN) TYPE: <u>SS # 304</u> DIA: <u>4.0-in. OD</u></p> <p>SEAL: <u>BENTONITE</u></p> <p>FILTER PACK: <u>SAND</u></p> <p>SCREEN TYPE: <u>SS/SW/.01</u> DIA: <u>4.0-in. OD</u></p> <p>TOTAL DEPTH: <u>188.0 ft</u></p> </td> <td style="width: 50%; vertical-align: top;"> <p>DEPTH <u>UNKNOWN</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>4.0 ft</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>174.0 ft</u></p> <p>TOP <u>+2.32 ft</u> BOTTOM <u>173.0 ft</u></p> <p>TOP <u>UNKNOWN</u> BOTTOM <u>151.5 ft</u></p> <p>TOP <u>151.5 ft</u> BOTTOM <u>174.0 ft</u></p> <p>TOP <u>155.0 ft</u> BOTTOM <u>173.0 ft*</u></p> </td> </tr> </table> <p>NOT TO SCALE</p>		<p>CONDUCTOR HOLE DIA: <u>UNKNOWN</u></p> <p>SURFACE CONDUCTOR TYPE: <u>STEEL</u> DIA: <u>10.75-in. OD</u></p> <p>BOREHOLE DIA: <u>9.5 in.</u></p> <p>FILLER: <u>CEMENT</u></p> <p>CASING (WITH SCREEN) TYPE: <u>SS # 304</u> DIA: <u>4.0-in. OD</u></p> <p>SEAL: <u>BENTONITE</u></p> <p>FILTER PACK: <u>SAND</u></p> <p>SCREEN TYPE: <u>SS/SW/.01</u> DIA: <u>4.0-in. OD</u></p> <p>TOTAL DEPTH: <u>188.0 ft</u></p>	<p>DEPTH <u>UNKNOWN</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>4.0 ft</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>174.0 ft</u></p> <p>TOP <u>+2.32 ft</u> BOTTOM <u>173.0 ft</u></p> <p>TOP <u>UNKNOWN</u> BOTTOM <u>151.5 ft</u></p> <p>TOP <u>151.5 ft</u> BOTTOM <u>174.0 ft</u></p> <p>TOP <u>155.0 ft</u> BOTTOM <u>173.0 ft*</u></p>	<p>REAMED DIA: <u>10-5/8 in./6.0-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>95.0 ft/142.5 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay</u></p> <p>Diagram showing the well after plugging and abandonment. The well is capped with a clay cap. The plug is 3.0 ft deep. The casing is 4.0-in. SS casing to 95.0 ft BGS. The well is abandoned in place at 174.0 ft depth.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>CAP</p> <p>PLUG</p> <p>4.0-in. SS CASING to 95.0 ft BGS</p> <p>ABANDONED IN PLACE</p> </td> <td style="width: 50%; vertical-align: top;"> <p>DEPTH: <u>3.0 ft</u></p> <p>DIA: <u>10-5/8 in.</u></p> <p>DEPTH: <u>95.0 ft</u></p> <p>DIA: <u>6.0 in.</u></p> <p>DEPTH: <u>142.5 ft</u></p> <p>DEPTH: <u>174.0 ft</u></p> </td> </tr> </table>	<p>CAP</p> <p>PLUG</p> <p>4.0-in. SS CASING to 95.0 ft BGS</p> <p>ABANDONED IN PLACE</p>	<p>DEPTH: <u>3.0 ft</u></p> <p>DIA: <u>10-5/8 in.</u></p> <p>DEPTH: <u>95.0 ft</u></p> <p>DIA: <u>6.0 in.</u></p> <p>DEPTH: <u>142.5 ft</u></p> <p>DEPTH: <u>174.0 ft</u></p>
<p>CONDUCTOR HOLE DIA: <u>UNKNOWN</u></p> <p>SURFACE CONDUCTOR TYPE: <u>STEEL</u> DIA: <u>10.75-in. OD</u></p> <p>BOREHOLE DIA: <u>9.5 in.</u></p> <p>FILLER: <u>CEMENT</u></p> <p>CASING (WITH SCREEN) TYPE: <u>SS # 304</u> DIA: <u>4.0-in. OD</u></p> <p>SEAL: <u>BENTONITE</u></p> <p>FILTER PACK: <u>SAND</u></p> <p>SCREEN TYPE: <u>SS/SW/.01</u> DIA: <u>4.0-in. OD</u></p> <p>TOTAL DEPTH: <u>188.0 ft</u></p>	<p>DEPTH <u>UNKNOWN</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>4.0 ft</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>174.0 ft</u></p> <p>TOP <u>+2.32 ft</u> BOTTOM <u>173.0 ft</u></p> <p>TOP <u>UNKNOWN</u> BOTTOM <u>151.5 ft</u></p> <p>TOP <u>151.5 ft</u> BOTTOM <u>174.0 ft</u></p> <p>TOP <u>155.0 ft</u> BOTTOM <u>173.0 ft*</u></p>					
<p>CAP</p> <p>PLUG</p> <p>4.0-in. SS CASING to 95.0 ft BGS</p> <p>ABANDONED IN PLACE</p>	<p>DEPTH: <u>3.0 ft</u></p> <p>DIA: <u>10-5/8 in.</u></p> <p>DEPTH: <u>95.0 ft</u></p> <p>DIA: <u>6.0 in.</u></p> <p>DEPTH: <u>142.5 ft</u></p> <p>DEPTH: <u>174.0 ft</u></p>					

*Hole originally drilled to 188.0 ft BGS but caved in to 174 ft BGS prior to well installation.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-571</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>12-29-92</u>
COORDINATES: <u>EFT 58,936</u> <u>NFT 27,672</u>		FINISH: <u>1-5-93</u>
REFERENCE POINT FOR MEASUREMENTS: _____		PREPARED BY: <u>M. Klidzejs - SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>
DRILLER: <u>Hubert Hall</u>		HELPERS: <u>Steve Brown, Greg Shilling</u>
REASON FOR P&A: <u>Well location impedes construction of new landfill.</u>		
P&A: METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>None</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Diagram showing a vertical well profile with various layers and components labeled. The well is shown as a vertical cylinder with different patterns for different materials. Labels include: BOREHOLE DIA.: 6.0 in., FILLER: Cement Grout, CASING WITH SCREEN TYPE: SS #304 DIA: 2.0 in., SEAL: Bentonite, FILTER PACK: Sand, SCREEN TYPE: SS/SW/.01 DIA: 2.0 in., and TOTAL DEPTH: 80.0 ft. Depth markers on the right indicate: TOP ground surface, BOTTOM 73.3 ft, 0.89 ft above ground surface, TOP ground surface, BOTTOM 73.3 ft, TOP N/A, BOTTOM 60.0 ft, TOP 60.0 ft, BOTTOM 73.3 ft, TOP 63.3 ft, and BOTTOM 73.3 ft.</p>		<p>REAMED DIA: <u>10 5/8 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>81.5 ft BGS</u></p> <p>PLUG MATERIAL: <u>Cement Grout</u></p> <p>CAP MATERIAL: <u>Soil</u></p>
<p>Diagram showing a vertical well plug and cap. The cap is at the top, labeled CAP. Below it is the plug, labeled PLUG. The plug is shown as a vertical cylinder with a hatched pattern. Labels include: CAP, PLUG, and DEPTH: 81.5 ft BGS. A depth marker on the right indicates: DEPTH: 3.7 ft BGS.</p>		<p>DEPTH: <u>3.7 ft BGS</u></p> <p>DIA: <u>10 5/8 in.</u></p> <p>DEPTH: <u>81.5 ft BGS</u></p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-572</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>SPAD Landfill Site</u>	DATE: START: <u>12-23-92</u>	
COORDINATES: <u>E 58,964</u> <u>N 27,751</u>	FINISH: <u>1-5-93</u>	
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>	PREPARED BY: <u>Susan Abston - SAIC</u>	
DRILLING COMPANY: <u>Highland Drilling Company</u>	DRILL: <u>Ingersoll-Rand XL-750</u>	
DRILLER: <u>Hubert Hall</u>	HELPERS: <u>Steve Brown/Greg Shillings</u>	
REASON FOR P&A: <u>Well location impedes construction of new landfill.</u>		
P&A: METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Casing cut while overwashing: ream hole to 39.9 ft BGS and grout.</u>		
WELL CONSTRUCTION SUMMARY	P&A SUMMARY
<div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CONDUCTOR HOLE DIA: <u>N/A</u></div> DEPTH <u>N/A</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SURFACE CONDUCTOR TYPE: <u>N/A</u> DIA: <u>N/A</u></div> TOP <u>N/A</u> BOTTOM <u>N/A</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">BOREHOLE DIA.: <u>6.0 in.</u></div> TOP <u>0.0</u> BOTTOM <u>74.0 ft</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">FILLER: <u>Cement</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CASING (WITH SCREEN) TYPE: <u>SS/#304</u> DIA: <u>2.0 in.</u></div> TOP <u>+ 4.7</u> BOTTOM <u>52.4 ft</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SEAL: <u>Bentonite</u></div> TOP <u>Unk</u> BOTTOM <u>50.0 ft</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">FILTER PACK: <u>Sand</u></div> TOP <u>50.0 ft</u> BOTTOM <u>74.0 ft</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SCREEN TYPE: <u>SS/SW.01</u> DIA: <u>2.0 in.</u></div> TOP <u>52.4 ft</u> BOTTOM <u>67.4 ft</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">TOTAL DEPTH: <u>74.0 ft</u></div> </div>	<div style="margin-bottom: 10px;"> REAMED DIA: <u>10 5/8 in.</u> DRILLED/REAMED DEPTH: <u>39.9 ft</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Soil</u> </div> <div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CAP</div> DEPTH: <u>2.1 ft</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">PLUG</div> DIA: <u>10 5/8 in.</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SCREEN</div> DEPTH: <u>39.9 ft</u> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">TOTAL DEPTH: <u>74.0 ft</u></div> </div> </div>	

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-573D

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 2/2/93

COORDINATES: EFT 60,852 NFT 27,028

FINISH: 3/18/93

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Michael Klidzejs-SAIC

DRILLING COMPANY: Law Environmental

DRILL: CME Model 55

DRILLER: John Voekel - Law

HELPER: Jason Smith - Law

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: A DEVIATIONS FROM METHOD: Hollow-stem auger used to overwash casing and condition borehole in one operation.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 10 5/8-in.
DRILLED/REAMED
DEPTH: 90.2 ft
PLUG MATERIAL: Cement
CAP MATERIAL: Soil

