Y-12

OAK RIDGE Y-12 PLANT

LOCKHEED MARTIN

Y/SUB/95-99069C(Y24)/2

RECEIVED

DEC 20 1995

OSTI

FISCAL YEAR 1995 WELL PLUGGING
AND ABANDONMENT PROGRAM
Y-12 PLANT, OAK RIDGE, TENNESSEE

September 1995

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

Prepared by

Science Applications International Corporation
P.O. Box 2501, 800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830

Under Purchase Order 91B-99069C-Y24

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

for the

Oak Ridge Y-12 Plant
Oak Ridge, Tennessee

Managed by

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

Under Contract Number DE-AC05-84OR21400

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

UCM-13672 (20 6-85)

MASTER

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Y/SUB/95-99069C(Y24)/2

**FISCAL YEAR 1995 WELL PLUGGING
AND ABANDONMENT PROGRAM
Y-12 PLANT
OAK RIDGE, TENNESSEE**

SEPTEMBER 1995

DISCLAIMER

**Portions of this document may be illegible
in electronic image products. Images are
produced from the best available original
document.**

CONTENTS

FIGURES	v
TABLES	v
ACRONYMS	vii
EXECUTIVE SUMMARY	ix
1. INTRODUCTION	1-1
2. GENERAL GEOLOGY	2-1
2.1 LOCATION AND PHYSIOGRAPHY	2-1
2.2 STRATIGRAPHY	2-1
3. WELL PLUGGING AND ABANDONMENT	3-1
3.1 DRILLING CONTRACTOR	3-1
3.2 PLUGGING AND ABANDONMENT METHODS	3-1
3.3 GROUTING PROCEDURES	3-5
3.4 WASTE MANAGEMENT PRACTICES	3-6
3.5 DEVIATIONS FROM NORMAL PLUGGING AND ABANDONMENT PROCEDURES	3-6
4. PLUGGING AND ABANDONMENT SUMMARIES	4-1
4.1 EXXON NUCLEAR SITE	4-1
4.2 GUM BRANCH ROAD FUNCTIONAL AREA	4-14
4.3 ASH DISPOSAL BASIN	4-16
4.4 BEAR CREEK BURIAL GROUNDS	4-19
4.5 S-3 PONDS AREA	4-20
4.6 MISCELLANEOUS SITES	4-22
5. QUALITY ASSURANCE	5-1
6. HEALTH AND SAFETY	6-1
7. REFERENCES	7-1
APPENDIX A: ACTIVITY/PROGRESS REPORTS	A-1
APPENDIX B: PLUGGING AND ABANDONMENT DIAGRAMS	B-1
APPENDIX C: WASTE MANAGEMENT PLAN	C-1
APPENDIX D: DISPOSAL AND SCREENING RECORDS	D-1
APPENDIX E: EQUIPMENT DECONTAMINATION SUMMARIES	E-1
APPENDIX F: WELL LOCATION MAP	F-1

FIGURES

2.1.	Generalized geologic cross-section through the Y-12 Plant and vicinity	2-2
2.2.	Bear Creek Valley geologic map.....	2-3
2.3.	Generalized geologic cross-section of the member formations of the Conasanga Group	2-4
2.4.	Stratigraphic units in the vicinity of the Y-12 Plant	2-5

TABLES

3.1	Summary of drilling contractor services provided at each abandoned well or boring	3-2
4.1	Summary of abandoned well construction data, Part I	4-2
4.2	Summary of abandoned well construction data, Part II	4-5
6.1	Action levels used for health and safety monitoring during well plugging and abandonment	6-1

ACRONYMS

ADB	Ash Disposal Basin
API	American Petroleum Institute
BCBG	Bear Creek Burial Grounds
BGS	below ground surface
Energy Systems	Lockheed Martin 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
MSL	mean sea level
OD	outside diameter
ORR	Oak Ridge Reservation
OVA	organic vapor analyzer
P&A	plugging and abandonment
PID	photoionization detector
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
SAIC	Science Applications International Corporation
TD	total depth
TOWR	top of weathered rock
TOFR	top of fresh rock

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 September 1994 through August 1995. A total of 67 wells, piezometers, 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

Science Applications International Corporation (SAIC) was authorized by Lockheed Martin Energy Systems, Inc. (Energy Systems) to provide technical oversight for the plugging and abandonment (P&A) of obsolete, damaged, and obstructing groundwater monitoring wells, piezometers, and coreholes in the vicinity of the Y-12 Plant at Oak Ridge, Tennessee from January 16, 1995 through September 30, 1995. 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 P&A, waste disposal, and health and safety monitoring requirements.

The criteria for determining the need for the P&A of monitoring wells, piezometers, and coreholes were stated in the *Monitoring Well Plugging and Abandonment Plan for the Department of Energy Y-12 Plant, Oak Ridge, Tennessee* (HSW, Inc. 1991). The P&A 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 Groundwater Protection Program (GWPP) Manager.

This report presents a summary of the activities performed during the fiscal year (FY) 1995 Plugging and Abandonment Program, and includes all wells decommissioned between September 15, 1994 and June 21, 1995. Note: the wells decommissioned from September 15, 1994 to September 30, 1994 (part of the Federal FY 1994) are included in this summary report because the FY 1994 summary report deadline required that preparations begin before the end of the fiscal year. A total of 67 monitoring wells, piezometers, and borings were decommissioned in FY 1995 (Appendix F). In addition to this introduction, this summary report contains:

- general geologic setting of the Y-12 Plant and vicinity;
- discussion of well plugging and abandonment methods, grouting procedures, and waste management practices (a Waste Management Plan for Drilling Activities is included in Appendix C);
- summaries of plugging and abandonment activities at each site; and
- quality assurance/quality control (QA/QC) and health and safety protocols used during the FY 1995 Plugging and Abandonment Program.

Copies of the well activity/progress reports, plugging and abandonment diagrams, well cuttings field screening/disposal sheets, and equipment decontamination summaries are included in Appendices A, B, D, and E, respectively.

All decommissioned wells were maintained by the Y-12 Plant GWPP within its administrative area, which includes Bear Creek Valley from Y-12 Plant proper to the Clinch River, the southern flank of Pine Ridge, Chestnut Ridge, and parts of Bethel Valley.

2. GENERAL GEOLOGY

2.1 LOCATION AND PHYSIOGRAPHY

The Oak Ridge Y-12 Plant is located in Bear Creek Valley on the U.S. Department of Energy Oak Ridge Reservation (ORR), in the southwestern corner of Anderson County. The area of interest covered by this report includes Pine Ridge (which bounds Bear Creek Valley to the north), Chestnut Ridge (to the south of Bear Creek Valley), and parts of Bethel Valley.

The ORR, occupying an area of approximately 55 square miles, lies in a portion of the Tennessee section of the Valley and Ridge Physiographic Province (McMaster 1963). This province is characterized by narrow, elongated ridges and valleys trending northeast-southwest. Resistant sandstone, siltstone, and siliceous limestone and dolostone typically form the ridges; the valleys are commonly underlain by less resistant shale and soluble carbonates (Rodgers 1953). Elevations within the ORR range from about 900 ft to just over 1200 ft above mean sea level.

2.2 STRATIGRAPHY

Four major stratigraphic units, classified according to lithology, fossils, and age, underlie the Bear Creek Valley and vicinity. From oldest to youngest, these units are the Rome Formation, Conasauga Group, Knox Group, and Chickamauga Group. The formations located in and around Bear Creek Valley generally strike N47°E to N67°E. Regional dips range from 30° to 50° to the southeast (King and Haase 1987). Figures 2.1 and 2.2 represent a generalized geologic cross section and map, respectively, that illustrate the locations and stratigraphic relationships of the major stratigraphic groups and formations that occur in the Bear Creek Valley area.

The Rome Formation, which forms Pine Ridge, is Lower Cambrian in age and consists of interbedded sandstone, shale, and siltstone with local beds of dolostone (McMaster 1963).

The Conasauga Group, of the Middle to Upper Cambrian period, has been subdivided into six formations of alternating, predominantly shale and limestone lithologies. The six divisions, from oldest to youngest, are the Pumpkin Valley Shale, Rutledge Limestone, Rogersville Shale, Maryville Limestone, Nolichucky Shale, and Maynardville Limestone. Detailed lithologic descriptions of these formations are given in King and Haase (1987). The majority of the wells decommissioned during FY 1995 had been installed in Conasauga Group formations. Figure 2.3 presents the relative positions of the member formations of the Conasauga Group, in cross section, as they appear in Bear Creek Valley.

Chestnut Ridge, to the south of Bear Creek Valley, is formed from siliceous dolostones of the Knox Group. This upper Cambrian to lower Ordovician-aged unit is divided into five formations that are, from oldest to youngest, the Copper Ridge Dolomite, Chepultepec Dolomite, Longview Dolomite, Kingsport Formations, and Mascot Dolomite. Detailed lithologic descriptions of the Knox Group formations are published in Milci (1973).

All of the bedrock formations in Bear Creek Valley and vicinity are overlain by unconsolidated deposits of fill, alluvium, colluvium, and in situ weathered bedrock (residuum). The thickness of unconsolidated deposits overlying the Conasauga and Chickamauga Groups (occupying valleys) ranged from approximately 1 ft to as much as 46 ft. Unconsolidated deposits overlying the Knox Group on Chestnut Ridge are considerably thicker than those in the adjacent valleys.

Figure 2.4 is a generalized stratigraphic column of the major stratigraphic units and accepted subdivisions of the Y-12 Plant area bedrock formations.

Source: McMaster 1963

Fig. 2.1. Generalized geologic cross-section through the Y-12 Plant and vicinity.

Fig. 2.2. Bear Creek Valley geologic map.

Fig. 2.3. Generalized geologic cross-section of the member formations of the Conasauga Group.

Age	Group	Formation	Approximate Thickness (ft)		
			King and Hanes 1987	MHCl 1973	McMaster 1963
Middle Ordovician	Chickamauga	Undifferentiated	Not Determined		1750
Lower Ordovician	Knox	Mascot Dolomite	Not Determined	400-800	3000 (undivided)
		Kingsport Formation		200-320	
		Longview Dolomite		250-450	
		Chepultepec Dolomite		725-880	
		Copper Ridge Dolomite		900-1000	
Middle & Upper Cambrian	Conasauga	Maynardville Limestone	418-450		1500 (undivided)
		Nolichucky Shale	422-550		
		Maryville Limestone	346-445		
		Rogersville Shale	80-120		
		Rutledge Limestone	80-120		
		Pumpkin Valley Shale	260-320		
Lower Cambrian		Rome	Not Determined		800+

Fig. 2.4. Stratigraphic units in the vicinity of the Y-12 Plant.

3. WELL PLUGGING AND ABANDONMENT

3.1 DRILLING CONTRACTOR

The principal drilling contractor for plugging and abandonment activities at the Y-12 Plant during FY 1995 was Highland Drilling Company (Highland). All plugging and abandonment activities were performed by Highland (Table 3.1).

Highland Drilling Company utilized either an air rotary drilling rig or a backhoe outfitted with an auger motor to plug and abandon wells during FY 1995. An Ingersoll-Rand XL-750 drill rig was used to plug wells 1034, 1100, 1101, 1102, 1103, 1104, 1105, 1106, BC-41, BC-42, BCU-12, BCU-15, BCU-21, BCU-23, BCU-24, BCU-25, BCU-26, BCU-27, BCU-28, BCU-29, CO-2, CO-4, GW-049, GW-050, GW-051, GW-060, GW-096A, GW-209, GW-545, LL/HAZ-04, LL/HAZ-15, and OR-03. A Ford 455 backhoe with a McMillan Diggerhead was used to plug wells 1107, 1108, BC-03, BC-25, BC-30, BC-31, BC-33, BC-36, BC-50, BC-62, BCU-14, BCU-17, BCU-18, BCU-19, GW-048, GW-215, and GW-447. The same backhoe without the auger motor was used to pull out the casing, or excavate around the wellhead, etc., on the following wells: 1109, 1110, Unidentified well A, and Unidentified well B. Some wells were decommissioned "by hand" (casing removal by hand or plugged/grouted in place). Those wells are listed here: 1008, BC-32, BC-34, BC-39, BC-40, BCU-22, GW-182, GW-216, S3-1, S3-3, S3-5, S3-6, S3-7, and S3-8.

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 1995 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. Method A involves the overwash and removal of casing with washover pipe. Once the well casing has been removed, the borehole is reamed with a tricone bit at least 0.25 in. larger in diameter than the original bore. American Petroleum Institute (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 or local materials. 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 1995, method A was followed for the plugging and abandonment of wells GW-048, GW-049, GW-050, GW-051, GW-060, GW-096A, and GW-545.

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 or more 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

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

Well Number	Contractor	Service Supplied
1008	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1034	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1100	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1101	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1102	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1103	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1104	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1105	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1106	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1107	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1108	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1109	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
1110	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BC-03	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-25	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-30	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-31	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-32	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-33	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-34	Highland Drilling Co.	Plugging and abandonment of a flowing open-interval well/core hole
BC-36	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-39	Highland Drilling Co.	Plugging and abandonment of a flowing open-interval well/core hole
BC-40	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-41	Highland Drilling Co.	Plugging and abandonment of a flowing open-interval well/core hole
BC-42	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-50	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BC-62	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BCU-12	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BCU-14	Highland Drilling Co.	Plugging and abandonment of an open-interval well

Table 3.1 (continued)

Well Number	Contractor	Service Supplied
BCU-15	Highland Drilling Co.	Plugging and abandonment of an open-interval well
BCU-17	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-18	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-19	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-21	Highland Drilling Co.	Plugging and abandonment of an open-interval well/core hole
BCU-22	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-23	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-24	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-25	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-26	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-27	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-28	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
BCU-29	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
CO-2	Highland Drilling Co.	Plugging and abandonment of an open-interval well
CO-4	Highland Drilling Co.	Plugging and abandonment of an open-interval well
GW-048	Highland Drilling Co.	Plugging and abandonment of a stainless-steel screened well
GW-049	Highland Drilling Co.	Plugging and abandonment of a stainless-steel screened well
GW-050	Highland Drilling Co.	Plugging and abandonment of a stainless-steel screened well
GW-051	Highland Drilling Co.	Plugging and abandonment of a stainless-steel screened well
GW-060	Highland Drilling Co.	Plugging and abandonment of a stainless-steel screened well
GW-096A	Highland Drilling Co.	Plugging and abandonment of a stainless-steel screened well
GW-182	Highland Drilling Co.	Plugging and abandonment of a core hole
GW-209	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
GW-215	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
GW-216	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
GW-447	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
GW-545	Highland Drilling Co.	Plugging and abandonment of a stainless-steel screened well
LL/HAZ-04	Highland Drilling Co.	Plugging and abandonment of a PVC screened well
LL/HAZ-15	Highland Drilling Co.	Plugging and abandonment of a PVC screened well/core hole
OR-03	Highland Drilling Co.	Plugging and abandonment of a open-interval well

Table 3.1 (continued)

Well Number	Contractor	Service Supplied
S3-1	Highland Drilling Co.	Plugging and abandonment of a PVC screened piezometer
S3-3	Highland Drilling Co.	Plugging and abandonment of a PVC screened piezometer
S3-5	Highland Drilling Co.	Plugging and abandonment of a PVC screened piezometer
S3-6	Highland Drilling Co.	Plugging and abandonment of a PVC screened piezometer
S3-7	Highland Drilling Co.	Plugging and abandonment of a PVC screened piezometer
S3-8	Highland Drilling Co.	Plugging and abandonment of a PVC screened piezometer
Unident. A	Highland Drilling Co.	Plugging and abandonment of an open-interval well
Unident. B	Highland Drilling Co.	Plugging and abandonment of a PVC screened well

has cured, the well casing is over washed or milled 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 1995, method B was used in the plugging and abandonment of wells BCU-14, BCU-15, BCU-21, CO-2, CO-4, OR-03, and Unidentified well A.

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 milling 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 1995, method C was used in the plugging and abandonment of wells 1008, 1034, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, BCU-17, BCU-18, BCU-19, BCU-22, BCU-23, BCU-24, BCU-25, BCU-26, BCU-27, BCU-28, BCU-29, GW-209, GW-215, GW-216, GW-447, LL/HAZ-04, LL/HAZ-15, S3-1, S3-3, S3-5, S3-6, S3-7, S3-8, and Unidentified well B.

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 (approximately 3.0-in. diameter) 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 1995, method D was used in the plugging and abandonment of wells BC-03, BC-25, BC-30, BC-31, BC-32, BC-33, BC-34, BC-36, BC-39, BC-40, BC-41, BC-42, BC-50, BC-62, BCU-12, and GW-182.

3.3 GROUTING PROCEDURES

Open Interval Wells

During plugging of the open-interval wells, the open intervals were reamed to fresh material, at least 1 ft deeper than the total depth (TD) of the well. The open intervals were then cleaned of as much debris as possible, and API Class I (Type I) cement was either hand-mixed or purchased from local vendors. Cement was tremied into the borehole 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 hours before further plugging and abandonment activities were pursued at each well.

Following removal of final casing and reaming of the borehole to expose fresh rock, cement grout was tremied to within ≤ 4 ft of the ground surface, again using 1.5-in. OD PVC. Where bore depth was < 20 ft below ground surface (BGS) and/or danger of the bore bridging was negligible, neat grout was poured directly into the borehole from the surface. The remaining bore (≤ 4 ft BGS) was subsequently filled with a compacted clay/soil cap after the plug was cured.

Screened Monitoring Wells and Piezometers

Following removal of screen and casing from these wells, and subsequent conditioning of the borehole, 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 of the same specifications delivered to the site by a cement subcontractor. In bores > 20 ft deep, grout was tremied through 1.5-in. OD PVC tremie pipe at a depth of approximately 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.

In the event that drill cuttings exceeded acceptable disposal limits, Health, Safety, Environment, and Accountability Organization (HSEA) personnel directed subcontractor personnel in the proper disposal techniques.

Organic Vapors

A headspace analysis of the cuttings composite from well 1104 measured in excess of acceptable disposal limits. After re-sealing the sample and allowing the appropriate incubation period, the headspace was again analyzed, and again found to exceed the disposal limits. HSEA directed the oversight geologist to allow the cuttings to aerate overnight and resample the following day. A headspace analysis of a composite of the same cuttings the following day, resulted in measurements that were in the acceptable range for on-site disposal. The source of the high headspace readings was thought to be the PVC (or plastic) casing used in the well. The headspace analysis of the cuttings composite from well 1101, which also utilized the same type of PVC casing, was marginally acceptable. The initial headspace analysis of the cuttings composite from well BC-33 exceeded the disposal limits. A headspace measurement of the same sample after re-sealing and a 1-hr incubation fell within acceptable disposal limits. The source of the high headspace reading was not determined, and the cuttings were spread on the ground surface at the well location.

pH

A measure of the pH of the cuttings composites of many wells was in excess of acceptable disposal limits. In all cases, cement fragments/dust in the cuttings composite were identified as the source of the high pH. The wells in which a high pH was measured are as follows: 1034, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, BCU-12, BCU-21, GW-049, GW-050, GW-060, GW-447, GW-545, and LL/HAZ-15. In all cases, the cuttings were scattered around the well location with no further action.

3.5 DEVIATIONS FROM NORMAL PLUGGING AND ABANDONMENT PROCEDURES

Due to certain irregularities or unusual circumstances in the installation of the well to be decommissioned, deviations from the approved P&A methods were necessary to complete the P&A. Authorization to deviate from P&A methods was obtained from HSEA prior to beginning P&A activities. Generally, deviations of this type included: milling of PVC well casing/screen while simultaneously reaming the wellbore to fresh material, thereby streamlining the applicable P&A method; using bentonite aggregate instead of cement to bridge voids, cavities, or fractures; and abbreviating P&A activities at a well when removal of the well casing/screen has been deemed impractical (either casing could not be extracted or waste generation was a concern).

A summary of some of the more common specific deviations to P&A methods that occurred during the FY 1995 program follows:

- Bentonite aggregate (Shur-Plug™) was used as part of the plug to bridge voids, cavities, or thief zones during P&A of the following wells: 1100, 1106, 1109, 1110, CO-4, GW-545, Unidentified well A, and Unidentified well B.
- Well casing/screen drilled up while the wellbore was reamed to fresh material in the following wells: 1034, 1100, 1101, 1102, 1104, BC-33, BCU-24, BCU-25, BCU-26, BCU-27, BCU-28, BCU-29, and LL/HAZ-04.
- Alcohol-based soap (Quik-Foam™) lubricant/drilling mud was used to raise cuttings and free the bit that became stuck while reaming the wellbore on well GW-545.
- The reamed wellbore was capped while the final cement level was greater than 4.0 ft BGS on wells GW-545, LL/HAZ-04, and LL/HAZ-15.
- The well casing was removed to the ground surface, and the well screen/casing grouted in place on wells 1000, GW-216, S3-1, S3-3, S3-5, S3-6, S3-7, and S3-8.

In some cases, it was impossible to complete the P&A of a well for one reason or another. Wells that were incompletely decommissioned, and the reason, are listed below:

1106, 1107, BC-03, BC-25, BC-31, BC-36, BC-50, BC-62, BCU-17, BCU-18, BCU-19, GW-048, GW-049, GW-051, and GW-215. Unable to ream the wellbore to 1 ft beyond TD because auger refusal occurred prior to reaching the target reaming depth.

BC-42, BCU-12, and BCU-21. Did not ream wellbore to 1 ft beyond TD because these wells were constructed equivalent to coreholes; method D or modified B was used for these wells.

1109, 1110, Unidentified well A, and Unidentified well B. Wells were not reamed at all because of the instability of the soil (fly ash). Casing extracted, and wellbore plugged with bentonite aggregate.

BC-32 and BC-40. Well was not reamed because of the location: too difficult to get equipment to. Well casing extracted by hand, top of wellbore capped with clay soil.

BC-34, BC-39, and BC-41. Wells were "flowing" wells complete with water piping and spigots. The top section of pipe was unthreaded, and the well left to flow naturally.

1102 and 1105. Wells were not reamed to 1 ft beyond TD because of lost circulation and communication to the surface in a wetlands.

BC-41, GW-060, and GW-096A. Unable to ream wellbore to 1 ft beyond TD because washover pipe cut through/twisted off well casing short of TD, making it impossible to recover the remaining casing. The reamed portion was plugged according to P&A procedures.

CO-4. Unable to ream to 1 ft beyond TD because a cavern and collapsing debris were encountered that threatened to hang up the bit.

LL/HAZ-15. Unable to ream to 1 ft beyond TD because wellbore was crooked, and reaming bit was unable to follow it.

The BC-Series wells, the S3 piezometers, and wells GW-182 and 1008 had blanket variations to the standard procedures pre-approved by HSEA prior to the P&A of the respective wells (piezometers). Those variations will be discussed in detail in Section 4.

4. PLUGGING AND ABANDONMENT SUMMARIES

This section provides a brief summary of each of the 67 wells decommissioned by the Y-12 Plant GWPP during FY 1995. The wells are arranged numerically within the same geographic region or functional area. A summary of the recorded well construction and location information is presented in Tables 4.1 and 4.2 (Jones et al. 1994). 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. Some wells had no listing in the Subsurface Data Base (Jones et al. 1994). Some information for the wells reported in Tables 4.1 and 4.2 is based on field observations.

4.1 EXXON NUCLEAR SITE

Located along Bear Creek Road, west of Highway 95, the Exxon Nuclear Site is an area that was investigated in the mid-1970s as a potential location for a low-level radioactive waste disposal facility (nuclear fuel recovery and recycling) (Law 1975). A total of 29 wells, the majority of which were converted from core holes, were plugged and abandoned during the FY 1995 program. Several wells could not be located in the field because they had either been destroyed, or were borings that had been constructed without casing.

In addition to wells for which records existed, a substantial number of wells were discovered at the Exxon Nuclear Site for which no construction information was available. These wells were labeled BCU-XX and numbered consecutively as per HSEA.

Many of the wells at the Exxon Nuclear Site were constructed in coreholes and, since many of these holes exceeded 300 ft in depth, HSEA personnel decided to consider these as modified coreholes. Therefore, the P&A methods were deviated for these wells as follows:

- If a BC-series well was less than 110 ft deep, a modified P&A method C was used. The surface casing was removed from the wellbore (if possible), the wellbore was reamed to fresh material to approximately 1 ft deeper than reported depth, and the borehole was grouted to within 4 ft of the ground surface. If the PVC well casing could not be extracted from the hole, it was milled as the borehole was reamed. Note: No steel casing (mild, stainless, etc.) was found at the Exxon Nuclear Site.
- If a BC-series well was greater than 110 ft deep, a modified P&A method D was used. The surface casing was removed from the wellbore, the open interval was grouted from TD to approximately 20 ft below reported top of fresh rock (TOFR), the cased interval reamed to 20 ft below TOFR, and the reamed borehole grouted to within 4 ft of the ground surface.
- Special circumstance: If it was possible to remove the casing from the wellbore, an option was available whereby the casing would be milled while the wellbore was reamed to expose fresh material to a point approximately 5 ft below the reported (or tagged) casing bottom.
- If a BCU-series well was less than 110 ft deep, a modified P&A method C was used. The surface casing was removed from the wellbore, the wellbore was reamed to fresh material to approximately 1 ft deeper than the TD of the well (if that depth can be determined while drilling), and the borehole was grouted to within 4 ft of the ground surface.
- If a BCU-series well was greater than 110 ft deep, a modified P&A method was used. The surface casing was removed from the wellbore, the open interval was grouted to at least 5 ft below the bottom of the casing, the cased interval was reamed to approximately 5 ft below the bottom of the casing, and the borehole was grouted to within 4 ft of the ground surface. Special circumstances, such as an inability to remove the casing from the wellbore, were treated in the same manner as the BC-series wells stated earlier. Note: During P&A activities at well BCU-12, it was discovered that the well also had a BC-66 nomenclature.

Table 4.1. Summary of decommissioned well construction data, Part I.

Well number	Y-12 Plant Coordinates		Surface Elevation (ft MSL ^a)	Total Depth (ft BGS ^b)	Functional Area	Other Names	Screened (S) Open interval (O)
	Northing	Easting					
1008	29933	52128	1004.50	20.0	S3 Ponds	AP-08, YAP-06, W-06, No. 04	S
1034	29953	42436	933.93	45.0	Y-12 Burial Grounds	YGMW-12, YMW-03, BG-08	S
1100	26365	57018	954.53	27.0	Ash Disposal Basin	BMW-1	S
1101	26317	57154	954.45	28.9	Ash Disposal Basin	I-1	S
1102	26345	57069	954.25	75.1	Ash Disposal Basin	BMW-3	S
1103	26352	57056	954.12	25.0	Ash Disposal Basin	MW-3	S
1104	26348	57061	954.27	54.3	Ash Disposal Basin	I-3	S
1105	26265	57054	922.04	56.4	Ash Disposal Basin	BMW-5	S
1106	26266	57071	922.47	34.5	Ash Disposal Basin	MW-5	S
1107	26184	57055	900.87	32.2	Ash Disposal Basin	BMW-6	S
1108	26185	57048	901.12	9.0	Ash Disposal Basin	MW-6	S
1109	26399	57148	953.74	41.8	Ash Disposal Basin	BMW-7	S
1110	26489	57173	953.96	8.0	Ash Disposal Basin	MW-9	S
1111 ^c	26878	57227	953.51	8.0	Ash Disposal Basin	MW-10	S
1112 ^c	27225	57235	954.73	8.0	Ash Disposal Basin	MW-11	S
44-DC ^d	29806	32584	875.47	42.4	Gum Branch Road	None	O
BC-03 ^e	29333	22033	877.36	349.1	Exxon Nuclear Site	None	O
*BC-25 ^e	30341	23425	889.80	104.0	Exxon Nuclear Site	None	O
BC-30 ^e	29840	20549	880.27	104.0	Exxon Nuclear Site	None	O
BC-31 ^e	30182	19620	860.50	101.0	Exxon Nuclear Site	None	O
BC-32 ^e	30183	19080	862.54	100.2	Exxon Nuclear Site	None	O
BC-33 ^e	30294	19602	867.78	145.3	Exxon Nuclear Site	None	O
BC-34 ^e	30538	19600	890.95	126.3	Exxon Nuclear Site	None	O
BC-36 ^e	30231	19795	862.70	350.0	Exxon Nuclear Site	None	O
BC-39 ^e	30728	19793	896.57	157.8	Exxon Nuclear Site	None	O
BC-40 ^e	30962	19878	964.90	135.5	Exxon Nuclear Site	None	O
BC-41 ^e	30538	20079	897.15	276.0	Exxon Nuclear Site	None	O
BC-42 ^e	30728	20086	935.91	203.0	Exxon Nuclear Site	None	O
*BC-50 ^e	28270	19793	829.00	100.0	Exxon Nuclear Site	None	O
BC-62 ^e	30495	19599	887.18	56.3	Exxon Nuclear Site	None	O

Table 4.1. (continued)

Well number	Y-12 Plant Coordinates		Surface Elevation (ft MSL ^a)	Total Depth (ft BGS ^b)	Functional Area	Other Names	Screened (S) Open interval (O)
	Northing	Easting					
BCU-12 ^c	30382	20103	878.02	201.08	Exxon Nuclear Site	BC-66	O
BCU-14 ^c	30266	19796	861.92	14.1 ^h	Exxon Nuclear Site	Unknown	O ⁱ
BCU-15 ^c	30281	19795	864.48	16.5 ^h	Exxon Nuclear Site	Unknown	O ⁱ
BCU-17 ^c	30180	19641	859.52	9.7 ^h	Exxon Nuclear Site	Unknown	O ⁱ
BCU-18 ^c	30149	19622	858.44	50.7 ^h	Exxon Nuclear Site	Unknown	O ⁱ
BCU-19 ^c	30181	19600	861.26	33.3 ^h	Exxon Nuclear Site	Unknown	O ⁱ
BCU-21 ^c	30392	19791	884.76	241.0 ^h	Exxon Nuclear Site	Unknown	O ⁱ
BCU-22 ^c	30671	19806	890.10	Unknown	Exxon Nuclear Site	Unknown	Unknown
BCU-23 ^c	30643	19828	896.20	58.3 ^h	Exxon Nuclear Site	Unknown	S
BCU-24 ^c	30647	19840	898.13	59.8 ^h	Exxon Nuclear Site	Unknown	S
BCU-25 ^c	30643	19845	898.04	58.5 ^h	Exxon Nuclear Site	Unknown	S
BCU-26 ^c	30645	19844	897.98	59.1 ^h	Exxon Nuclear Site	Unknown	S
BCU-27 ^c	30647	19844	898.18	58.3 ^h	Exxon Nuclear Site	Unknown	S
BCU-28 ^c	30648	19844	898.08	58.3 ^h	Exxon Nuclear Site	Unknown	S
BCU-29 ^c	30650	19844	898.04	59.2 ^h	Exxon Nuclear Site	Unknown	S
CO-2	30082	38510	985.30	107.2 ^h	West Bear Creek Valley	Unknown	O ⁱ
CO-4	29411	38525	908.10	57.0 ^h	West Bear Creek Valley	Unknown	O ⁱ
GW-048	29386	44241	914.84	Unknown	Y-12 Burial Grounds	None	S
GW-049	29245	44129	918.17	20.5	Y-12 Burial Grounds	None	S
GW-050	29074	44101	912.03	15.0	Y-12 Burial Grounds	None	S
GW-051	29051	43744	907.15	11.2	Y-12 Burial Grounds	None	S
GW-060	28931	43047	900.51	50.0	Y-12 Burial Grounds	None	S
GW-096A	29254	44116	918.92	61.0	Y-12 Burial Grounds	None	S
GW-182	28373	57663	1147.2	402.1	Chestnut Ridge Security PH	None	O
GW-209	31775	27699	792.96	48.1	USGS Sites	USGS-4Wa	S
GW-215	29369	9169	754.46	15.2	USGS Sites	USGS-3Na	S
GW-216	29384	9170	754.79	10.7	USGS Sites	USGS-3Nb	i
GW-447	29894	31745	872.64	8.55	Gum Branch Road	None	S
GW-545	27641	51729	1055.40	67.0	Landfill VI	None	S
LL/HAZ-04	29783	32582	873.91	25.0	Gum Branch Road	None	S
LL/HAZ-15	29780	32153	878.41	375.0	Gum Branch Road	None	S

Table 4.1. (continued)

Well number	Y-12 Plant Coordinates		Surface Elevation (ft MSL ^a)	Total Depth (ft BGS ^b)	Functional Area	Other Names	Screened (S) Open interval (O)
	Northing	Easting					
OR-03	30074	33117	858.75	100.0	Gum Branch Road	None	O ^d
Unidentified A	Unknown	Unknown	Unknown	36.2 ^h	Ash Disposal Basin	Unknown	O ^d
Unidentified B	Unknown	Unknown	Unknown	19.3 ^h	Ash Disposal Basin	Unknown	S ⁱ
S3-1 ^f	30427	52537	1010.8		S3 Ponds	None	S
S3-3 ^f	30069	52118	1006.3		S3 Ponds	None	S
S3-5 ^f	30381	51802	1005.0		S3 Ponds	None	S
S3-6 ^f	30425	51937	1011.6		S3 Ponds	None	S
S3-7 ^f	30179	51991	1008.1		S3 Ponds	None	S
S3-8 ^f	30173	52368	1006.0		S3 Ponds	None	S

^aMSL = mean sea level

^bBGS = below ground surface

^cWells 1111 and 1112 were not physically located in the field. The wells were assumed destroyed.