NOT TO SCALE

N/A = Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-573S</u>																										
WELL PLUGGING AND ABANDONMENT DIAGRAM																												
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>2/2/93</u>																										
COORDINATES: <u>EFT 60,847 NFT 27,044</u>		FINISH: <u>3/18/93</u>																										
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>Michael Klidzejs-SAIC</u>																										
DRILLING COMPANY: <u>Law Environmental</u>		DRILL: <u>CME Model 55</u>																										
DRILLER: <u>John Voekel - Law</u>		HELPER: <u>Jason Smith - Law</u>																										
REASON FOR P&A: <u>Well location impedes construction of new landfill.</u>																												
P&A: METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Hollow-stem auger used to overwash casing. Portion of casing remained in hole.</u>																												
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Diagram showing the well construction layers from top to bottom: CONDUCTOR HOLE, TYPE (None), BOREHOLE, FILLER (Grout), CASING, SEAL (Bentonite), FILTER PACK, SCREEN, and TOTAL DEPTH.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">CONDUCTOR HOLE DIA.: <u>None</u></td> <td>DEPTH <u>N/A</u></td> </tr> <tr> <td>TYPE: <u>None</u> DIA.: <u>N/A</u></td> <td>TOP <u>N/A</u> BOTTOM <u>N/A</u></td> </tr> <tr> <td>BOREHOLE DIA.: <u>6.0</u></td> <td>TOP <u>ground surface</u> BOTTOM <u>15.0</u></td> </tr> <tr> <td>FILLER: <u>Grout</u></td> <td></td> </tr> <tr> <td>CASING TYPE: <u>SS/#304</u> DIA.: <u>2.0-in. OD</u></td> <td>TOP <u>ground surface</u> BOTTOM <u>10.0</u></td> </tr> <tr> <td>SEAL: <u>Bentonite</u></td> <td>TOP <u>N/A</u> BOTTOM <u>N/A</u></td> </tr> <tr> <td>FILTER PACK: <u>NA</u></td> <td>TOP <u>5.00</u> BOTTOM <u>15.0</u></td> </tr> <tr> <td>SCREEN TYPE: <u>SS/SW.01</u> DIA.: <u>2.0</u></td> <td>TOP <u>10.0</u> BOTTOM <u>15.0</u></td> </tr> <tr> <td colspan="2">TOTAL DEPTH: <u>15.0</u></td> </tr> </table> <p style="text-align: center;">N/A: Not Applicable/Not Available</p>		CONDUCTOR HOLE DIA.: <u>None</u>	DEPTH <u>N/A</u>	TYPE: <u>None</u> DIA.: <u>N/A</u>	TOP <u>N/A</u> BOTTOM <u>N/A</u>	BOREHOLE DIA.: <u>6.0</u>	TOP <u>ground surface</u> BOTTOM <u>15.0</u>	FILLER: <u>Grout</u>		CASING TYPE: <u>SS/#304</u> DIA.: <u>2.0-in. OD</u>	TOP <u>ground surface</u> BOTTOM <u>10.0</u>	SEAL: <u>Bentonite</u>	TOP <u>N/A</u> BOTTOM <u>N/A</u>	FILTER PACK: <u>NA</u>	TOP <u>5.00</u> BOTTOM <u>15.0</u>	SCREEN TYPE: <u>SS/SW.01</u> DIA.: <u>2.0</u>	TOP <u>10.0</u> BOTTOM <u>15.0</u>	TOTAL DEPTH: <u>15.0</u>		<p>REAMED DIA: <u>10 5/8-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>16.0 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Soil</u></p> <p>Diagram showing the well components: CAP, PLUG, and CASING SECTION.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">CAP</td> <td>DEPTH <u>3.7 ft</u></td> </tr> <tr> <td>PLUG</td> <td>DIA <u>10 5/8-in.</u></td> </tr> <tr> <td>CASING SECTION</td> <td></td> </tr> <tr> <td></td> <td>DEPTH <u>16.0 ft</u></td> </tr> </table>	CAP	DEPTH <u>3.7 ft</u>	PLUG	DIA <u>10 5/8-in.</u>	CASING SECTION			DEPTH <u>16.0 ft</u>
CONDUCTOR HOLE DIA.: <u>None</u>	DEPTH <u>N/A</u>																											
TYPE: <u>None</u> DIA.: <u>N/A</u>	TOP <u>N/A</u> BOTTOM <u>N/A</u>																											
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CAP	DEPTH <u>3.7 ft</u>																											
PLUG	DIA <u>10 5/8-in.</u>																											
CASING SECTION																												
	DEPTH <u>16.0 ft</u>																											

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW -580

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: SPAD Landfill Site

DATE: START: 12-8-92

COORDINATES: EFT 58,922 NFT 27,846

FINISH: 12-18-92

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Michael A. Klidzejs

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: Hubert Hall

HELPERS: Greg Shillings, Steve Brown, Jim Gallaher

REASON FOR P&A: Well location impedes construction of new landfill.

P&A: METHOD: A DEVIATIONS FROM METHOD: Casing, below 5 ft BGS, cemented in hole. Unable to remove casing due to deviated original hole. Deviations approved by HSEA.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

TOP	N/A
BOTTOM	N/A
TOP	60.0 ft
BOTTOM	76.7 ft
TOP	61.7 ft
BOTTOM	76.7 ft

REAMED DIA: 5.75 in.

DRILLED/REAMED
DEPTH: 79.6 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Soil/Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-607</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>SPAD Landfill Site</u>		DATE: START: <u>1-21-93</u>
COORDINATES: <u>N27,363 E58,174</u>		FINISH: <u>2-1-93</u> Susan Abston-SAIC
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>V.R. Hamess-SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>
DRILLER: <u>Hubert Hall/Scott Gilbert</u>		HELPERS: <u>Greg Shillings/Steve Brown</u>
REASON FOR P&A: <u>Well obstructs construction of SPAD Landfill.</u>		
P&A: METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Received approval to drill out SS casing instead of overwash, use Hole Plug in bore, abandon SS casing from 118.2 ft to 151.3 ft BGS in place and to ream bore from 107.1 to 118.2 BGS to same size as installation bore.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Diagram showing a vertical well profile with various components labeled on the right side:</p> <ul style="list-style-type: none"> CONDUCTOR HOLE DIA: <u>Unknown</u> DEPTH <u>Unknown</u> SURFACE CONDUCTOR TYPE: <u>F/25 Steel</u> DIA: <u>10.75-in OD</u> TOP <u>+0.5 ft</u> BOTTOM <u>106.8 ft</u> BOREHOLE DIA.: <u>9.5-in.</u> TOP <u>0.0 ft</u> BOTTOM <u>151.3 ft</u> FILLER: <u>Cement Grout</u> CASING (WITH SCREEN) TYPE: <u>SS/#304</u> DIA: <u>4.5-in. OD</u> TOP <u>+3.12 ft</u> BOTTOM <u>151.3 ft</u> SEAL: <u>Bentonite</u> TOP <u>Unknown</u> BOTTOM <u>138.0 ft</u> FILTER PACK: <u>Sand</u> TOP <u>138.0 ft</u> BOTTOM <u>151.3 ft</u> SCREEN TYPE: <u>SS/SW.01</u> DIA: <u>4.5-in. OD</u> TOP <u>141.0 ft</u> BOTTOM <u>151.3 ft</u> TOTAL DEPTH: <u>151.3 ft</u> 		<p>REAMED DIA: <u>15.0-in./9.5-in.</u></p> <p>DRILLED/REAMED DEPTH: <u>107.1 ft/118.2 ft</u></p> <p>PLUG MATERIAL: <u>Cement grout</u></p> <p>CAP MATERIAL: <u>Clay</u></p> <p>Diagram showing a vertical well profile with components labeled on the right side:</p> <ul style="list-style-type: none"> CAP PLUG DEPTH: <u>107.1 ft</u> DIA: <u>15.0-in.</u> DEPTH: <u>118.2 ft</u> DIA: <u>9.5-in.</u> DEPTH: <u>151.3 ft</u> (P/A in place)

APPENDIX C
Waste Management Plan

1. INTRODUCTION

The ultimate objective of monitoring groundwater is gathering data to assess potential impacts to human health and the environment. It is also the objective of Y-12 Groundwater Protection Program (GWPP) to handle drill cuttings from the installation of groundwater monitoring wells or borings in a manner that protects the environment. The Y-12 philosophy has been and continues to be consistent with the EPA and Energy Systems E&SA guidance for managing well cuttings. Site-specific professional judgment is used to determine the potential for contamination prior to installation of each well. Factors considered in evaluating potential for site contamination include:

- previously collected sampling and analysis data;
- groundwater flow patterns;
- geologic and hydrogeologic setting; and
- purpose of well (containment plume assessment, background monitoring defining lines of compliance, etc.).

Based on the evaluation, one of two options is selected:

- stabilize material on site; or
- collect for treatment or storage.

2. DRILL CUTTINGS DISPOSAL

There are two levels of drill cuttings management at the Y-12 Plant: (1) drill-site disposal and (2) containerization for waste disposal. Disposal of drill cuttings at the drill-site following best management practices (BMP) is permitted if the cuttings do not exceed the field-screening criteria discussed below. If the field-screening criteria are exceeded, the cuttings must be containerized at the drill-site, labeled, and handled according to Y-12 Plant waste disposal procedures. Sampling and field screening of the drill cuttings will be conducted in accordance with the procedures specified in the Energy Systems Environmental Surveillance Procedures Quality Control Program document (ESH/Sub/87/21706/1).

2.1 FIELD SCREENING

Field screening of drill cuttings will consist of measuring three parameters: radioactivity, volatile organics, and pH. The Energy Systems procedures specified in Table 1 will be followed with some modification as described below.

Table 1. Y-12. Field-screening criteria for drill cuttings and development water

Field Analysis	Energy Systems Procedure No.	Limit
pH	ESP-307-2	4.0 - 10.5
Specific Conductivity ^a	ESP-307-8	< 1000 μ mhos/cm
Organic	ESP-307-6	< 5 ppm
Radioactivity	ESP-307-7	beta/gamma < 600 dpm/100 cm ² (< 100 cpm) alpha < 1000 dpm/100 cm ² (< 500 cpm)

^a Not applicable to drill cuttings.

Radioactivity will be measured using two separate meters: a survey meter with a pancake Geiger tube for determining beta and gamma activity and a scintillation counter with a zinc sulfide window for determining alpha activity. The meters will be passed over the surface area of the cuttings and the highest readings will be recorded.

Screening for organic vapors will be conducted on a composite sample from the cuttings generated at a single well. The sample will be collected with a hand trowel or similar tool to select cuttings from several depths. Enough cuttings will be placed in a clean 1-gal glass or metal container to half fill it. Aluminum foil will be placed over the mouth of the container to make an airtight seal. The sample will then be incubated for 1 h at 70°F or the ambient temperature, whichever is higher. Organic vapors in the headspace of the sample container will be measured by puncturing the aluminum foil and inserting the probe of an organic vapor analyzer. This instrument will have a photoionization detector with a 10.2 eV lamp and will be calibrated to isobutylene. The highest reading of the headspace vapors will be recorded.

The pH of the cuttings will be estimated by adding one quart of deionized water to the composite sample used to determine the presence of organic vapors. The sample will be agitated until well mixed. The pH of the mixture will be determined by moistening a piece of pH paper (range 4-9 or similar) and checking the color of the paper against the color key. This pH will be recorded.

2.2 CONTAINERIZATION FOR WASTE DISPOSAL

If the cuttings from a borehole exceed any one of the field screening limits, they will be containerized at the drill-site and labeled with the contents (drill cuttings), borehole number, and date. The cuttings will then be handled according to Y-12 Plant waste management procedures.

An exception to the above may be made if the cuttings only exceed the organic vapor limits. Weather permitting, those cuttings may be passively treated by aeration at the drill-site in order to reduce the organic vapor content. Such treatment shall not exceed five working days. If reanalysis following aeration indicates the cuttings continue to exceed the organic vapor limits, they must be containerized and handled as above.

2.3 BMP FOR DRILL-SITE DISPOSAL

Drill cuttings which do not exceed the field-screening criteria will be disposed of at the drill site, if practicable. BMP dictates that the cuttings be disposed in such a way as to not be unsightly or cause erosion/sedimentation impacts on nearby surface water. The cuttings shall therefore be used as part of the restoration of the drill site, to fill in low areas and tire tracks, or spread to conform to the natural topography. They will subsequently be seeded and mulched. If bedrock cuttings contain a liquid fraction, care shall be taken to ensure this liquid infiltrates or evaporates at the drill site and in no case runs off into surface waters, ephemeral drainages, or storm sewers. Drill cuttings that do not exceed the field-screening criteria but cannot be disposed at the drill site due to its location (parking lot, yard, etc.) will be transported to a designated location and disposed of as clean fill, following BMP.

2.4 DOCUMENTATION

The results of all field-screening analyses and a description of the disposition of the drill cuttings from each borehole will be documented on a Drill Cuttings Field Screening/Disposal Sheet, an example of which is attached. These forms will be completed for each borehole by the onsite geologist who conducts the screening. A copy of each form will be provided to the Project Manager of the GWPP within two days of its completion.

3. DEVELOPMENT WATER DISPOSAL

There are two levels of development water management at the Y-12 Plant: (1) drill-site disposal and (2) containerization for waste disposal. Disposal of development water at the drill-site following BMP is permitted if the water does not exceed the field-screening discussed below. If the field-screening criteria are exceeded, the water must be containerized at the drill-site, labeled, and handled according to Y-12 Plant waste disposal procedures. Sampling and field screening of development water will be conducted in accordance with the procedures specified in the Energy Systems Environmental Surveillance Procedures Quality Control Program document (ESH/Sub/87/21706/1).

3.1 FIELD SCREENING

Initial development water will be containerized until it has been screened. This is accomplished by pumping the water into drums or other suitable container(s). Screening will be conducted on grab samples taken approximately every hour after the first one-half hour of development. (An alternative to the hourly grab samples is to totally contain all the development water produced at a well, then analyze a composite sample.) If initial grab samples do not exceed the limits specified in Table 1, development water may be pumped directly on the ground (following BMP) unless or until a subsequent grab sample exceeds the limits.