^dWell 44-DC was not physically located in the field. The well was assumed destroyed.

^eLocation coordinates and elevations of these wells provided by as-built survey data during FY 1995 unless noted (*). All BC-series wells are open-interval construction (installation in NX core holes).

^fPiezometer (source of information is original field logbooks)

^gSource: Drier, R.B., P.H. Pollard, and M.B. Leaf 1990, *Core Barn Inventory, Status Report*, Y/TS-655.

^hTotal depths listed are apparent depths obtained from field observations.

ⁱConstruction type is reported as "unknown." Field observations determine well to be of open-interval construction.

*Not re-surveyed during FY 1995.

Entries in italics represent data obtained from field observations.

Source: Jones et al. 1994.

Table 4.2. Summary of decommissioned well construction data, Part II

Well number	Protective Casing Depth/OD (ft,BGS/in.)	Surface Casing ^a Type	Surface Casing Depth/OD (ft,BGS/in.)	TOWR ^b (ft,BGS)	TOFR ^c (ft,BGS)	Plugging and Abandonment Method	Rock Formation(s) ^d
1008	None	PVC/#40 ^b	20.0/-NA-	-NA-	-NA-	C	Nolichucky
1034	None	PVC/#40	45.0/6.5	15.0	30.0	C	Nolichucky
1100	None	PVC/#40	27.0/2.37	-NA-	27.4	C	Knox
1101	None	PVC/unknown	28.4/2.70	-NA-	27.1	C	Knox
1102	None	PVC/#40	75.1/2.37	-NA-	-NA-	C	Knox
1103	None	PVC/#40	25.0/2.37	-NA-	-NA-	C	Knox
1104	None	PVC/unknown	53.5/2.70	-NA-	55.9	C	Knox
1105	None	PVC/#40	56.4/2.37	-NA-	-NA-	C	Knox
1106	None	PVC/#40	34.0/2.37	-NA-	34.7	C	Knox
1107	None	PVC/#40	32.2/2.37	-NA-	-NA-	C	Knox
1108	None	PVC/#40	9.0/2.37	-NA-	-NA-	C	Knox
1109	None	PVC/#40	39.4/2.37	-NA-	-NA-	C	Knox
1110	None	PVC/unknown	8.0/2.0	-NA-	-NA-	C	Knox
1111 ^e	Unknown	PVC/unknown	8.0/2.0	-NA-	-NA-	-NA-	Knox
1112 ^e	Unknown	PVC/unknown	8.0/2.0	-NA-	-NA-	-NA-	Knox
44-DC ^f	Unknown	steel/-NA-	27.0/6.63	7.5	35.4	-NA-	Nolichucky
BC-03	None	PVC/#40	37.8/1.5	12.0	14.0	D	Nolichucky/Maryville (223)
BC-25	None	PVC/#40	-NA-/4.5	8.0	22.0	D	Rogersville
BC-30	None	PVC/#40	18.8/1.75	-NA-	16.0	D	Maryville
BC-31	None	PVC/#40	12.0/4.5	8.8	10.0	D	Rutledge/Pumpkin Valley (84)
BC-32	None	PVC/#40	62.4/1.25	16.5	18.8	D	Rutledge/Pumpkin Valley (58)
BC-33	None	PVC/#80	-NA-/1.25	8.0	13.7	D	Pumpkin Valley
BC-34	None	Steel	-NA-/1.0	13.0	21.0	D	Pumpkin Valley
BC-36	None	PVC/#40	14.8/4.5	15.0	16.0	D	Rutledge/Pumpkin Valley (70)
BC-39	None	Steel	-NA-/1.0	4.0	6.0	D	Pumpkin Valley/Rome (112)
BC-40	None	PVC/#40	-NA-/4.5	-NA-	68.0	D	Rome
BC-41	None	Steel	-NA-/1.0	3.0	21.8	D	Pumpkin Valley/Rome (270)

Table 4.2. (continued)

Well number	Protective Casing Depth/OD (ft,BGS/in.)	Surface Casing ^a Type	Surface Casing Depth/OD (ft,BGS/in.)	TOWR ^b (ft,BGS)	TOFR ^c (ft,BGS)	Plugging and Abandonment Method	Rock Formation(s) ^d
BC-42	None	PVC/#80	66.4/1.0	13.0	36.2	D	Pumpkin Valley/ Rome (182)
BC-50	None	PVC/#40	13.0/4.5	-NA-	13.0	D	Maynardville
BC-62	None	PVC/#80	-NA-/1.25	-NA-	24.0	D	Pumpkin Valley
BCU-12	None	PVC/#40	37.7/1.5	3.5	13.0	D	-NA-
BCU-14	None	PVC/#40	9.2/4.5	-NA-	-NA-	B	-NA-
BCU-15	None	PVC/#40	9.8/4.5	7.0	-NA-	B	-NA-
BCU-17	None	PVC/#80	-NA-/1.25	-NA-	-NA-	C	-NA-
BCU-18	None	PVC/#80	-NA-/1.25	-NA-	-NA-	C	-NA-
BCU-19	None	PVC/#80	-NA-/1.25	-NA-	-NA-	C	-NA-
BCU-21	None	PVC/#40	18.7/4.5	15.0	19.0	B	-NA-
BCU-22	None	PVC/#40	-NA-/4.5	-NA-	-NA-	C	-NA-
BCU-23	None	PVC/#80	58.3/1.25	9.0	11.0	C	-NA-
BCU-24	None	PVC/#80	59.8/1.25	4.6	10.6	C	-NA-
BCU-25	None	PVC/#80	58.5/1.25	-NA-	11.0	C	-NA-
BCU-26	None	PVC/#80	59.1/1.25	4.0	-NA-	C	-NA-
BCU-27	None	PVC/#40	58.3/1.25	1.0	9.0	C	-NA-
BCU-28	None	PVC/#40	58.3/1.25	2.0	8.0	C	-NA-
BCU-29	None	PVC/#40	59.2/1.25	2.0	8.0	C	-NA-
CO-2	None	Steel	10.0/4.0	10.0	50.0	B	-NA-
CO-4	None	Steel	37.0/4.0	14.4	48.4	B	-NA-
GW-048	2.7/6.63	SS/#304	7.3/2.37	3.5	-NA-	A	Maynardville
GW-049	3.2/6.63	SS/#304	18.6/2.37	8.7	-NA-	A	Maynardville
GW-050	3.0/6.63	SS/#304	13.0/2.37	15.0	-NA-	A	Maynardville
GW-051	2.0/6.63	SS/#304	9.6/2.37	11.2	-NA-	A	Maynardville
GW-060	1.8/5.63	SS/#304	49.8/2.37	-NA-	7.0	A	Maynardville
GW-096A	1.1/6.63	SS/#304	61.0/2.37	-NA-	-NA-	A	Maynardville
GW-182	7/6.63	Steel/F25	126.6/4.5	-NA-	-NA-	D	Knox
GW-209	None	PVC/#40	48.1/2.37	-NA-	-NA-	C	Rome
GW-215	None	PVC/#40	15.2/2.37	-NA-	-NA-	C	Maryville
GW-216	None	PVC/#40	-NA-/8.5	-NA-	-NA-	C	Maryville
GW-447	None	PVC/#40	8.55/2.37	-NA-	-NA-	C	-NA-
GW-545	None	SS/#304	67.0/4.5	54.5	-NA-	A	Knox

Table 4.2. (continued)

Well number	Protective Casing Depth/OD (ft,BGS/in.)	Surface Casing ^a Type	Surface Casing Depth/OD (ft,BGS/in.)	TOWR ^b (ft,BGS)	TOFR ^c (ft,BGS)	Plugging and Abandonment Method	Rock Formation(s) ^d
LL/HAZ-04	None	PVC/#40	25.0/6.5	19.0	-NA-	C	Nolichucky
LL/HAZ-15	None	PVC/#40	372.0/2.37	15.0	35.0	C	Nolichucky/Maryville (94)
OR-03	None	PVC/#80	-NA-/2.0	5.0	20.0	B	Maryville
S3-18	None	PVC/#40	12.37	-NA-	-NA-	C	Nolichucky
S3-38	None	PVC/#40	12.37	-NA-	-NA-	C	Nolichucky
S3-58	None	PVC/#40	12.37	-NA-	-NA-	C	Nolichucky
S3-68	None	PVC/#40	12.37	-NA-	-NA-	C	Nolichucky
S3-78	None	PVC/#40	12.37	-NA-	-NA-	C	Nolichucky
S3-88	None	PVC/#40	12.37	-NA-	-NA-	C	Nolichucky

^aDenotes surface casing for open-interval wells and well casing for screened interval wells.

^bTOWR = Top of weathered rock.

^cTOFR = Top of fresh rock.

^dDepth of contact given in parentheses.

^eWells 1111 and 1112 were not physically located in the field. The wells were assumed destroyed.

^fWell 44-DC was not physically located in the field. The well was assumed destroyed.

^gPiezometer (source of information is original field logbooks).

^hCasing type is unknown. Field observations determine casing to be PVC.

Entries in italics indicate data obtained from field observations.

Source: Jones et al. 1994.

In this section, the well in question will be referred to as BCU-12 (BC-66). [See BCU-12 (BC-66) Activity/Progress Report in Appendix A for details.]

Toward the end of the Exxon Nuclear Site P&A project, site access became more and more difficult. Additional P&A method modifications were employed to reduce disturbance of woodlands and tributaries. The following P&A methods were modified to decommission the wells in the western part of the Exxon Nuclear Site as follows:

- BC-series and BCU-series wells of PVC construction, regardless of depth, were plugged using a backhoe-mounted auger rather than a drilling rig. As much casing as possible was removed and the wellbore was reamed to expose fresh material to auger refusal. Finally, the reamed wellbore was grouted to within 4 ft of the ground surface.
- Several artesian wells that were constructed of 1-in. diameter steel water pipe were decommissioned by unthreading the top-most section of water pipe. These sites were left undisturbed as artificial seeps or springs.
- Wells located in places where motorized vehicle access was impossible were decommissioned by hand-excavating a pit around the casing to approximately 2 ft BGS, removing or breaking off the casing below ground surface, and refilling the pit with the excavated material.

BC-03

Well BC-03 was an open-interval, artesian well constructed in a continuously cored, NX-size hole with a reported TD of 349.1 ft. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access. An obstruction occurred at 50.7 ft BGS; therefore, the total depth was not verified prior to P&A activities. The ground surface around the well was consistently wet from groundwater flowing out of an apparently broken casing.

A total of 41.0 ft of 1.75-in. OD, schedule 40 PVC casing (slotted over the lower 35.0 ft) was extracted from the wellbore. The wellbore was reamed using an 8-in. diameter, solid-stem auger to refusal at 8.7 ft BGS. The reamed borehole was grouted by pumping 2, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the following day at 1.0 ft BGS. The remaining borehole was capped with clay soil.

BC-25

Well BC-25 was presumably an open-interval well constructed in a continuously cored, NX-size hole with a reported TD of 104.0 ft (tagged bottom at 95.3 ft BGS). The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

Only 3.8 ft of 4.5-in. OD, schedule 40 PVC casing was removed from the wellbore as it appeared that the extracted casing had slipped out of a connection. The wellbore was reamed and a portion of the remaining casing drilled up using an 8-in. diameter, solid-stem auger to refusal at 17.4 ft BGS. The reamed hole was grouted by pumping 5, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the following day at 1.0 ft BGS. The remaining borehole was capped with clay soil.

BC-30

Well BC-30 was an open-interval well constructed in a continuously cored, NX-size hole with a reported TD of 104.0 ft (tagged bottom at 70.3 ft BGS). The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 20.2 ft of 1.75-in. OD, schedule 40 PVC casing (slotted over the lower 15.6 ft) was extracted from the wellbore. The wellbore was reamed using an 8-in. diameter, solid-stem auger to refusal at 12.4 ft BGS. The reamed borehole was grouted by pumping 4, 94-lb sacks of Type I

cement into the borehole. The cement was allowed to cure and the level tagged the following day at 1.0 ft BGS. The remaining borehole was capped with clay soil.

BC-31

Well BC-31 was an open-interval well constructed in a continuously cored, NX-size hole with a reported TD of 101.0 ft (tagged bottom at 93.0 ft BGS). The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 12.5 ft of 4.5-in. OD, schedule 40, PVC casing was extracted from the wellbore. The wellbore was reamed using an 8-in. diameter, solid-stem auger to refusal at 8.9 ft BGS. The reamed borehole was grouted by pumping 2, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the next day at 1.0 ft BGS. The remaining borehole was capped with clay soil.

BC-32

Well BC-32 was an open-interval well constructed in a continuously cored NX-size hole with a reported TD of 100.2 ft. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 63.1 ft of 1.25-in. OD, schedule 40 PVC casing (slotted over the bottom 54.9 ft) was extracted from the wellbore. The well was further decommissioned by hand-digging a small pit around the wellbore collar to remove fragments of the concrete pad. The pit was refilled with the excavated soil, and the site returned to its pre-P&A condition.

BC-33

Well BC-33 was presumably an open-interval well constructed in a continuously cored, NX-size hole with a reported TD of 145.3 ft (tagged bottom prior to P&A activities at 141.5 ft BGS). The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

Only 7.6 ft of 1.25-in. OD, schedule 80 PVC casing was removed from the wellbore as it appeared that the extracted casing had slipped out of a connection. The wellbore was reamed and a portion of the remaining casing was drilled up using an 8-in. diameter, solid-stem auger to refusal at 10.6 ft BGS. The reamed hole was grouted by pumping 2, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the following day at 2.3 ft BGS. The remaining borehole was capped with clay soil.

BC-34

Well BC-34, a flowing well, was constructed with an unknown length of 1-in. OD steel water pipe inside a continuously cored, NX-size hole with a reported TD of 126.3 ft. Flow had been controlled by a spigot on the above-ground piping; a pressure gauge was also fixed to the above-ground piping. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A shallow pit was hand-excavated around the wellhead to remove fragments of the concrete pad. After several unsuccessful attempts to pull out the water pipe, the top-most section of water pipe (a total of 11.0 ft of 1-in. OD steel pipe) was unthreaded and removed. The pit was refilled and the site returned to its pre-P&A condition. Groundwater was allowed to discharge from the abandoned wellbore as an artificial seep.

BC-36

Well BC-36 was an open-interval well constructed in a continuously cored, NX-size hole with a reported TD of 350.0 ft (tagged bottom at 220.1 ft BGS). The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

The open interval was first grouted (from 200.1 ft to 12.3 ft BGS) by pumping a total of 9, 94-lb sacks of Type I cement through 200 ft of 1.5-in. OD PVC tremie pipe inserted to 97.0 ft BGS. The cement was allowed to cure a total of 15.5 ft of 4.5-in. OD, schedule 40, PVC casing was then extracted from the wellbore. The wellbore was reamed using an 8-in. diameter solid-stem auger to refusal at 15.0 ft BGS. The reamed borehole was grouted by pumping 3 1/2, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the following day at 1.3 ft BGS. The remaining borehole was capped with clay soil.

BC-39

Well BC-39, a flowing well, was constructed with an unknown length of 1-in., OD, steel water pipe inside a continuously cored, NX-size hole with a reported TD of 157.8 ft. Flow had been controlled by a spigot on the above-ground piping; a pressure gauge was also affixed to the above-ground piping. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

The top-most section of water pipe (a total of 16.6 ft of 1-in. OD steel pipe) was unthreaded and removed (1.8 ft of 4.5-in. OD, schedule 40, PVC conductor casing cemented to the water were also removed at this time). The site was allowed to remain, with no further action, as an artificial spring.

BC-40

Well BC-40 was presumably an open-interval well constructed in a continuously cored, NX-size hole with a reported TD of 135.5 ft (tagged bottom prior to P&A activities at 115.0 ft BGS). The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

The well was decommissioned by first hand-excavating a shallow pit around the wellhead to remove fragments of the concrete pad. The casing (4.5-in. OD, schedule 40 PVC) was then cut off below the ground surface. A plug was constructed inside the remaining casing by using pieces of broken casing and fragments of the concrete pad. This plug was intended to prevent subsequent subsidence. Finally, the pit was refilled with the excavated material and the site returned to its pre-P&A condition.

BC-41

Well BC-41, a flowing well was presumably an open-interval well constructed of 1.0-in. OD water pipe in a continuously cored, NX-size hole with a reported TD of 276.0 ft. Water flow was controlled by a spigot on the above-ground piping. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

The 1.0-in. OD steel water pipe, along with 4.5-in. OD PVC conductor casing, was overwashed with 6.5-in. OD, 5.5-in. ID washover pipe to a depth of 41.7 ft BGS. A total of 41.4 ft of 1-in. OD steel water pipe and 20.0 ft of 4.5-in. OD PVC conductor casing were extracted from the borehole. The borehole was grouted by pumping 7, 94-lb sacks of Type I cement into the borehole through 40 ft of 1.5-in. OD PVC tremie pipe inserted to 37.0 ft BGS. The cement was allowed to cure and the level tagged the next working day at 2.8 ft BGS. The remaining borehole was capped with clay soil.

BC-42

Well BC-42 was an open-interval well constructed in a continuously-cored, NX-size hole with a reported TD of 203.0 ft (tagged bottom at 195.3 ft BGS). The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 69.6 ft of 1.0-in. OD PVC casing was extracted from the wellbore. The wellbore was reamed using a 6 1/2-in. diameter tricone roller bit to a depth of 56.0 ft BGS (20 ft below the reported TOFR). The reamed wellbore was grouted by pumping a total of approximately 12 1/2, 94-lb sacks of Type I cement through 50 ft of 1.5-in. OD PVC tremie pipe inserted to 48.0 ft

BGS. The cement was allowed to cure and the level tagged the following working day at 1.8 ft BGS. The remaining borehole was capped with clay soil.

BC-50

Well BC-50 was an open-interval well constructed in a continuously cored, NX-size hole with a reported TD of 100.0 ft. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access. An obstruction occurred at 11.8 ft BGS, and the total depth was not verified prior to P&A activities.

A total of 16.0 ft of 4.5-in. OD, schedule 40 PVC casing (slotted over the lower 12.0 ft) was extracted from the wellbore. The wellbore was reamed using an 8-in. OD, solid-stem auger to refusal at 13.5 ft BGS. The reamed hole was grouted by pumping 4, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the following day at 2.6 ft BGS. The remaining borehole was capped with clay soil.

BC-62

The original location of a well thought to be BC-62 was, in actuality, a piece of casing merely stuck in the ground. A flowing well approximately 6 ft northwest of the misplaced casing was determined to be well BC-62. The obsolete well, of unsubstantiated construction, was completed in a continuously cored, NX-size hole with a reported depth of 56.3 ft (tagged bottom of the well at 56.0 ft BGS prior to P&A activities). The well was of substandard construction, and lacked a locking mechanism to prevent unauthorized access.

Attempts to extract the casing resulted in the casing breaking and failure to recover any substantial pieces. The wellbore was reamed and a portion of the casing was drilled up using an 8-in. diameter, solid stem auger to refusal at 10.8 ft BGS. The reamed hole was grouted by pumping 2, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the next day at 1.8 ft BGS. The remaining borehole was capped with clay soil.

BCU-12 (BC-66)

Well BCU-12 (BC-66) was apparently an open-interval well constructed in a continuously cored, NX-size hole with a reported TD of 201.0 ft. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 40.2 ft of 1.25-in. ID, schedule 40 PVC casing (slotted over the bottom 35.0 ft, and capped on both ends). The open interval was grouted by pumping 7, 94-lb sacks of Type I cement into the wellbore through 180 ft of 1.5-in. OD PVC tremie inserted to 179.0 ft BGS. The cement was allowed to cure and the level tagged the next day at 9.5 ft BGS. The cased portion of the wellbore was reamed using a 6 1/4-in. diameter tricone roller bit of 42.8 ft BGS. The reamed hole was grouted by pumping a total of 8, 94-lb sacks of Type I cement into the borehole through 40 ft of 1.5-in. OD PVC tremie pipe inserted to 39.0 ft BGS. The final cored grout level reached 1.0 ft BGS. The remaining borehole was capped with clay soil.

BCU-14

Well BCU-14 was presumably an open-interval well constructed in a 5-in. diameter borehole with an apparent (measured in the field) TD of 14.1 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 10.1 ft of 4.5-in. OD, schedule 40, PVC casing was extracted from the wellbore. The wellbore was reamed using an 8-in. diameter solid-stem auger to refusal at 12.5 ft BGS. The reamed hole was grouted by pumping 2 1/2, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the next day at 1.1 ft BGS. The remaining borehole was capped with clay soil.

BCU-15

Well BCU-15 was presumably an open-interval well constructed in a 5-in. diameter borehole with an apparent TD of 16.5 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 10.0 ft of 4.5-in. OD, schedule 40, PVC casing was extracted from the wellbore. The wellbore was reamed using an 8 3/4-in. diameter tricone roller bit to 22.2 ft BGS (approximately 5 ft below the tagged depth of well). The reamed hole was grouted by pumping a total of 6, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the following work day at 3.3 ft BGS. The remaining borehole was capped with clay soil.

BCU-17

Well BCU-17 was presumably a screened well constructed in a 5-in. diameter borehole with an apparent TD of 9.2 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of only 6.0 ft of 1.25-in. OD PVC casing was extracted from the wellbore (the casing appeared to have broken off, leaving an unknown amount still in the hole). The wellbore was reamed (and some of the remaining casing was milled) using an 8-in. diameter solid-stem auger to refusal at 7.9 ft BGS. The reamed bore was grouted by pumping 2, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the following work day at 1.6 ft BGS. The remaining borehole was capped with clay soil.

BCU-18

Well BCU-18 was presumably a screened well constructed in a 5-in. diameter borehole with an apparent TD of 50.3 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 9.7 ft of 1.25-in OD PVC casing (slotted over its entire length) was extracted from the wellbore (the casing appeared to have broken off, leaving an unknown amount still in the hole). The wellbore was reamed using an 8-in. diameter solid-stem auger to refusal at 7.6 ft BGS. The reamed bore was grouted by pumping a total of 4, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure, and the level tagged the following work day at 1.0 ft BGS. The remaining borehole was capped with clay soil.

BCU-19

Well BCU-19 was presumably a screened well constructed in a 5-in. diameter borehole with an apparent TD of 33.3 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 1.6 ft of 1.25-in. OD, slotted, PVC casing was extracted from the wellbore (the casing broke off, leaving an unknown amount still in the hole). The wellbore was reamed (and part of the remaining casing was milled) using an 8-in. diameter solid-stem auger to refusal at 8.4 ft BGS. The reamed wellbore was grouted by pumping 2, 94-lb sacks of Type I cement into the borehole. The cement was allowed to cure and the level tagged the next day at 1.1 ft BGS. The remaining borehole was capped with clay soil.

BCU-21

Well BCU-21 was presumably an open-interval well with an apparent 3-in. diameter completion zone from 18.7 ft to 241.0 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 20.0 ft of 4.5-in. OD, schedule 40, PVC casing was extracted from the borehole. The open interval of the well was grouted by pumping 15, 94-lb sacks of Type I cement through

200 ft of 1.5-in. OD PVC tremie pipe inserted to 198.0 ft BGS. The cement was allowed to cure before continuing with decommissioning activities. The upper portion of the wellbore was reamed using an 8 3/4-in. diameter tricone roller bit to a depth of 35.0 ft BGS. The reamed wellbore was grouted by pumping a total of 11, 94-lb sacks of Type I cement into the borehole through 30 ft of 1.5-in. OD PVC tremie pipe inserted to 28.0 ft BGS. The cement was allowed to cure and the level tagged the next day at 2.8 ft BGS. The remaining borehole was capped with clay soil.

BCU-22

Well BCU-22 was apparently a screened well with little else known about its construction. While no trace of a wellbore was found, the casing was assumed to be in its original location, though damaged.

The location of the well casing, in the bank of a small tributary to Break Creek, required minimal P&A to reduce disturbance to the surface water. The well was decommissioned by removing the single, 5.1-ft long section of 4.5-in. OD PVC casing (1.7 ft of which was commercially manufactured screen) and returning the creek bed and bank to its pre-P&A condition.

BCU-23

Well BCU-23 was presumably a screened well constructed in a 5-in. diameter borehole with an apparent TD of 58.3 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

After the 1.25-in. ID, schedule 40 PVC casing was cut off flush with the ground surface, the wellbore was reamed and the well casing and screen milled using a 6 1/4-in. diameter tricone roller bit to 63.4 ft BGS. The reamed hole was grouted by pumping approximately 10 1/2, 94-lb sacks of Type I cement into the borehole through 60 ft of 1.5-in. OD PVC tremie pipe inserted to 56.0 ft BGS. The final cured grout level reached 1.0 ft BGS. The remaining borehole was capped with clay soil.

BCU-24

Well BCU-24 was presumably a screened well constructed in a 5-in. diameter borehole with an apparent TD of 59.8 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

Only 1.9 ft of 1 1/4-in. OD, schedule 80 PVC casing was removed from the wellbore as the extracted casing had apparently slipped out of a connection. The wellbore was reamed to fresh material and the well casing and screen milled using a 6 1/4-in. diameter tricone roller bit to 64.6 ft BGS. The reamed hole was grouted by pumping a total of 16 1/2, 94-lb sacks of Type I cement into the borehole. The final cured grout level was tagged at 3.1 ft BGS. The remaining borehole was capped with clay soil.

BCU-25

Well BCU-25 was presumably a screened well constructed in a 5-in. diameter borehole with an apparent TD of 58.5 ft. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

The wellbore was reamed and the 1 1/4-in. OD, schedule 80 PVC casing and screen were milled (which had been broken off even with the ground surface) using a 6 1/4-in. diameter tricone roller bit to a depth of 63.5 ft BGS. The reamed hole was grouted by pumping a total of 10 1/2, 94-lb sacks of Type I cement into the borehole. The final cured grout level was tagged at 3.2 ft BGS. The remaining borehole was capped with clay soil.

BCU-26

Well BCU-26 was presumably a PVC screened well constructed in a 5-in. diameter borehole, having an apparent TD of 59.1 ft BGS. The obsolete well was of substandard construction and also lacked a locking mechanisms to prevent unauthorized access.

The wellbore was reamed (and the PVC well screen and casing milled) using a 6 1/4-in. diameter tricone roller bit to a depth of 65.8 ft BGS. The reamed bore was grouted by pumping a total of 12, 94-lb sacks of Type I cement into the borehole through 60 ft of 1.5-in. OD PVC tremie pipe inserted to about 60 ft BGS. The cement was allowed to cure and the level tagged the following day at 1.9 ft BGS. The remaining borehole was capped with clay soil.

BCU-27

Well BCU-27 was presumably a PVC screened well constructed in a 5-in. diameter borehole, having an apparent TD of 58.3 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

The wellbore was reamed (and the PVC well screen and casing milled) using a 6 1/4-in. diameter tricone roller bit to a depth of 63.3 ft BGS. The reamed hole was grouted by pumping a total of 14, 94-lb sacks of Type I cement into the borehole through 60 ft of 1.5-in. OD PVC tremie pipe inserted to about 58.0 ft BGS. The cement was allowed to cure and the level was tagged at 1.5 ft BGS. The remaining borehole was capped with clay soil.