Field screening of development water will consist of measuring four parameters: radioactivity, volatile organics, specific conductivity, and pH. The Energy Systems procedures specified in Table 1 will be followed with some modification, as described below.

Radioactivity will be measured using two separate meters: a survey meter with a pancake Geiger tube for determining beta and gamma activity and a scintillation counter with a zinc sulfide window for determining alpha activity. The meters will be passed over the surface area of the sample and the highest readings will be recorded.

Screening for organic vapors will be conducted by placing enough development water in a clean 1-gal glass or metal container to half fill it. Aluminum foil will be placed over the mouth of the container to make an airtight seal. The sample will then be incubated for 1 h at 70°F or the ambient temperature, whichever is higher. Organic vapors in the headspace of the sample container will be measured by puncturing the aluminum foil and inserting the probe of an organic vapor analyzer. This instrument will have a photoionization detector with a 10.2 eV lamp and will be calibrated to isobutylene. The highest reading of the headspace vapors will be recorded.

3.2 CONTAINERIZATION FOR WASTE DISPOSAL

If the development water from a well exceeds any one of the field screening limits, it will be containerized at the drill-site and labeled with the contents (development water), well number, and date. The water will then be handled according to Y-12 Plant waste management procedures.

An exception to the above may be made if the development water only exceeds the organic vapor limits. Weather permitting, the water may be passively treated at the drill-site by leaving the containers open for aeration in order to reduce the organic vapor content. Such treatment shall not exceed five working days and shall not be conducted over weekends without supervision. If reanalysis following aeration indicates the development water continues to exceed the organic vapor limits, it must be containerized and handled as above.

3.3 BMP FOR DRILL-SITE DISPOSAL

Development water that does not exceed the field-screening criteria will be disposed of at the drill site if practicable. BMP dictates that the water be disposed in such a way as to not cause erosion or enter nearby surface water or storm sewers. Precautions shall therefore be taken to ensure that development water pumped onto the ground or released from containers at the drill site either infiltrates or evaporates at the site and in no case runs off into surface waters, ephemeral drainages, or storm sewers. Development water that does not exceed the field screening (i.e., within a drainage, near a storm sewer, etc.) will be transported to a designated location and disposed as clean water following BMP.

3.4 DOCUMENTATION

The results of all field-screening analyses and a description of the disposition of the development water from each well will be documented on a Development Water Field Screening/Disposal Sheet, an example of which is attached. These forms will be completed for each well by the onsite geologist who conducts the screening. A copy of each form will be provided to the Project Manager of the GWPP within two days of its completion.

APPENDIX D
Site-Specific Waste Management Plans

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO: SEE ATTACHMENT

PLUGGING & ABANDONMENT WASTE MANAGEMENT PLAN

DATE: 2/8/93

Borehole Diameter(s): 2"

Borehole Depth(s) : MULTIPLE

ESTIMATED VOLUME OF CUTTINGS:

cu. 50

ESTIMATED VOLUME OF FLUIDS:

gal. 50-100

Potential contaminants and maximum concentration levels (if known) that may be encountered:

CONTAMINANTCONCENTRATIONPlease reference the site historical data
GWOAR 1990 and 1991

Source of data (attach analytical results if available):

DISCHARGE DRILLING**MATERIALS TO:**XXXX

Ground surface at drill site

XXXX

Unlined containment pit at drill site

 Lined containment pit at drill site Containment vessels at drill site**SAMPLE ANALYSIS REQUIRED PRIOR TO DISPOSAL/TREATMENT FOR:**NO FLUIDSPARAMETERS:NO CUTTINGSPARAMETERS:**PROPOSED DISPOSITION/TREATMENT OF CONTAINERIZED MATERIAL:**FLUIDS:FLUIDS WILL REMAIN ON SITE AND DISPERSED ACROSS THE SURFACE TO ALLOW GROUND SATURATION
AND EVAPORATION. FLUIDS WILL NOT BE ALLOWED TO REACH ANY DRAINAGE DITCH, STREAM,
SEDIMENT BASIN OR TO CREAT A MUD HOLE.CUTTINGS:WELL CASING, CONCRETE PAD AND CUTTINGS WILL REMAIN AT THE SITE AND USED AS FILL IN MATERIAL.
ENTIRE AREA IS TO BE CAPPED AT A LATER DATE BY ER CONTRACT PERSONNEL.PPE WILL BE CONTAINED AND LABELLED BY HSE PROJECT PERSONNEL , BUT WILL BE THE RESPONSIBILITY
OF THE ER PROJECT MANAGER. (WASTE GENERATOR CLAUSE)**APPROVALS**

SITE MANAGER: M.S. ELLIOTT / W.E. THEDFORD

DATE: 2/8/93

CWPP DRILLING PROJECTS: S.B. JONES

DATE: 2/2/93

HQA ENVIR COORD: C.C. HILL

DATE: 2/8/93

WASTE DISPOSAL COORD: M. MIGNON

DATE: 2/8/93

(5 signatures required - this space is for the maximum number)

564-2357

1) **Project Name:** Walk In Pit Well Plugging & Abandonment

Plan Y-12

Organization: Environmental Management, Groundwater Protection Program

2) **Responsible Project Manager:** Jerome Miller

3) **Expected Start/Completion Dates:** 1-18-93/1-28-93

4) **Project Description(Brief):** Plug and Abandon 11 Monitoring Wells in WTP Area

5) **Project Participants: (for waste management interface only)**

Waste Generator: ER

Waste Handler: Highland Rigging/Env. Management

Waste Transporter: WTSD

Interim Waste Storage: WTSD

Permanent Waste Storage: WTSD

Waste Treatment: WTSD

Waste Disposal: WTSD

6) **Waste Generation**

Waste Description	Category (ACM, LLW, TSD, Radioactive, Solid, Liquid)	Characteristics	Hazardous Materials	Volume (ft ³ or gal)	Packaging
Well water displacement to be drained to surface				500 gallons	
Concrete pad, steel posts, 7 ft. of casing to be placed in hole at each well & covered with soil				100 ft ³	
Personnel protective equip. to be transferred to a rad dumpster	Sanitary LLW	Rad	No	3 ft ³	Plastic Bag
Equipment decon to be drained to surface at site boundary	LLW	Rad	No	500 gal	NA

7) **Transport Across Public Access Roads:** ☐ Yes ☒ No

Road Involvement:

DOT Regulations to be applied: ☐ Yes ☒ No

Report to DOT: ☐ Yes ☒ No

2) Wine Storage Requirements

Field Staging Area ☐ Yes ☒ No ☐ N/A

Locations

Responsible Cryptocurrency:

90-Day Storage Area ☐ Yes ☐ No ☒ N/A

(Waste Handler Must Attain 90 Day Permit From Environmental Compliance Department)

London

Capacitors

Waste Acceptance Criteria Requirements

Responsible Organization:

Permitted (or Intended Status) Storage: ☐ Yes ☐ No ☒ N/A

Location:

Connectors

Waste Acceptance Criteria Requirements:

Responsible Organization:

9.) Identification of Potential Treatment Options:

Location:

Creating

Responsible Organization:

Special Waste Acceptance Criteria Requirements:

10.)	Identification of Potential Disposal Options:	On Site

Location:

Openings

Responsible Organization:

Special Waste Acceptance Criteria Requirements:

11.) Waste Minimization and Reduction Techniques to be Implemented:

Segregation: 5

Discontinuation X

Conclusions

Solvent Substitution:

Shedding Downcasting

Section of FPE:

Outcomes

La Field Progression:

Waste Handling (Spill Control):

Material Recycle (Solvents, Containers):

Material Reuse (Solvents, Wash Waters):

Cutting Fluids Recovery.

Section of Equipment: X

Description of Special Techniques and Expected Effectiveness:

Prepared by: Mike Elliot

Date: 1-15-93

Review.

3 Plant Environmental Compliance Organization:

2. Firm Confidentiality

1 ~~ER W. Management Committee~~ *Chin Sst* 1-8-92

Y-12 PLANT GROUNDWATER PROTECTION PROGRA		WELL NO: GW-63
PLUGGING & ABANDONMENT WASTE MANAGEMENT PLAN		DATE: 3/9/93
<div style="display: flex; justify-content: space-between;"> Borehole Diameter(s): 2" Borehole Depth(s) : 35.0 FT </div>		
ESTIMATED VOLUME OF CUTTINGS:		ESTIMATED VOLUME OF FLUIDS:
<u>15 CU. FT</u>		<u>100 GAL.</u>
Potential contaminants and maximum concentration levels (if known) that may be encountered:		
<u>CONTAMINANT</u>		<u>CONCENTRATION</u>
NONE ANTICIPATED		
Source of data (attach analytical results if available):		
DISCHARGE DRILLING		
MATERIALS TO: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%; border-bottom: 1px solid black; text-align: center;">XXXX</div> <div style="width: 70%;">Ground surface at drill site</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%; border-bottom: 1px solid black; text-align: center;"></div> <div style="width: 70%;">Unlined containment pit at drill site</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%; border-bottom: 1px solid black; text-align: center;"></div> <div style="width: 70%;">Lined containment pit at drill site</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%; border-bottom: 1px solid black; text-align: center;"></div> <div style="width: 70%;">Containment vessels at drill site</div> </div>		
SAMPLE ANALYSIS REQUIRED PRIOR TO DISPOSAL/TREATMENT FOR:		
FLUIDS	PARAMETERS:	
CUTTINGS	PARAMETERS:	
PROPOSED DISPOSITION/TREATMENT OF CONTAINERIZED MATERIAL:		
FLUIDS: <u>FLUIDS TO BE CONTAINED IN PIT AND FILLED UPON COMPLETION</u> <u>EXTRA PRECAUTIONS ARE TO BE TAKEN SO THAT NO MATERIAL OR FLUIDS</u> <u>ARE TO ENTER SS3 SPRING. HAY BALES AND SILT FENCE ARE TO BE UTILIZED.</u>		
CUTTINGS: <u>CUTTINGS TO BE CONTAINED IN PIT AND FILLED UPON COMPLETION</u> <u>EXTRA PRECAUTIONS ARE TO BE TAKEN SO THAT NO MATERIAL OR FLUIDS</u> <u>ARE TO ENTER SS3 SPRING. HAY BALES AND SILT FENCE ARE TO BE UTILIZED.</u>		
APPROVALS		
SITE MANAGER: M.S. ELLIOTT / W.E. THEDFORD <i>M.S. Elliott</i>		DATE: <u>3/15/93</u>
GWTP DRILLING PROJECTS: S.B. JONES <i>S.B. Jones</i>		DATE: <u>3/16/93</u>
HSEA ENVIR COORD: C.C. HILL <i>C.C. Hill</i>		DATE: <u>3/16/93</u>
WTSD DISPOSAL COORD: M. WIGINTON <i>M.C. Wiginton</i>		DATE: <u>3/16/93</u>
(Signature required for disposal/treatment options)		
1/17/91