BCU-28

Well BCU-28 was presumably a PVC screened well constructed in a 5-in. diameter borehole with an apparent TD of 58.3 ft BGS. The obsolete well was of substandard construction and also lacked a locking mechanism to prevent unauthorized access.

After the 1.25-in OD, schedule 80 PVC casing stick-up was cut off flush with the ground surface, the wellbore was reamed and the remaining casing and screen milled using a 6 1/4-in. diameter tricone roller bit to a depth of 64.1 ft BGS. The reamed hole was grouted by pumping a total of 13, 94-lb sacks of Type I cement into the borehole. The final cured grout level was tagged at 1.1 ft BGS. The remaining borehole was capped with clay soil.

BCU-29

Well BCU-29 was presumably a PVC screen well constructed in a 5-in. diameter borehole with an apparent TD of 59.2 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

The wellbore was reamed and the well casing and screen using a 6 1/4-in. diameter tricone roller bit to a depth of 64.2 ft BGS. The reamed hole was grouted by pumping a total of 11, 94-lb sacks of Type I cement into the borehole. The final cured grout level was tagged at 3.9 ft BGS. The remaining borehole was capped with clay soil.

4.2 GUM BRANCH ROAD FUNCTIONAL AREA

The Gum Branch Road Functional Area is located in west Bear Creek Valley, north of Bear Creek. The area has been the site of several groundwater characterization studies for either research or proposed industrial purposes. A total of 4 wells were decommissioned from the Gum Branch Road area during FY 1995. A fifth well from this area, 44-DC, was scheduled for P&A. It was assumed destroyed when a field search found no evidence of its existence.

Plans are being made to construct a low-level waste repository in the Gum Branch Road area. Some of the wells that were plugged here during FY 1995 were done so because they impeded construction of the waste facility.

GW-447

Well GW-447 was decommissioned because it was a dry well throughout most of the year. The well had been installed in a 6 5/8-in. diameter borehole, 8.55 ft deep.

A total of 5.0 ft of 2 3/8-in OD PVC casing as well as 5.0 ft of 2 3/8-in. OD PVC screen (no end cap) were extracted from the wellbore. The wellbore was reamed using 8-in. diameter solid-stem augers to a depth of 10.4 ft BGS. The reamed wellbore was grouted by pouring 3, 94-lb sacks of neat, Type I Portland cement directly into the borehole. The cement was allowed to cure, and the level tagged the next day at 1.2 ft BGS. The remaining borehole was capped with clay soil.

LL/HAZ-04

Well LL/HAZ-04 was an obsolete PVC screened well that impeded construction of the proposed waste facility. The well was installed in an 8-in. diameter borehole, 25.0 ft deep.

The PVC well casing and screen were milled while the wellbore was reamed using an 8 3/4-in. diameter tricone roller bit to a depth of 27.3 ft BGS. The reamed well-bore was grouted by pumping 8, 94-lb sacks of neat, Type I Portland cement into the borehole through 20 ft of 1.5-in. OD PVC tremie pipe inserted to 19.0 ft BGS. The cement was allowed to cure and the level tagged the following day at 4.3 ft BGS. The remaining borehole was capped with clay soil.

LL/HAZ-15

Well LL/HAZ-15 was an obsolete PVC screened well that had been installed in a reamed corehole. The substandard well had a total depth of 375.0 ft.

The PVC casing was milled while the wellbore was reamed using an 8 3/4-in. diameter tricone roller bit to a depth of 35.2 ft BGS (the wellbore was crooked and had deviated out from under the reaming bit). The reamed borehole was grouted by pumping 12, 94-lb sacks of neat, Type I Portland cement into the bore through 30 ft of 1.5-in. OD PVC tremie pipe inserted to 29.0 ft BGS. The cement was allowed to cure, and level tagged the next day at 4.7 ft BGS. The remaining borehole was capped with clay soil.

OR-03

Well OR-03 was an obsolete well, presumably of open-interval construction. The substandard well also lacked a locking mechanism to prevent unauthorized access. The total depth of the well was 100.0 ft BGS.

The PVC well casing and screen were milled while the wellbore was reamed using a 6 1/4-in. diameter tricone roller bit to a depth of 102.2 ft BGS. The reamed borehole was grouted by pumping a total of 14, 94-lb sacks of neat, Type I Portland cement into the borehole through 100 ft of 1.5-in. OD PVC tremie pipe inserted to 98.0 ft BGS. The cement was allowed to cure, and the final level tagged at 1.2 ft BGS. The remaining borehole was capped with clay soil.

44-DC

Well 44-DC was an obsolete well located in the Gum Branch Road area, reportedly in a cluster with well LL/HAZ-04.

No above-ground evidence of the well remained. An attempt to locate the casing or evidence of past plugging and abandonment in the subsurface was unsuccessful. The well was considered destroyed, no further P&A activity required.

1107

Well 1107 was an obsolete PVC well constructed in a 6 1/2-in. diameter borehole (field observations). Jones et al. (1994) report the wellbore to be 3-in. diameter. The total depth of the substandard well was 32.2 ft BGS.

A total of 24.6 ft of 2 3/8-in. OD PVC casing as well as 9.2 ft of 2 3/8-in. OD PVC screen (no end cap) were extracted from the well. The wellbore was reamed using 8-in. OD solid stem augers to refusal at 11.5 ft BGS. The incompletely reamed wellbore was grouted by pumping 3, 94-lb sacks of neat, Type I cement into the bore. The cement was allowed to cure, and the level tagged the following day at 1.4 ft BGS. The remaining borehole was with clay soil.

1108

Well 1108 was an obsolete PVC well constructed in a 6 1/2-in. diameter borehole. The total depth of the substandard well was 9.0 ft BGS.

A total of 6.5 ft of 2 3/8-in. OD PVC casing in addition to 5.0 ft of 2 3/8-in. OD PVC screen (no end cap) were extracted from the well. The wellbore was reamed using 8-in. diameter solid stem augers to a depth of 10.4 ft BGS. The reamed wellbore was grouted by pumping 3, 94-lb sacks of neat, Type I Portland cement into the bore. The cement was allowed to cure, and the level tagged the following day at 1.0 ft BGS. The remaining borehole was capped with clay soil.

1109

Well 1109 was an obsolete PVC well constructed in a 6 1/2-in. diameter borehole. The total depth of the substandard well was 41.8 ft BGS. The well lacked a locking mechanism to prevent unauthorized access.

A total of 32.0 ft of 2 3/8-in. OD PVC casing and an additional 10.2 ft of 2 3/8-in. OD PVC screen (no end cap) were extracted from the well. The wellbore was plugged by pouring 3/4 of a 50-lb sack of 3/8-in. diameter bentonite aggregate into the hole. The bentonite was allowed to hydrate according to the manufacturer's recommendations (final hydrated plug: 36.3 ft to 2.4 ft BGS). The remaining wellbore was capped with native materials (fly ash).

1110

Well 1110 was an obsolete PVC well constructed in a borehole of unknown diameter. The substandard well lacked a locking device, and was completed to 8.0 ft BGS.

A total of 9.0 ft of 1.5-in. OD PVC screen wrapped in cloth and duct tape was extracted from the wellbore. The wellbore was plugged by pouring 1/4 of a 50-lb sack of 3/8-in. diameter bentonite aggregate into the hole. The bentonite was allowed to hydrate according to the manufacturer's recommendations (final hydrated plug: 8.5 ft to 2.0 ft BGS). The remaining wellbore was capped with native materials (fly ash).

Unidentified Well A

Unidentified well A was an obsolete presumable open-interval well with PVC casing. The substandard well lacked a locking mechanism, and was apparently completed to 36.2 ft BGS.

A total of 20.0 ft of 4 1/2-in. OD PVC casing was extracted from the wellbore. The wellbore collapsed on itself to 6.0 ft BGS. One, 50-lb sack of 3/8-in. diameter bentonite aggregate was used to plug the wellbore from 6.0 ft to 0.6 ft BGS. The remaining wellbore was capped with native materials (fly ash).

Unidentified Well B

Unidentified well B was an obsolete, presumably PVC-screened well. The substandard well lacked a locking mechanism, and was apparently completed to 19.3 ft BGS.

A total of 19.6 ft of 4 1/2-in. OD PVC casing, hand-slotted over the bottom 5.0 ft, was extracted from the wellbore. The wellbore collapsed on itself to 7.0 ft BGS. One, 50-lb sack of 3/8-in. diameter bentonite aggregate was used to plug the wellbore from 7.0 ft to 1.0 ft BGS. The remaining wellbore was capped with native materials (fly ash).

4.4 BEAR CREEK BURIAL GROUNDS

The Bear Creek Burial Grounds (BCBG) are located in Bear Creek Valley west of the Y-12 Plant. The BCBG consist of areas that had been used for the disposal of solid and liquid wastes relating to production operations at the Y-12 Plant. Several of the sites have recently been closed and capped. Of the seven wells decommissioned from the BCBG area, the majority were located in the vicinity of Burial Ground A (south).

1034

Well 1034 was an obsolete PVC screened well constructed in an 8-in. diameter borehole. The substandard well had a total depth of 45.0 ft BGS.

The PVC well screen and casing were milled while the wellbore was reamed using an 8 3/4-in. diameter tricone roller bit to a depth of 46.6 ft BGS. The reamed wellbore was grouted by pumping a total of 20, 94-lb sacks of neat, Type I Portland cement into the borehole, 17 of them through 40 ft of 1.5-in. OD PVC tremie pipe inserted to 39.0 ft BGS. The cement was allowed to cure, and the level tagged the following day at 1.8 ft BGS. The remaining borehole was capped with clay soil.

GW-048

Well GW-048 had been damaged, which resulted in a bailer becoming stuck inside. The stainless-steel screened well was constructed in a 6-in. diameter borehole, 9.0 ft deep.

A total of 5.0 ft of 6 5/8-in. OD steel conductor casing, as well as 11.7 ft of stainless-steel well assembly (casing, screen, and silt trap) were extracted together from the wellbore. The wellbore was reamed using 8-in. diameter augers to refusal at 8.8 ft BGS. The incompletely reamed wellbore was grouted by pumping 3, 94-lb sacks of neat, Type I Portland cement into the borehole. The cement was allowed to cure, and the level tagged the following day at 0.5 ft BGS. With HSEA approval, the remaining borehole was capped with clay soil.

GW-049

Well GW-049 was obstructed by a stuck sampling pump. the stainless-steel screened well was constructed in a 4 1/2-in. diameter borehole, 20.5 ft deep.

A total of 4.3 ft of 6 5/8-in. OD steel conductor casing in addition to 22.3 ft of 2 3/8-in. OD stainless steel well assembly (casing, screen, and silt trap) were extracted together from the wellbore. The wellbore was then reamed using 8-in. diameter solid-stem augers to refusal at 17.2 ft BGS. The incompletely reamed wellbore was grouted by pumping 4, 94-lb sacks of neat, Type I Portland cement into the borehole through 20 ft of 1.5-in. OD PVC tremie pipe inserted to 17.0 ft BGS. The cement was allowed to cure, and the level tagged the next working day at 2.3 ft BGS. The remaining borehole was capped with clay soil.

GW-050

Well GW-050 was decommissioned because it was dry during the majority of the year. The stainless-steel screened well was constructed in a 6-in. diameter borehole, 15.0 ft deep.

A total of 4.9 ft of 6 5/8-in. OD steel conductor casing and an additional 17.7 ft of 2 3/8-in. OD stainless-steel well assembly (casing, screen, and silt trap) were extracted together from the wellbore. The wellbore was then reamed using 8-in. diameter solid-stem augers to a depth of 16.2 ft BGS. The reamed wellbore was grouted by pouring 4, 94-lb sacks of neat, Type I Portland cement directly into the bore. The cement was allowed to cure, and the level tagged the following day at 1.5 ft BGS. The remaining borehole was capped with clay soil.

GW-051

Well GW-051 was decommissioned because it was dry during the majority of the year. The stainless-steel screened well was constructed in a 6-in. diameter borehole, 11.2 ft deep.

A total of 5.0 ft of 6 5/8-in. OD steel conductor casing as well as 14.4 ft of 2 3/8-in. OD stainless-steel well assembly (casing, screen, and silt trap) were extracted together from the wellbore. The wellbore was then reamed using 8-in. diameter augers to refusal at 11.2 ft BGS. The reamed wellbore was grouted by pouring 3, 94-lb sacks of neat, Type I Portland cement directly into the bore. The cement was allowed to cure, and the level tagged the next day even with the ground surface. One foot of the hardened cement was removed from the borehole, which was then refilled with clay soil.

GW-060

Well GW-060 was obstructed by either a sampling pump or a bailer, stuck at approximately 28.5 ft BGS. The stainless-steel screened well was constructed in a 6-in. diameter borehole (field observation). Jones et al. (1994) report a wellbore diameter of 4-in., 50.0 ft deep.

The well casing was overwashed using 6 1/2-in. OD, 4 3/4-in. ID washover pipe to a depth of 19.7 ft BGS. At this point, the washover pipe cut through the well casing and was no longer reaming the wellbore (the wellbore had deflected). A total of 20.0 ft of 2 3/8-in. OD stainless-steel casing was recovered from the washover pipe (5.0 ft of 5 5/8-in. OD steel conductor casing had been recovered prior to over washing). The incompletely reamed wellbore was grouted by pumping 6, 94-lb sacks of neat, Type I Portland cement into the borehole through 20 ft of 1.5-in. OD PVC tremie pipe inserted to 16.0 ft BGS. The cement was allowed to cure, and the level tagged the next day at 1.9 ft BGS. The remaining borehole was capped with clay soil.

GW-096A

Well GW-096A was obstructed by a sampling pump stuck at approximately 51 ft BGS. The stainless-steel screened well was constructed in a 6 1/2-in. diameter wellbore, 61.0 ft deep.

A total of 17.0 ft of 2 3/8-in. OD stainless-steel casing was extracted from the wellbore (the casing appeared to have broken at a joint). The remaining casing was overwashed with 6 1/2-in. OD, 4 3/4-in. inside diameter (ID) washover pipe to a depth of 49.1 ft BGS. No more casing was recovered as the washover pipe had missed the casing and cut a new hole next to the wellbore. The wellbore was reamed using an 8 3/4-in. diameter tricone roller bit to a depth of 49.5 ft BGS. The incompletely reamed wellbore was grouted by pumping a total of 32, 94-lb sacks of neat, Type I Portland cement into the borehole, 18 of them through 50 ft of 1.5-in. PVC tremie pipe inserted to 49.0 ft BGS. The cement was allowed to cure, and the final level tagged at 1.6 ft BGS. The remaining borehole was capped with clay soil.

4.5 S-3 PONDS AREA

A total of 7 wells and piezometers surrounding the S-3 Ponds cap were decommissioned during FY 1995. The obsolete wells and piezometers were all plugged with the screen/casing left in the ground, in an effort to reduce waste.

1008

Well 1008 was an obsolete PVC screened well of substandard construction. The total depth of the well was 20.0 ft.

The well screen and casing were left in the ground, and the interior portion of the well was plugged with 3/8-in. Shur-Plug™ bentonite aggregate. The bentonite was allowed to hydrate. The top 1.8 ft of the casing was removed (to 0.8 ft BGS), and the well was grouted by pouring 2, 94-lb sacks of neat, Type I Portland cement into the casing. The cement was allowed to cure and the level tagged the following day at 0.8 ft BGS. The remaining borehole was capped with clay soil.

S3-1

Piezometer S3-1 was located on the east side of the S-3 Ponds cap. The obsolete piezometer was constructed of PVC casing and screen in an 8-in. diameter borehole.

The piezometer casing stick-up was removed to just below the ground surface. The interior portion of the piezometer was plugged with 3/8-in. Shur-Plug™ bentonite aggregate, and allowed to hydrate (bentonite plug from 24.2 ft to 0.9 ft BGS). The remaining casing was grouted to the ground surface with neat, Type I Portland cement.

S3-3

Piezometer S3-3 was located south of the S-3 Ponds cap. The obsolete piezometer was constructed of PVC casing and screen in an 8-in. diameter borehole.

The piezometer casing stick-up was removed to just below the ground surface. The interior portion of the piezometer was plugged with 3/8-in. Shur-Plug™ bentonite aggregate, and allowed to hydrate (bentonite plug from 6.2 ft to 5.3 ft BGS). The remaining casing was grouted to the ground surface with neat, Type I Portland cement.

S3-5

Piezometer S3-5 was located west of the S-3 Ponds cap. The obsolete piezometer was constructed with PVC casing and screen in an 8-in. diameter borehole.

The piezometer casing stick-up was removed to just below the ground surface. The interior portion of the piezometer was plugged with 3/8-in. Shur-Plug™ bentonite aggregate, and allowed to hydrate (bentonite plug from 7.0 ft to 3.2 ft BGS). The remaining casing was grouted to the ground surface with neat, Type I Portland cement.

S3-6

Piezometer S3-6 was located west of the S-3 Ponds cap. The obsolete piezometer was constructed with PVC casing and screen in an 8-in. diameter borehole.

The piezometer casing stick-up was removed to just below the ground surface. The interior portion of the piezometer was plugged with 3/8-in. Shur-Plug™ bentonite aggregate, and allowed to hydrate (bentonite plug from 20.6 ft to 4.2 ft BGS). The remaining casing was grouted to the ground surface with neat, Type I Portland cement.

S3-7

Piezometer S3-7 was located on the west side of the S-3 Ponds cap. The obsolete piezometer was constructed with PVC casing and screen in an 8-in. diameter borehole.

The piezometer casing stick-up was removed to just below the ground surface. The interior portion of the piezometer was plugged with 3/8-in. Shur-Plug™ bentonite aggregate, and allowed to hydrate (bentonite plug from 27.7 ft to 6.8 ft BGS). The remaining casing was grouted to the ground surface with neat, Type I Portland cement.

Piezometer S3-8 was located on the south side of the S-3 Ponds cap. The obsolete piezometer was constructed with PVC casing and screen in an 8-in. diameter borehole.

The piezometer casing stick-up was removed to just below the ground surface. The interior portion of the piezometer was plugged with 3/8-in. Shur-Plug™ bentonite aggregate, and allowed to hydrate (bentonite plug from 28.4 ft to 4.8 ft BGS). The remaining casing was grouted to the ground surface with neat, Type I Portland cement.

4.6 MISCELLANEOUS SITES

During the FY 1995 Plugging and Abandonment Program, a number of wells were plugged that were from single- or dual-well sites scattered throughout the Y-12 Plant area. This section provides a brief description of the P&A of each of these wells (including location), presented in numerical order. Seven wells fall into this category.

CO-2

Well CO-2 was an obsolete well located on the southern flank of Pine Ridge in west Bear Creek Valley, west of the BCBG. The substandard well was presumably of open-interval construction with an apparent total depth of 107.2 ft BGS. The well also lacked a locking mechanism to prevent unauthorized access.

A total of 14.6 ft of 4-in. OD steel casing was extracted from the wellbore. The wellbore was then reamed using a 6 1/4-in. diameter tricone roller bit to a depth of 112.0 ft BGS. The reamed wellbore was grouted by pumping a total of 19, 94-lb sacks of Type I Portland cement into the borehole through 110 ft of 1.5-in. OD PVC tremie pipe inserted to 107.0 ft BGS. The cement was allowed to cure, and the final level tagged at 2.4 ft BGS. The remaining borehole was capped with clay soil.

CO-4

Well CO-4 was an obsolete well located near Bear Creek Road in west Bear Creek Valley. The well had apparently been installed in a linear transect with well CO-2 and other, previously decommissioned, wells. The substandard well was presumably of open-interval construction with an apparent total depth of 57.0 ft BGS. The well also lacked a locking mechanism to prevent unauthorized access.

A total of 37.7 ft of 4-in. OD steel casing was extracted from the wellbore. The wellbore was then reamed using a 6 1/4-in. diameter tricone roller bit to a depth of 50.4 ft BGS. At 50.4 ft, the borehole had collapsed on itself and it was impossible to ream to the required 1 ft beyond TD. The bottom of the incompletely reamed wellbore was plugged by pouring 9, 50-lb sacks of 3/8-in. diameter bentonite aggregate into the borehole (final hydrated plug: 32.2 ft to 11.7 ft BGS). Three, 94-lb sacks of neat, Type I Portland cement were subsequently poured into the borehole on top of the bentonite plug. The cement was allowed to cure, and the level tagged the following day at 1.4 ft BGS. The remaining borehole was capped with clay soil.

GW-182

Well GW-182 was an obsolete NX corehole. The corehole was located in a manhole in one lane of the South Patrol Road at the Chestnut Ridge Security Pits. The lower portion of the wellbore had partially or completely collapsed between 402.1 ft and 152.4 ft BGS.

An initial attempt to grout the wellbore failed as 15, 94-lb sacks of neat, Type I Portland cement pumped through 150 ft of 1.5-in. OD PVC tremie pipe apparently found its way into voids or the lower, collapsed portion of the borehole.

The wellbore was plugged with 3/8-in. Shur-Plug™ bentonite aggregate from 152.4 ft to 113.0 ft BGS, and allowed to hydrate. The remaining wellbore and surface casing were grouted by pumping 12, 94-lb sacks of neat, Type I Portland cement through 110 ft of 1.5-in. OD PVC tremie inserted to 109.0 ft BGS. After the well had been completely grouted, the manhole well access was filled with concrete to 0.2 ft below the road surface.

GW-209

Well GW-209 was located along Hwy. 95, north of the intersection with Bear Creek Road. The PVC screened well (screened interval: 53.0 ft to 48.1 ft BGS) had been constructed in an 8-in. diameter borehole with a reported TD of 48.1 ft BGS. The obsolete well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

A total of 4.5 ft of 2 3/8-in. OD PVC casing was recovered from the wellbore (the casing broke off below the ground surface). The wellbore was reamed, and the remaining casing and screen were drilled up using an 8 1/4-in. diameter tricone roller bit to a depth of 49.1 ft BGS. The reamed wellbore was grouted by pumping a total of 16, 94-lb sacks of neat, Type I Portland cement into the borehole through 50 ft of 1.5-in. OD PVC tremie pipe inserted to 45.3 ft BGS. The cement was allowed to cure, and the level tagged at 3.1 ft BGS. The remaining borehole was capped with clay soil.

GW-215

Well GW-215 was located at the far west end of Bear Creek Valley, where Bear Creek Road turns to parallel the Clinch River. The obsolete PVC screened well had been installed in an 8-in. diameter borehole, 15.2 ft deep. The substandard well also lacked a locking mechanism to prevent unauthorized access.

A total of 10.3 ft of 2 3/8-in. OD PVC casing was recovered from the wellbore (the casing broke off below the ground surface). The wellbore was reamed using an 8-in. diameter solid-stem auger to refusal at 12.9 ft BGS. The incompletely reamed wellbore was grouted by pumping 4, 94-lb sacks of neat, Type I Portland cement into the borehole through 13 ft of 1.5-in. OD PVC tremie pipe inserted to 12.6 ft BGS. The cement was allowed to cure overnight. No final cement level tag was made. Apparently, the augers had cut a telephone line that was repaired during the night. Upon returning to the site the following day, the borehole and any other excavations for repair of the line had been filled in with soil.

GW-216

Well GW-216, approximately 15 ft south of well GW-215, was an unknown well until an identifying cover was found in the overgrown ditch line in which it was located. The obsolete PVC screened well was of substandard construction, and also lacked a locking mechanism to prevent unauthorized access.

The top 1.3 ft of the 8.5-in. OD PVC well casing was removed while the annular cement was being excavated. The well (with casing and screen left in place to avoid another possible incident with the telephone line cut while decommissioning GW-215) was grouted by pumping 3, 94-lb sacks of neat, Type I Portland cement into the well (TD = 10.7 ft BGS). The cement was allowed to cure, and the level tagged the following day at 2.0 ft BGS. The remaining hole was capped with clay soil.

GW-545

Well GW-545 was located on the perimeter of Landfill VI. The well was essentially dry, and was decommissioned after a replacement well (GW-827) had been installed. Well GW-545 was a stainless-steel screened well constructed in a 9 1/4-in. diameter borehole, having a reported TD of 67.0 ft BGS.

The 4 1/2-in. OD well casing and screen were overwashed using 6 1/2-in. OD, 4 3/4-in. ID washover pipe to a depth of 60.5 ft BGS. A total of 57.3 ft of 4 1/2-in. OD stainless-steel casing

was extracted from the bore. Only a few tangled screen wires were recovered along with the casing. The wellbore was reamed using a 10 5/8-in. diameter tricone roller bit to a depth of 68.0 ft BGS. The reamed wellbore was grouted by pumping 25, 94-lb sacks of neat, Type I Portland cement into the borehole through 60 ft of 1.5-in. OD PVC tremie pipe inserted to 57.0 ft BGS. Just prior to completion, the entire cement column apparently washed into a void. The top of the first-stage cement stopped at 54.7 ft BGS. The borehole was plugged, from 54.7 ft to 42.0 ft BGS, with 8, 50-lb sacks of 3/8-in. bentonite aggregate and allowed to hydrate according to the manufacturer's recommendations. An additional 14, 94-lb sacks of neat, Type I Portland cement were pumped into the borehole through 40 ft of 1.5-in. OD PVC tremie pipe inserted to 39.0 ft BGS. The cement was allowed to cure, and the level tagged the next day at 6.6 ft BGS. With HSEA approval, the remaining borehole 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 P&A 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 (Well-Guard™ – a beeswax-based thread lubricant) was used when needed during drilling.

At 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.

*Energy Systems personnel initiated the use of a new form, Equipment Decontamination Inspection Summary, to be included with all P&A well reports during FY 1994. This form documents the steam cleaning and inspection of all equipment prior to use at each location.

6. HEALTH AND SAFETY

A Health and Safety Plan (SAIC 1992) was followed for all FY 1995 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 and occupational medical examination program. Additionally, all personnel present on site 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 organic vapor analyzer (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 Rate meter 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 D.