Y-12 PLANT GROUNDWATER PROTECTION PROGRA		WELL NO: GW-63
PLUGGING & ABANDONMENT WASTE MANAGEMENT PLAN		DATE: 3/9/93
<div style="display: flex; justify-content: space-between;"> Borehole Diameter(s): 2" Borehole Depth(s) : 35.0 FT </div>		
ESTIMATED VOLUME OF CUTTINGS:		ESTIMATED VOLUME OF FLUIDS:
<u>15 CU. FT</u>		<u>100 GAL.</u>
Potential contaminants and maximum concentration levels (if known) that may be encountered:		
<u>CONTAMINANT</u>	<u>CONCENTRATION</u>	
NONE ANTICIPATED		
Source of data (attach analytical results if available):		
DISCHARGE DRILLING		
MATERIALS TO:		
_____	Ground surface at drill site	
XXXX	Unlined containment pit at drill site	
_____	Lined containment pit at drill site	
_____	Containment vessels at drill site	
SAMPLE ANALYSIS REQUIRED PRIOR TO DISPOSAL/TREATMENT FOR:		
_____ FLUIDS	PARAMETERS: _____	
_____ CUTTINGS	PARAMETERS: _____	
PROPOSED DISPOSITION/TREATMENT OF CONTAINERIZED MATERIAL:		
FLUIDS: <u>FLUIDS TO BE CONTAINED IN PIT AND FILLED UPON COMPLETION</u> <u>EXTRA PRECAUTIONS ARE TO BE TAKEN SO THAT NO MATERIAL OR FLUIDS</u> <u>ARE TO ENTER SS3 SPRING. HAY BALES AND SILT FENCE ARE TO BE UTILIZED.</u>		
CUTTINGS: <u>CUTTINGS TO BE CONTAINED IN PIT AND FILLED UPON COMPLETION</u> <u>EXTRA PRECAUTIONS ARE TO BE TAKEN SO THAT NO MATERIAL OR FLUIDS</u> <u>ARE TO ENTER SS3 SPRING. HAY BALES AND SILT FENCE ARE TO BE UTILIZED.</u>		
APPROVALS		
SITE MANAGER: M.S. ELLIOTT / W.E. THEDFORD <i>M.S. Elliott</i>		DATE: <i>3/15/93</i>
GWPP DRILLING PROJECTS: S.B. JONES <i>S.B. Jones</i>		DATE: <i>3/16/93</i>
HSEA ENVIR COORD: C.C. HILL <i>C.C. Hill</i>		DATE: <i>3/16/93</i>
WTSD DISPOSAL COORD M. WIGINTON <i>M. Wiginton</i>		DATE: <i>3/16/93</i>
(Signature required for disposal/treatment options)		
1/17 91		

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO: SEE ATTACHMENT

PLUGGING & ABANDONMENT WASTE MANAGEMENT PLAN

DATE: 3/9/93

Borehole Diameter(s): 4"

Borehole Depth(s) : MULTIPLE

ESTIMATED VOLUME OF CUTTINGS:

cu. 100

ESTIMATED VOLUME OF FLUIDS:

gal. 500-1000

Potential contaminants and maximum concentration levels (if known) that may be encountered:

CONTAMINANTCONCENTRATION

Source of data (attach analytical results if available):

DISCHARGE DRILLING

MATERIALS TO:

XXXX

Ground surface at drill site

Unlined containment pit at drill site

Lined containment pit at drill site

Containment vessels at drill site

SAMPLE ANALYSIS REQUIRED PRIOR TO DISPOSAL/TREATMENT FOR:

NO FLUIDS

PARAMETERS:

NO CUTTINGS

PARAMETERS:

PROPOSED DISPOSITION/TREATMENT OF CONTAINERIZED MATERIAL:FLUIDS:

FLUIDS WILL REMAIN ON SITE AND DISPERSED ACROSS THE SURFACE TO ALLOW GROUND SATURATION AND EVAPORATION. FLUIDS WILL NOT BE ALLOWED TO REACH ANY DRAINAGE DITCH, STREAM, SEDIMENT BASIN OR TO CREAT A MUD HOLE.

CUTTINGS:

CUTTINGS WILL REMAIN AT THE SITE AND USED AS FILL IN MATERIAL. ALL SCRAPE MATERIALS WILL BE COLLECTED AT DESIGNATED LOCATIONS (SEE ATTACHED) . METAL WILL BE CLEANED AND RAD SURVEYED FOR DISPOSAL. PVC AND CONCRETE WILL BE DISPOSED OF IN THE LANDFILL.

APPROVALS

SITE MANAGER: M.S. ELLIOTT / W.E. THEDFORD

M.S. Elliott

DATE: 3/9/93

GWPP DRILLING PROJECTS: S.B. JONES

S.B. Jones

DATE: 3/16/93

HSE ENVIR COORD: C.C. HILL

C.C. Hill

DATE: 3/16/93

WTSD DISPOSAL COORD: M. WIGINTON

M. Wiginton

DATE: 3/16/93

(Signature required for disposal/treatment options)

1/17/91

I N T E R O F F I C E M E M O R A N D U M

Date: 09-Mar-1993 09:25am EST
From: Michael Scott Elliott
ELLIOTTMS
Dept: 2366
Tel No: 6-2815

TO: Use SH menu option to see recipients
Subject: PLUGGING AND ABANDONMENT

STEVE,

I HAVE BROKEN THE P&A REQUEST INTO THREE SECTIONS.

- (1) S-3 POND AREA (1003, 1007, 1008, 1010 AND 1011)
- (2) OIL LAND FARM (1048, 1049, 1050, 1051, 1052 1088 AND GW-063)
- (3) BURIAL GROUNDS (1027, 1028, 1029, 1032, 1033, 1035, 1036, 1037, 1038, 1040, 1041, 1071, GW-088 AND GW-234)

CERTAIN REQUIREMENTS WILL NEED TO TAKEN TO ALLOW FOR THE DISPOSAL OF EXCESS MATERIALS. A EXCESS MATERIAL DISPOSAL STAGING AREA WILL NEED TO BE MADE AT EACH OF THE ABOVE SITES. AFTER EACH P&A WELL COMPLETION, TRANSPORT MATERIALS TO A DESIGNATED LOCATION AND SEGREGATE(METAL VS OTHER). PVC MATERIAL CANNOT BE IN LENGTHS GREATER THAN 5-6 FEET GOING TO THE LANDFILL.

KEVIN AND I AGREED THAT THE METAL/PIPE SHOULD BE STEAMED CLEANED AND ALLOWED TO DRY PRIOR TO HP SURVEY. OTHER MATERIAL WILL BE COLLECTED AND TRANSPORTED BY HIGHLAND TO THE LANDFILL UNDER THE CURRENT DISPOSAL PERMITS SIGNED BY MARY WIGINTON THAT YOU OR BILL POSSESS.

SUGGESTED LOCATIONS

- (1) S-3 POND AREA-YOU COULD START A COLLECTION AREA AT WELL 1007 AFTER P&A WORK. ALL AREAS WILL NEED TO BE FLAGGED OFF.
- (2) OIL LAND FARM-DESIGNATE AN AREA IN THE IMMEDIATE VICINITY OF OUR TRAILER 9983-79.
- (3) BURIAL GROUNDS-THE AREA AROUND WELL 1033 MIGHT BE A GOOD CHOICE SEEING HOW ENTRANCES AND EXITS WILL BE OUT GATE 4 BY DARA IN MOST CASES.
- (4) WELLS 1081 AND 1083 MATERIALS CAN EITHER GO WITH THE SPAD MATERIAL OR ANY OF THE OTHER LOCATIONS.

DUE TO THE NATURE OF THESE AREAS WE SHOULD ALSO HAVE A DRUM AT EACH LOCATION FOR PPE. IT WILL BE CONSIDERED NON-HAZARDOUS WITH A 2114B AND I'LL PREPARE THE PAPER WORK FOR DISPOSAL.

NOTE: JUST A REMINDER ABOUT THE ER WORK WITH THE 1000FT RESTRICTION AROUND THE WALK-IN PITS CAPPING ACTIVITIES. DEPENDING ON YOUR START WORK DATE YOU MAY NOT BE ABLE TO DO THE BG AREA.

WE DON'T WANT ANYTHING GOING TO THE YARD UNLESS WERE SURE ITS CLEAN!! EVERYTHING ELSE IS IN THE WORKS. ANY QUESTIONS GIVE ME A SHOUT.

MIKE ELLIOTT

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO: SEE ATTACHMENT

PLUGGING & ABANDONMENT WASTE MANAGEMENT PLAN

DATE: 12/1/92

Borehole Diameter(s): 4"

Borehole Depth(s): MULTIPLE

ESTIMATED VOLUME OF CUTTINGS:

cu. ft. 50

ESTIMATED VOLUME OF FLUIDS:

gal. 500-1000

Potential contaminants and maximum concentration levels (if known) that may be encountered:

CONTAMINANTCONCENTRATION

NONE ANTICIPATED

Source of data (attach analytical results if available):

**DISCHARGE DRILLING
MATERIALS TO:**XXXX

Ground surface at drill site

 Unlined containment pit at drill site Lined containment pit at drill site Containment vessels at drill site**SAMPLE ANALYSIS REQUIRED PRIOR TO DISPOSAL/TREATMENT FOR:**NO FLUIDS PARAMETERS:NO CUTTINGS PARAMETERS:**PROPOSED DISPOSITION/TREATMENT OF CONTAINERIZED MATERIAL:**FLUIDS:

FLUIDS WILL REMAIN ON SITE AND DISPERSED ACROSS THE SURFACE TO ALLOW GROUND SATURATION AND EVAPORATION. FLUIDS WILL NOT BE ALLOWED TO REACH ANY DRAINAGE DITCH, STREAM, OR TO CREAT A MUD HOLE.

CUTTINGS:

CUTTINGS WILL REMAIN AT THE SITE AND USED AS FILL IN MATERIAL. THE REMAINING CUTTINGS ARE TO BE DISPLACED ONTO THE IMMEDIATE SURFACE THEN SEEDED AND MULCHED.

APPROVALS

SITE MANAGER: M.S. ELLIOTT / W.E. THIEDFORD

M.S. Elliott

DATE: 12/1/92

GWPP MANAGER: S.B. JONES

S.B. Jones

DATE: 12/1/92

HS ENVIR COORD: C.C. HILL

Ken Keyser for C.C. Hill

DATE: 12/4/92

WTSD DISPOSAL COORD: M. WIGINTON

M. Wiginton

DATE: 12/15/92

(Signature required for disposal/treatment options)

1/17/91

**SPAD Landfill Project Release
(Completion Date 3/18/93)**

Phase I

ILF5

**Start Date: 12/1/92
Completion Date: 1/30/93**

**Install
MW11
MW13**

P&A

1130

1131

1132

GW551

GW580

GW561

GW572

GW607***

GW571

SB12

PZ32

GW556

GW565

Core Rig

GW551

GW556

GW553*

Phase I

Sub Completion Date: 1/16/93

Maintenance Work

GW555

GW564

GW557

1134

*** - P&A Phase II, Core Phase I**

***** - State Approval Needed**

Phase II

CDL VII

Start Date: 2/1/93

Completion Date: 3/1/93

Install

MW 12

MW14

P&A

GW573S

GW573D

PZ34

SB44B

PZ24

SB14

SB 34

PZ 14

SB 24

GW553

GW566

SB 54

Phase II

Sub Completion Date: 2/12/93

Maintenance Work

GW560

GW562

**SPAD Landfill Project Release
(Completion Date 3/18/93)**

Phase I ILF5

**Start Date: 12/1/92
Completion Date: 1/30/93**

**Install
MW11
MW13**

P&A

**1130
1131
1132
GW551
GW580
GW561
GW572
GW607***
GW571**

**SB12
PZ32
GW556
GW565
Core Rig
GW551
GW556
GW553***

**Phase I
Sub Completion Date: 1/16/93
Maintenance Work
GW555
GW564
GW557
1134**

*** - P&A Phase II, Core Phase I
*** - State Approval Needed**

APPENDIX E
Disposal and Screening Records

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. PZ-12 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Rate meter; with Ludlum Scintillation Tube Y7015P</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 9.3 Date/Time 3-10-93/1431 (4.0 - 10.5)

Organic vapors 0 ppm Date/Time 3-10-93/1431 (<5.0 ppm)

Beta/Gamma 60 cpm Date/Time 3-10-93/1055 (<100 cpm)

Alpha 20 cpm Date/Time 3-10-93/1426 (<500 cpm)

Weather: See field notes Temp.: See field notes

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings and water discharged to ground.