Health and safety plan action levels (SAIC 1992) and waste management guideline values used during P&A 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
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

APPENDIX A
ACTIVITY/PROGRESS REPORTS

44

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1008</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>6-20-95</u>	
HELPER: <u>J. Gallaher - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-19-95	1112	1122	Arrive at well 1008 site. Well consists of 6 3/4-in. outside diameter (OD) PVC casing. Casing stick-up = 1.0 ft. Note: P&A operations had been attempted during calendar year 1993. At that time, an attempt was made to over wash the casing. A metal plate was encountered that impeded advance. P&A operations were then suspended. P&A will now consist of plugging the well with bentonite aggregate, and then topping off the casing with neat cement (approved by HSEA). Uncap well, organic vapors in headspace = 0.0 ppm. Measure water level at 10.2 ft below ground surface (BGS). Tag bottom of well at 19.1 ft BGS. The subsurface Data Base (Y/TS-881/R1) reports the total depth of well 1008 to be 20.0 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60 cpm.
	1122	1135	Slowly pour four 5-gal. buckets (approximately 200 lbs) of 3/8-in. bentonite aggregate into the well. Unhydrated bentonite level to 5.0 ft BGS. Bentonite to hydrate for approximately 4 hrs. Depart site.
	1446	1508	Return to 1008 site. Tag hydrated bentonite level at 5.0 ft BGS (no vertical swell). Cut off casing stick-up (1.8 ft removed). Mix and pour 2 sacks (approximately 20 gallons) of neat, Type I Portland cement into the well.
	1508	1527	Using a torch, cut off the protective posts surrounding the well, and remove from the location. Depart site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1034</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-11-95</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>5-16-95</u>	
HELPERS: <u>R. Jones/J. Gallaher - Highland Drilling Co.</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	
5-11-95	1318	1325	Arrive at well 1034 site. Measure water level at 9.3 ft below top of casing (BTOC) = 6.2 ft below ground surface (BGS). Tag bottom of well (soft) at 44.6 ft BTOC = 41.5 ft BGS. Note: The Subsurface Data Base (Y/TS-881/R2) reports the total depth of well 1034 to be 45.0 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50-60 cpm.
	1325	1344	Cut off protective posts surrounding the well. Cut off 2.3 ft of the casing stick-up (casing is 6.5-in. outside diameter, thin-walled PVC).
	1344	1429	Use backhoe to cut notches in hillside for a level place to position rig jacks.
	1429	1539	Excavate a cuttings pit. Final pit dimensions: 6 ft long x 5 ft wide x 4 ft deep. Move drill rig onto location, and position over the well. Set up site. Depart site. Will continue tomorrow.
5-12-95	0827	0838	Arrive at 1034 site. Conduct pre-work equipment inspections. Steam clean the bit/subadapter assembly.
	0838	0844	Start drill rig, raise mast.
	0844	0850	Rig up with an 8 3/4-in. diameter bit on a subadapter; total length = 4.3 ft, table height = 2.7 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMWELL NO. 1034**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

PAGE 2 of 3

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-12-95	0850	0926	Commence drilling up casing/reaming wellbore. Drill/ream from
(cont.)			0.0 ft to 46.6 ft BGS. Breathing zone analysis (BZA) at 4.0 ft BGS
			= 0.0 ppm. Encounter moisture at 4.6 ft BGS. Top of weathered
			rock at 4.6 ft BGS. Cuttings from 0.0 ft to 4.6 ft BGS are: moderate
			yellowish-brown (10YR 5/4) to light brown (5YR 5/6), moist, stiff
			clay; with medium gray (N5) cement fragments, and PVC
			fragments. BZA at 9.6 ft BGS = 0.0 ppm. Increase in water
			production at 11.0 ft BGS. Top of fresh rock at 18.6 ft BGS.
			Cuttings from 4.6 ft to 18.6 ft BGS consist of moderate yellowish-
			brown (10YR 5/4) to olive gray (5Y 3/2), weathered and stained
			(moderate brown: 5YR 4/4) shale; cement; and PVC. Lower
			explosive limit (LEL) reading at 20.6 ft BGS < 1% (5.3 ppm). BZA
			at 31.0 ft BGS = 0.0 ppm. LEL reading at 37.6 ft BGS < 1% (4.8
			ppm). BZA at 43.0 ft BGS = 0.0 ppm. Cuttings from 18.6 to 46.6
			ft BGS consist of medium dark gray (N4) and blackish-red (5R 2/
			2), thinly laminated shale; medium dark gray (N4), massive
			micrite with abundant granular calcite stringers; and PVC
			fragments. From 35.6 ft to end of boring, coarse-grained filter
			sand occurs with the returns. Beta/gamma scan of cuttings range
			60-70 cpm for the 0.0 ft to 76.6 ft interval.
	0926	0953	Borehole difficult to clean due to fill in. Tag bottom of borehole at
			41.4 ft BGS (5.2 ft of fill). Calculate a borehole volume to 4.0 ft
			BGS of 15.7 cubic ft, equivalent to 13.3 sacks of Type I cement.
	0953	1004	Lower mast. Move rig off location.
	1004	1032	Crew departs site to get grout equipment and supplies.
	1032	1045	Crew returns. Run 1.5-in. OD PVC tremie pipe into borehole to
			39.0 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1100</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-5-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>4-7-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
4-5-95	1241	1303	Arrive at well marked "1101". Measure water level; well is dry. Tag bottom of well at 27.5 ft below ground surface (BGS). This depth coincides with the depth of well 1100 (27.0 ft) reported in the Subsurface Data Base (Y/TS-681/R2). This well will be referred to as 1100. Note: The casing of some of the wells at the Ash Disposal Basin had recently been labeled, apparently incorrectly. The wells in question were correctly identified using pre-P&A tagged depths and the reported location coordinates. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 to 60 cpm. Well casing is 2 3/8-in. outside diameter (OD) PVC. Dig around wellhead, and break up annular cement. Break off casing at 0.5 ft BGS by mistake. Plan to drill up casing while reaming wellbore, but will wait until tomorrow to prevent blowing out of freshly cemented borehole approximately 5 ft away.
	1303	1340	Move drill rig onto location, and position over the well. Secure site. Depart.
4-6-95	0844	0857	Arrive at 1100 site. Crew performs pre-work equipment inspections. Raise mast.
	0857	0902	Rig up with a 7 7/8-in. diameter tricone bit on a subadapter; total length = 4.2 ft, table height = 2.1 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1100</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-6-95 (cont.)	0902	0930	Commence drilling up casing/reaming wellbore. Drill/ream from 0.0 ft to 28.6 ft BGS using compressed air only. Breathing zone analysis (BZA) at 4.0 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 6.8 ft BGS are predominantly medium gray (N5) cement fragments with moderate brown (5YR 4/4), stiff clay and white (N9) PVC fragments. BZA at 9.0 ft BGS = 0.0 ppm. Cuttings from 6.8 ft to 11.6 ft BGS consist mostly of moderate brown (5YR 4/4) to light brown (5YR 5/6), stiff clay with minor cement and PVC fragments. Lower explosive limit (LEL) reading at 13.1 ft BGS <1% (6.0 ppm). Cuttings from 11.6 ft to 14.1 ft BGS are light brown (5YR 5/6), moist, sticky clay. Circulation is spotty below approximately 22 ft BGS. BZA at 24.1 ft BGS = 0.0 ppm. Encounter rock at 27.4 ft BGS. Cuttings from 14.1 ft to 27.4 ft BGS consist of very pale orange (10YR 8/2) to pale yellowish-orange (10YR 8/6) punky chert in moderate yellowish-brown (10YR 5/4) to dark yellowish-brown (10YR 4/2), clayey residuum. Cuttings from 27.4 ft to 28.4 ft BGS are: grayish-orange pink (5YR 7/2), punky dolostone with regular occurrences of sparite (60%) and greenish-gray (5G 6/1), massive, very finely crystalline, siliceous dolostone (40%). Bit drops into a cavity at 28.5 ft BGS. Beta/gamma scan of cuttings range from 50 to 60 cpm for the entire interval.
	0930	0940	AT 28.6 ft BGS. Clean out borehole. Trip out, rig down bit/subdeapter assembly. Tag bottom of borehole at 25.8 ft BGS (2.8 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 7.4 cubic ft, equivalent to 6.3 sacks of Type I cement.
	0940	0955	Secure rods in carousel, lower mast. Move drill rig off location.
	0955	1036	Mix and pour 7 sacks (8.3 cubic ft) of neat, Type I Portland cement (grout weight = 12.5 lbs/gal) directly into the borehole. With cement level at approximately 2 ft BGS, the bottom falls out and

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1101</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-4-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>4-6-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
4-4-95	1331	1353	Move drill onto site with well labeled "1102", and position over the well. Measure water level at 13.9 ft below ground surface (BGS). Tag bottom of well (firm) at 28.5 ft BGS. This depth coincides with the depth of well 1101 (28.9 ft) reported in the Subsurface Data Base (Y/TS-881/R2). This well will be referred to as 1101. Note: The casing of some of the wells at the Ash Disposal Basin had recently been labeled, apparently incorrectly. The wells in question were correctly identified using pre-P&A tagged depths and the reported location coordinates. Well casing is 2.7-in. outside diameter (OD) plastic extensometer casing. Raise mast.
	1353	1358	Wrap a chain around the casing stick-up, and attempt to pull out the casing; the casing breaks off at the ground surface. Plan to drill up the casing while reaming the wellbore tomorrow.
	1358	1417	Lower mast as safety precaution. Secure site and depart.
4-5-95	0858	0925	Arrive at 1101 site. Crew performs prework equipment inspections. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm. Raise mast. Add 5 gallons of hydraulic fluid to drill rig.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1101</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-5-95 (cont.)	0925	0928	Rig up with a 7 7/8-in. diameter tricone bit on a subadapter; total length = 4.2 ft, table height = 2.1 ft.
	0928	1001	Commence drilling up casing and reaming wellbore. Drill/ream from 0.0 ft to 29.6 ft BGS using compressed air only. Breathing zone analysis (BZA) at 3.6 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 7.0 ft BGS consist predominantly of medium gray (N5) cement fragments, with a small amount of moderate brown (5YR 4/4), stiff clay, and light blue (5B 7/6) PVC casing fragments. BZA at 11.1 ft BGS = 0.0 ppm. Cuttings from 7.0 ft to 15.5 ft BGS are light brown (5YR 5/6), moist, sticky clay with pale yellowish-orange (10YR 8/6) chert; minor light blue (5B 7/6) PVC; and medium gray (N5) cement fragments. BZA at 19.1 ft BGS = 0.0 ppm. Lose circulation at 20.5 ft BGS. Air blowing out of well approximately 5 ft away. Circulation restored at 26.6 ft BGS. Air ceases from nearby well. Very hard drilling at 27.1 ft BGS (rock). Cuttings from 15.5 ft to 27.1 ft BGS consist of very pale orange (10YR 8/2) to pale yellowish-orange (10YR 8/6), punky chert in moderate brown (5YR 4/4) to dark yellowish-brown (10YR 4/2), clayey residuum. BZA at 27.5 ft BGS = 0.0 ppm. Cuttings from 27.1 ft to 29.6 ft BGS are exclusively pale yellowish-brown (10YR 6/2), massive, siliceous dolostone (possibly a boulder). Beta/gamma scan of cuttings range from 40 to 60 cpm for the entire interval.
	1001	1013	At 29.6 ft BGS. Clean out borehole. Trip out (having to rotate/back drill in several tight spots). Rig down bit/subadapter assembly. Tag bottom of borehole at 25.4 ft BGS (4.2 ft of fill). Hole is dry. Calculate a borehole volume to 4.0 ft BGS of 7.3 cubic ft, equivalent to 6.2 sacks of Type I cement.
	1013	1029	Secure rods in carousel. Lower mast. Move drill rig away from borehole.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1102</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-3-85</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>4-6-85</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
4-3-85	1329	1337	Move drill rig over well labelled "1104" and position over the well. Measure water level at 52.2 ft below ground surface (BGS). Tag bottom of well (solid) at 75.5 ft BGS. This depth coincides with the depth of well 1102 (75.1 ft) reported in the Subsurface Data Base (Y/TS-881/R2). This well will be referred to as 1102. Note: The casing of some of the wells at the Ash Disposal Basin had recently been labeled, apparently incorrectly. The wells in question were correctly identified using pre-P&A tagged depths and the reported location coordinates. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50-60 cpm. Well casing is 2 3/8-in. outside diameter (OD) PVC. The diameter of the wellbore appears to be 6.5-in. in diameter, not 3.0 in. as reported in the Subsurface Data Base.
	1337	1342	Raise the mast.
	1342	1346	Wrap a chain around the casing stick-up and attempt to pull out the casing: casing breaks off at the ground surface. Plan to drill up the casing while reaming the wellbore, but will wait until tomorrow to prevent blowing out freshly cemented, borehole just 5 ft away.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1102WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 3

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-3-95	1346	1400	Lower mast as safety precaution. Secure site and depart.
(cont.)			
4-4-95	0845	0922	Arrive at 1102 site. Crew performs pre-work equipment inspections.
	0922	0930	Start drill rig. Raise mast. Rig up with a 7 7/8-in. diameter tricone bit on a subadapter; total length = 4.2 ft, table height = 2.2 ft.
	0930	1024	Commence drilling up casing and reaming wellbore using compressed air only. Drill/ream from 0.0 ft to 52.0 ft BGS. Breathing zone analysis (BZA) at 4.2 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 5.0 ft consist of dusky yellowish-brown (10YR 2/2) topsoil and moderate brown (5YR 4/4), stiff clay with medium gray (N5) cement fragments and white (N9) PVC fragments. BZA at 7.0 ft and 13.5 ft both read 0.0 ppm. Lower explosive limit (LEL) reading at 20.5 ft BGS <1% (2.4 ppm). BZA at 28.0 ft BGS = 0.0 ppm. LEL reading at 35.0 ft BGS <1% (2.4 ppm). BZA at 43.0 ft BGS = 0.0 ppm. Cuttings from 5.0 ft to 52.0 ft BGS are light brown (5YR 5/6), stiff and sticky clay with pale yellowish-orange (10YR 8/6) residual chert, plus minor cement and PVC fragments (may be deflecting off of wellbore). Beta/gamma scan of cuttings range from 50 to 90 cpm for the entire interval.
	1024	1040	At 52.0 ft BGS. Beginning to lose circulation, also appear to be muddying up swampy area at the base of the dam (communication to surface through base of dam). Report status to K. Jago (HSEA) who directs to stop and grout the borehole as is.
	1040	1050	Trip out, rig down bit/subadapter assembly. Tag bottom of borehole at 50.3 ft BGS (1.7 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 15.7 cubic ft, equivalent to 13.3 sacks of Type I cement.

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1103</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-31-95	0951	0956	Rig up with a 7 7/8-in. diameter tricone bit on a subadapter; total length = 4.2 ft, table height = 2.1 ft.
(cont.)			
	0956	1014	Commence reaming the wellbore using compressed air only. Ream from 0.0 ft to 27.1 ft BGS. Breathing zone analysis (BZA) at 3.1 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 7.1 ft BGS consist predominantly of medium gray (N5) cement fragments (70%); plus moderate brown (5YR 4/4) to light brown (5YR 5/6), stiff clay (30%). BZA at 9.1 ft and 22.1 ft BGS both read 0.0 ppm. Cuttings from 7.1 ft to 27.1 ft BGS are light brown (5YR 5/6), moist, sticky clay with pale yellowish-orange (10YR 8/6) chert fragments. Interval contains rare cement fragments. Beta/gamma scan of cuttings = 50 cpm for the entire interval.
	1014	1021	At 27.1 ft BGS. Clean out borehole. Trip out, rig down bit/subadapter assembly. Tag bottom of borehole at 26.3 ft BGS (0.8 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 7.9 cubic ft, equivalent to 6.7 sacks of Type I cement.
	1021	1100	Secure drill rods in carousel, lower mast. Move drill rig away from the borehole. Gather grouting materials.
	1100	1125	Mix and pour 6 sacks (7.1 cubic ft) of neat, Type I Portland cement into the borehole. Liquid cement fills borehole to the ground surface.
	1125	1130	Clean up. Secure site. Depart for lunch.
4-3-95	1103	1105	At 1103 site. Tag cement level at 1.7 ft BGS. Cap remaining borehole with clay soil.
			P&A of well 1103 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1104</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>3-31-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>4-4-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
3-31-95	1243	1312	Move drill rig onto site and position over well labelled "1103."
			Measure water level at 51.9 ft below ground surface (BGS). Tag
			bottom of well (firm) at 55.9 ft BGS. This depth coincides with the
			depth of well 1104 (54.3 ft) reported in the Subsurface Data Base
			(Y/TS-881/R2). This well will be referred to as 1104. Note: The
			casing of some of the wells at the Ash Disposal Basin had recently
			been labeled, apparently incorrectly. The wells in question were
			correctly identified using pre-P&A tagged depths and the reported
			location coordinates. Set up site. Background radiological scan
			of location: alpha = 0 cpm, beta/gamma = 50-60 cpm. Well casing
			is 2.7-in. outside diameter (OD) plastic extensometer casing.
	1312	1327	Cut off a portion of the casing stick-up. Raise the mast.
	1327	1330	Wrap a chain around the remaining casing stick-up, and attempt
			to pull out the casing; the casing breaks at the ground surface.
			Plan to drill up casing while reaming the wellbore, but will wait until
			4-3-95 to prevent blowing out freshly cemented borehole just 5 ft
			away.
	1330	1340	Lower mast as safety precaution. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. 1104
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-3-95	0914	0929	Arrive at 1104 site. Crew performs pre-work equipment inspections.
(cont.)			Raise mast.
	0929	0935	Steam clean the bit/subadapter assembly.
	0935	0938	Rig up with the 7 7/8-in. diameter tricone bit on a subadapter; total length = 4.2 ft, table height = 2.1 ft.
	0938	1032	Commence drilling up casing and reaming wellbore using compressed air only. Drill/ream from 0.0 ft to 56.6 ft BGS. Breathing zone analysis (BZA) at 3.1 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 6.1 ft BGS consist predominantly of medium gray (N5) cement fragments with moderate brown (5YR 4/4) to light brown (5YR 5/6), stiff clay; and light blue (5B 7/6) PVC fragments. BZA at 8.1 ft BGS = 0.0 ppm. Lower explosive limit (LEL) reading at 16.1 ft BGS <1% (2.5 ppm). BZA at 20.5 ft BGS = 0.2 ppm. LEL reading at 30.1 ft BGS <1% (2.5 ppm). Lose circulation briefly at 41.1 ft BGS. BZA at 47.5 ft BGS = 0.0 ppm. BZA at 54.1 ft BGS = 0.1 ppm. Encounter rock at 55.9 ft BGS. Cuttings from 6.1 ft to 55.9 ft BGS generally are light brown (5YR 5/6), moist, sticky clay with pale yellowish-orange (10YR 8/6) chert; and minor PVC fragments (bit may be deflecting off of wellbore). Cuttings from 55.9 ft to 56.6 ft BGS are pale yellowish-brown (10YR 6/2), massive, very finely crystalline, pebbled dolostone. Beta/gamma scan of cuttings range from 50 to 60 cpm for the entire interval.
	1032	1054	At 56.6 ft BGS. Clean out borehole. Water spurts out of nearby well, and has slight communication to surface through small seeps on dam mid-point. Trip out, rig down bit/subadapter assembly. Tag bottom of borehole at 51.7 ft BGS (4.9 ft of fill). Borehole is dry. Calculate a borehole volume to 4.0 ft BGS of 16.2 cubic ft, equivalent to 13.7 sacks of Type I cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1105</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>3-28-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>3-30-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
3-28-95	1219	1225	Arrive at well labelled "1106." Uncap well: organic vapors = 0.0 ppm. Measure water level at 21.4 ft below ground surface (BGS). Tag bottom of well (solid) at 56.2 ft BGS. This depth coincides with the depth of well 1105 (56.4 ft) reported in the Subsurface Data Base (Y/TS-881/R2). This well will be referred to as 1105. Note: The casing of some of the wells at the Ash Disposal Basin had recently been labeled, apparently incorrectly. The wells in question were correctly identified using pre-P&A tagged depths and the reported location coordinates. Well casing is 2 3/8-in. outside diameter (OD) PVC.
	1225	1320	Move drill rig onto site and position over well. There is not much room to maneuver the drill rig, so the crew cuts off the casing stick-up flush with the ground surface for additional maneuvering room. Get drill rig close enough to position, to "walk" rig sideways until centered over the well.
	1320	1339	B. McMaster (HSEA/UT) on site. Conducts Ash Disposal Basin P&A site-specific health & safety briefing.
	1339	1344	Raise the mast. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50-60 cpm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1105

WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 4

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-28-95 (cont.)	1344	1412	Dig around the wellhead, and break up some of the annular cement. The wellbore appears to be larger than the 3-in. diameter reported in the Data Base; 6.5-in. is more probable. Wrap a chain around the casing and attempt to pull out; the casing comes out with some difficulty. Extract a total of 47.9 ft (includes stick-up cut off earlier) of 2.37-in. OD PVC casing (Triloc™ Monitor Pipe) and 10.0 ft of 2.37-in. OD, slotted PVC screen (there was no cap on the bottom of the screen section).
	1412	1432	Rig up with a 7 7/8-in. diameter tricone bit on a subadapter; total length of bit/subadapter assembly = 4.2 ft, table height = 1.4 ft.
	1432	1446	Commence reaming the wellbore using compressed air only. Ream from 0.0 ft to 27.8 ft BGS. Breathing zone analysis (BZA) at 6.8 ft BGS = 0.4 ppm. Cuttings from 0.0 ft to 7.8 ft BGS consist of moderate brown (5YR 4/4), moist, stiff clay and medium gray (N5) cement fragments (approximately 50% of each). Lower explosive limit (LEL) reading at 12.8 ft BGS <1% (8.5 ppm). BZA at 19.8 ft BGS = 0.2 ppm. Drill tools vibrating/drill rig chatter at 23.5 ft BGS, lose circulation. Cuttings from 7.8 ft to 23.5 ft BGS are predominantly light brown (5YR 5/6), moist, "sticky" clay with minor pale yellowish-orange (10YR 8/6) chert. Rare cement fragments this interval.
	1446	1450	At 27.8 ft BGS. Water begins bubbling out of well approximately 5 ft from 1105. Water also spurting out of the swampy area near the base of the dam (blow-out). Shut off air, pull bit up to ground surface. Shut off rig.
	1450	1514	Try unsuccessfully to get in touch with someone from HSEA to report status. Finish tripping out of the borehole, rig down bit subadapter assembly. Tag bottom of the borehole at 27.8 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1105</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-28-95			Drill crew is concerned about more blow-outs and the potential for
(cont.)			washing out of the supports with the drill rig perched on this bench
			mid-way up the dam.
	1514	1536	Place crushed rock under drill rig, in wheel ruts, to help in moving
			the rig when complete with the P&A of well 1105.
	1536	1552	Secure carousel and lower mast as a safety precaution. Secure
			site and depart.
3-29-95	0855	0911	Arrive at 1105 site. Tag bottom of the borehole again at 21.5 ft
			BGS (an additional 6.5 ft of fill accumulated in the hole overnight).
	0911	0932	Pour 5, 50-lb sacks of 3/8-in. Shur-Plug™ bentonite aggregate
			into the borehole (approval by K. Jago-HSEA). Top of bentonite
			is at 13.5 ft BGS. Pour 10 gallons of potable water on bentonite
			to hydrate. Bentonite to hydrate a minimum of 4 hours. Depart
			site.
	1341	1345	Return to 1105 site. Tag hydrated bentonite at 13.2 ft BGS
			(bentonite swelled 0.3 ft). Calculate a borehole volume to 4.0 ft
			BGS of 3.1 cubic ft, equivalent to 2.7 sacks of Type I cement.
	1345	1400	Mix and pour 4 sacks (4.7 cubic ft) of neat, Type I Portland cement
			directly into the borehole. Liquid grout fills borehole to the ground
			surface.
	1400	1412	Clean up. Oversight departs, crew remains to perform light
			maintenance on drill rig.

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1106WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 4

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-30-95 (cont.)	1044	1047	Rig up with a 7 7/8-in. diameter tricone bit on a subadapter; total length = 4.2 ft, table height = 2.2 ft.
	1047	1055	Commence reaming the wellbore using compressed air only. Ream from 0.0 ft to 9.0 ft BGS. Breathing zone analysis (BZA) at 3.0 ft BGS = 0.1 ppm. Cuttings from 0.0 ft to 9.0 ft BGS consist of medium dark gray (N4) cement fragments (60%) and moderate brown (5YR 4/4) to light brown (5YR 5/6), moist clay. Beta/gamma scan of cuttings range from 50 to 60 cpm for the interval.
	1058	1069	At 9.0 ft BGS. Clean out borehole. Rig down bit/subadapter assembly.
	1059	1111	Rig up with 8-in. diameter, solid-stem augers; lead flyte is 5.4 ft long, subsequent flytes are 5.0 ft long. Rig up a total of 20.4 ft of augers.
	1111	1116	Continue reaming the wellbore. Ream from 9.0 ft to 18.4 ft BGS. BZA at 10.4 ft BGS = 0.0 ppm. Lower explosive limit (LEL) reading at 15.0 ft BGS <1% (3.8 ppm). Cuttings from 9.0 ft to 18.4 ft BGS are predominantly light brown (5YR 5/6), moist, "sticky" clay containing small fragments of pale yellowish-orange (10YR 8/6) chert, and rare cement fragments.
	1116	1122	At 18.4 ft BGS. Clean out borehole. Rig up a string of 4 more auger flytes.
	1122	1133	Continue reaming wellbore. Ream from 18.4 ft to 34.7 ft BGS. BZA at 25.4 ft BGS = 0.0 ppm. LEL reading at 31.0 ft BGS <1% (4.8 ppm). BZA at 34.0 ft = 1.4 ppm (max.), 0.2 ppm (steady). Cuttings become wet at 30.0 ft BGS. Cuttings from 18.4 ft to 34.7 ft BGS are a continuation of the 9.0 to 18.4-ft interval. Beta/gamma

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1106</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-30-95			scan of the cuttings range from 50 to 60 cpm for the augered interval.
(cont.)			
	1133	1147	Auger refusal at 34.7 ft BGS. Clean out borehole. Begin tripping augers out of the borehole.
	1147	1259	Break for lunch.
	1259	1311	Finish tripping augers out of the borehole. Tag bottom of borehole at 33.7 ft BGS (1.0 ft of fill). Approximately 10 ft of water in the bore.
	1311	1338	Secure drill rods in carousel. Lower mast. Move drill rig away from borehole. It is suspected that the reamed wellbore crosses the base of the dam. Plan to plug the bottom of the hole with bentonite.
	1338	1342	Pour 4, 50-lb sacks of 3/8-in. Shur-Plug™ bentonite aggregate into the borehole. Unhydrated bentonite level at 15.5 ft BGS.
	1342	1350	Secure site. Crew moving drill rig to next location.
3-31-95	0842	0850	At 1106 site. Tag hydrated bentonite level at 15.3 ft BGS (bentonite swelled 0.2 ft). Calculate a borehole volume to 4.0 ft BGS of 4.0 cubic ft, equivalent to 3.4 sacks of Type I cement.
	0850	0905	Mix and pour 4 sacks (4.7 cubic ft) of neat, Type I Portland cement (grout weight = 12.8 lbs/gal) into the borehole. Liquid grout circulates to the ground surface.
	0905	0922	Clean up. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1107</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-10-95</u>	
DRILLER: <u>D. Williford - Highland Drilling Co.</u>		FINISH: <u>4-12-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 455 Backhoe with McMillen Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-10-95	1323	1330	Move backhoe to well 1107 site. Measure water level in well at 2.8 ft below ground surface (BGS). Tag bottom of well (solid) at 31.6 ft BGS. The Subsurface Data Base (Y/TS-881/R2) reports the total depth of well 1107 to be 32.2 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 40 cpm.
	1330	1347	Dig around wellhead, and break up a portion of the annular cement. Wellbore appears to be approximately 6.5-in. in diameter rather than the 3.0-in. diameter reported in the Data Base. Wrap a chain around the casing stick-up, and attempt to pull out the casing: casing comes out with some difficulty. Extract a total of 24.6 ft of 2.37-in. outside diameter (OD) PVC casing (2-in. Truloc™ Monitor Pipe), and 9.2 ft of 2.37-in. OD slotted PVC screen (2-in. Truloc™ Monitor Pipe) with no end cap on bottom.
	1347	1430	At a near-by well site.
	1430	1437	Position backhoe over well 1107. Rig up with an 8-in. diameter, solid-stem auger; lead flyte is 5.4 ft long, subsequent flytes are 5.0 ft long.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1107</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-10-95	1437	1450	Commence reaming wellbore. Ream from 0.0 ft to 11.5 ft BGS.
(cont.)			Breathing zone analysis (BZA) at 3.0 ft BGS = 0.0 ppm. BZA at
			9.4 ft BGS = 0.2 ppm. Water at 11.2 ft BGS. Cuttings from 0.0 ft
			to 11.2 ft BGS consist mainly of moderate brown (5YR 4/4) to light
			brown (5YR 5/6), stiff clay with pale yellowish-orange (10YR 8/6)
			chert; and minor medium dark gray (N4) cement fragments. BZA
			at 11.4 ft BGS = 0.0 ppm. Cuttings from 11.2 ft to 11.5 ft BGS are:
			pale brown (5YR 5/2) to dark yellowish-orange (10YR 6/6), wet
			clay. No obvious sand pack observed.
	1450	1504	Auger refusal at 11.5 ft BGS. Trip out augers. Tag bottom of
			borehole at 11.3 ft (0.2 ft of fill). Calculate a borehole volume to
			4.0 ft BGS of 2.6 cubic ft, equivalent to 2.2 sacks of Type I cement.
			Plan to cement tomorrow. Secure site and depart.
4-11-95	0930	0947	At 1107 site. Move backhoe from site.
	0947	1022	Mix and pump tremie (using pump discharge hose as the tremie
			pipe) 3 sacks (3.6 cubic ft) of neat, Type I Portland cement (grout
			weight = 13.8 lbs/gal) into the borehole. Circulate water, then
			100% cement.
	1022	1032	Clean up. Depart site.
4-12-95	0845	0847	At 1107 site. Tag cement level at 1.4 ft BGS. Cap remaining
			borehole with clay soil.
			P&A of well 1107 is complete.

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1109</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-11-95</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>4-12-95</u>	
HELPER: <u>H. Hall - Highland Drilling Co.</u>		METHOD: <u>A</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-11-95	1248	1251	At 1109 site. Measure water level at 11.8 ft below ground surface (BGS). Tag bottom of well (solid) at 37.6 ft BGS. Note: the Subsurface Data Base (Y/TS-881/R2) reports the total depth of well 1109 to be 41.8 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 80 to 90 cpm. NOTE: This well is located on the ashfield which is suspected of being incapable of supporting a drill rig. This well to be decommissioned by removing the casing and allowing the wellbore to cave in naturally. If the bore remains open, it may be plugged with bentonite aggregate to within 4 ft of ground surface, as per HSEA.
	1251	1255	Move Ford 455 backhoe onto site, and set up.
	1255	1310	Wrap a chain around the casing stick-up and attempt to pull out the casing; casing breaks. Try again; casing comes out relatively easily. Extract a total of 32.0 ft of 2.37-in. outside diameter (OD) PVC casing (2-in. Truloc™ Monitor Pipe), and 10.2 ft of 2.37-in. OD slotted PVC screen. Beta/gamma scan of extracted casing/screen = 40-60 cpm. Tag bottom of wellbore at 36.3 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 1 cubic ft, equivalent to 1.4 sacks of Shur-Plug™ bentonite aggregate. Depart site.
	1350	1402	Return to 1109 site. Slowly pour 3/4 of a 50-lb sack of 3/8-in. Shur-Plug™ bentonite aggregate into the borehole. Unhydrated bentonite level at 3.0 ft BGS. Add 5 gal. of potable water to hydrate the bentonite. Depart site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO: 1109

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

PAGE 2 of 2

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>1110</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-11-95</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>4-12-95</u>	
HELPER: <u>H. Hall - Highland Drilling Co.</u>		METHOD: <u>A</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-11-95	1240	1244	At well 1110 site (well has no cap). Measure water level at 6.4 ft below ground surface (BGS). Tag bottom of well (firm) at 8.0 ft BGS. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 70-80 cpm. NOTE: This well is located on the ash field which is suspected of being incapable of supporting a drill rig. This well to be decommissioned by removing the casing and allowing the wellbore to cave in naturally. If the bore remains open, it may be plugged with bentonite aggregate to within 4 ft of ground surface, as per HSEA.
	1244	1248	Wrap a chain around the casing stick-up, and easily pull out 9.0 ft of 1.5-in. outside diameter (OD) slotted PVC screen wrapped in cloth and duct tape. There was no cap on the bottom other than cloth wedged into the end. Beta/gamma scan of extracted casing = 50 cpm. Tag bottom of wellbore at 8.5 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 0.1 cubic ft, equivalent to 0.2 sacks of bentonite aggregate. Depart site.
	1402	1407	Return to 1110 site. Slowly pour 1/4 of a 50-lb sack of 3/8-in. Shur-Plug™ bentonite aggregate into the borehole. Unhydrated bentonite level at 3.0 ft BGS. Add 5 gal. of potable water to hydrate the bentonite. Depart site.
4-12-95	0852	0853	At 1110 site. Tag hydrated bentonite at 2.0 ft BGS (bentonite swelled 1.0 ft). Cap borehole with fly ash (native materials).