Onsite Geologist (print): Victor R. Harness - SAIC, TN0025

Signature:

Date: 3/10/93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. PZ-14 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH	<u>8.6</u>	Date/Time	<u>2-5-93/1325</u>	(4.0 - 10.5)
Organic vapors	<u>0.3 ppm</u>	Date/Time	<u>2-4-93</u> <u>2-5-93/All</u>	(<5.0 ppm)
Beta/Gamma	<u>60 cpm</u>	Date/Time	<u>2-4-93/0910</u>	(<100 cpm)
Alpha	<u>20 cpm</u>	Date/Time	<u>2-5-93/1125</u>	(<500 cpm)

Weather: Refer to field notebooks Temp.: Refer to field notebooks

DISPOSITION: Drill-site Disposal X Containerization n
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Michael Klidzejs/Timothy Coffey - SAIC

Signature:

Date: 3-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. PZ-24 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS. -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 7.8 Date/Time 2-9-93/1800 (4.0 - 10.5)

Organic vapors 0.6 ppm Date/Time 2-9-93/1800 (<5.0 ppm)

Beta/Gamma 70 cpm Date/Time 2-9-93/1659 (<100 cpm)

Alpha 0 cpm Date/Time 2-9-93/1659 (<500 cpm)

Weather: Cloudy Temp.: 50°F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Susan L. Abston - SAIC

Signature: *Susan L. Abston*

Date: 3-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. PZ-32 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; with Ludlum Y71128P Scintillation Tube</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10 Date/Time 1-22-93/1700

Organic vapors 6.8 ppm Date/Time 1-25-93/1150

Beta/Gamma 70 cpm Date/Time 1-22-93/1700

Alpha 30 cpm Date/Time 1-25-93/1150

Weather: See field log Temp.: See field log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings and water discharged to ground surface.

Onsite Geologist (print): Victor R. Harness - SAIC, TN0025

Signature:

Date: 1-25-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. PZ-34 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.8* Date/Time 2-10-93/1735

Organic vapors 0.4 ppm Date/Time 2-10-93/1735

Beta/Gamma 60 cpm Date/Time 2-10-93/1547

Alpha 20 cpm Date/Time 2-10-93/1547

*High pH due to cement fragments in sample.

Weather: Cloudy Temp.: 50°F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Susan L. Abston - SAIC

Signature: *Susan L. Abston*

Date: 3-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. SB-12 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>OVA Model 128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Y71128P Ludlum Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10 Date/Time 1-26-93

Organic vapors 4 ppm Date/Time 1-26-93

Beta/Gamma 60 cpm Date/Time 1-26-93

Alpha 20 cpm Date/Time 1-26-93

Weather: See field log

Temp.: See field log

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y/n

Describe: Cuttings and water discharged to ground surface.

Onsite Geologist (print): Victor R. Harness - SAIC TN0025

Signature:

Date: 1-26-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. SB-14 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.8 Date/Time 3-8-93/1702 (4.0 - 10.5)

Organic vapors 0.6 ppm Date/Time 3-8-93/All
3-9-93/0828, 0840 (<5.0 ppm)

Beta/Gamma 60 cpm Date/Time 3-8-93/1544 (<100 cpm)

Alpha 30 cpm Date/Time 3-8-93/1550 (<500 cpm)

Weather: Sunny and clear Temp.: =40°F

DISPOSITION: Drill-site Disposal X Containerization X
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Susan L. Abston - SAIC

Signature: *Susan L. Abston*

Date: 3-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. SB-24 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 9.6 Date/Time 2-17-93/1540 (4.0 - 10.5)

Organic vapors 0.0 ppm Date/Time 2-17-93/1530 (<5.0 ppm)

Beta/Gamma 60 cpm Date/Time 2-17-93/1455 (<100 cpm)

Alpha 40 cpm Date/Time 2-17-93/1455 (<500 cpm)

Weather: Partly Cloudy Temp.: 30°F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Susan L. Abston - SAIC

Signature: *Susan L. Abston*

Date: 3-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. SB-34 SITE: SPAD Landfill SiteAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS:

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.6* Date/Time 2-11-93/1733 (4.0 - 10.5)Organic vapors 0.1 ppm Date/Time 2-11-93/1727 (<5.0 ppm)Beta/Gamma 70 cpm Date/Time 2-11-93/1536 (<100 cpm)Alpha 40 cpm Date/Time 2-11-93/1536 (<500 cpm)

*High pH reading due to grout fragments in cuttings sample.

Weather: Raining Temp.: 55°FDISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/nDescribe: Cuttings discharged to ground surface.Onsite Geologist (print): Susan L. Abston - SAICSignature: *Susan L. Abston*Date: 3-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. SB-44B SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.6* Date/Time 2-12-93/1520

Organic vapors 11.0 ppm** Date/Time 2-12-93/1520

Beta/Gamma 60 cpm Date/Time 2-12-93/1520

Alpha 30 cpm Date/Time 2-12-93/1520

*High pH reading due to cement fragments in cuttings.

**High headspace reading due to alcohol anti-freeze used to winterize the drill rig.

Weather: Drizzly Temp.: 50°F

DISPOSITION: Drill-site Disposal X Containerization X
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Susan L. Abston - SAIC

Signature: *Susan L. Abston*

Date: 3-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. SB-54 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.7* Date/Time 2-17-93/1458

Organic vapors 10.2 ppm** Date/Time 2-17-93/1458

Beta/Gamma 60 cpm Date/Time 2-17-93/1100

Alpha 40 cpm Date/Time 2-17-93/1100

*High pH reading due to cement fragments in cuttings.

**High headspace reading due to alcohol anti-freeze used to winterize drill rig.

Weather: Partly Cloudy Temp.: 30°F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Susan L. Abston - SAIC

Signature: *Susan L. Abston*

Date: 3-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. SB-72a SITE: SPAD Landfill SiteAPPROX. VOLUME OF CUTTINGS: Not Applicable

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>N/A</u>	(model)	<u>N/A</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model PI-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH N/A Date/Time N/A (4.0 - 10.5)Organic vapors 8 ppm* Date/Time 3-8-93/1330 (<5.0 ppm)Beta/Gamma 60 cpm Date/Time 3-8-93/1218 (<100 cpm)Alpha 20 cpm Date/Time 3-8-93/1226 (<500 cpm)

N/A: Not Analyzed

*HNu survey of the headspace of 8 ppm contributed by damp cuttings, condensation inside headspace jar and alcohol used to winterize drilling equipment.

Weather: Rain and overcast a.m. Clearing by 1200. Temp.: ~65°FDISPOSITION: Drill-site Disposal X Containerization _____
(Labeled?) y / nDescribe: Cuttings released to ground surface.Onsite Geologist (print): Dwight Hollon/Victor Harness - SAICSignature: Date: 3/18/93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1003 SITE: S-3 Ponds Functional AreaAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH 9.1 Date/Time 5-20-93/1523 (4.0 - 10.5)Organic vapors 0.0 ppm/0.0 ppm* Date/Time 5-20-93/1523 (<5 ppm above background)Beta/Gamma 50 cpm/80 cpm Date/Time 5-20-93/1301 (<100 cpm above background)Alpha 0 cpm/0 cpm Date/Time 5-20-93/1318 (<500 cpm above background)

*Same for all BZA measurements and headspace analysis of cuttings.

Weather: See Field Logs Temp.: See Field LogsDISPOSITION: Drill-site Disposal X Containerization N/A
(Labeled?) y / nDescribe: Cuttings and circulation waters disposed of in shallow on-site cuttings pit.Onsite Geologist (print): Victor R. Harness TN0025Signature: Date: 5-20-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1007 SITE: S-3 Ponds Functional Area

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>Foxboro Century OVA Model 138</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.4</u>	Date/Time	<u>5-25-93/1442</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/26 ppm</u>	Date/Time	<u>5-25-93/1442</u>	(<5 ppm above background)
Beta/Gamma	<u>60 cpm/100 cpm</u>	Date/Time	<u>5-25-93/0956</u>	(<100 cpm above background)
Alpha	<u>0 cpm/20 cpm</u>	Date/Time	<u>5-25-93/1126</u>	(<500 cpm above background)

Weather: See Field Log Temp.: See Field Log

DISPOSITION: Drill-site Disposal X Containerization N/A
(Labeled?) y/n

Describe: Cuttings disposed of on ground surface.

Onsite Geologist (print): Victor R. Harness, TN0025

Signature: *Victor R. Harness*

Date: 5-25-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1010 SITE: S3 Ponds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>OVA Model 101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M pancake probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>8.0</u>	Date/Time	<u>5-21-93/1551</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.6 ppm</u>	Date/Time	<u>5-21-93/1551</u>	(<5 ppm Above Background)
Beta/Gamma	<u>60 cpm/80 cpm</u>	Date/Time	<u>5-21-93/1433</u>	(<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>5-21-93/1434</u>	(<500 cpm Above Background)

Weather: see field log Temp.: see field log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings discharged onto ground surface

Onsite Geologist (print): Victor R. Harness, TN0025

Signature: Date: 5-21-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1011 SITE: S3 Ponds Functional Area

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>OVA Model 101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M pancake probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.0</u>	Date/Time	<u>5-24-93/1635</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.4 ppm</u>	Date/Time	<u>5-24-93/1635</u>	(<5 ppm Above Background)
Beta/Gamma	<u>60 cpm/700 cpm*</u>	Date/Time	<u>5-24-93/1348</u>	(<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm*</u>	Date/Time	<u>5-24-93/1505</u>	(<500 cpm Above Background)

*Soils from approximately 9 ft BGS to 15 ft BGS showed elevated beta emissions.
Alpha emissions never exceeded 0 cpm.

Weather: see field log Temp.: see field log

DISPOSITION: Drill-site Disposal and Containerization Containerization X
(Labeled?) ☒

Describe: Returned soils from 9 ft to 15 ft BGS showed beta emissions greater than 500 cpm and were containerized in one US DOT-approved 55-gal. drum which was labelled and left at site for disposition by HSE. All other returns showing beta emissions <160 cpm were disposed of on ground surface.

Onsite Geologist (print): Victor R. Harness, TN0025

Signature:

Date: 5-24-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1013 SITE: S3 Ponds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.5</u>	Date/Time	<u>8-5-93/1147</u> (4.0-10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>ALL</u> (<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/60 cpm</u>	Date/Time	<u>8-5-93/1040</u> (<100 cpm above background)
Alpha	<u>10 cpm/10 cpm</u>	Date/Time	<u>8-5-93/1036</u> (<500 cpm above background)

Weather: 8-5-93: Partly to mostly cloudy Temp.: 8-5-93: Low-70s to low-80s F

DISPOSITION: Drill-site Disposal X Containerization -NA-
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Susan L. Abston/Timothy Coffey - SAIC

Signature: *Susan L. Abston* *Timothy Coffey* Date: 8-5-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1014 SITE: S3 Ponds Functional Area

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.4</u>	Date/Time	<u>7-15-93/1410</u>	(4.0 - 10.5 above bckground)
Organic vapors	<u>0.0 ppm/0.4 ppm</u>	Date/Time	<u>7-15-93/1410</u>	(<5.0 ppm above background)
Beta/Gamma	<u>60 cpm/70 cpm</u>	Date/Time	<u>7-16-93/1028</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>7-16-93/1028</u>	(<500 cpm above background)

Weather: See field notes. Temp.: See field notes.

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings and water discharged to ground surface.

Onsite Geologist (print): Susan L. Abston/Victor R. Harness - SAIC

Signature: *Susan L. Abston* *Victor R. Harness*

Date: 7-19-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1017 SITE: S3 Ponds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.9</u>	Date/Time	<u>7-22-93/1544</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>7-21-93/1230</u> (<5.0 ppm above background)
Beta/Gamma	<u>60 cpm/70 cpm</u>	Date/Time	<u>7-21-93/0945</u> (<100 cpm above background)
Alpha	<u>0 cpm/10 cpm</u>	Date/Time	<u>7-22-93/1402</u> (<500 cpm above background)

Weather: Refer to field logbook. Temp.: Refer to field logbook.

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Onsite cuttings pit.

Onsite Geologist (print): Victor Harness/Timothy Coffey - SAIC

Signature: Date:

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1022 SITE: S3 Ponds Functional Area

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Fox Century OVA Model 128</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with Ludlum G-M Pancake Probe</u>
			<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.6</u>	Date/Time	<u>7-14-93/1444</u>	(4.0 - 10.5 above background)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>All</u>	(<5.0 ppm above background)
Beta/Gamma	<u>60 cpm/70 cpm</u>	Date/Time	<u>All</u>	(<100 cpm above background)
Alpha	<u>0 cpm/20 cpm</u>	Date/Time	<u>7-13-93/0915</u>	(<500 cpm above background)

Weather: See field logs.

Temp.: See field logs.

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y/n

Describe: Cuttings and water discharged to ground surface.