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

PAGE 2 of 2

A-37

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-03</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-28-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-30-94</u>	
HELPERS: <u>R. Phillips - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-28-94	1402	1410	Arrive at BC-03 site. Well BC-03 consists of uncapped, 1.75-in. outside diameter (OD) PVC casing. Stick-up = 3.2 ft. The ground immediately surrounding the well is wet. Measure water level at 0.1 ft above ground surface. Tag bottom of well (soft) at 50.7 ft below ground surface (BGS). The subsurface Data Base (Y/TS-881/R1) reports that well BC-03 is completed in an NX core hole (approximately 3.0-in. diameter) with a total depth of 349.1 ft. The casing is loose.
	1410	1423	Move backhoe onto location. Set up site, prepare to drill. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60-70 cpm.
	1423	1430	Break up the concrete "pad," and pull out the casing by hand. Extract a total of 41.0 ft of 1.75-in. OD, schedule 40 PVC casing, slotted over the bottom 35.0 ft.
	1430	1439	Rig up with an 8.0-in. diameter solid stem auger; the lead flyte is 5.6 ft long.
	1439	1454	Commence augering well bore. Auger well bore from 0.0 ft to 8.7 ft BGS. Cuttings from 0.0 to 1.0 ft BGS are moderate yellowish-brown (10YR 5/4) to moderate olive brown (5Y 4/4), sandy loam

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-03WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 2

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-28-94	1439	1454	(topsoil) with minor thinly laminated shale fragments (weathered).
(cont.)			Breathing zone analysis (BZA) at 2.6 ft BGS = 0.2 ppm. BZA at
			4.2 ft, 6.0 ft, and 8.6 ft BGS all read 0.0 ppm. Cuttings from 1.0 ft
			to 8.7 ft BGS consist of light olive brown (5Y 5/6) to dark yellowish-
			orange (10Y 6/6), weathered, thinly laminated shale in a wet,
			dusky yellow green (5GY 5/2) mud.
	1454	1516	Auger refusal at 8.7 ft BGS. Clean out borehole. Trip out augers.
			Tag bottom of borehole at 8.0 ft BGS (0.7 ft of collapse). Calculate
			a borehole volume to 4.0 ft BGS of 1.4 cubic ft, equivalent to
			1.2 sacks of Type I cement.
	1516	1520	Move backhoe off location. Secure site and depart.
11-29-94	0853	0904	At BC-03 site. Tag bottom of borehole at 8.0 ft (no change from
			yesterday). Water level is at the ground surface.
	0904	0923	Mix and pump tremie (using pump discharge hose as tremie pipe)
			2 sacks (2.4 cubic ft) of neat, Type I Portland cement into the
			borehole. Grout weight = 14.4 lbs/gal. Circulate water, then 100%
			cement.
	0923	0930	Clean up. Load equipment and depart site.
11-30-94	0757	0759	At BC-03 site. Tag cement level at 1.0 ft BGS. Borehole is ready
			to be capped. Depart.
	0825	0830	Return to BC-03 site with crew. Cap remaining borehole with clay
			soil.
			P&A of BC-03 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-25</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-30-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>12-02-94</u>	
HELPER: <u>R. Phillips - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-30-94	1310	1330	Arrive at BC-25 site. Well BC-25 consists of uncapped, 4.5-in. outside diameter (OD) PVC casing. Slick-up = 1.2 ft. Tag bottom of well at 95.3 ft below ground surface (BGS). Water level is at 11.2 ft BGS. The subsurface data base (Y/TS-881/R1) reports well BC-25 is completed in an NX corehole (approximately 3.0 in. diameter) with a total depth of 104.0 ft. Move backhoe onto location. Set up site. Plan to drill tomorrow. Depart site.
12-1-94	0840	0848	Arrive at BC-25 site. Start backhoe and allow to warm up. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 70 cpm. W. Thedford (HSEA) on site.
	0848	0853	Break up concrete "pad," and remove fragments. Attach a jawed clamp to casing and pull out 3.8 ft of 4.5-in. OD, schedule 40 PVC casing; appears to have slipped out of a connection. Will try to break up casing while augering the well bore.
	0853	0855	Rig up with an 8.0-in diameter solid-stem auger; lead flyte is 5.6 ft long.
	0855	0928	Commence augering. Auger well bore from 0.0 ft to 15.2 ft BGS. Cuttings from 0.0 ft to 2.5 ft BGS are dark yellowish-brown (10YR 4/2), moist, clayey topsoil and very light gray (N8) concrete

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-25WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 3

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
12-1-94	0855	0928	(pad) fragments. Breathing zone analysis (BZA) at 2.5 ft BGS =
(cont.)			0.0 ppm. Top of weathered bedrock at 4.0 ft BGS. Cuttings from
			2.5 ft to 4.0 ft BGS consist of dark yellowish-brown (10YR 4/2) to
			moderate yellowish-brown (10YR 5/4), moist, clayey subsoil;
			concrete (pad) fragments; and medium gray (N5) PVC fragments.
			BZA at 4.0 ft BGS = 0.0 ppm. BZA at 6.0 ft, 8.2 ft, 11.4 ft, and 13.1
			ft BGS all read 0.0 ppm. Cuttings from 4.0 ft to 15.2 ft consist of
			dark yellowish-orange (10YR 6/6) to moderate olive brown (5Y 4/
			4), weathered, thinly laminated shale. PVC fragments observed
			in this interval, but decrease with depth. Cuttings very moist below
			11.6 ft BGS. W. Thedford departs.
	0928	0956	At 15.2 ft BGS, out of augers. Crew goes to get more.
	0956	1006	Crew returns, adds a 5.0 ft auger flyte to string. Continue
			augering. Auger from 15.2 ft to 17.4 ft BGS. BZA at 15.6 ft and
			17.0 ft BGS both read 0.0 ppm. Cuttings from 15.2 ft to 17.4 ft BGS
			are the same as the 4.0 to 15.2-ft interval. No PVC fragments
			observed this interval. Beta/gamma scan of the cuttings range
			from 50 to 60 cpm for the entire interval.
	1006	1033	Auger refusal at 17.4 ft BGS. Clean out borehole. Trip out augers.
			Tag bottom of borehole at 16.4 ft BGS (1.0 ft of collapse).
			Calculate a borehole volume to 4.0 ft BGS of 4.3 cubic ft,
			equivalent to 3.7 sacks of Type I Portland cement. Secure site
			and depart.
	1155	1204	Return to BC-25 site. Move backhoe off site.
	1204	1224	Mix and pump tremie (using pump discharge hose as the tremie
			pipe) 5 sacks (5.9 cubic ft) of neat, Type I Portland cement into the
			borehole (grout weight = 13.8 lbs/gal.) Circulate 100% cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-30</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-21-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-23-94</u>	
HELPERS: <u>H. Hall/R. Phillips - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ford 455 Backhoe w/McMillan Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-21-94	1312	1318	Arrive at BC-30 site. Backhoe is at the site. Crew has broken up the concrete "pad"; the casing is loose. Well consists of uncapped, 1.75-in. outside diameter (OD) PVC casing. Stick-up = 1.4 ft. Water level is at 1.5 ft below ground surface (BGS). Tag bottom of the well (soft) at 70.3 ft BGS. The Subsurface Data Base (Y/TS-881/R1) reports the well is completed in an NX core hole (approximately 3.0-in. diameter) to a total depth of 104.0 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm.
	1318	1322	Pull out casing by hand, extract 20.2 ft of 1.75-in. OD, schedule 40 PVC casing slotted over the bottom 15.6 ft.
	1322	1355	When preparing to rig up lead auger, the crew discovers a leak in one of the Diggerhead hydraulic lines. Crew removes both hydraulic lines taking precaution to contain any hydraulic oil that might drip from hoses and connections. Crew to have new fittings put on the ends; doubtful if any drilling will occur today. Depart site.
11-22-94	0850	0908	Arrive at BC-30 site. Water level remains at 1.5 ft BGS. Crew replaces repaired hydraulic hoses.
	0908	0912	Conduct pre-work equipment inspection of backhoe.
	0912	0913	Rig up with an 8.0-in. diameter solid stem lead auger flyte; length = 5.6 ft. Length of subsequent flytes = 5.0 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-30</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-22-94	0913	0926	Commence augering the wellbore. Auger from 0.0 ft to 12.4 ft BGS.
(cont.)			Cuttings from 0.0 ft to 2.0 ft BGS: olive gray (5Y 3/2) to dusky yellowish-brown (10YR 2/2), moist, clayey topsoil. Breathing
			zone analysis (BZA) at 4.0 ft, 7.4 ft, and 9.2 ft BGS read 0.0 ppm,
			0.1 ppm, and 0.0 ppm, respectively. Cuttings from 2.0 ft to
			10.0 ft BGS are dark greenish-gray (5GY 4/1), moist, clayey
			subsoil. Augering water out of the borehole. BZA at 11.3 ft and
			12.0 ft BGS both read 0.0 ppm. Cuttings from 10.0 ft to 12.4 ft BGS
			are grayish-olive green (5GY 3/2), wet clayey soil with minor shale
			fragments.
	0926	0945	Auger refusal at 12.4 ft BGS. W. Thedford (HSEA) on site. Trip
			out augers. Tag bottom of borehole at 12.4 ft BGS (clean); water
			level is at 3.0 ft BGS. Calculate a borehole volume to 4.0 ft BGS
			of 2.9 cubic ft, equivalent to 2.5 sacks of Type I Portland cement.
	0945	1005	Gather grouting supplies, equipment.
	1005	1028	Mix and pump tremie (using pump discharge hose as tremie pipe
			4 sacks (4.7 cubic ft) of neat, Type I Portland cement into the
			borehole. Circulate water, thick muck, then 100% cement.
	1028	1042	Clean up. Depart site.
11-23-94	0848	0853	At BC-30 site. Tag cement level at 1.0 ft BGS. Cap remaining
			borehole with clay soil.
			P&A of well BC-30 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-31</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-10-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-11-94</u>	
HELPERS: <u>H Hall/R. Phillips - Highland Drill. Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>S. L. Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-10-94	0914	1007	Arrive at BC-31 site. Well consists of uncapped, 4 1/2 in. outside diameter (OD), schedule 40, PVC casing with concrete apron containing aluminum box around well head. Stick up = 0.5 ft, water level is 2.5 ft below ground surface (BGS). Tag bottom of well (soft) at 5.6 ft BGS. The Subsurface Data Base (Y/TS-881/R1) reports well BC-31 is completed in an NX corehole (approximately 3.0 in. diameter) with a total depth of 101.0 ft.
	1007	1234	Drillers able to break through plug in well. Tag borehole at (soft) 93.0 ft BGS, odd natural organic odor coming from borehole. Calculate borehole volume to 14.0 ft BGS (assuming 10 ft of casing) of 3.9 cubic ft, equivalent to 3.3 sacks of Type I Portland cement. Can only get 12 ft of tremie pipe in borehole. As per HSEA, rigging up to pull casing, auger to refusal, then grout.
	1234	1308	Break up concrete apron around well and remove aluminum box. Peg gravel under concrete. Attach a jawed clamp to casing collar and pull out 12.5 ft of 4.5 in. OD, schedule 40, PVC casing. Casing does not appear to have broken off. Tag well at 11.5 ft BGS; still is blocked off.
	1308	1315	Rig up with an 8.0-in. diameter, solid stem auger; lead flyte is 5.6 ft long. Background radiation scan of location: alpha = 0 cpm, beta/gamma = 70-150 cpm.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-31</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-10-94	1315	1328	Commence augering. Auger well bore from 0.0 ft to 8.9 ft BGS.
(cont.)			Cuttings from 0.0 ft to 8.9 ft BGS consist of moderate brown (5YR 3/4) clay with reddish brown (10R 3/4) weather stained, thinly laminated shale fragments and some medium dark gray (N4) shale fragments. Some traces of pea gravel. (No cuttings came to surface, had to collect off augers after pulling out of borehole). Breathing zone analysis (BZA) at 3.5 ft BGS = 0.0 ppm. Lower explosive limit (LEL) at 4 ft BGS < 1% (4.5 ppm). Weathered bedrock at 7.8 ft BGS. BZA at 7.8 ft BGS = 0.0 ppm. LEL at 7.9 ft BGS < 1% (4.5 ppm). Beta/gamma scan of well pipe = 80 cpm.
	1328	1333	Auger refusal at 8.9 ft BGS. Trip out augers. Tag bottom of borehole at 7.0 ft BGS (soft). Calculate a borehole volume to 4.0 ft BGS of 1 cubic ft, equivalent to 1.2 sacks of Type I Portland cement. Beta/gamma scan of well pipe = 40 cpm.
	1333	1340	Mix and pump tremie (using pump discharge hose as tremie pipe) 2 sacks (2.4 cubic ft) of neat, Type I Portland cement (grout weight = 12.3 lbs/gal) into borehole until circulation of cement.
	1340	1345	Clean up, moving off borehole.
11-11-94	0957	1000	At BC-31 site. Tag cement level at 1.0 ft BGS. Cap remaining borehole with clay soil.
			P&A of well BC-31 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-32</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 1
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-15-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>11-15-94</u>	
HELPERS: <u>G-Shillings/H. Hall - Highland Drilling Co.</u>		METHOD: <u>0</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-15-94	1236	1240	Arrive at BC-32 site. Well consists of uncapped, 1.25-in. outside diameter (OD) PVC casing. Slick-up = 0.7 ft. The Subsurface Data Base reports well BC-32 completed in an NX core hole (3.0-in. diameter), with a total depth of 100.2 ft. Did not tag bottom prior to P&A work (did not have long tape at location). Measure water level at 5.6 ft below ground surface (BGS). Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm. NOTE: Well BC-32 is located in a place that is difficult to get any equipment to. K. Jago (HSEA) suggests cutting off the well casing below the ground surface, then capping the vacant well bore.
	1240	1248	Dig around wellhead to expose the concrete pad. Break up concrete pad, and remove pieces. Deepen excavation to 1.5 ft BGS.
	1248	1250	Pull out casing by hand. Extract a total of 63.1 ft of 1.25-in. OD PVC casing, slotted over the bottom 54.9 ft.
	1250	1253	Refill pit with excavated material.
			P&A of well BC-32 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-33</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-14-94</u>	
DRILLER: <u>Greg Shillings - Highland Drilling Co.</u>		FINISH: <u>11-15-94</u>	
HELPERS: <u>R. Phillips/H. Hall - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ford 455 Backhoe with McMillian Diggerhead</u>		LOGGED BY: <u>Timothy Coffey</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-14-94	0913	0928	Arrive at BC-33 site. Well consists of uncapped, 1.25-in. outside diameter (OD) PVC casing. Stick-up = 1.8 ft. Measure water level at 4.4 ft. below ground surface (BGS). Tag bottom of well (soft) at 141.5 ft BGS. The Subsurface Data Base (Y/TS-881/R1) reports this well constructed in an NX core hole (approximately 3.0-in. diameter), total depth = 145.3 ft. Move backhoe onto the site; begin setting up site. Background radiological scan of location: alpha = 0 cpm, Beta/gamma = 40 cpm.
	0928	0930	Break up concrete pad, and pull out a total of 7.6 ft. of 1.25-in. OD, schedule 80 PVC casing (casing appears to have slipped out of a connection).
	0930	0941	Rig up with an 8.0-in. diameter solid stem auger; lead flyte is 5.6 ft. in length (subsequent flytes = 5.0 ft.).
	0941	1002	Commence augering well bore. Auger from 0.0 ft. to 10.6 ft. BGS. Breathing zone analysis (BZA) at 3.6 ft. BGS = 0.0 ppm. Adding subsequent auger flytes as necessary. BZA at 6.6 ft., 7.5 ft., and 10.0 ft. BGS all read 0.0 ppm. Cuttings from 0.0 ft. to 10.6 ft. BGS are predominantly dark yellowish-brown (10YR 4/2), moist, clayey soil with cement fragments and bentonite gel near top of interval; and shale fragments lower. Water and very wet cuttings from below 8.0 ft. BGS. Beta/gamma scan of cuttings = 50 cpm (background = 40 cpm) for entire interval.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-34</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-15-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>11-15-94</u>	
HELPERS: <u>G. Shillings/H. Hall - Highland Drilling Co.</u>		METHOD: <u>0</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-15-94	0844	0846	Arrive at BC-34 site. Well BC-24 is a "flowing" (artesian) well consisting of 1.0-in. inside diameter (ID) steel water pipe constructed within an NX core hole (approximately 3.0-in. in diameter). The reported total depth of the well is 126.3 ft (Subsurface Data Base -Y/TS-881/R1). The casing stick-up is 2.0 ft where the piping elbows off to pressure valve and spigot. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm.
	0846	0850	Break up concrete "pad," which extends to about 1 ft below ground surface (BGS). Continue excavating a pit around the wellhead to approximately 2 ft BGS. Radiological scan of excavated material: alpha = 0 cpm, beta/gamma = 50 cpm. Attempt to pull out water pipe by hand; pipe will not move. Try twisting the pipe with a wrench, distorting the pipe.
	0850	0909	Crew goes to get backhoe; clears brush around well.
	0909	0915	Backhoe onsite. Attach a chain to the water pipe and attempt to pull with backhoe boom: will not move, chain comes off pipe. Try again using front bucket; water pipe breaks at elbow.
	0915	0919	Twist off water pipe with pipe wrench: extract 11.0 ft of 1.0-in. ID steel water pipe (includes stick-up).

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-36</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-4-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-9-94</u>	
HELPERS: <u>H. Hall/R. Phillips - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>S. L. Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-4-94	0956	1009	Arrive at BC-36 site. Well consists of uncapped 4.5-in. outside diameter (OD) PVC casing with slick up = 0.7 ft. Water level is at 2.8 ft below ground surface (BGS). Tag bottom of the well (soft) at 220.1 ft BGS. The Subsurface Data Base (Y/TS-8B1/R1) reports well BC-36 is completed in an NX corehole (approximately 3.0 in. diameter) with a total depth of 350 ft BGS. Preparing to grout borehole to within 14 ft of ground surface (4 ft below assumed depth of surface casing). Calculate a borehole volume of 10.2 cubic ft, equivalent to 8.6 sacks of neat, Type I Portland cement.
11-4-94	1210	1250	Run PVC tremie pipe in borehole to approximately 198 ft BGS (only able to use 200 ft due to strength of PVC pipe).
	1250	1311	Mix and pump tremie 8 sacks (9.6 cubic ft) of neat, Type I Portland cement (weight = 12.7 lbs/gal). Circulate water, then cloudy water.
	1311	1338	Clean up equipment, secure site, depart.
11-7-94	1344	1351	Arrive at BC-36 site. Tag cement level at 30.3 ft BGS. Depart site.
	1508	1524	Return to BC-36 site. Run PVC tremie pipe in borehole to 29.0 ft BGS. Calculate a well bore volume to 14 ft BGS of 1.3 cubic ft, equivalent to 1.1 sacks of neat, Type I Portland cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-36</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-7-94	1524	1543	Mix and pump tremie 1 sack (1.2 cubic ft) of neat, Type I Portland cement.
(cont.)			
	1543	1621	Clean equipment, secure site, depart.
11-8-94	1010	1020	Arrive at BC-36 site. Tag cement at 12.3 ft BGS.
	1142	1159	Backhoe setting up on location to pull out casing. Attach jawed clamp and pull out 15.5 ft of 4.5-in. OD PVC casing. Beta/gamma scan of casing = 0-10 cpm. Background radiation scan of location: beta/gamma = 40-60 cpm, alpha = 0 cpm.
	1159	1204	Rig up with an 8-in. diameter, solid stem auger; lead flyte is 5.6 ft long.
	1204	1220	Commence augering. Auger well bore from 0.0 ft to 15.0 ft BGS. Cuttings from 0.0 ft to 14.8 ft BGS consist of moderate brown (5YR 3/4) clay with large fragments of dark yellowish orange (10YR 6/6) very weathered chert grading into moderate yellowish brown (10YR 5/4) weathered stained thinly laminated shale fragments. Breathing zone analysis (BZA) at 3.0 ft BGS = 0.0 ppm. Lower explosive limit (LEL) at 3.5 ft BGS <1% (1.8 ppm). BZA at 7.5 ft BGS = 0.2 ppm. LEL at 8 ft BGS <1% (1.8 ppm). Not many cuttings returning up borehole. BZA at 12.0 ft BGS = 0.0 ppm. LEL at 12.5 ft BGS = <1% (1.6 ppm). Bedrock at 14.8 ft BGS. Cuttings at 14.8 ft to 15.0 ft BGS consist of medium dark gray (N4), thinly laminated shale fragments and some grout fragments. Beta/gamma scan of cuttings = 60 cpm.
	1220	1235	Auger refusal at 15.0 ft BGS. Trip out augers. Tag bottom of borehole at 13.6 ft BGS (1.4 ft of soupy fill). Calculate a borehole volume to 4.0 ft BGS of 3.8 cubic ft equivalent to 3.3 sacks of neat,

DATE		TIME		ACTIVITY/COMMENTS
		START	FINISH	
11-22-94	1101	1103	Arrive at BC-39 site. Well BC-39 is a flowing (artesian) well consisting of 1.0-in. inside diameter (ID) steel water pipe inside a section of 4.5-in. outside diameter (OD) PVC conductor casing. Stick-up of conductor casing = 0.9 ft, stick-up of water pipe = 2.7 ft where the pipe elbows off to a pressure gauge and spigot. The subsurface data base (Y/TS-881/R1) reports well BC-39 is completed in an NX corehole (3.0-in. diameter) with a total depth of 157.8 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60 cpm.	
	1103	1111	Unscrew water pipe using a pipe wrench. Break up concrete "pad" and remove concrete pieces from around the casing. Pull out the water pipe/casing by hand. Extract 1.8 ft of 4.5-in. OD PVC casing surrounding a total of 16.6 ft of 1.0-in. ID steel water pipe (includes stickup, elbow, etc.). Site to remain as flowing spring as per HSEA.	
			P&A of well BC-39 is complete (no cuttings field screening/disposal form completed because no cuttings or excavated material generated).	

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-40</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 1
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-15-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>11-15-94</u>	
HELPERS: <u>G-Shillings/H. Hall - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-15-94	1058	1102	Arrive at BC-40 site. Well BC-40 consists of uncapped, 4.5-in. outside diameter (OD), schedule 40 PVC casing. Stick-up = 0.4 ft. Tag bottom of well (soft) at 116.0 ft below ground surface (BGS). Water level is at 66.0 ft BGS. The subsurface data base (Y-TS-881/R1) reports that well BC-40 is constructed in an NX corehole (3.0-in. diameter) with a total depth of 135.5 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm. Note: Well BC-40 is located in a place that is difficult to get any equipment to. K. Jago (HSEA) suggests cutting off the well casing below the ground surface, then capping the vacant wellbore.
	1102	1120	Dig around wellhead to expose the concrete "pad." Break up concrete and continue excavating to a depth of 1.3 ft. Radiological scan of excavated material: alpha = 0 cpm, beta/gamma = 70 cpm. Break off casing at bottom of excavation. Place casing and concrete fragments inside remaining casing to prevent subsidence.
	1120	1124	Refill pit with excavated material as per HSEA.
			P&A of well BC-40 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-41</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-17-94</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>11-21-94</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-17-94	0906	0924	Arrive at BC-41 site. Well BC-41 is a flowing/artesian well and consists of 1.0-in. inside diameter (ID) steel water pipe. Stickup = 2.7 ft where pipe elbows off to a spigot. The Subsurface Data Base (Y/TS-881/R1) reports that well BC-41 was installed in an NX core hole (approximately 3.0-in. diameter) to a total depth of 276.0 ft. The water pipe is inside a piece of 4.5-in. outside diameter (OD) PVC conductor casing, the top of which is flush with the ground surface. Crew has already positioned the drill rig over the well and rigged up with a 24.0-ft long section (includes subadapter) of 6.5-in. OD, 5.5-in. ID washover pipe; table height = 2.3 ft. Crew cuts off the water pipe at the ground surface. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 80-90 cpm.
	0924	0947	Commence overwash. Overwash water pipe and conductor casing from 0.0 ft to 21.7 ft BGS. Top of weathered rock at 1.5 ft BGS. Cuttings from 0.0 ft to 1.5 ft BGS: moderate yellowish-brown (10YR 5/4) to dark yellowish-brown (10YR 4/2) topsoil with minor PVC fragments. Breathing zone analysis (BZA) at 2.7 ft BGS = 0.0 ppm. Lower explosive limit (LEL) reading at 7.3 ft BGS <1% (5.8 ppm). BZA at 8.7 ft and 13.7 ft BGS read 0.2 ppm and 0.0 ppm, respectively. LEL reading at 11.7 ft BGS <1% (5.0 ppm). Top of fresh bedrock at 13.7 ft BGS. Cuttings from 1.5 ft to 13.7 ft BGS consist of grayish-orange (10YR 7/4) to dark yellowish-orange (10YR 6/6), dry, extremely weathered shale (upper), and light olive gray (5Y 5/2) to dark

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-41WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 4

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-17-94			yellowish-brown (10YR 4/2) shale with white (N9) PVC fragments.
(cont.)			BZA at 19.7 ft BGS = 0.2 ppm. BGS = 0.2 ppm. Observe water
			in returns at 20.0 ft BGS, suspect water pipe twisted off. Cuttings
			from 13.7 ft to 21.7 ft are predominantly pale brown (5YR 5/2) to
			grayish-red (10R 4/2) and medium light gray (N6), thinly laminated
			shale, plus minor olive gray (5Y 4/1), massive micrite. Beta/
			gamma scan of cuttings = 60-70 cpm.
	0947	1004	At 21.7 ft BGS. Trip out washover pipe: conductor casing and
			water pipe still at ground surface (and firmly anchored in ground);
			water pulsating out of water pipe. Attach a chain to the water pipe
			and attempt to pull out; chain comes off. Plan to add another
			section of washover pipe.
	1004	1046	Run lead washover pipe back into borehole and break connection
			with the subadapter.
	1046	1100	Thread subadapter onto second piece of washover pipe (20.2 ft
			in length) and thread onto lead washover pipe (total washover
			pipe = 41.9 ft).
	1100	1119	Connection made; continue with overwash. Overwash water pipe
			from 21.7 ft to 41.7 ft BGS. BZA at 25.9 ft, 31.9 ft, and 38.9 ft all
			read 0.0 ppm. LEL reading at 28.4 ft BGS <1% (6.0 ppm).
			Cuttings from 21.7 ft to 41.7 ft BGS are the same as the 13.7-21.7
			ft interval, but no PVC fragments observed from this interval.
			Beta/gamma scan of cuttings = 80 cpm.
	1119	1206	At 41.7 ft BGS. Trip out to break connection between the two
			sections of washover pipe. Assembling tools.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMWELL NO. BC-41**WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued**

PAGE 3 of 4

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-17-94	1206	1248	Break for lunch.
(cont.)			
	1248	1333	Break connection with some difficulty and lay down second section of washover pipe.
	1333	1350	Trip out lead washover pipe. Water pipe and conductor casing drop out of pipe into borehole. Top of water pipe is at approximately 4 ft BGS. Water is circulating out of the borehole.
	1350	1450	Fishing for water pipe and casing.
	1450	1540	Finally hooked the water pipe with a chain. Pull out. Extract 20.0 ft of 4.5-in. OD PVC conductor casing and a total of 41.4 ft (includes stick-up and miscellaneous piping) of 1.0-in. ID steel water pipe. It appears as though the washover pipe may have forced the disconnection of the water pipe at a connection. Still have water flowing out of borehole. Tag bottom of the borehole at 37.6 ft BGS (4.1 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 7.0 cubic ft, equivalent to 6.0 sacks of Type I Portland cement. Secure site and depart.
11-18-94	0830	0844	Arrive at BC-41 site. Water is no longer flowing out of the borehole. Tag bottom again at 37.6 ft BGS (no change from yesterday).
	0844	0901	Mix 7 sacks (8.3 cubic ft) of neat, Type I Portland cement. Grout weight = 13.1 lb./gal.
	0901	0907	Run PVC tremie pipe into the borehole to 37.0 ft BGS.
	0907	0913	Pump-tremie the cement into the borehole. Circulate water, then 100% cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-42</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-30-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>11-8-94</u>	
HELPERS: <u>H. Hall/J. Gallaher- Highland Drill.Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>S. L. Abston- SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-30-94	1215	1320	Arrive at BC-42 site. Moving drill rig into position over well. Well BC-42 originally consisted of 1-in. outside diameter (OD), PVC casing. Slick up = 3.2 ft. The Subsurface Data Base (Y/TS-881/R1) reports well BC-42 has a total depth of 203 ft below ground surface (BGS). Tagged bottom of well at 195.3 ft BGS (soft). Water within top 30 ft but unable to determine exact depth.
	1320	1415	Attach a jawed clamp to the casing and pull out 69.6 ft of 1-in. PVC pipe. Beta/gamma scan of pipe = 40-90 cpm. Not able to put tremie pipe down borehole (borehole diameter too small). HSEA approved to ream 20 ft below top of fresh bedrock and grout. Top of fresh rock at 36.2 ft BGS, according to Subsurface Data Base.
	1415	1438	Rigging up with 6 1/4-in. tricone bit on a subadapter for a total length of 2.8 ft. Table height = 4.1 ft.
	1438	1529	Commence reaming borehole with compressed air only. Ream from 0.0 ft to 56.0 ft BGS. Cuttings from 0.0 to 10.5 ft BGS consist of moderate yellowish brown (10YR 5/4) clay with dark yellowish orange (10YR 6/6), pale yellowish brown (10YR 6/2), and moderate reddish brown (10R 4/6) weathered shale fragments. Breathing zone analysis (BZA) at 1.0 ft BGS = 0.1 ppm. Lower explosive limit (LEL) at 2.0 ft BGS < 1% (1.5 ppm). Cuttings from 10.5 to 15.0 ft BGS consist of same as 0.0 ft to 10.5 ft, but wet with some yellowish gray (5Y 8/1) shale fragments. Cuttings from

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-42</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-30-94	1438	1529	15.0 ft to 23.7 ft BGS consist of 50% medium gray (N5) shale fragments and 50% weathered shale fragments. Cuttings from
(cont.)			23.7 ft to 35.0 ft BGS consist of pale yellowish brown (10YR 6/2)
			clay (churned shale fragments) with medium gray (N5) shale
			fragments. Decreasing amounts of weathered shale fragments.
			BZA at 25.5 ft BGS = 0.0 ppm. LEL at 25.8 ft BGS <1% (1.5 ppm).
			Cuttings from 35.0 ft to 48.7 ft BGS are dark gray (N3) shale
			fragments. BZA at 46.0 ft BGS = 0.2 ppm. LEL at 46.2 ft BGS <1%
			(1.4 ppm). Cuttings from 48.7 ft to 56.0 ft BGS consist of dark gray
			to grayish-black (N3-N2) shale fragments. BZA at 54.0 ft BGS =
			0.2 ppm. LEL at 54.2 ft <1% (1.5 ppm). Beta/gamma scan of
			cuttings = 70 cpm over entire interval.
	1529	1549	At 56.0 ft BGS. Clean out borehole. Trip out. Tag bottom of
			borehole at 55.8 ft BGS (0.4 ft of fill). Calculate a borehole volume
			to 4.0 ft BGS of 10.2 cubic ft, equivalent to 8.7 sacks of Type I
			Portland cement.
	1549	1607	Clean up, secure site, and depart.
10-3-94	0825	0941	Arrive at BC-42 site. Tag bottom of borehole at 54.2 ft BGS (1.2 ft
			of total fill) after weekend. Run 50 ft of 1.5-in. PVC tremie pipe into
			borehole to 48 ft BGS.
	0941	0959	Mix and pump tremie 8 sacks (9.4 cubic ft) of neat, Type I Portland
			cement into borehole. Circulate water, then cement.
	0959	1010	Clean up, secure site, and depart. NOTE: HSEA stopped work
			on 11-4-94 until further notice for internal review of procedures.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-50</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-29-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-30-94</u>	
HELPER: <u>R. Phillips - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-29-94	1055	1115	Arrive at BC-50 site. Begin clearing brush around well. Well BC-50 consists of uncapped, 4.5-in. outside diameter (OD) PVC casing. Casing stick-up = 3.0 ft. Measure water level at 9.4 ft below ground surface (BGS). Tag bottom of well at 11.8 ft BGS. The subsurface data base (Y/TS-881/R1) reports that well BC-50 was installed in an NX corehole (approximately 3.0-in. diameter) with a total depth of 100.0 ft (well is apparently obstructed).
	1115	1123	Move backhoe onto site. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50-60 cpm.
	1123	1133	Break up concrete "pad." Attach a jawed clamp to the casing collar and pull out 16.0 ft of 4.5-in. OD, schedule 40 PVC casing, slotted over the bottom 12.0 ft. Tag bottom of well bore again at 11.8 ft BGS.
	1133	1208	Break for lunch.
	1208	1212	Rig up with an 8.0-in. diameter solid-stem auger; lead flyte is 5.6 ft long.
	1212	1225	Commence augering. Auger well bore from 0.0 ft to 13.5 ft BGS. Cuttings from 0.0 ft to 2.6 ft BGS consist of grayish-brown (5YR 3/2) to dark yellowish-brown (10YR 4/2), moist, clayey topsoil with minor concrete (pad) fragments. Breathing zone analysis (BZA) at 3.0 ft BGS = 0.0 ppm. Cuttings from 2.6 ft to

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-50</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-29-94	1212	1225	5.0 ft BGS are grayish-brown (5YR 3/2) to moderate brown (5YR 3/4), moist, clayey soil; still with concrete (pad) fragments.
(cont.)			BZA at 8.0 ft, 11.6 ft, and 13.4 ft BGS all read 0.0 ppm. Cuttings from 5.0 ft to 13.5 ft BGS consist of moderate brown (5YR 4/4) to light brown (5YR 5/6), moist stiff clay. Beta/gamma scan of cuttings range from 40 to 50 cpm for the entire interval.
	1225	1253	Auger refusal at 13.5 ft BGS. Trip out augers. Tag bottom of borehole at 12.8 ft BGS (0.7 ft of collapse). Calculate a borehole volume to 4.0 ft BGS of 3.1 cubic ft, equivalent to 2.6 sacks of Type I Portland cement.
	1253	1333	Mix and pump tremie (using pump discharge hose as tremie pipe) 4 sacks (4.7 cubic ft) of neat, Type I Portland cement (grout weight = 13.7 lbs/gal) into the borehole. Cement/water level to ground surface.
	1333	1347	Clean up. Load up equipment and depart site.
11-30-94	0747	0751	At BC-50 site. Tag cement level at 2.6 ft BGS. Borehole is ready to be capped. Depart.
	0835	0840	Return to BC-50 site with crew. Cap remaining borehole with clay soil.
			P&A of well BC-50 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BC-62</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-14-94</u>	
DRILLER: <u>Greg Shillings - Highland Drilling Co.</u>		FINISH: <u>11-15-94</u>	
HELPERS: <u>R. Phillips/H. Hall - Highland Drilling Co.</u>		METHOD: <u>D</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-14-94	1042	1100	Arrive at BC-62 site. Suspect well consists of uncapped, 1.25-in. outside diameter (OD) PVC casing. Stick-up = 2.2 ft. Casing appears broken off flush with the ground. Actually, the stick-up and concrete "pad" have been broken off and just placed at this spot (I suspect that the coordinates for well BC-62 were obtained on this misplaced casing).
			Find a flowing well (casing broken off nearly flush with the ground) approximately 6 ft. northwest of the loose casing. Suspect this to be BC-62. Tag bottom (firm) at 56.0 ft. below ground surface (BGS). The Subsurface Data Base (Y/TS-881/R1) reports that BC-62 is completed in an NX corehole (approximately 3.0-in. diameter) with a total depth of 56.3 ft.
	1100	1114	Clear brush from around flowing well (BC-62) to allow backhoe access. Move backhoe onto location, begin setting up site. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm. Dig around well, exposing concrete "pad." Break up pad, exposing casing.
	1114	1116	Wrap a chain around the casing stick-up and attempt to pull out: casing breaks.
	1116	1118	Rig up with an 8.0-in. diameter solid stem auger; lead flyte is 5.6 ft in length (subsequent flytes = 5.0 ft)

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. BCU-12 (BC-66)
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-22-94	1059	1152	Run PVC tremie into borehole. Discovered that there were only
(cont.)			13 sections (130 ft) of PVC tremie pipe available. Drilling
			supervisor, R. Phillips (Highland) left the site briefly to get
			additional tremie pipe at the pipeyard. Once back, crew runs
			tremie pipe to 179.0 ft BGS.
	1152	1233	Break for lunch.
	1233	1258	Mix and pump-tremie 7 sacks (8.3 cubic ft) of neat, Type I
			Portland cement into the borehole. Circulate water, then 100%
			cement.
	1258	1323	Pull out tremie. Clean up. Lower mast as safety precaution.
			Secure site and depart.
6-23-94	0824	0920	Arrive at BCU-12 (BC-66) site. Tag cement level at 9.5 ft BGS.
			Waiting on crew. Plan to ream borehole to approximately 5 ft
			below the bottom of the casing.
	0920	0933	Crew arrives (they had been delayed by a breakdown of one of
			their vehicles), conduct pre-work equipment inspection. Start
			drill rig, raise mast.
	0933	0939	Rig up with a 6 1/8-in. diameter tricone bit on a subadaptor; total
			length = 2.8 ft, table height = 3.0 ft.
	0939	0953	Commence reaming borehole with compressed air only. Ream
			from 0.0 ft to 24.8 ft BGS. Breathing zone analysis (BZA) at
			1.0 ft BGS = 0.0 ppm (background). Top of weathered bedrock
			at 3.5 ft BGS. Cuttings from 0.0 ft to 3.5 ft BGS are: dusky brown
			(5 YR 2/2) topsoil; and moderate brown (5 YR 4/4 to 5 YR 3/4),
			moist, clayey subsoil. Encounter water at 3.8 ft BGS. BZA at

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-12 (BC-86)

WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT
continued

PAGE 3 of 5

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-23-94			6.8 ft BGS = 0.1 ppm. LEL reading at 8.8 ft BGS <1% (9.0 ppm).
(cont.)			Top of fresh bedrock at 13.0 ft BGS. Cuttings from 3.5 ft to 13.0
			ft BGS consist of: moderate brown (5 YR 4/4), weathered and
			stained, sandy siltstone; dark yellowish-orange (10 YR 6/6),
			weathered, thinly laminated shale; and olive gray (5 Y 3/2),
			partially cured cement fragments. BZA at 19.5 ft BGS = 0.1 ppm.
			LEL reading at 21.5 ft BGS <1% (8.5 ppm). Cuttings from 13.0 ft
			to 24.5 ft BGS consist predominantly of blackish-red (5 R 2/2) and
			medium dark gray (N4), thinly laminated shale; with dark greenish-
			gray (5 GY 4/1), bedded and banded, glauconitic siltstone. Also
			observed olive gray (5 Y 3/2) cement fragments from this interval.
			Beta/gamma survey of cuttings for the interval ranges from 50 to
			70 cpm.
	0953	0958	At 24.8 ft BGS. Clean out borehole. Hydraulic line bursts when
			adding a drill rod.
	0958	1031	Shut off drill rig. Spill control measures in place: place additional
			plastic on ground under rig table, cover borehole collar and rig
			table with oil-absorbent pads, and sop up and wipe off excess
			hydraulic oil from drill rig. After inspecting the hydraulic line the
			problem is determined to be in the bend of a metal portion of the
			hydraulic line. The broken hydraulic line is removed.
	1031	1141	Crew departs for replacement hydraulic line. Screen cuttings
			from 0.0 ft to 24.8 ft BGS (see Well Cuttings Field Screening/
			Disposal sheet). Waiting on crew.
	1141	1207	Crew returns with replacement tubing. Break for lunch.
	1207	1248	Install replacement hydraulic tubing.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-12 (BC-66)

WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT
continued

PAGE 4 of 5

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-23-94	1248	1251	Start drill rig. Add a clean drill rod to string.
(cont.)			
	1251	1300	Continue reaming borehole with compressed air only. Ream from 24.8 ft to 42.8 ft BGS. BZA at 26.8 ft BGS = 0.2 ppm. LEL reading at 30.8 ft BGS <1% (9.0 ppm). BZA at 35.8 ft BGS = 0.2 ppm. Cuttings from 24.8 ft to 42.8 ft are: blackish-red (5 YR 2/2) and medium dark gray (N4), thinly laminated shale; dark greenish-gray (5 GY 4/1), bedded, glauconitic siltstone; brownish-black (5 YR 2/1), massive micrite with sparite blebs; and olive gray (5 Y 3/2) cement. The helper, J. Monger, detected a strange, indistinguishable odor near the end of the interval: BZA = 0.2 ppm (max). Beta/gamma survey of the cuttings in this interval range from 60 to 70 cpm.
	1300	1309	At 42.8 ft BGS. Clean out the borehole. Again detected a faint, strange odor while cleaning out the borehole: BZA = 0.0 ppm. Tag bottom of the borehole at 42.2 ft BGS (0.6 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 7.8 cubic ft, equivalent to 6.6 sacks of Type I cement.
	1309	1315	Run PVC tremie pipe into borehole to 39.0 ft BGS.
	1315	1328	Mix and pump tremie 7 sacks (8.3 cubic ft) of neat, Type I Portland cement into the borehole. Circulate 100% cement.
	1328	1355	Pull out tremie pipe. Clean up. Lower mast as safety precaution. Crew to remain and steam clean the drill rig. Oversight departs.
6-24-94	0812	0826	Arrive at BCU-12 (BC-66) site. Tag cement level at 7.0 ft BGS. Water level is at 4.3 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 0.6 cubic ft, equivalent to 0.5 sacks of Type I

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-14</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-3-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-9-94</u>	
HELPERS: <u>R. Phillips/H. Hall - Highland Drilling Co.</u>		METHOD: <u>B</u>	
DRILL: <u>Ford 455 Backhoe w/ McMillan Diggerhead</u>		LOGGED BY: <u>S. L. Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-3-94	1134	1145	Arrive at BCU-14 site. Well consists of uncapped 4 1/2 in. outside diameter (OD), schedule 40, PVC casing. Water at 2.3 ft below ground surface (BGS). Stick up = 0.9 ft. Tag bottom at 14.1 ft BGS (soft). Well BCU-14 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-14 designation for this well as per HSEA.
11-7-94	1327	1335	Arrive at site. Backhoe setting up on location to pull out casing.
	1335	1341	Attach a jawed clamp and pull 10.1 ft of 4 1/2 in. OD, schedule 40, PVC casing. Beta/gamma scan of pipe = 50 cpm.
	1341	1351	Rig up with an 8-in. diameter, solid stem auger; lead flyte is 5.6 ft long. Background radiation scan at location: alpha = 0 cpm, beta/gamma = 50-60 cpm.
	1351	1431	Commence augering. Auger well bore from 0.0 ft to 12.5 ft BGS. Cuttings from 0.0 ft to 11.7 ft BGS consist of moderate brown (5YR 3/4) clay with traces of medium gray (N5) completely weathered shale fragments. Breathing zone analysis (BZA) at 3.5 ft BGS = 0.0 ppm. Lower explosive limit (LEL) at 4.0 ft BGS <1% (2.2 ppm). BZA at 7 ft BGS = 0.0 ppm. LEL at 7.1 ft BGS <1% (2.2 ppm). BZA at 11.7 ft BGS = 0.0 ppm. LEL at 11.7 ft BGS <1% (1.8 ppm). Top of weathered bedrock at 11.7 ft BGS. Cuttings from 11.7 ft to 12.5 ft BGS consist of medium dark gray (N4) shale fragments with some reddish brown (10R 3/4)

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-15</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>10-3-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>11-8-94</u>	
HELPERS: <u>H Hall/J Gallaher/G Shillings - Highland Drill. Co.</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>S. L. Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
10-3-94	1312	1400	Arrive at BCU-15 site. Tag well at 16.5 ft BGS (soft). Water at 3.8 ft BGS. Stickup = 0.2 ft. Drillers preparing site for drill rig. Well BCU-15 originally consisted of uncapped 4 1/2 in. outside diameter (OD), schedule 40, PVC casing. Well BCU-15 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-15 designation for this well as per HSEA. Off site.
10-4-94	0832	0850	Arrived at site. Moving drill rig to position over well.
	0850	0901	Mast up on drill rig and attaching a jawed clamp to the casing and pull out 10 ft of 4 1/2 in. OD PVC casing that appears to be all that was in borehole. Beta/gamma scan of casing = 60 cpm.
	0901	0911	Rig up with an 8 3/4-in. diameter tricone bit with subadaptor for a total length of 4.2 ft. Table height = 3.6 ft. Background radiation scan of location: alpha 0 cpm, beta/gamma = 50-70 cpm.
	0911	0935	Commence reaming the borehole with compressed air only. Ream from 0.0 ft to 22.2 ft BGS. Cuttings from 0.0 ft to 7.0 ft BGS consist of moderate brown (5YR 3/4) clay with approximately 25% dark yellowish brown (10YR 4/2) weathered shale fragments. Breathing zone analysis (BZA) at 1.5 ft BGS = 0.0 ppm. Lower explosive limit (LEL) at 1.7 ft BGS <1% (2.0 ppm). Cuttings from 7.0 ft to 11.5 ft BGS consist of grayish brown (5YR 3/2) shale with a few fragments of moderate yellowish brown

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-15</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 2
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
10-4-94	0911	0935	(10YR 5/4) shale and 30% dark gray (N3) shale fragments with moderate reddish brown (10R 4/6) weathered staining. BZA at 9.5 ft BGS = 0.0 ppm. LEL at 9.7 ft BGS <1% (1.8 ppm). Cuttings from 11.5 ft to 22.2 ft BGS consist of grayish brown (5YR 3/2) to dark gray (N3) shale fragments.
(cont.)			
	0935	1012	At 22.2 ft BGS, clean out borehole. Trip out. Tag bottom of the borehole at 22.2 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 6.4 cubic ft, equivalent to 5.4 sacks of Type I Portland cement. HSEA stopped work until further notice due to internal review of procedures.
11-3-94	1134	1245	Arrived at BCU-15 site. Tag bottom of borehole at 21.3 ft BGS (0.9 of fill). Place 20 ft of 1 1/2 in. OD PVC tremie pipe in borehole to approximately 19 ft BGS.
	1245	1322	Mix and pump tremie 5 1/2 sacks (6.5 cubic ft) of neat, Type I Portland cement into borehole (weight = 13 lbs/gal). Circulate cement.
	1322	1405	Pull out tremie pipe. Clean up, secure site, and depart.
11-4-94	1058	1120	Arrive at site. Tag grout at 5.8 ft BGS. Mix and pour 2 buckets (.5 sack) of neat, Type I Portland cement weighing 13.7-13.9 lbs/gal into borehole to bring it within 4 ft of ground surface.
11-8-94	1027	1036	Arrive at site. Tag grout at 3.3 ft BGS.
	1309	1431	Cap with clay soil.
			P&A of well BCU-15 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-17</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-11-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-14-94</u>	
HELPER: <u>H. Hall/R. Phillips - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>S. Abston/T. Coffey-SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-11-94	0951	1000	Arrived at BCU-17 site. Well consists of capped, 1.25 in. outside diameter (OD) PVC casing. Stick up = 1.2 ft. Water level is at 3.7 ft below ground surface (BGS). Tagged bottom of well (soft) at 9.7 ft BGS. Well BCU-17 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-17 designation for this well as per HSEA. Background radiation scan of location: alpha = 0 cpm, beta/gamma = 40-50 cpm. Backhoe setting up on location to pull out casing.
	1000	1003	Breaking up concrete apron around well with a sledge hammer.
	1003	1005	Attach a jawed clamp to the casing collar and pull out 6.0 ft of 1.25 in. OD PVC casing; casing appears to have broken. Will try to break up casing while augering the well bore.
	1005	1007	Rig up with an 8.0-in. diameter, solid stem auger; lead flyte is 5.6 ft long.
	1007	1018	Commence augering. Auger well bore from 0.0 ft to 7.9 ft BGS. Cuttings from 0.0 ft to 3.5 ft BGS consist of dry moderate brown (5YR 3/4) clay with grayish orange (10YR 7/4) weathered chert fragments with some rootlets. Breathing zone analysis (BZA) at 2.5 ft BGS = 0.0 ppm. Lower explosive limit (LEL) analysis at 2.7 ft BGS <1% (4.0 ppm). Cuttings from 3.5 ft to 7.9 ft BGS consist of dry moderate yellowish brown (10YR 5/4) clay with olive gray (5Y 4/1) weathered shale fragments, bottom 0.3 ft

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-18</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-11-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-14-94</u>	
HELPERS: <u>H Hal/VR. Phillips- Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ford 455 Backhoe w/McMillan Diggerhead</u>		LOGGED BY: <u>S. Abston/T. Coffey-SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-11-94	0850	0912	Arrived at BCU-18 site. Well consists of capped, 1.25 in. outside diameter (OD), PVC casing. Stick up = 1.2 ft. Water level is at 1.2 ft below ground surface (BGS). Tag bottom of the well (soft) at 50.7 ft BGS. Well BCU-18 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-18 designation for this well as per HSEA. Background radiation scan of location: alpha=0cpm, beta/gamma=40cpm. Backhoe setting up on location to pull out casing.
	0912	0919	Attach a jawed clamp to the casing collar and pull out 9.7 ft of 1.25 in. OD PVC casing, slotted over entire length; casing appears to have broken off. Will try to break up casing while augering the well bore.
	0919	0923	Rig up with an 8.0-in. diameter, solid stem auger; lead flyte is 5.6 ft long.
	0923	0937	Commence augering. Auger well bore from 0.0 ft to 7.6 ft BGS. Cuttings from 0.0 ft to 4.5 ft BGS consist of dry, moderate brown (5YR 3/4) clay with grayish orange (10YR 7/4) weathered chert fragments. Breathing zone analysis (BZA) at 2.5 ft BGS = 0.0 ppm. Lower explosive limit (LEL) analysis at 3.0 ft BGS <1% (5.5 ppm). Cuttings from 4.5 ft to 6.5 ft BGS consist of moderate yellowish brown (10YR 5/4) slightly moist clay with olive gray (5Y 4/1) weathered shale fragments. Top of weathered rock at 4.5 ft BGS. BZA at 6.0 ft BGS = 0.0 ppm. LEL at 6.2 ft BGS <1%

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-19</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-10-94</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>11-11-94</u>	
HELPERS: <u>H. Hall/R. Phillips - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>S. L. Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-10-94	1340	1345	Arrive at BCU-19 site. Well consists of capped 1.25 in. outside diameter (OD) PVC casing. Stick up = 1.0 ft. Water level is at 4.5 ft below ground surface (BGS). Tag bottom of well at (soft) 33.3 ft BGS. Well BCU-19 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-19 designation for this well as per HSEA. Background radiation scan of location: alpha = 0 cpm, beta/gamma = 50-60 cpm. Backhoe setting up on location to pull out casing after breaking up concrete apron around well casing. Beta/gamma scan of well pipe = 50-70 cpm.
	1345	1401	Attach a jawed clamp to the casing collar and pull out 1.6 ft of 1.25 in. OD, PVC slotted casing. Casing appears to have broken, will try to break up casing while augering the well bore.
	1401	1404	Rig up with an 8.0-in. diameter, solid stem auger; lead flyte is 5.6 ft long.
	1404	1418	Commence augering. Auger well bore from 0.0 ft to 8.4 ft BGS. Cuttings from 0.0 ft to 5.9 ft BGS consist of dry moderate brown (5YR 4/4) clay with large fragments and small fragments of grayish orange (10YR 7/4) weathered chert fragments. Cuttings from 0.5 ft to 5.0 ft BGS contained pieces of PVC casing. Breathing zone analysis (BZA) at 3.5 ft BGS = 0.0 ppm. Lower explosive limit (LEL) at 3.6 ft BGS <1% (5.0 ppm). Cuttings from 5.9 ft to 8.4 ft BGS consist of moderate yellowish brown (10YR 5/4) clay with grayish brown (5YR 3/2) weathered thinly

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-21</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-26-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>10-4-94</u>	
HELPER: <u>H. Hal/J. Gallaher - Highland Drilling Co.</u>		METHOD: <u>B</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>S. L. Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-26-94	1535	1620	Arrive at BCU-21 site. Moving drill rig to position over well. Well BCU-21 originally consisted of uncapped 4 1/2 in. outside diameter (OD), schedule 40, PVC casing with stick up of 1.3 ft. Well BCU-21 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-21 designation for this well as per HSEA. Measure water level at 3.4 ft below ground surface (BGS). Tagged bottom of well at 241.0 BGS (soft). Securing site to pull casing tomorrow.
9-27-94	1030	1110	At BCU-21 site. Attach a jawed clamp to the casing and pull 20 ft of 4 1/2 in. casing with drill rig. Casing does not appear to have broken.
	1110	1220	Unload pallet of cement and place 200 ft of 1 1/2 in. PVC tremie in borehole. PVC strength only allows for 200 ft.
	1220	1300	Break for lunch.
	1300	1410	Calculate a borehole volume to 15 ft BGS (approximate top of bedrock) of 11.5 cubic ft, equivalent to 9.7 sacks of Type I Portland cement. Mix and pump tremie 15 sacks (17.7 cubic ft) of neat, Type I Portland cement into borehole. Circulate water, then cement.
	1410	1416	Pull out tremie pipe, clean up, secure site, and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-21</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-29-94	1120	1241	Arrive at BCU-21 site. Tag cement at 13.8 ft BGS. Will drill to 35 ft (20 ft below estimated top of bedrock).
(cont.)			
	1241	1252	Rig up with an 8 3/4-in. diameter tricone bit with subadapter for a total length of 4.2 ft. Table height = 3.7 ft. Background radiation scan of locations: alpha = 0 cpm, beta/gamma = 60 cpm.
	1252	1317	Commence reaming borehole with compressed air only. Ream from 0.0 ft to 35.0 ft BGS. Cuttings from 0.0 ft to 7.0 ft BGS consist of moderate brown (5YR 4/4) clay with 10% moderate brown (5YR 3/4) weathered shale fragments and some rootlets. Breathing zone analysis (BZA) at 1 ft BGS = 0.0 ppm. Lower explosive limit (LEL) of 1.2 ft BGS <1% (1.6 ppm). Cuttings from 7.0 ft to 15.0 ft BGS consist of moderate brown (5YR 3/4) clay with 20% weathered shale fragments. Cuttings from 15.0 ft to 19.0 ft BGS consist of brownish gray (5YR 4/1) to medium dark gray (N4) shale fragments and grout fragments. BZA at 18 ft BGS = 0.0 ppm. LEL at 18.2 ft BGS <1% (1.6 ppm). Cuttings from 19.0 ft to 25.5 ft BGS consist of medium gray (N5), micaceous shale fragments, grout fragments, and small pieces of red and blue cloth and orange tape. Cuttings from 25.5 ft to 35.0 ft BGS consist of grayish black (N2) to brownish gray (5YR 4/1), micaceous shale fragments and grout fragments. BZA at 28 ft BGS = 0.0 ppm. LEL at 28.2 ft BGS <1% (1.6 ppm). Beta/gamma scan of cuttings = 40-90 cpm for entire interval.
	1317	1340	At 35.0 ft BGS. Clean out borehole. Trip out and tag the bottom of the borehole at 34.6 ft BGS (0.4 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 10.8 cubic ft, equivalent to 9.1 sacks of Type I Portland cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-23</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-14-94</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>9-16-94</u>	
HELPERS: <u>R. Phillips/J. Monger - 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	
9-14-94	1246	1256	Arrive at BCU-23 site. Well consists of capped 1 1/4-in. outside diameter (OD), thin-walled (probably schedule 80) PVC casing. Slick-up above concrete "pad" = 0.6 ft. Water trickling out from under the concrete pad has an oily sheen on it. Background radiological scan of location alpha = 0 cpm, beta/gamma = 50 cpm.
	1256	1302	Uncap well, measure headspace: organic vapors = 0.7 ppm (background = 0.7 ppm), lower explosive limit (LEL) reading <1% (3.5 ppm). Break up concrete "pad," and remove 1.4 ft of the casing. The water level is even with the ground surface. Tag bottom of the well at 58.3 ft below ground surface (BGS). Well BCU-23 is a previously unknown and unreported (in Subsurface Data Base) well. The BCU-23 designation for the well is per HSEA.
	1302	1321	Raise the mast. Wrap a choker around the casing and attempt to pull out with the drill rig winch: unsuccessful. W. Thedford (HSEA) on site briefly. Attempt to pull out casing using a jawed clamp; also unsuccessful. Plan to drill up casing while reaming the wellbore. Target depth = 63.3 ft BGS.
	1321	1331	Rig up with a 6 1/4-in. diameter tricone roller bit on a subadapter; total length = 2.8 ft, table height = 2.4 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-23</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-14-94	1331	1430	Commence reaming wellbore ream from 0.0 ft to 63.4 ft BGS.
(cont.)			Breathing zone analysis (BZA) at 1.4 ft BGS = 0.0 ppm
			(background). LEL reading at 5.4 ft BGS <1% (4.9 ppm).
			Observe a musty, stale odor at 8.0 ft BGS, BZA = 0.2 ppm. Top
			of weathered bedrock at 9.0 ft BGS. Cuttings from 0.0 ft to 9.0 ft
			BGS are dark yellowish-brown (10YR 4/2) topsoil to pale brown
			(5YR 5/2), moist, clayey subsoil with weathered shale fragments,
			undifferentiated gravel fragments, and rare cement fragments.
			Top of fresh bedrock at 11.0 ft BGS. Cuttings from 9.0 ft to
			11.0 ft BGS are predominantly moderate yellowish-brown
			(10YR 5/4) to dark yellowish-orange (10YR 6/6), stained and
			weathered, thinly laminated shale; and massive, weathered
			siltstone. LEL reading at 11.4 ft BGS <1% (3.9 ppm). BZA at
			16.4 ft BGS = 0.0 ppm. Fatty drilling at 20.0 ft BGS. Encounter
			water zone at 20.4 ft BGS. BZA at 28.4 ft, 47.0 ft, and 57.4 ft BGS
			all read 0.0 ppm. Cuttings from 11.0 ft to 63.4 ft BGS consist of
			blackish-red (5R 2/2), dark gray (N3), and dark greenish-gray
			(5GY 4/1), thinly laminated, micaceous shale; and dark greenish-
			gray (5G 4/1) to greenish-black (5G 2/1), bedded and banded,
			glauconitic siltstone. Interval contains locally abundant calcite
			veinlets. No PVC fragments observed. Radiological scan of the
			cuttings range 70-80 cpm.
	1430	1454	At 63.4 ft BGS. Clean out borehole. Trip out well, casing is still
			visible in the borehole. Tag bottom of borehole at 63.0 ft BGS
			(0.4 ft of fill). Pull out casing and extract 18.4 ft (plus 1.4 ft cutoff
			earlier makes a total of 19.8 ft) of 1 1/4-in. OD PVC casing slotted
			over the bottom 10 ft. Casing appears to have pulled out of a
			connection. May have left as much as 38.5 ft still in borehole.
			Calculate a borehole volume to 4 ft BGS of 12.6 cubic ft,
			equivalent to 10.6 sacks of Type I cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-23

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

PAGE 3 of 3

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-24</u>
WELL PLUGGING AND ABANDONMENT/ACTIVITY/ PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-15-94</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>9-29-94</u>	
HELPERS: <u>R. Phillips/J. Monger - 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	
9-15-94	1040	1103	Move drill rig onto site and position over the well. Begin setting up location. Well consists of uncapped 1 1/4-in. outside diameter (OD), thin-walled (probably schedule 80) PVC casing. Casing stick-up = 0.7 ft. Measure water level at 0.3 ft below ground surface (BGS). Tag bottom of the well at 59.8 ft BGS. Reaming target is approximately 64.8 ft BGS. Well BCU-24 is a previously unknown and unreported (in Subsurface Data Base) well. The BCU-24 designation is per HSEA. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60 cpm.
	1103	1108	Raise mast. Break up concrete "pad." Pull out casing, extract 1.9 ft of 1 1/4-in. OD, schedule 80 PVC casing (appears to have slipped out of a connection). Plan to drill up the remaining casing while reaming the borehole. Assume casing to be slotted (screen) as other wells in vicinity.
	1108	1112	Rig up with a 6 1/4-in. diameter tricone bit on a subadapter; total length = 2.8 ft, table height = 2.2 ft.
	1112	1156	Break for lunch.
	1156	1241	Commence drilling up casing while reaming the well bore. Ream from 0.0 ft to 64.6 ft BGS. Encounter water at approximately 1.0 ft BGS. Breathing zone analysis (BZA) at 2.8 ft BGS = 0.0 ppm (background = 0.0 ppm). Top of weathered bedrock at

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-24WELL PLUGGING AND ABANDONMENT/ACTIVITY/
PROGRESS REPORT continued