Onsite Geologist (print): Victor R. Harness - SAIC

Signature:

Date: 7-14-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1024 SITE: S3 Ponds Functional AreaAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M pancake probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.2</u>	Date/Time	<u>8-19-93/1055</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/1.2 ppm</u>	Date/Time	<u>8-19-93/1054</u> (<5.0 ppm above background)
Beta/Gamma	<u>30 cpm/65 cpm</u>	Date/Time	<u>8-19-93/0955</u> (<100 cpm above background)
Alpha	<u>20 cpm/20 cpm</u>	Date/Time	<u>8-18-92/0920</u> (<500 cpm above background)

Weather: 8-18-93: clear and warm.
8-19-93: clear to partly cloudy.Temp.: 8-18-93: Upper-70's to low-80's F.
8-19-93: Upper 70's to low-90's F.DISPOSITION: Drill-site Disposal XContainerization
(Labeled?) y/nDescribe: Cuttings discharged to ground surface.Onsite Geologist (print): Timothy Coffey - SAICSignature: Date: 8-19-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1025 SITE: S3 Ponds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>Foxboro Century OVA Model 108</u> <u>Foxboro Century OVA Model 128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>with GM Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>8.3</u>	Date/Time	<u>7-26-93/1519</u>	(4.0 - 10.5 above background)
Organic vapors	<u>0.0 ppm/4.3 ppm</u>	Date/Time	<u>7-26-93/1517</u>	(<5 ppm above background)
Beta/Gamma	<u>60 cpm/60 cpm</u>	Date/Time	<u>8-2-93/1549</u>	(<100 cpm above background)
Alpha	<u>0 cpm/10 cpm</u>	Date/Time	<u>8-2-93/1549</u>	(<500 cpm above background)

Weather: See field logs

Temp.: See field logs

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey/Victor R. Harness - SAIC

Signature:

Date: 8-2-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1025A SITE: S3 Ponds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; with G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>11.2</u>	Date/Time	<u>8-9-93/1617</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.6 ppm</u>	Date/Time	<u>8-9-93/1108</u> (>5.0 ppm above background)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>8-9-93/0958</u> (>100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u> (>500 cpm above background)

Weather: 8-6-93: Rain, clearing.
8-9-93: Clear to partly cloudy.

Temp.: 8-6-93: Low-to upper-70's F.
8-9-93: Low-70's to upper-80's F.

DISPOSITION: Drill-site Disposal X

Containerization -NA-
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 8-10-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1027 SITE: Y-2 Burial Grounds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model 108</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M pancake probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>0.0 ppm/8.1</u>	Date/Time	<u>4-28-93/1515</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>4-28-93/1515</u> (<5 ppm Above Background)
Beta/Gamma	<u>60 cpm/80 cpm</u>	Date/Time	<u>4-28-93/1128</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-28-93/1458</u> (<500 cpm Above Background)

Weather: see field log Temp.: see field log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings and drilling water disposed of into on-site cuttings pit.

Onsite Geologist (print): Victor R. Harness, TN0025

Signature:

Date: 5-5-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1028 SITE: Bear Creek Burial GroundsAPPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS: (Check those instruments calibrated to manufacturer's specifications.)

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 G&M Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.9*</u>	Date/Time	<u>5-6-93/1511</u>	(4.0-10.5)
Organic vapors	<u>0.0 ppm/2.2 ppm</u>	Date/Time	<u>5-7-93/1010</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/65 cpm</u>	Date/Time	<u>5-6-93/1518</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u>	(<500 cpm above background)

*High pH reading due to cement fragments in cuttings.

Weather: 5-6-93: Partly cloudy and warm.
5-7-93: Clear and warm.Temp.: 5-6-93: Low 80's F
5-7-93: Upper 50's to low 60's FDISPOSITION: Drill-site Disposal XContainerization _____
(Labeled?) y / n

Describe: Onsite cuttings pit.

On-site Geologist (print): Timothy Coffey - SAICSignature: Date: 5-7-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1029 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 G-M Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 6.5 Date/Time 5-5-93/0941 (4.0 - 10.5)

Organic vapors 0.3 ppm Date/Time 5-5-93/0823 (<5.0 ppm)

Beta/Gamma 70 cpm Date/Time 5-5-93/0825 (<100 cpm)

Alpha 10 cpm Date/Time 5-5-93/0835 (<500 cpm)

Weather: Clear and warm

Temp.: Upper-50's to low-60's F

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-5-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1032 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter;</u> <u>Ludlum Model 44-9 G-M Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter;</u> <u>Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 11.1* Date/Time 5-5-93/1132 (4.0 - 10.5)

Organic vapors 0.6 ppm Date/Time 5-5-93/1130 (<5.0 ppm)

Beta/Gamma 50 cpm Date/Time 5-5-93/1103 (<100 cpm)

Alpha 0 cpm Date/Time All Readings (<500 cpm)

*High pH reading due to cement fragments in cuttings.

Weather: Partly cloudy and warm Temp.: Mid- to upper-60's F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Onsite cuttings pit.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-5-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1033 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW 101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>OVA Model 128</u>
			<u>Ludlum Model 3 Survey Meter</u>
			<u>with Ludlum Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u>
			<u>with Ludlum Scintillation Tube</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH	<u>9.1</u>	Date/Time	<u>4-12-93/1320</u>	(4.0 - 10.5)
Organic vapors	<u>4.4 ppm</u>	Date/Time	<u>4-6-93/1620</u>	(<5.0 ppm)
Beta/Gamma	<u>70 cpm</u>	Date/Time	<u>4-12-93/1223</u>	(<100 cpm)
Alpha	<u>60 cpm</u>	Date/Time	<u>4-8-93/1027</u>	(<500 cpm)

Weather: See field notes

Temp.: See field notes

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y / n

Describe: Cuttings and water disposed of at site in cuttings pit. Silt fencing and hay bales used to control run-off.

Onsite Geologist (print): T.J. Coffey/Victor R. Harness

Signature:

Date: 4-12-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1035 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS: (Check those instruments calibrated to manufacturer's specifications.)

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>8.2</u>	Date/Time	<u>5-11-93/0935</u>	(4.0-10.5)
Organic vapors	<u>0.0 ppm/0.3 ppm</u>	Date/Time	<u>5-11-93/0810</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/80 cpm</u>	Date/Time	<u>5-11-93/0905</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u>	(<500 cpm above background)

Weather: Clear, becoming partly cloudy

Temp.: Upper 70's to low 80's F

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y / n

Describe: Cuttings discharged to ground surface.

On-site Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-11-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1036 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: N/A

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 G&M Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>11.2*</u>	Date/Time	<u>5-3-93/1035</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/200 ppm</u>	Date/Time	<u>5-3-93/1035</u> (<5.0 ppm above background)
Beta/Gamma	<u>55 cpm/80 cpm</u>	Date/Time	<u>5-3-93/1006</u> (<100 cpm above background)
Alpha	<u>0 cpm/20 cpm</u>	Date/Time	<u>5-3-93/0903</u> (<500 cpm above background)

*High pH reading due to cement fragments in cuttings. Steve Jones (HSE) notified.

Weather: Overcast; spotty light rain showers Temp.: Low- to upper-60's F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Onsite cutting pit.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-3-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1037 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 G&M Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Rate meter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.5 Date/Time 5-4-93/1224 (4.0 - 10.5)

Organic vapors 0.6 ppm Date/Time 5-4-93/0930 (<5.0 ppm)

Beta/Gamma 80 cpm Date/Time 5-4-93/1042 (<100 cpm)

Alpha 10 cpm Date/Time 5-4-93/1126 (<500 cpm)

Weather: Mostly cloudy to partly cloudy Temp.: Mid-60's to mid-70's F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Onsite cutting pit.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: Date: 5-4-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1038 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS: (Check those instruments calibrated to manufacturer's specifications.)

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 G&M Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>6.3</u>	Date/Time	<u>5-12-93/1307</u> (4.0-10.5)
Organic vapors	<u>0.0 ppm/4.0 ppm</u>	Date/Time	<u>5-12-93/0930</u> (<5.0 ppm above background)
Beta/Gamma	<u>60 cpm/100 cpm</u>	Date/Time	<u>5-12-93/1120</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u> (<500 cpm above background))

Weather: Partly cloudy becoming mostly cloudy

Temp.: Low-60's to low-80's F

DISPOSITION: Drill-site Disposal X

Containerization _____
(Labeled?) y / n

Describe: Cuttings discharged to ground surface.

On-site Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-12-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1040 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS: (Check those instruments calibrated to manufacturer's specifications.)

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>6.9</u>	Date/Time	<u>5-10-03/1422</u>	(4.0-10.5)
Organic vapors	<u>0.0 ppm/0.4 ppm</u>	Date/Time	<u>5-10-93/1420</u>	(<5.0 ppm above background)
Beta/Gamma	<u>80 cpm/120 cpm</u>	Date/Time	<u>5-10-93/1316</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u>	(<500 cpm above background)

Weather: Clear, becoming mostly cloudy

Temp.: Mid-70's to mid-80's F

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y / n

Describe: Cuttings discharged to ground surface.

On-site Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-10-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1041 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 G&M Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>5.2</u>	Date/Time	<u>5-6-93/1225</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.8 ppm</u>	Date/Time	<u>5-6-93/1120</u> (<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>5-6-93/0935</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u> (<500 cpm above background)

Weather: Partly cloudy and warm Temp.: Upper-60's to mid-70's F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-6-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. 1043 SITE: Bear Creek Burial Grounds, Walk-ins Pits

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>- NA -</u>	(model)	<u>- NA -</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH - NA - Date/Time - NA -

Organic vapors 1.6 ppm* Date/Time 2-9-93/1420

Beta/Gamma 900 cpm** Date/Time 2-12-93/1004

Alpha 0 cpm Date/Time All Readings

* At well collar while sealing case with Hole Plug™.

** Local hot spot at 1.5 ft BGS, covered with cement and clean soil. Readings do not exceed 100 cpm at any other time. Y-12 HP was not notified, since they were conferred with prior to beginning work activities. They were already aware of localized hot spots and gave direction and cautions about their presence.

Weather: 2-9-93: Clear 2-12-93: Mostly cloudy. Scattered T-storms p.m. Temp.: 2-9-93: Low-30's to mid-60's F 2-12-93: Low- to upper-50's F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: No cuttings generated by P&A activities. Excavated soil returned to excavation and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)

Signature: Date: 2-12-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1048 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: N/A

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>7.5</u>	Date/Time	<u>5-12-93/1230</u>	(4.0-10.5)
Organic vapors	<u>0.0 ppm/1.0 ppm</u>	Date/Time	<u>5-12-93/1023</u>	(<5 ppm above background)
Beta/Gamma	<u>50 cpm/90 cpm</u>	Date/Time	<u>5-12-93/1101</u>	(<100 ppm above background)
Alpha	<u>0 cpm/10 cpm</u>	Date/Time	<u>5-12-93/1101</u>	(<500 ppm above background)

*Headspace of composite sample is 0.2 ppm. (1215 hrs.)

•Breathing zone value of 1 ppm due to alcohol in the Quick Foam™.

Weather: Sunny Temp.: 80°F to 84°F

DISPOSITION: Drill-site Disposal X Containerization N/A
(Labeled?) y / n

Describe: Cuttings and water discharged to ground surface.

Onsite Geologist (print): Dwight Hollon - SAIC

Signature:

Date: 5/12/93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1049 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS: (Check those instruments calibrated to manufacturer's specifications.)

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH	<u>9.9</u>	Date/Time	<u>5-14-93/0959</u> (4.0-10.5)
Organic vapors	<u>0.6 ppm</u>	Date/Time	<u>5-14-93/1020</u> (<5 ppm)
Beta/Gamma	<u>90 cpm</u>	Date/Time	<u>5-14-93/0915</u> (<100 cpm)
Alpha	<u>0 cpm</u>	Date/Time	<u>5-14-93/0915</u> (<500 cpm)

Weather: Sunny

Temp.: 80°-85° F

DISPOSITION: Drill-site Disposal X

Containerization -NA-
(Labeled?) y / n

Describe: Cuttings discharged to ground surface.

On-site Geologist (print): Dwight Hollon - SAIC

Signature:

Date: 5-14-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1050 SITE: Oil Landfarm

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNU Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with Ludlum G-M pancake probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Ludlum Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>8.0</u>	Date/Time	<u>5-17-93/1512</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.6 ppm</u>	Date/Time	<u>5-17-93/1512</u> (<5 ppm Above Background)
Beta/Gamma	<u>60 cpm/60 cpm</u>	Date/Time	<u>5-18-93/1452</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/20 cpm</u>	Date/Time	<u>5-17-93/1005</u> (<500 cpm Above Background)

Weather: See Field Log Temp.: See Field Log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings disposed of in on-site cuttings pit

Onsite Geologist (print): Victor R. Harness, TN0025

Signature: *Victor R. Harness*

Date: 5-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1051 SITE: Bear Creek Burial GroundsAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>5.3</u>	Date/Time	<u>1358</u>	(4.0-10.5)
Organic vapors	<u>0.0 ppm/0.4 ppm</u>	Date/Time	<u>1234</u>	(<5 ppm above background)
Beta/Gamma	<u>50 cpm/60 cpm</u>	Date/Time	<u>1108</u>	(<100 ppm above background)
Alpha	<u>0 cpm/10 cpm</u>	Date/Time	<u>1108</u>	(<500 ppm above background)

*Due to cement cuttings in returns.

Weather: Sunny Temp.: 80°F to 85°FDISPOSITION: Drill-site Disposal X Containerization -NA-
(Labeled?) y / nDescribe: Cuttings and water discharged to ground surface.Onsite Geologist (print): Dwight Hollon - SAICSignature: Date: 5-14-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1052 SITE: Oil Landfarm Functional Area

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>OVA Model 108</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M pancake probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>8.0</u>	Date/Time	<u>5-19-93/1322</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>5-19-93/1322</u>	(<5 ppm above background)
Beta/Gamma	<u>60 cpm/90 cpm</u>	Date/Time	<u>5-19-93/1322</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>5-19-93/1322</u>	(<500 cpm above background)

Weather: See Field Log Temp.: See Field Log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings discharged onto ground surface per the Waste Management Plan

Onsite Geologist (print): Victor R. Harness, TN0025

Signature:

Date: 5-19-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1071 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS: (Check those instruments calibrated to manufacturer's specifications.)

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>N/A</u>	Date/Time	<u>N/A</u>	(4.0-10.5)
Organic vapors	<u>0.0 ppm/1.0 ppm</u>	Date/Time	<u>5-12-93/1</u>	(<5.0 ppm above background)
Beta/Gamma	<u>150 cpm/200 cpm</u>	Date/Time	<u>5-12-93/1402</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u>	(<500 cpm above background)

N/A: Not Analyzed

Weather: Partly cloudy becoming mostly cloudy

Temp.: Low-60's to low-80's F

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y / n

Describe: Cuttings discharged to ground surface.

On-site Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-12-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1130 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter;</u> <u>Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter;</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 11.4 Date/Time 12-3-92/1335 (4.0 - 10.5)

Organic vapors 15 ppm* Date/Time 12-3-92/1235 (<5.0 ppm)

Beta/Gamma 30-35 cpm Date/Time All Readings (<100 cpm)

Alpha 0 cpm Date/Time All Readings (<500 cpm)

* see notes in progress report

Weather: 12-2-92: Partly cloudy and windy
12-3-92: Clear and cool

Temp.: 12-2-92: low- to mid 40's F
12-3-92: upper- 20's to upper 40's F

DISPOSITION: Drill-site Disposal X

Containerization -NA-
(Labeled?) y/n

Describe: Returns discharged to ground surface

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 12-15-92

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1131 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 12.1 Date/Time 12-3-92/1630 (4.0 - 10.5)

Organic vapors 2.4 ppm Date/Time 12-4-92/1196 (<5.0 ppm)

Beta/Gamma 60 cpm Date/Time 12-4-92/0953 (<100 cpm)

Alpha 0 cpm Date/Time All (<500 cpm)

Weather: 12-3-92: clear and cool
12-4-92: Intermittent drizzle, cool

Temp.: 12-3-92: upper 20's to upper 40's F
12-4-92: upper 30's to lower 40's F

DISPOSITION: Drill-site Disposal X

Containerization -NA-
(Labeled?) y / n

Describe: Returns discharged to ground surface.

Onsite Geologist (print): Timothy Coffey/Mike Klidzejs - SAIC

Signature:

Date: 12-15-92

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1132 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.3 Date/Time 12-14-92/1531 (4.0 - 10.5)

Organic vapors 0.0 ppm Date/Time 12-14-92/1530 (<5.0 ppm)

Beta/Gamma 60 cpm Date/Time 12-14-92/1530 (<100 cpm)

Alpha 20 cpm Date/Time 12-14-92/1426 (<500 cpm)

Weather: Cloudy with steady drizzle Temp.: low 50's F

DISPOSITION: Drill-site Disposal X Containerization -NA-
(Labeled?) y / n

Describe: Returns discharged to ground surface

Onsite Geologist (print): Mike Klidzejs - SAIC

Signature:

Date: 12-15-92

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1133 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Ludlum Scintillation Tube Probe Y70115P</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.4 Date/Time 3-3-93/1529 (4.0 - 10.5)

Organic vapors 0.5 ppm Date/Time 3-3-93/1529 (<5.0 ppm)

Beta/Gamma 70 cpm Date/Time 3-3-93/1122 (<100 cpm)

Alpha 40 cpm Date/Time 3-3-93/1122 (<500 cpm)

Weather: See field log Temp.: See field log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: Cuttings and water discharged to ground surface.

Onsite Geologist (print): Victor R. Harness - SAIC/TN0025

Signature: Date: 3/3/93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. 1134 SITE: Spad Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model 101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum model 3 Survey Meter with GM pancake probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>11.9*</u>	Date/Time	<u>6-8-93/1040</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/1.0 ppm</u>	Date/Time	<u>5-27-93/1634</u>	(<5 ppm above background)
Beta/Gamma	<u>30 cpm/50 cpm</u>	Date/Time	<u>6-4-93/1056</u>	(<100 cpm above background)
Alpha	<u>0 cpm/10 cpm</u>	Date/Time	<u>6-3-93/1524</u>	(<500 cpm above background)

*Steve Jones (HSE) gave permission to discharge high pH cuttings to cutting pit. Elevated pH values due to grout in cuttings.

Weather: Refer to field logbook Temp.: Refer to field logbook

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Onsite cuttings pit

Onsite Geologist (print): Victor Harness/ Timothy Coffey - SAIC

Signature:

Date: 6-16-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. GW-030 SITE: Bear Creek Burial Grounds, Walk-ins Pits

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>- NA -</u>	(model)	<u>- NA -</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH - NA - Date/Time - NA -

Organic vapors 0.0 ppm Date/Time All Readings

Beta/Gamma 70 cpm Date/Time 2-10-93/1240

Alpha 0 cpm Date/Time All Readings

Weather: Generally clear Temp.: Low-30's to low-60's F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: No cuttings generated by P&A activities. Excavated soil returned to excavation and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)

Signature: Date: 2-10-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. GW-031 SITE: Bear Creek Burial Grounds, Walk-ins PitsAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>-NA-</u>	(model)	<u>-NA-</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH	<u>-NA-</u>	Date/Time	<u>-NA-</u>
Organic vapors	<u>0.0 ppm</u>	Date/Time	<u>All Readings</u>
Beta/Gamma	<u>70 cpm</u>	Date/Time	<u>2-10-93/1240</u>
Alpha	<u>0 cpm</u>	Date/Time	<u>All Readings</u>

Weather: Generally clear Temp.: Low-30's to low-60's FDISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: No cuttings generated by P&A activities. Loose soil piled over wellhead and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)Signature: Date: 2-10-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. GW-032 SITE: Bear Creek Burial Grounds, Walk-ins Pits

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>-NA-</u>	(model)	<u>-NA-</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH -NA- Date/Time -NA-

Organic vapors less than 1.0 ppm Date/Time 2-12-93/0905

Beta/Gamma 90 cpm* Date/Time 2-12-93/1440

Alpha 0 cpm Date/Time All Readings

*Includes measurement taken of water displaced out of well casing while cementing.

Weather: 2-12-93: Cloudy with scattered T-storms p.m. Temp.: 2-12-93: Low- to upper-50's F.

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: No cuttings generated during P&A activities. Excavated soil returned to excavation and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)

Signature: Date: 2-12-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. GW-035 SITE: Bear Creek Burial Grounds, Walk-ins PitsAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>-NA-</u>	(model)	<u>-NA-</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH -NA- Date/Time -NA-Organic vapors less than 1.0 ppm Date/Time 2-12-93/1540Beta/Gamma 120 cpm* Date/Time 2-16-93/0850Alpha 0 cpm Date/Time All Readings

Background = 50 cpm.

Weather: 2-12-93: Cloudy with scattered T-storms p.m.
2-16-93: Cloudy to partly cloudy and windy.Temp.: 2-12-93: Low- to upper-50's F
2-16-93: Low- to upper-40's FDISPOSITION: Drill-site Disposal XContainerization _____
(Labeled?) y / n

Describe: No cuttings generated by P&A activities. Excavated soil/weathered bedrock returned to excavation and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)Signature: Date: 2-16-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. GW-036 SITE: Bear Creek Burial Grounds, Walk-ins Pits

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>-NA-</u>	(model)	<u>-NA-</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH -NA- Date/Time -NA-

Organic vapors 0.0 ppm Date/Time All Readings

Beta/Gamma 90 cpm* Date/Time 2-11-93/1315

Alpha 0 cpm Date/Time All Readings

*Background = 60 cpm

Weather: 2-11-93: cloudy and rainy Temp.: Mid- to upper-40's F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: No cuttings generated by P&A activities. Excavated soil returned to excavation and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)

Signature: Date: 2-11-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. GW-037 SITE: Bear Creek Burial Grounds, Walk-ins Pits

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>-NA-</u>	(model)	<u>-NA-</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH -NA- Date/Time -NA-

Organic vapors 0.0 ppm Date/Time All Readings

Beta/Gamma 100 cpm Date/Time 2-11-93/1425

Alpha 20 cpm Date/Time 2-10-93/0952

Weather: 2-10-93: cloudy to partly cloudy
2-11-93: cloudy, rain in p.m.

Temp.: 2-10-93: Mid-40's to upper-50's F
2-11-93: Mid- to upper-40's F

DISPOSITION: Drill-site Disposal X

Containerization _____
(Labeled?) y / n

Describe: No cuttings generated by P&A activities. Excavated soil/residuum/weathered bedrock fragments returned to excavation and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)

Signature: _____

Date: 2-11-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. GW-038 SITE: Bear Creek Burial Grounds, Walk-ins Pits

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>-NA-</u>	(model)	<u>-NA-</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH -NA- Date/Time -NA-

Organic vapors 0.0 ppm Date/Time All Readings

Beta/Gamma 120 cpm Date/Time 2-11-93/1445

Alpha 0 cpm Date/Time All Readings

Weather: 2-11-93: Cloudy, rain in p.m. Temp.: 2-11-93: Mid- to upper-40's F

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: No cuttings generated by P&A activities. Excavated soil returned to excavation and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)

Signature:

Date: 2-11-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-063 SITE: Oil Landform Functional Area

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with Ludlum Probe M44-9</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Ludlum Probe Y70115P</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.6* Date/Time 3/29/93 1430

Organic vapors 2.8 ppm Date/Time 3/29/93 1533

Beta/Gamma 50 cpm Date/Time 3/30/93 1514

Alpha 20 cpm Date/Time 3/26/93 1559

*High pH reading resulted from cement fragments in the cuttings.

Weather: See field log Temp.: See field log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings and water from activities discharged to cuttings pit by trench. All activities mitigated by use of siltation fencing and straw bales. No contamination of adjacent surface waters.

Onsite Geologist (print): Victor R. Harness/Timothy J. Coffey

Signature:

Date: 3/30/93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-088 SITE: Bear Creek Burial Grounds

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter with G-M pancake probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Scintillation tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.8</u>	Date/Time	<u>4-27-93/1501</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.2 ppm</u>	Date/Time	<u>4-27-93/1455</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>80 cpm/120 cpm</u>	Date/Time	<u>4-27-93/1343</u> (<100 cpm Above Background)
Alpha	<u>20 cpm/20 cpm</u>	Date/Time	<u>4-27-93/1343</u> (<500 cpm Above Background)

Weather: see field log Temp.: see field log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings and drilling water disposed of onto ground surface at site.