PAGE 2 of 3

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-15-94 (cont.)			4.6 ft BGS. Cuttings from 0.0 ft to 4.6 ft BGS consist generally of pale brown (5YR 5/2), moist, clayey soil/subsoil with weathered shale fragments. Lower explosive limit (LEL) reading at 5.6 ft BGS <1% (3.4 ppm). Encounter additional water at 6.0 ft BGS; water level in nearby wells (within 5-ft radius from BCU-24) dropping. Top of fresh bedrock at 10.6 ft BGS. Cuttings from 4.6 ft to 10.6 ft BGS are moderate brown (5YR 4/4), massive, weathered and stained micrite; and moderate yellowish-brown (10YR 5/4), weathered and stained shale. BZA at 14.6 ft BGS = 0.0 ppm. LEL reading at 19.6 ft BGS <1% (3.2 ppm). BZA at 21.6 ft and 29.0 ft BGS = 0.0 ppm. LEL reading at 33.0 ft BGS <1% (2.6 ppm). BZA at 43.6 ft and 54.6 ft BGS both read 0.0 ppm. Begin to see "pea" gravel in returns below 45 ft BGS. Cuttings from 10.6 ft to 64.6 ft BGS consist of: dark gray (N3) and blackish-red (5R 2/2), thinly laminated shale; medium dark gray (N4) to dark greenish-gray (5GY 4/1), massive micrite; and PVC fragments with "pea" gravel near bottom of interval. Radiological scan of the cuttings from this interval range 70 - 90 cpm.
	1241	1255	At 64.6 ft BGS. Clean out the borehole. Trip out. Tag bottom of hole at 64.0 ft BGS (0.6 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 12.6 cubic ft, equivalent to 10.7 sacks of Type I cement.
	1255	1300	Run PVC tremie pipe into the borehole to 58.0 ft BGS.
	1300	1320	Take a break from the heat.
	1320	1357	Mix and pump-tremie 9 sacks (10.6 cubic ft) of neat, Type I Portland cement into the borehole. Circulate water.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-24</u>
WELL PLUGGING AND ABANDONMENT/ACTIVITY/ PROGRESS REPORT continued			PAGE 3 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-15-94 (cont.)	1357	1426	Pull out tremie pipe. Clean up. Secure carousel, lower mast on drill rig. Move rig off site. Depart.
9-16-94	0936	0939	Arrive at BCU-24 site. Tag cement level at 29.0 ft BGS. Water level is at ground surface. Calculate a borehole volume to 4.0 ft BGS of 5.3 cubic ft, equivalent to 4.5 sacks of Type I cement.
	0939	0944	Run PVC tremie pipe into borehole to 28.0 ft BGS.
	0944	1033	Mix and pump-tremie 5 sacks (5.9 cubic ft) of neat, Type I Portland cement into the borehole. Circulate water then 100% cement. Had also circulated water out well BCU-26 casing, and from around the BCU-25 "pad" which are 4.6 ft and 5.8 ft away from BCU-24, respectively.
	1033	1045	Pull out tremie pipe. Clean up. Depart site.
9-19-94	0841	0925	Technical oversight by S.L. Abston (SAIC). Arrive at BCU-24 site. Tag cement level at 8.2 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 0.9 cubic ft, equivalent to 0.8 sacks of Type I cement. Prepare to mix cement.
	0925	0949	Mix and pump-tremie (using discharge hose as tremie pipe) 2.5 sacks (3.0 cubic ft) of neat, Type I Portland cement into the borehole. Circulate water and 100% cement. Cleanup and depart site.
9-29-94	1000	1010	At BCU-24 site. Tag cement level at 3.1 ft BGS. Cap remaining borehole with clay soil to ground surface.
			P&A of well BCU-24 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-25</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-16-94</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>9-29-94</u>	
HELPERS: <u>R. Phillips - 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	
9-16-94	1045	1105	Move drill rig onto BCU-25 site and position over the well. Begin setting up the location. Well consists of uncapped 1 1/4-in. outside diameter (OD), thin-walled (probably schedule 80) PVC casing. Casing stick-up = 0.4 ft (casing had been broken off). Measure water level at 0.2 ft below ground surface (BGS). Tag bottom of well at 58.5 ft BGS. Reaming target is approximately 63.5 ft BGS. Well BCU-25 is a previously unknown and unreported (in Subsurface Data Base) well. The BCU-25 designation is per HSEA.
	1105	1110	Raise mast and rig up with a 6 1/4-in. diameter tricone bit on a subadapter; total length = 2.8 ft, table height = 2.2 ft.
	1110	1125	Crew installing silt fence and hay bale filter to slow muddy drilling discharge water from running into a nearby tributary.
	1125	1206	Break for lunch.
	1206	1232	D. Key (Highland) brings a pallet of cement to the site, crew unloading. Background radiological scan of BCU-25 location: alpha = 0 cpm, beta/gamma = 60-70 cpm.
	1232	1234	Commence reaming well bore (and drilling up casing). Ream from 0.0 ft to 0.6 ft BGS. Drill rig is not perfectly centered over the well. Cuttings from 0.0 ft to 0.6 ft BGS consist of pale brown (5 YR 5/2), moist, clayey surface soil.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-25</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-16-94	1234	1238	Re-position drill rig to center over the well.
(cont.)			
	1238	1326	Continue reaming well bore. Ream from 0.6 ft to 63.5 ft BGS.
			Encounter water immediately. Breathing zone analysis (BZA) at
			3.0 ft BGS = 0.8 ppm (background = 0.8 ppm). Lose circulation
			at 4.0 ft BGS. Cuttings from 0.6 ft to 4.0 ft BGS are the same as
			the 0.0-ft to 0.6-ft interval grading to moderate brown (5 YR 3/4),
			moist clayey soil with weathered shale fragments. Spotty to no
			returns between 4.0 ft and 7.8 ft BGS. Circulation restored at
			7.8 ft BGS. More water at 8.8 ft BGS. Lower explosive limit (LEL)
			reading at 10.0 ft BGS <1% (2.3 ppm). Top of fresh bedrock at
			11.0 ft BGS (top of weathered bedrock somewhere from 4.0 ft to
			7.8 ft BGS). Cuttings from 7.8 ft to 11.0 ft BGS are predominantly
			moderate yellowish-brown (10 YR 5/4), weathered massive
			micrite; and white PVC fragments. BZA at 15.2 ft BGS = 0.0 ppm.
			LEL reading at 17.7 ft BGS <1% (2.1 ppm). BZA at 26.2 ft,
			43.0 ft, and 55.2 ft BGS all read 0.0 ppm above background.
			Observe "pea" gravel in returns from below 50 ft BGS. Cuttings
			from 11.0 ft to 63.5 ft BGS are: dark gray (N3) to dark greenish-
			gray (5 G 4/1) and blackish-red (5 YR 2/2), thinly laminated
			shale; brownish-black (5 YR 2/1), intramicritic pelmicrite and
			light brownish-gray (5 YR 6/1) to grayish-orange pink (5 YR 7/2),
			massive, very finely crystalline micrite/intramicroite; and PVC
			fragments (both gray and white). Radiological scan of the
			cuttings range 70-90 cpm for the entire interval.
	1326	1342	At 63.5 ft BGS. Clean out borehole. Trip out. Tag bottom of the
			hole at 62.2 ft BGS (1.3 ft of fill). Calculate a borehole volume
			to 4.0 ft BGS of 12.2 cubic ft, equivalent to 10.4 sacks of Type I
			cement.
	1342	1350	Run PVC tremie pipe into borehole to 58.0 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-26</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-19-94</u>	
DRILLER: <u>R. Phillips/H. Hall - Highland Drilling Co.</u>		FINISH: <u>9-21-94</u>	
HELPERS: <u>J. Gallaher - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Susan L. Abston-SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-19-94	0949	1025	Moving drill rig on to site, position over the well. Well BCU-26 originally consists of uncapped, 1.25-in. outside diameter (OD), schedule 80 PVC casing with a stick-up of 0.6 ft. Well BCU-26 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-26 designation for this well is per HSEA. Water level at 0.8 ft below ground surface (BGS). Tag bottom of well at 59.1 BGS. Diameter of original well bore appears to be 5.0 in. Background radiation scan of location: alpha = 0 cpm, beta gamma = 40 cpm.
	1025	1038	Crew setting jacks, grounding rig, and raising mast.
	1038	1100	Lower mast and reposition drill rig over the well.
	1100	1110	Raise mast and thread a 6 1/4-in. diameter tricone bit and subadapter into the drill head; length of the bit and subadapter = 2.8 ft, table height = 2.3 ft.
	1110	1125	Rig off, preparing site to divert drill water runoff.
	1125	1155	Break for lunch.
	1155	1231	Commence reaming the borehole with compressed air only. Ream from 0.0 ft to 65.8 ft BGS. Encounter water at 1.0 ft BGS. Cuttings from 0 to 0.5 ft BGS are: moderate brown (5YR 4/4) moist clay (topsoil). Cuttings from 0.5 to 7.0 ft BGS

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-26</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-19-94 (cont.)			are: moderate brown clay (5YR 4/4) with weathered dark gray (N3) shale fragments and medium gray (N5) crystalline limestone fragments and PVC fragments. Weathered rock at approx. 4 ft BGS. Breathing zone analysis (BZA) at 0.7 ft BGS = 0.4 ppm. Lower explosive limit (LEL) reading <1% (5.0 ppm). Cuttings from 7.0 to 29.5 ft BGS are: dark gray (N3) shale fragments (some weathered) with medium gray (N5) limestone fragments and PVC fragments (Top of freshrock somewhere between 7-15 ft BGS). BZA at 25.5 ft BGS = 0.5 ppm, LEL reading <1% (1.5 ppm). Rig chattering at 29.5 ft BGS. Cuttings from 29.5 to 59.5 BGS are: dark gray (N3) shale fragments with medium gray (N5) limestone fragments. Some shale fragments have red tint (5R 2/2); PVC fragments present. BZA at 35 ft BGS = 0.7 ppm, LEL reading <1% (1.5 ppm). BZA at 51.0 ft BGS = 0.6 ppm, LEL reading <1% (1.5 ppm). Cuttings from 59.5 to 65.8 ft BGS are: dark gray (N3) smaller, thinly laminated shale fragments. Some water and cuttings are being blown out of well BCU-27 nearby (communication). Beta/gamma scan of the cuttings = 50 ppm, alpha = 0 cpm for the entire interval.
	1231	1258	At 65.8 BGS. Clean out borehole. Trip out. Tag bottom of the borehole at 65.8 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 12.1 cubic ft, equivalent to 10.2 sacks of Type I cement.
	1258	1319	Run PVC tremie pipe into the borehole to 60 ft BGS.
	1319	1410	Mix and pump-tremie 8 sacks (9.4 cubic ft) of neat, Type I Portland cement into the borehole. Circulate water, then 100% cement.
	1410	1520	Pull out tremie pipe. Clean up. Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-27</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-20-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>9-29-94</u>	
HELPER: <u>J. Gaffner - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Susan L. Abston -SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-20-94	0932	1009	At site. Moving drill rig to position over the well. Well BCU-27 originally consists of uncapped, 1.25-in. outside diameter (OD), thin-walled PVC casing with stick-up of 0.6 ft. Well BCU-27 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-27 designation for this well is per HSEA. Measure water level at 0.3 ft below ground surface (BGS). Tag bottom of well at 58.3 ft BGS. Diameter of original well bore appears to be 5.0 in.
	1009	1015	Mast up. Add a 25-ft long drill rod to drill head. Thread a 6 1/4-in. diameter tricone bit with subadapter onto the drill rod; length of bit and subadapter = 2.8 ft, table height = 2.1 ft. Background radiation scan of location: alpha = 0 cpm, beta/gamma = 50 cpm.
	1015	1150	Break for safety meeting and lunch.
	1150	1259	Commence reaming the borehole and PVC well casing with compressed air only. Ream from 0.0 ft - 63.3 ft BGS. Encounter water at <0.5 ft BGS. Top of weathered rock at 1 ft BGS. Cuttings from 0.0 ft to 1.0 ft BGS are: moderate yellow brown (10YR 5/4) clay with light gray N7 limestone fragments and PVC fragments. Water coming out of Well BCU-29 at 0.6 ft BGS (apparent communication with BCU-27). Breathing zone analysis (BZA) at 1.0 ft BGS = 0.2 ppm (background). Lower explosive limit (LEL) reading <1% (1.2 ppm). Encounter fresh rock at 9 ft BGS. Cuttings from 1.0 ft to 9.0 ft BGS are: 60% dark

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-27WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 3

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-20-94			yellow brown (10YR 4/2) weathered shale fragments with some
(cont.)			dark gray (N3) and grayish red (5R 4/2) shale fragments. Also
			some fragments of crystalline limestone and PVC fragments.
			Water stopped coming out of BCU-29 at 5.0 ft BGS. Water
			discharging from BCU-29 ceased when drill bit advanced past 5.0
			ft BGS. Cuttings from 9.0 ft to 25.7 ft BGS are: >95% dark gray
			(N3) thinly laminated shale fragments with some weathered
			stained and grayish red shale fragments and PVC fragments.
			BZA at 15.5 ft BGS = 0.2 ppm. LEL at 15.5 ft BGS <1% (1.8 ppm).
			Rig chattering from 20.7 ft to 25.7 ft BGS and large PVC fragments
			in cuttings. Cuttings from 25.7 ft to 58.0 ft BGS are: dark gray (N3)
			thinly laminated shale fragments with PVC fragments and some
			pea gravel beginning at 30 ft BGS and increasing to 50% of the
			cuttings from 32-58 ft BGS. BZA at 26 ft BGS = 0.2 ppm. LEL at
			26 ft BGS <1% (1.5 ppm). BZA at 35 ft BGS = 0.2 ppm. LEL at
			35 ft BGS <1% (1.2 ppm). BZA at 52 ft BGS = 0.2 ppm. LEL at
			52 ft BGS <1% (1.8 ppm). Cuttings from 58.0 ft to 63.3 ft BGS are:
			dark gray (N3) thinly laminated smaller fragments of shale. Some
			of the shale fragments have a dark greenish gray (5GY 4/1) tint.
			Some traces of pea gravel and PVC fragments from 58.0 to 63.3
			ft BGS. BZA at 59 ft BGS = 0.4 ppm. LEL at 59 ft BGS <1% (1.5
			ppm). Good water return while drilling entire length of well bore.
			The bottom of the well at 58.3: assume PVC screen to the bottom.
			Beta/Gamma scan of the cuttings = 70 cpm for entire interval.
	1259	1335	At 63.3 ft BGS. Clean out borehole. Trip out. Tag the bottom of
			the borehole at 62.4 ft BGS (0.9 ft of fill). Calculate a borehole
			volume to 4.0 ft BGS of 11.5 cubic ft equivalent to 9.7 sacks of
			Type I cement.
	1335	1405	Run PVC tremie into the borehole to 58.0 ft BGS.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-28</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-22-94</u>	
DRILLERS: <u>R. Phillips/H. Hall - Highland Drilling Co.</u>		FINISH: <u>9-29-94</u>	
HELPERS: <u>J. Gallaher - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Susan L. Abston -SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-22-94	0822	0847	Arrive at site. Crew moving drill rig into position over the well. Well BCU-28 originally consisted of capped, 1.25-in. outside diameter (OD), thin-walled PVC casing with stick-up of 1.9 ft. Well BCU-28 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-28 designation for this well is per HSEA. Measure water level at 0.3 ft below ground surface (BGS). Original bottom of well tagged at 58.3 ft BGS. Present bottom of well is now at 55.3 ft BGS (bottom 3.0 ft of well grouted through communication with well BCU-27). Diameter of original well bore appears to be 5.0 in. Background radiation scan of location: alpha = 0 cpm, beta/gamma = 60 cpm. Remove stick up.
	0847	0912	Mast up. Add a 25-ft long drill rod to drill head. Thread a 6 1/4-in. diameter tricone bit with subadapter onto the drill rod; length of bit and subadapter = 2.8 ft. Table height = 1.8 ft.
	0912	0917	Commence reaming the borehole and PVC well casing with compressed air only. Breathing zone analysis (BZA) at 0.5 ft BGS = 0.4 ppm lower explosive limit (LEL) reading at 0.5 ft BGS < 1% (1.5 ppm). Weathered bedrock at 2.0 ft BGS. Cuttings from 0.0 ft to 2.0 ft BGS are moderate brown (5YR 4/4) clay with grayish-orange (10YR 7/4) weathered chert fragments. Cuttings from 2.0 ft to 6.0 ft are light brown (5YR 5/6) to moderate brown (5YR 4/4), thinly laminated, shale fragments with some grayish-red (5R 4/2) weathered chert fragments.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-28</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-22-94	0917	0924	Tripping out of borehole due to lack of PVC fragments. Adjusting
(cont.)			rig to center over well casing better.
	0924	1005	Continue drilling. Cuttings from 6.0 ft to 8.0 ft BGS are light brown
			(5YR 5/6) to moderate brown (5YR 4/4) thinly laminated shale
			fragments with some grayish-red (5R 4/2) weathered chert
			fragments. Fresh bedrock at 8.0 ft BGS. Cuttings from 8.0 ft to
			13.0 ft BGS are medium dark gray (N3) to dark gray (N2) thinly
			laminated shale fragments. BZA at 14.0 ft BGS = 0.2 ppm. LEL
			reading at 14.0 ft BGS <1% (1.2 ppm). Cuttings from 13.0 ft to
			21.0 ft BGS are medium dark gray (N3) to dark gray (N2) thinly
			laminated shale fragments with <5% light gray (N7) micrite
			fragments and 1 piece of PVC. BZA at 22 ft BGS = 0.2 ppm.
			Cuttings from 21.0 ft to 51.0 ft BGS are medium dark gray (N3)
			to dark gray (N2), thinly laminated shale fragments. Cuttings
			saturated from 21 ft to 36 ft BGS and 38.0 ft to 38.5 ft BGS. BZA
			at 45 ft BGS = 0.2 ppm, LEL reading at 45 ft BGS <1% (1.2 ppm).
			Cuttings from 51.0 ft to 64.1 ft BGS are medium dark gray (N3) to
			dark gray (N2), thinly laminated shale fragments with <5% light
			gray (N7) micrite fragments. Cuttings saturated 51.0 ft to
			55.5 ft BGS and 60.5 ft to 61.5 ft BGS. BZA at 59.0 ft BGS =
			0.0 ppm. The bottom of the well at 58.3 ft: assume PVC screen
			to bottom. Beta/gamma scan of cuttings = 90 cpm for entire
			interval.
	1005	1020	At 64.1 ft BGS, clean out borehole. Trip out. Tag bottom of
			borehole at 64.1 ft BGS. Calculate a borehole volume to 4.0 ft BGS
			of 11.8 cubic ft, equivalent to 10 sacks of Type I cement.
	1020	1055	Run PVC tremie into borehole to 58.0 ft BGS. Fill tub with water
			to mix cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-29</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-26-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>10-3-94</u>	
HELPERS: <u>J. Gallaher/H. Hall - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>Susan L. Abston -SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-26-94	0947	1025	Arrive at BCU-29 site. Moving drill rig into position over the well.
			Well BCU-29 originally consisted of uncapped, 1.25-in. outside diameter (OD), thin-walled PVC casing with stick-up of 0.7 ft.
			Well BCU-29 is a previously unknown and unreported (in the Subsurface Data Base) well. The BCU-29 designation for this well is per HSEA. Measure water level at 0.3 ft below ground surface (BGS). Original bottom of well tagged at 59.2 ft BGS.
			Present bottom of well is now at 42.3 ft BGS (bottom 16.9 ft of well grouted through communication with well BCU-27). Diameter of original well bore appears to be 5.0 in. Background radiation scan of location: alpha = 0 cpm, beta/gamma = 70 cpm.
	1025	1036	Mast up. Add a 25-ft long drill rod to drill head. Thread a 6 1/4-in. diameter tricone bit with subadapter onto the drill rod; length of bit and subadapter = 2.8 ft, table height = 2.2 ft.
	1036	1136	Commence reaming the borehole and PVC well casing with compressed air only. Ream from 0.0 ft - 64.2 ft BGS. Encounter water at 2 ft BGS. Top of weathered rock at ~2 ft BGS. Cuttings from 0.0 ft to 8.0 ft BGS are moderate yellow brown (10YR 5/4) clay with <5% dark yellowish-orange (10YR 6/6) weathered shale fragments and a couple of light gray (N7) chert fragments and PVC fragments. Breathing zone analysis (BZA) from 0 to 1.0 ft BGS = 0.2 ppm (background). Lower explosive limit (LEL) from 0 to 1 ft BGS <1% (1.4 ppm). Encountered fresh rock at 8 ft BGS. Cuttings from 8.0 ft to 13.0 ft BGS are medium gray (N5)

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>BCU-29</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
9-28-94			powdered shale fragments with 20-30% medium dark gray (N4)
(cont.)			thinly laminated shale fragments. BZA at 11.5 ft BGS = 0.2 at 11.5
			ft BG <1% (1.2 ppm). Cuttings from 13.0 ft to 14.5 ft BGS are dark
			gray (N3) shale with <5% moderate brown (5YR 4/4) weathered
			shale fragments and grout fragments, dry. Cuttings from 14.5 ft
			to 50.6 ft BGS are dark gray (N3) to medium gray (N5) shale
			fragments with some grout fragments. Cuttings are saturated
			14.5 ft to 17.5 ft BGS, 25.6 ft to 46.0 ft BGS, and 49 ft to 50.6 ft
			BGS. Cuttings from 50.6 ft to 63.0 ft BGS are dark gray (N3) to
			medium gray (N5) shale fragments with some exhibiting a dark
			greenish-gray (5GY 4/1) tint. BZA at 54.5 ft BGS = 0.2 ppm, LEL
			at 54.5 ft <1% (1.0 ppm). The bottom of the well at 59.2 ft: assume
			PVC screen to the bottom. Beta/gamma scan of the cuttings =
			80 cpm for entire interval.
	1136	1207	At 64.2 ft BGS, clean out borehole. Trip out. Tag bottom of the
			borehole at 63.5 ft (0.7 ft of fill). Calculate a borehole volume to
			4.0 ft BGS of 11.7 cubic ft, equivalent to 9.9 sacks of Type I
			Portland cement.
	1207	1245	Break for lunch.
	1245	1316	Prepare to mix grout; run water into the tub. Run PVC tremie pipe
			into the borehole to 59.0 ft BGS.
	1316	1345	Mix and pump tremie 8 sacks (9.4 cubic ft) of neat Type I Portland
			cement into borehole. Circulate water, then cement.
	1345	1406	Pull out tremie. Clean up and secure site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			PROBE NO. <u>CO-2</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>West Bear Creek Valley</u>		DATE: START: <u>3-16-95</u>	
DRILLER: <u>R. Collins - Highland Drilling Co.</u>		FINISH: <u>3-20-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
3-16-95	1021	1030	Arrive at CO-2 site. Drill rig is at the location. Well CO-2 consists of 4.0-in. outside diameter (OD) steel casing with a stick-up of 4.6 ft. The wellhead is open. Measure water level at 45.0 ft below ground surface (BGS). Tag bottom of well (soft) at 107.2 ft BGS. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 70 cpm. Note: wellsite had been prepared for the drill rig using a dozer; weathered bedrock is exposed at several places in the cuts.
	1030	1047	Cut off 3.8 ft of the casing stick-up. New stick-up = 0.6 ft. Burn lifting holes in casing.
	1047	1109	Position drill rig over the well. Set up the site. Raise the mast.
	1109	1122	Thread clevis onto drillhead. Run a chain through the clevis and the lifting holes, and attempt to pull out the casing: casing comes out relatively easily. Extract a total of 14.6 ft (includes piece cut off of original stick-up) of 4.0-in. OD steel casing.
	1122	1146	Rig up with a 6 1/4-in. tricone bit on a subadapter; total length = 2.6 ft, table height = 1.6 ft.
	1146	1235	Break for lunch.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

PROBE NO. CO-2WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 3

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-16-95	1235	1340	Commence reaming wellbore using compressed air only. Ream from 0.0 ft to 112.0 ft BGS. Encounter top of weathered bedrock at 10.0 ft BGS. Cuttings from 0.0 ft to 10.0 ft BGS are: dusky yellowish-brown (10YR 2/2), moist topsoil with organic detritus, and moderate yellowish-brown (10YR 5/4), dry, clayey subsoil with weathered shale fragments. Breathing zone analysis (BZA) at 11.5 ft BGS = 0.0 ppm. Lower explosive limit (LEL) reading at 19.0 ft BGS <1% (4.8 ppm). BZA at 29.0 ft BGS = 3.6 ppm (max.), 1.5 ppm (steady); detect the odor of alcohol antifreeze. LEL reading at 40.5 ft BGS <1% (5.4 ppm). Encounter moisture (enough for dust abatement) at 43.0 ft BGS. Top of fresh bedrock at 50.0 ft BGS. Cuttings from 10.0 ft to 50.0 ft BGS consist of: pale olive (10Y 6/2) to grayish-olive (10Y 4/2), weathered and stained, thinly laminated shale; and dark yellowish-brown (10YR 4/2), weathered and stained, massive micrite. Some dark gray (N3), thinly laminated shale observed near end of interval. BZA at 56.0 ft BGS = 0.8 ppm (max.), 0.2 ppm (steady). BZA at 68.0 ft BGS = 0.4 ppm. Drilling has become dusty again by 75 ft BGS. BZA at 82.0 ft, 92.5 ft, and 106.0 ft BGS all read 0.0 ppm. Cuttings from 50.0 ft to 112.0 ft BGS consist predominantly of medium dark gray (N4), thinly laminated, micaceous shale (60%); with minor brownish-gray (5YR 4/1) to dark greenish-gray (5G 4/1), massive micrite (30%), and rare blackish-red (5R 2/2) shale (10%). The amount of limestone appears to increase over the bottom 10 ft of the interval, and with it is observed: white to pink, granular calcite vein material. Beta/gamma scan of cuttings is 70-80 cpm for the entire interval.
	1340	1425	At 112.0 ft BGS. Clean out borehole. Trip out. Tag bottom of borehole at 110.5 ft BGS (1.5 ft of fill).