Onsite Geologist (print): Victor R. Harness, TN0025

Signature: *Victor R. Harness*

Date: 4-27-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-234 SITE: Bear Creek Burial GroundsAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44-9 G-M Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 11.5* Date/Time 4-26-93/1425 (4.0 - 10.5)Organic vapors 0.0 ppm Date/Time All Readings (<5.0 ppm)Beta/Gamma 30 cpm Date/Time 4-26-93/1317 (<100 cpm)Alpha 0 cpm Date/Time All Readings (<500 cpm)

*High pH reading due to cement fragments in cuttings.

Weather: Partly cloudy, gradual clearing Temp.: Low- to mid-60's FDISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Onsite cuttings pit.

Onsite Geologist (print): Timothy Coffey - SAICSignature: Date: 4-26-93

Y-12 PLANT GWPP WELL SITE FIELD SCREENING SHEET

WELL/BOREHOLE NO. GW-502 SITE: Bear Creek Burial Grounds, Walk-in PitsAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>-NA-</u>	(model)	<u>-NA-</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA M-128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter w/Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH -NA- Date/Time -NA-Organic vapors less than 1 ppm Date/Time 0910
2-11-93/1110Beta/Gamma 70 cpm* Date/Time 2-11-93/0938Alpha 20 cpm Date/Time 2-10-93/0830

*Includes screening of water displaced out of well while grouting and adding Hole Plug™ bentonite pellets.

Weather: 2-10-93: Cloudy 2-11-93: Cloudy and rainy Temp.: 2-10-93: Mid- to upper-40's F
2-11-93: Mid-40's FDISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: No cuttings generated by P&A activities. Excavated soil returned to excavation and compacted.

Onsite Geologist (print): Timothy Coffey - SAIC/Tim Long - SAIC (SHSO)Signature: Date: 2-11-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-551 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter w/Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; w/Ludlum 40249 Scintillation Tube</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 11.1 Date/Time 12-3-92/1721 (4.0 - 10.5)

Organic vapors 18.4 ppm* Date/Time 12-18-92/1552 (<5.0 ppm)

Beta/Gamma 70 cpm Date/Time 12-16-92/1631 (<100 cpm)

Alpha 5 cpm Date/Time 12-17-92/1603 (<500 cpm)

*High reading attributed to contamination of sample with alcohol used to anti-freeze rig water pipes.

Weather: See Field Logs Temp.: See Field Logs

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: Disposal of cuttings and drilling water onto ground surface and to cuttings pit.

Onsite Geologist (print): Victor R. Harness - SAIC/Mike Klidzejs - SAIC/Susan Abston - SAIC

Signature:

Victor R. Harness / Mike Klidzejs / Susan Abston

Date: 12-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-553 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>OVA Model 128</u>
			<u>Ludlum Model 3 Survey Meter</u>
			<u>with Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; with</u>
			<u>Ludlum Scintillation Probe Y-9635P or Y-70087P</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.7* Date/Time 12-16-92/1516 (4.0 - 10.5)

Organic vapors 5.4** ppm Date/Time 12-18-92/1615 (<5.0 ppm)

Beta/Gamma 60 cpm Date/Time 12-16-92/1516 (<100 cpm)

Alpha 20 cpm Date/Time 12-8-92/1430 (<500 cpm)

*High pH value due to grout in cuttings. Deviation approved by Steve Jones - HSE.

**Moisture in cuttings.

Weather: See Field Logs Temp.: See Field Logs

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: Cuttings and drilling water discharged to surface.

Onsite Geologist (print): Susan L. Abston - SAIC/Victor R. Harness - SAIC

Signature: *Susan L. Abston* *Victor R. Harness*

Date: 3/18/92

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-556 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7 Water Checker</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter w/Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter Ludlum Model 43-4 Air Probe or Ludlum #Y71126P Scintillation Tube</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>12.3 °</u>	Date/Time	<u>1-8-93/1600</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/10.4 ppm**</u>	Date/Time	<u>1-11-93/1720</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>30 cpm/60 cpm</u>	Date/Time	<u>1-19-93/1637</u> (<100 cpm Above Background)
Alpha	<u>10 cpm/20 cpm</u>	Date/Time	<u>1-6-93/1600</u> (<500 cpm Above Background)

* Cement fragments in cuttings.

** Elevated headspace probably due to soap used to raise cuttings.

Weather: See Field Logbooks Temp.: See Field Logbooks

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: Returns discharged to ground surface.

Onsite Geologist (print): V. Harness/T. Coffey/M. Kildzejs (SAIC)

Signature:

Date: 1/19/93

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Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-561 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS:

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>Foxboro Century OVA Model 128</u>
Beta/gamma meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
			<u>Ludlum Model 3 Survey Meter;</u>
			<u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter;</u>
			<u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.9 Time/Date 1610/12-14-92

Organic vapors 21.0 ppm * Time/Date 1247/12-14-92

Beta/Gamma 60 cpm/360 dpm Time/Date 1134/12-14-92

Alpha 0 cpm/0 dpm Time/Date 1134/12-14-92

*High value attributed to contamination from alcohol in rig winterization.
Steve Jones (HSE) notified of reading.

Weather: See field log Temp.: See field log

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/n

Describe: Cuttings released to ground surface.

Onsite Geologist (print): Michael A. Klidzejs - SAIC

Signature:

Date: 12-23-92

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-565 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: - NA -

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter w/Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter w/Y71128P Ludlum Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH	<u>10.3</u>	Date/Time	<u>1-21-93/1710</u>	(4.0 - 10.5)
Organic vapors	<u>2.8 ppm</u>	Date/Time	<u>1-21-93/1710</u>	(<5.0 ppm)
Beta/Gamma	<u>30 cpm</u>	Date/Time	<u>1-21-93/1710</u>	(<100 cpm)
Alpha	<u>20 cpm</u>	Date/Time	<u>1-21-93/1710</u>	(<500 cpm)

Weather: See Field Logs Temp.: See Field Logs

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: Cuttings and circulation water disposed of on ground surface.

Onsite Geologist (print): Victor R. Harness - SAIC, TN0025

Signature:

Date: 1-21-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-566 SITE: SPAD Landfill SiteAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter w/Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter w/Ludlum Scintillation Tube</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH	<u>11.2*</u>	Date/Time	<u>2-23-93/1541</u> 4.5 - 10.5
Organic vapors	<u>0.2 ppm</u>	Date/Time	<u>2-24-93/1612</u> (<5.0 ppm above background)
Beta/Gamma	<u>50 cpm</u>	Date/Time	<u>2-24-93/1510</u> (<100 cpm above background)
Alpha	<u>40 cpm</u>	Date/Time	<u>2-24-93/1510</u> (<500 cpm above background)

*Due to cement cuttings in returns.

Weather: See Field Logs Temp.: See Field LogsDISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / nDescribe: Cuttings and water discharged to ground surface.Onsite Geologist (print): Mike Klidzejs/V.R. Harness/S.L. Abston (SAIC)Signature: *Mike Klidzejs* *V.R. Harness* *Susan Abston*Date: 2-24-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-571 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 9.9 Date/Time 12-30-92/1655 (4.0 - 10.5)

Organic vapors 3.8 ppm Date/Time 12-30-92/1654 (<5.0 ppm)

Beta/Gamma 40 cpm Date/Time 12-30-92/1520 (<100 cpm)

Alpha 20 cpm Date/Time 12-30-92/1520 (<500 cpm)

Weather: Cloudy and hazy Temp.: 50°s

DISPOSITION: Drill-site Disposal X Containerization No
(Labeled?) y / n

Describe: Cuttings released to onsite cuttings pit.

Onsite Geologist (print): Susan Abston/Mike Klidzejs - SAIC

Signature:

Date: 1-18-93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-572 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter; Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter; Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 11.6* Time/Date 1530/12-23-92

Organic vapors 9.1 ppm headspace** Time/Date 1531/12-23-92

Beta/Gamma 60 cpm Time/Date 1334/12-23-92

Alpha 10 cpm Time/Date 1534/12-28-92

*High value of pH attributed to grout cuttings. Steve Jones (HSE) notified of reading.

**High headspace reading probably due to residual alcohol anti-freeze in drill rig water system.

Weather: See field log Temp.: See field log

DISPOSITION: Drill-site Disposal X Containerization -NA-
(Labeled?) y/n

Describe: Returns discharged to ground surface.

Onsite Geologist (print): Susan L. Abston - SAIC

Signature: *Susan L. Abston*

Date: 12-28-92

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-573D SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: N/A

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH	<u>12.0*</u>	Date/Time	<u>2-2-93/1618</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm</u>	Date/Time	<u>2-2-93/1618</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50 cpm</u>	Date/Time	<u>2-2-93/1510</u>	(<100 cpm above background)
Alpha	<u>20 cpm</u>	Date/Time	<u>2-2-93/1510</u>	(<500 cpm above background)

*Elevated pH reading from cement cuttings.

Weather: Clear Temp.: Upper 40°s

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: Cuttings released to ground surface.

Onsite Geologist (print): Michael Klidzejs - SAIC

Signature:

Date: 2/5/93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-573S SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: N/A

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter</u> <u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter</u> <u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH	<u>10.7*</u>	Date/Time	<u>2-2-93/1036</u>	(4.0 - 10.5)
Organic vapors	<u>0.1 ppm</u>	Date/Time	<u>2-2-93/1036</u>	(<5.0 ppm above background)
Beta/Gamma	<u>60 cpm</u>	Date/Time	<u>2-2-93/0853</u>	(<100 cpm above background)
Alpha	<u>10-20 cpm</u>	Date/Time	<u>2-2-93/0853</u>	(<500 cpm above background)

*Elevated pH reading from cement cuttings.

Weather: Clear Temp.: Mid 30's

DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / n

Describe: Cuttings spread over ground surface at site.

Onsite Geologist (print): Michael Klidzejs - SAIC

Signature:

Date: 2/5/93

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-580 SITE: SPAD Landfill Site

APPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS:

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Foxboro Century OVA Model 128</u>
			<u>Ludlum Model 3 Survey Meter;</u>
			<u>Ludlum Model 44 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter;</u>
			<u>Ludlum Model 43-4 Air Probe</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 10.5 Time/Date 1627/12-8-92

Organic vapors 15.4 ppm Time/Date 1622/12-8-92

Beta/Gamma 60 cpm Time/Date 1405/12-8-92

Alpha 20 cpm Time/Date 1405/12-8-92

Weather: 12-8-92 Cloudy, light snow

Temp.: Mid 30s F

DISPOSITION: Drill-site Disposal X

Containerization
(Labeled?) y/n

Describe: Cuttings released to ground surface.

Onsite Geologist (print): Michael A. Klidzejs - SAIC

Signature:

Date: 12-18-92

Y-12 PLANT GWPP WELL CUTTINGS FIELD SCREENING/DISPOSAL SHEET

WELL/BOREHOLE NO. GW-607 SITE: SPAD Landfill SiteAPPROX. VOLUME OF CUTTINGS: -NA-

CALIBRATION OF INSTRUMENTS (Check those instruments calibrated to manufacturer's specifications):

pH meter	<u>X</u>	(model)	<u>Horiba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>HNu Model HW-101</u>
Beta/gamma meter	<u>X</u>	(model)	<u>Ludlum Model 3 Survey Meter w/Ludlum Model 44-9 Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratemeter with Ludlum Scintillation Tube Probe Y70087P</u>

FIELD SCREENING RESULTS (Maximum Observed Values):

pH 11 S.U.* Date/Time 1-27-93/1730 (4.0-10.5)Organic vapors 7.4 ppm** Date/Time 1-29-93/1637 (<5.0 ppm)Beta/Gamma 70 cpm/420 dpm Date/Time 2-2-93/1755 (<100 cpm)Alpha 40 cpm/80 dpm Date/Time 1-27-93/1730 (<500 cpm)

*Received permission from Steve Jones HSE to deposit cutting & water returns into cuttings pit, despite high pH.

**Sample contained moisture which may have caused an anomalous elevated reading.

Weather: See Field Logs Temp.: See Field LogsDISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y / nDescribe: Cuttings and water returns discharged to adjacent cuttings pit.Onsite Geologist (print): Susan Abston - SAIC/Victor R. Hamess - SAICSignature: *Susan Abston* *Victor Hamess*Date: 2-2-93

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