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			PROBE NO. <u>CO-4</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>West Bear Creek Valley</u>		DATE: START: <u>3-15-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>3-17-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
3-15-95	1001	1049	Arrive at CO-4 site. Move drill rig onto location and position over well. Well CO-4 consists of 4.0-in. outside diameter (OD) steel casing with a stickup of 0.7 ft. The casing collar is covered with a rusty coffee can. Measure water level at 15.0 ft below ground surface (BGS). Tag bottom of the well (firm) at 57.0 ft BGS. Crew conducts pre-work equipment inspection and begins setting up the site. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60 cpm. Raise mast.
	1049	1103	B. McMaster (HSEA/UT) on site, conducts health and safety briefing for West Bear Creek Valley P&A project.
	1103	1110	Attach a jawed clamp to casing and attempt to pull out: clamp slips off of casing.
	1110	1127	Burn a pair of lifting holes in casing.
	1127	1150	Thread clevis into drill head, run a chain through clevis and lifting holes in casing and attempt to pull out: casing comes out with a great deal of difficulty. Extract a total of 37.7 ft of 4.0-in. OD steel casing. No evidence of cement anywhere on the casing.
	1150	1236	Break for lunch.
	1236	1241	Rig up with a 6 1/4-in. diameter tricone bit on a subadapter; total length = 2.6 ft, table height = 2.2 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			PROBE NO. <u>CO-4</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-15-95	1241	1301	Commence reaming wellbore using compressed air only. Ream from 0.0 ft to 50.4 ft BGS. Breathing zone analysis (BZA) at 7.4 ft BGS = 0.0 ppm. Begin returning water and encounter top of weathered bedrock at 14.4 ft BGS. Cuttings from 0.0 ft to 14.4 ft BGS consist of: dusky yellowish-brown (10 YR 2/2), moist topsoil with organic detritus and light brown (5 YR 5/6) to dark yellowish-orange (10 YR 6/6), dry subsoil with weathered shale fragments. BZA at 18.4 ft and 31.4 ft BGS both read 0.0. Borehole is making substantial water by 31 ft BGS. Firm drilling (rig chatter) from 37.5 ft to 40.4 ft BGS, then big returns—suspect water-filled cave or fracture zone. Having difficulty accommodating the returns. Lower explosive limit (LEL) reading at 47.4 ft BGS <1% (5.3 ppm). Estimate top of fresh bedrock at 48.4 ft BGS. Cuttings from 14.4 ft to 48.4 ft BGS are: pale red (10 R 6/2), moderate yellowish-brown (10 YR 5/4), and light olive gray (5 Y 5/2), weathered and stained, thinly laminated shale, and dark yellowish-brown (10 YR 4/2), weathered and stained, massive, occasionally cavatoise/punky micrite. Many of the fragments are very large (greater than 1 in.). Cuttings from 48.4 ft to 50.4 ft are: medium dark gray (N 4) to medium bluish-gray (5 B 5/1), thinly laminated shale. Beta/gamma scan of cuttings is 60 cpm for entire interval.
	1301	1305	At 50.4 ft BGS. Driller is concerned about the possibility of getting the bit stuck. Pull bit 25 ft off bottom. Turn off compressed air and trip back in: bit stops at approximately 34 ft BGS (more than 16 ft of fill).
	1305	1313	Call to K. Jago (HSEA), report status. Kevin directs to terminate reaming and suggests using Shur-Plug™ bentonite chips to bridge cavity prior to grouting the wellbore.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			PROBE NO. <u>CO-4</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-15-95	1313	1326	Complete trip out, rig down bit/subadapter assembly. Tag bottom
(cont.)			of borehole at 32.2 ft BGS (18.2 ft of fill). Secure carousel and
			lower mast.
	1326	1350	Crew departs for Shur-Plug™.
	1350	1403	Crew returns. Slowly pour 9, 50-lb sacks of 3/8-in. Shur Plug™
			bentonite chips into the borehole. Tag unhydrated bentonite level
			at 12.0 ft BGS. Bentonite to hydrate overnight. Oversight departs.
			Crew to remain to demobilize drill rig.
3-16-95	0800	0813	At CO-4 site. Tag hydrated bentonite at 11.7 ft BGS (bentonite
			swelled 0.3 ft). Calculate a borehole volume to 4.0 ft BGS of
			1.6 cubic ft, equivalent to 1.4 sacks of Type I cement. Depart.
	0920	0927	Return to CO-4 site. Crew is moving water supply and grouting
			equipment to location.
	0927	0946	Mix and pour directly into borehole 3 sacks (3.5 cubic ft) of neat,
			Type I Portland cement. Liquid cement level to ground surface.
	0946	0956	Clean up site, and depart.
3-17-95	0810	0814	At CO-4 site. Tag cement level at 1.4 ft BGS. Cap remaining
			borehole with clay soil.
			P&A of well CO-4 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-048</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>6-5-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>6-6-95</u>	
HELPERS: <u>J. Gallahey/J. Monger - Highland Drilling Co.</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-5-95	1033	1056	Arrive at GW-048 site. The well is damaged: the wellhead is tilted over slightly. The well consists of 2 3/8-in. outside diameter (OD) stainless steel well casing (casing stick-up = 3.0 ft) inside 6 5/8-in. OD steel conductor casing (stick-up = 2.3 ft). Uncap well, measure organic vapors in wellhead space = 0.1 ppm. Move backhoe onto location, set up site. Well has a bailer stuck inside, unable to measure water level or tag bottom. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm. Give site-specific health and safety briefing to Highland Drilling Co. driller, H. Hall.
	1056	1121	Wrap a chain around the conductor casing, and attempt to pull out both the well casing and conductor casing together; both come out easily. Extract 5.0 ft of the 6 5/8-in. OD steel conductor casing, and a total of 11.7 ft of well assembly (5.2 ft of casing, 5.2 ft of screen, and a 1.3-ft silt trap).
	1121	1123	Rig up with 8-in. diameter solid-stem augers; bit and lead flyte = 5.4 ft, second auger flyte = 5.0 ft.
	1123	1130	Ream wellbore. Ream from 0.0 ft to 8.8 ft below ground surface (BGS). Water level in bore (water table) = 2.0 ft BGS. Cuttings from 0.0 ft to 2.0 ft BGS are dark yellowish-brown (10YR 4/2), moist, clayey topsoil. Breathing zone analysis (BZA) at 4.0 ft and 7.0 ft BGS both read 0.0 ppm. Hard augering; encounter rock at

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-049</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-4-95</u>	
DRILLER: <u>R. Jones - Highland Drilling Co.</u>		FINISH: <u>5-8-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
5-4-95	1350	1401	Arrive at GW-049 site. Uncap well: organic vapors in headspace = 0.0ppm. Well consists of 2 3/8-in. outside diameter (OD) stainless steel casing (with a stick-up of 1.3 ft) within 6 5/8-in. OD steel conductor casing (stick-up = 1.1 ft). Measure water level at 9.8 ft below ground surface (BGS). Well has a sampling pump stuck inside.
	1401	1425	Cut off protective posts surrounding well. Burn two lifting holes in the conductor casing.
	1425	1517	Move drill rig onto location, and position over the well. Set up site. Depart. Will continue tomorrow.
5-5-95	0833	0858	Arrive at GW-049 site. Crew performs pre-work equipment inspections. Start drill rig, raise mast.
	0858	0916	Thread clevis into drill rig head, and attempt to pull out well casing and conductor casing together: casings do not move.
	0916	0940	Cut off well casing below the top of the conductor casing, and burn more lifting holes into conductor casing.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-049</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-5-95 (cont.)	0940	0955	Successfully pull out both casings together. Extract 4.3 ft of 6 5/8-in. OD steel conductor casing; and a total of 22.3 ft of 2 3/8-in. OD stainless steel well assembly (includes portion cut off earlier). Well assembly includes 15.6 ft of casing, a 5.2-ft section of screen, and a 1.5-ft-long silt trap.
	0955	1016	Rig up with 8-in. diameter, solid-stem augers; bit and first auger flyte is 5.6 ft long, subsequent flytes are 5.0 ft long, table height = 2.7 ft.
	1016	1054	Commence reaming wellbore. Ream from 0.0 ft to 17.2 ft BGS. Breathing zone analysis (BZA) at 2.4 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 6.2 ft BGS consist of dusky yellowish-brown (10YR 2/2) topsoil and dark yellowish-orange (10YR 8/6) to moderate yellowish-brown (10YR 5/4) clay with light gray (N7) cement fragments. BZA at 7.2 ft BGS = 0.0 ppm. Cuttings from 6.2 ft to 10.6 ft BGS are predominantly pale olive (10Y 6/2) and light olive gray (5Y 5/2) bentonite. Lower explosive limit (LEL) reading at 11.7 ft BGS <1% (4.4 ppm). BZA at 15.0 ft BGS = 0.0 cpm. Moisture (mud) at 16.7 ft BGS. Hard augering at 17.0 ft BGS (fresh bedrock). Cuttings from 10.6 ft to 17.0 ft BGS are mostly grayish-olive (10Y 4/2), weathered shale with dusky yellow (5Y 6/4) clay. No filter sand observed. No bedrock cuttings raised from 17.0 ft to 17.2 ft BGS. Beta/gamma scan of cuttings: 60 cpm for 0.0 to 17.2 ft BGS.
	1054	1113	Auger refusal at 17.2 ft BGS (still 3.3 ft short of well total depth). Call to K. Jago (HSEA), report status. Kevin directs to grout borehole as is. Clean out borehole. Trip out, rig down augers. A minor amount of filter sand is clinging to the augers. Tag bottom of borehole at 12.6 ft BGS (4.6 ft of very viscous mud fill).

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-050</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-2-95</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>5-4-95</u>	
HELPERS: <u>R. Jones/G. Shillings - Highland Drilling Co.</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	
5-2-95	1328	1339	Arrive at GW-050 site. Uncap well: organic vapors in headspace = 0.0 ppm. Well consists of 2 3/8-in. outside diameter (OD) stainless steel casing (with a stickup of 2.3 ft) within 6 5/8-in. OD steel conductor casing (stick-up = 1.9 ft). Measure water level at 13.9 ft below ground surface (BGS). Tag bottom of well (solid) at 16.4 ft BGS. Note: The Subsurface Data Base (Y/TS-881/R2) reports the total depth of well GW-050 at 15.0 ft BGS.
	1339	1347	Move drill rig onto location. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60 cpm.
	1347	1435	Cut off protective posts. Cut off 1.0 ft of the conductor casing stick-up. Dig around wellhead exposing concrete pad. Break up pad, and remove fragments.
	1435	1515	Position drill rig over well. Set up site. Burn lifting holes in conductor casing. Secure site and depart. Will continue tomorrow.
5-3-95	0818	0840	Arrive at GW-050 site. B. McMaster (UT/HSEA) arrives, conducts pre-work health and safety briefing. Emphasizes chemical hazards possible at Bear Creek Burial Grounds, and use augers wherever possible.
	0840	0905	Crew performs pre-work equipment inspections. Cut off 0.9 ft of well casing stick-up. Start drill rig, and raise mast.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-051</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-3-95</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>5-5-95</u>	
HELPERS: <u>R. Jones/G. Shillings - Highland Drilling Co.</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	
5-3-95	1400	1407	Arrive at GW-051 site. Uncap well; organic vapors in headspace = 0.0 ppm. Well consists of 2 3/8-in. outside diameter (OD) stainless steel casing (with a stick-up of 3.5 ft) within 6 5/8-in. steel conductor casing (stick-up = 3.0 ft). Measure water level at 6.2 ft below ground surface (BGS). Pull out Well Wizard™ sampling pump and place in plastic bag. Tag bottom of well (solid) at 10.9 ft BGS. Note: The Subsurface Data Base (Y/TS-881/R2) reports the total depth of well GW-051 to be 11.2 ft BGS.
	1407	1450	Cut off protective posts surrounding the well. Cut off 1.8 ft of the conductor casing stick-up; cut off 1.3 ft of the well casing stick-up. Burn lifting holes in the well casing. Background radiological scan of the location: alpha = 0 cpm, beta/gamma = 50 cpm.
	1450	1508	Position drill rig over well and set up site. Depart site. Will continue tomorrow.
5-4-95	0830	0853	Arrive at GW-051 site. Crew performs pre-work equipment inspections. Start rig, raise mast.
	0853	0857	Attempt to pull out well casing and conductor casing together; both come out together fairly easily. Extract 5.0 ft of the 6 5/8-in. OD steel conductor casing (includes portion cut off earlier) and a total of 14.4 ft of 2 3/8-in. OD stainless steel well assembly (includes portion cut off earlier). Well assembly includes 8.1 ft of casing, a 6.2-ft section of screen, and a 1.1-ft-long silt trap.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-051WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 2

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-4-95 (cont.)	0857	0902	Rig up with 8-in. diameter, solid-stem augers; bit and first flyte are 5.6 ft long, subsequent flytes are 5.0 ft long, table height = 2.8 ft.
	0902	0916	Commence reaming wellbore. Ream from 0.0 ft to 11.2 ft BGS. Breathing zone analysis (BZA) at 3.8 ft BGS = 0.0 ppm. Lower explosive limit (LEL) reading at 7.8 ft BGS <1% (4.8 ppm). BZA at 10.6 ft BGS = 0.0 ppm. Hard augering at 10.9 ft BGS (rock). Cuttings from 0.0 ft to 11.2 ft BGS consist of dusky yellowish-brown (10 YR 2/2) topsoil, and moderate brown (5 YR 4/4), moist clay. Fine-grained filter sand was observed from 3.8 ft to total depth. Beta/gamma scan of cuttings = 40 cpm.
	0916	0930	Auger refusal at 11.2 ft BGS. Clean out borehole. Trip out, rig down augers. Tag bottom of borehole at 10.9 ft BGS (0.3 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 2.4 cubic ft, equivalent to 2.1 sacks of Type I cement.
	0930	0944	Lower mast. Move drill rig away from borehole.
	0944	1002	Mix and pour 3 sacks (3.5 cubic ft) of neat, Type I Portland cement (grout weight = 14.6 lbs/gal) directly into the borehole. Liquid cement to ground surface.
	1002	1011	Clean up. Depart site. Crew moves drill rig to pipeyard.
5-5-95	1401	1414	At GW-051 site. Cement remains at the ground surface (did not settle). Chip and remove hardened cement from borehole to 1.0 ft BGS. Refill borehole with clay soil.
			P&A of Well GW-051 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-060</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 4
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-19-95</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>5-23-95</u>	
HELPERS: <u>J. Gallaher/J. Monger - Highland Drilling Co.</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	
5-19-95	0950	0920	Arrive at GW-060 site. Crew onsite excavating a cuttings pit.
			Uncap well: organic vapors in well headspace = 1.6 ppm. Well
			consists of 2 3/8-in. outside diameter (OD) stainless steel well
			casing (stick-up = 3.8 ft), inside 5 5/8-in. OD steel conductor
			casing (stick-up = 3.2 ft). Measure water level at 8.2 ft below
			ground surface (BGS). Tag bottom of well (solid) at 28.5 ft BGS.
			The Subsurface Data Base (Y/TS-881/R2) reports total depth of
			well GW-060 to be 50.0 ft (there is an apparent obstruction in this
			well). Background radiological scan of location: alpha = 0 cpm,
			beta/gamma = 40-50 cpm.
	0920	0935	Cut off protective posts surrounding the well.
	0935	0951	Dig around base of the well, break up the concrete pad and
			remove the fragments. Continue digging to expose bottom of
			conductor casing.
	0951	1050	Split conductor casing in two places using a torch.
	1050	1111	Attach a choker to the conductor casing, and pull off from around
			the well casing with the backhoe (well casing remains in ground,
			will over wash for removal). Recover 5.0 ft of 5 5/8-in. OD steel
			casing. Well casing is distorted (pinched) in several locations.
			Cut off 2.9 ft of the well casing to facilitate drill rig set-up. Burn
			lifting holes in casing collar.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-060WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 4

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-19-95	1111	1225	Move drill rig onto location, and position over well. Set up site.
(cont.)			Raise mast.
	1225	1300	Break for lunch.
	1300	1313	Give site-specific health and safety briefing to Highland Drilling Co. helpers: J. Gallaher and J. Monger.
	1313	1326	Rig up with a section of washover pipe on a subadapter; total length = 24.0 ft, table height = 2.2 ft. Dimensions of cutting bit = 6 1/2-in. OD, 4 3/4-in. inside diameter (ID).
	1326	1526	Commence overwash. Overwash casing from 0.0 ft to 19.7 ft BGS using compressed air only. Breathing zone analysis (BZA) at 2.8 ft BGS = 0.2 ppm. Very hard, slow drilling at 6.8 ft BGS (suspect bedrock). Cuttings from 0.0 ft to 6.8 ft BGS consist of dusky yellowish-brown (10YR 2/2) topsoil; moderate brown (5YR 4/4), moist, packed silt; and light gray (N7) cement fragments. Lower explosive limit (LEL) reading at 7.2 ft BGS <1% (10.1 ppm). Interrupt over wash to check on well casing: wellbore appears to be deflecting to one side. Adjust drill rig positioning and alignment to stay on the wellbore. Small amount of moisture (dust abates momentarily) at 11.0 ft BGS. BZA at 12.7 ft BGS = 0.0 ppm. LEL reading at 14.5 ft BGS <1% (8.5 ppm). Slow drilling again at 14.5 ft BGS (washover pipe may be binding in the hole). Moisture (dust abates again momentarily) at 18.5 ft BGS. BZA at 19.5 ft BGS = 0.0 ppm. Cuttings from 6.8 ft to 19.7 ft BGS consist of approximately equal amounts of: light gray (N7) to medium gray (N5) cement fragments; and brownish-gray (5YR 4/1) to brownish-black (5YR 2/1), massive micrite/intramicroite. Beta/gamma scan of cuttings = 40 cpm for the 0.0 ft to 19.7 ft interval.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-060</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 4
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-19-95 (cont.)	1526	1540	At 19.7 ft BGS. Clean out borehole. Trip out washover pipe, casing is gone. Casing is bound up inside washover pipe along with "cores" of rock (wellbore has deflected out from under washover pipe—cutting new hole now).
	1540	1554	Secure carousel. Lower mast as safety precaution. Clean up. Secure site and depart.
5-22-95	0914	0919	Arrive at GW-060 site. Crew conducts pre-work equipment inspections.
	0919	1000	Start drill rig, raise mast. Extract twisted and distorted stainless steel well casing out of the washover pipe (plus approximately 3 ft of cored rock). Recover approximately 20 ft (includes piece cut earlier) of the 2 3/8-in. OD well casing. B. McMaster (UT/HSEA) directs to grout borehole as is.
	1000	1018	Break down washover pipe and rig down. Tag bottom of borehole at 16.0 ft BGS (3.7 ft of fill). Calculate a borehole volume to 4.0 ft BGS of 2.8 cubic ft, equivalent to 2.3 sacks of Type I cement.
	1018	1109	Lower mast. Move rig off-site. Gather cement and supplies.
	1109	1135	Return to GW-060 site. Run 1.5-in. OD PVC tremie pipe into borehole to 16.0 ft BGS. Mix and pump tremie 3 sacks (3.5 cubic ft) of neat, Type I Portland cement (grout weight = 13.3 lbs/gal) into borehole. Water level rises nearly to ground surface. Pull out tremie pipe.
	1135	1235	Break for lunch.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-096A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 7
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-5-95</u>	
DRILLERS: <u>R. Phillips/R. Jones - Highland Drilling Co.</u>		FINISH: <u>5-16-95</u>	
HELPERS: <u>G. Shillings/J. Gallaher - Highland Drilling Co.</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	
5-5-95	1305	1313	Arrive at GW-096A site. Uncap well; organic vapors in headspace = 0.0 ppm. Well consists of 2 3/8-in. outside diameter (OD) stainless steel casing (with a stick-up of 2.6 ft) within 6 5/8-in. OD steel conductor casing (stick-up = 1.5 ft). Measure water level at 9.1 ft below ground surface (BGS). Tag bottom of well (soft) at 60.9 ft BGS. Note: The Subsurface Data Base (Y/TS-88/R2) reports the total depth of GW-096A to be 61.0 ft.
	1313	1400	Cut off protective posts surrounding the well. Cut off 1.0 ft of the well casing. Burn lifting holes into the conductor casing. Secure site and depart after 30 minute fire watch. Will continue on Monday.
5-8-95	0850	0920	Arrive at GW-096A site. Move drill rig onto location, and position over the well. Perform pre-work equipment inspections. Raise mast.
	0920	0950	Attempt to pull out the well casing and the conductor casing together: both come out with some difficulty. Extract 2.6 ft of 6 5/8-in. OD steel conductor casing; and a total of 17.0 ft of 2 3/8-in. OD stainless steel well casing (includes the portion cut off earlier). Well casing broke, still have approximately 46.5 ft of casing/screen still in well bore.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-096A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-8-95	0950	1025	Discuss options with driller. Plan to use washover pipe to over
(cont.)			wash the casing. It is believed that the casing may become
			wedged inside washover pipe and be retrievable.
	1025	1305	Depart site: to pipeyard to get washover pipe. Steam clean
			washover pipe. Take lunch break.
	1305	1312	Return to GW-096A site. Unload washover pipe.
	1312	1327	Dig cuttings pit. Final dimensions: 6 ft long x 3 ft wide x 3 ft deep.
			Rig up with lead section of washover pipe (with subadapter); total
			length = 24.0 ft, table height = 2.6 ft.
	1327	1356	Commence overwash. Overwash casing from 0.0 ft to 21.4 ft BGS
			using compressed air only. Breathing zone analysis (BZA) at
			2.4 ft BGS = 0.0 ppm. Top of weathered rock at 8.2 ft BGS.
			Cuttings from 0.0 ft to 8.2 ft BGS are: dark yellowish-brown
			(10 YR 4/2) topsoil; moderate yellowish-brown (10 YR 5/4) to dark
			yellowish-orange (10 YR 6/6), dry, clayey subsoil with weathered
			shale fragments; and medium gray (N5) cement fragments. BZA
			at 9.0 ft BGS = 0.0 ppm. Encounter moisture at 11.6 ft BGS. BZA
			at 16.0 ft BGS = 0.0 ppm. Top of fresh rock at 19.5 ft BGS.
			Cuttings from 8.2 ft to 19.5 ft BGS consist of dusky yellow (5 Y 6/4)
			to dark greenish-gray (5 G 4/1), weathered and stained, thinly
			laminated shale; with rare medium gray (N5) cement fragments.
			Cuttings from 19.5 ft to 21.4 ft BGS contain blackish-red (5 R 2/2)
			and medium dark gray (N4), thinly laminated shale; and brownish-
			gray (5 YR 4/1) to dark gray (N3), massive, pelltal micrite with
			scattered blebs of sparite.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-096A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-8-95 (cont.)	1356	1426	At 21.4 ft BGS. Break subadapter loose from lead washover section. Add 20.3 ft piece of washover pipe to string; total length of tools = 44.3 ft.
	1426	1527	Connection made, continue overwash. Overwash casing from 21.4 ft to 41.7 ft BGS. BZA at 23.5 ft BGS = 0.0 ppm. Moisture at 24.5 ft BGS. Water at 28.4 ft BGS. Lower explosive limit (LEL) reading at 28.7 ft BGS <1% (9.9 ppm). BZA at 34.4 ft BGS = 0.0 ppm. LEL reading at 38.3 ft BGS <1% (9.5 ppm). Additional moisture at 38.6 ft BGS, and at 41.3 ft BGS. Cuttings from 21.4 ft to 41.7 ft BGS consist of dark gray (N3) and blackish-red (5 R 2/2), thinly laminated shale (50%); and brownish-gray (5 YR 4/1) to brownish-black (5 YR 2/1), massive intramicrite with scattered occurrences of oolite (50%). No cement observed in returns. Beta/gamma scan of cuttings ranges 60-70 cpm for 21.4 ft to 41.7 ft BGS.
	1527	1602	At 41.7 ft BGS. Break subadapter loose from washover pipe. Tag bottom inside washover pipe at 42.2 ft below top of pipe. Run tremie pipe into washover pipe to locate well casing; effort is unsuccessful. Unsure about the whereabouts of the well casing. Plan to continue overwash tomorrow. Secure site and depart.
5-9-95	0827	0943	Arrive at GW-096A site. Give site-specific health and safety briefing to new Highland Drilling Company helper: J. Gallaher. Conduct pre-work equipment inspections: tighten alternator belt on rig motor. Start drill rig and rig up for operation.
	0943	1042	Commence over wash operations. Over wash casing from 41.7 ft to 49.1 ft BGS. Encounter water at 42.0 ft BGS. Water is bubbling out of well GW-096 approximately 10 ft away. BZA at

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-096AWELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 4 of 7

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-9-85 (cont.)			44.9 ft BGS = 0.0 ppm. Additional water at 46.8 ft BGS. Cuttings from 41.7 ft to 49.1 ft BGS are the same as the 21.4 to 41.7-ft interval
	1042	1104	With cutting bit of washover pipe at 49.1 ft BGS, the pressure check valve pops off: pressure is building down-hole. Washover pipe may be plugged. Unable to continue over wash.
	1104	1123	Begin tripping out of borehole. Rig down washover pipe. Connection breaks at top of mast (at drill head and not at the table). Depart to pipeyard to construct a lifting bell for the washover pipe.
	1123	1348	At pipeyard, build lifting bell for washover pipe. Break for lunch.
	1348	1415	Return to GW-096A site. Continue tripping out washover pipe.
	1415	1443	Interrupt work because of brief thunderstorm, shut off drill rig. Raining hard: take cover in trucks.
	1443	1508	Continue tripping out washover pipe.
	1508	1532	Finish tripping washover pipe out of the ground, several cement and limestone "core" fragments inside. One limestone core is a solid cylinder of rock 0.4 ft long: indicates that washover pipe was not around the well casing, the washover pipe was cutting new hole. Tag bottom of borehole at 47.7 ft BGS. Secure site and depart.
	0831	0847	Arrive at GW-096A site. HSEA had directed to cease washover operations, and to ream the borehole. Conduct pre-work equipment

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-096A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 5 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-10-95			inspections. Enlarge cuttings pit for the water that will be generated
(cont.)			by the hole today. Steam clean an 8 3/4-in. diameter bit on a
			subadapter.
	0847	0851	Rig up with the bit/subadapter assembly; total length = 4.3 ft, table
			height = 2.6 ft.
	0851	0928	Commence reaming wellbore. Ream from 0.0 ft to 49.5 ft BGS.
			BZA at 4.3 ft BGS = 0.0 ppm. Encounter water at 6.7 ft BGS.
			Cuttings from 0.0 ft to 7.7 ft BGS are dusky yellowish-brown
			(10 YR 2/2) topsoil and dark yellowish-orange (10 YR 6/6) subsoil;
			minor cement fragments included. BZA at 15.7 ft BGS = 0.0 ppm.
			Cuttings from 7.7 ft to 19.7 ft BGS consist of yellowish-gray (5 Y
			7/2) to pale olive (10 Y 6/2) to light olive gray (5 Y 5/2), weathered
			and stained light brown (5 YR 5/6) shale. Water production
			increases at 21.6 ft BGS. BZA at 22.7 ft and at 31.7 ft BGS, both
			read 0.0 ppm. Enlarging pit again because of significant water
			production. BZA at 42.6 ft BGS = 0.0 ppm. Cuttings from 19.7 ft
			to 49.5 ft BGS are: medium dark gray (N4) to medium bluish-gray
			(5 B 5/1), thinly laminated shale; grayish-red (5 R 4/2) shale;
			brownish-gray (5 YR 4/1), fossiliferous (fragments) micrite; and
			light brownish-gray (5 YR 6/1), very finely crystalline micrite. Beta/
			gamma scan of cuttings range 60-90 cpm for 0.0 ft to 49.5 ft BGS.
	0928	0938	At 49.5 ft BGS. No stainless steel fragments in returns, HSEA
			directs to grout borehole. Clean out borehole. Trip out, rig down
			bit/subadapter assembly. Tag bottom of borehole at 49.5 ft BGS
			(no fill). Calculate a borehole volume to 4.0 ft BGS of 19.0 cubic ft,
			equivalent to 16.1 sacks of Type I cement.
	0938	1025	Move drill rig off location. Depart site.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-096A</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 6 of 7
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
5-10-95	1025	1234	Collect cement and other grouting supplies and equipment (grout plant). Break for lunch.
(cont.)			
	1234	1246	Return to GW-096A site. Run 1.5-in. OD PVC tremie pipe into borehole to 49.0 ft BGS.
	1246	1348	Mix and pump-tremie 18 sacks (21.2 cubic ft) of neat, Type I Portland cement (grout weight = 14.9 lbs/gal) into borehole. Did not circulate water.
	1348	1428	Pull out tremie pipe. Clean up. Secure site and depart.
5-11-95	0848	0904	At GW-096A site. Tag cement level at 25.0 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 8.8 cubic ft, equivalent to 7.5 sacks of Type I cement.
	0904	0911	Run 1.5-in. OD PVC tremie pipe into borehole to 20.0 ft BGS.
	0911	0941	Mix and pump-tremie 9 sacks (10.6 cubic ft) of neat, Type I Portland cement (grout weight 14.9 lbs/gal) into the borehole. Circulate water.
	0941	1003	Pull out tremie pipe. Clean up. Secure site and depart.
5-12-95	1344	1347	At GW-096A site. Tag cement level at 9.3 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 2.2 cubic ft, equivalent to 1.9 sacks of Type I cement.
	1347	1358	Mix and pump-tremie (using discharge hose as the tremie pipe) 3 sacks (3.5 cubic ft) of neat, Type I Portland cement (grout weight = 15.0 lbs/gal) into the borehole. Circulate water.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-182</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Chestnut Ridge Security Pit</u>		DATE: START: <u>6-20-95</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>6-21-95</u>	
HELPER: <u>H. Hall - Highland Drilling Co.</u>		METHOD: <u>0</u>	
DRILL: <u>NA</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-20-95	0826	0838	Arrive at GW-182 site. The location of this well (in one lane of the South Patrol Road) requires that P&A consist of merely plugging the well with cement. The man-hole access will also be plugged.
			Remove man-hole cover over well. Tag bottom of well at 152.4 ft below ground/road surface (BGS). Note: The subsurface Data Base (Y/TS-881/R2) reports the total depth of GW-182 to be 402.1 ft. Apparently some collapse of the borehole has occurred.
			Well consists of 4.5-in. outside diameter (OD) steel casing within 6 5/8-in. OD steel casing. Measure water level in well at 121.3 ft BGS. Calculate a casing volume from 152.4 ft BGS to top of 13.2 cubic ft, equivalent to 11.2 sacks of cement. Secure man-hole cover. Depart site.
	1000	1033	Return to GW-182 site. Set up location. Run 1.5-in. OD PVC tremie pipe into the well to 150.0 ft BGS. Encountered several weak blockages in the wellbore, able to easily push through them with the tremie pipe.
	1033	1119	Mix and pump-tremie 15 sacks (17.7 cubic ft) of neat, Type I Portland cement (grout weight = 14.6 lbs per gallon) into the well.
	1119	1144	Pull out tremie pipe (no cement clinging to outside of pipe). Clean up. Try to tag liquid cement level: tag bottom of bore at 152.5 ft BGS, but no indication of cement in borehole. Plan to set a bentonite plug (with K. Jago-HSEA approval). Secure site and depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-209</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Bear Creek Valley, along Hwy. 95</u>		DATE: START: <u>11-1-94</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>11-8-94</u>	
HELPER: <u>H. Hall/J. Monger - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>Ingersoll-Rand XL-750</u>		LOGGED BY: <u>S. L. Abston - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
11-1-94	1245	1343	Arrive at GW-209 site. Moving drill rig to position over the well.
			Well GW-209 consists of 2.4-in. outside diameter (OD), schedule 40, PVC casing. Stick up = 0.5 ft. Tag bottom of well (soft) at 47.9 ft below ground surface (BGS). Water is coming out at the top of the well. The Subsurface Data Base (Y/TS-881/R1) reports well GW-209 is completed in an 8-in. borehole with a total depth of 48.1 ft. Drillers breaking up pad around well. Background radiation scan of location: alpha = 0-30 cpm, beta/gamma = 40-60 cpm.
	1343	1420	Attach a jawed clamp to the casing and pull out 4.5 ft of well pipe, leaving an unknown length of casing within the borehole. Will try to break up casing while reaming the well bore. Putting up silt fencing between well location and creek.
	1420	1438	Rigging up with an 8 1/4-in diameter tricone bit with a sub adaptor for a total length of 4.3 ft. Table height = 2.5 ft.
	1438	1525	Commence reaming the borehole and drilling up to the PVC well casing with compressed air only. Ream from 0.0 ft to 49.1 ft BGS. Encounter water at surface. Cuttings from 0.0 ft to 10.5 ft BGS consist of moderate brown (5YR 4/4) clay with weathered grayish orange (10YR 7/4) chert to light gray (N7) chert fragments and 50% medium dark gray (N4) cement fragments and PVC fragments. Breathing zone analysis (BZA) at 2.0 ft BGS = 0.0 ppm. Lower explosive limit (LEL) at 2.0 ft BGS < 1% (2.0 ppm).

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-209

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

PAGE 3 of 3

[illegible]

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-215WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 2 of 3

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-21-95	1123	1214	Commence reaming wellbore. Ream from 0.0 ft to 11.3 ft BGS.
(cont.)			Breathing zone analysis (BZA) at 3.3 ft BGS = 0.0 ppm. Cuttings
			become moist at 4.3 ft BGS. Cuttings from 0.0 ft to 4.3 ft BGS are
			dusky, yellowish-brown (10YR 2/2) to olive black (5Y 2/1), moist,
			clayey topsoil (0.0 ft to 2.8 ft), and olive black (5Y 2/1) to greenish-
			black (5G 2/1), moist clay (2.8 ft to 4.3 ft) with weathered shale
			fragments; miscellaneous limestone gravel fragments; and medium
			dark gray (N4) cement fragments. BZA at 6.0 ft BGS = 0.0 ppm.
			Augering becoming easier below 8.6 ft BGS. Cuttings from 4.3 ft
			to 8.6 ft BGS continued olive black (5Y 2/1) to greenish-black (5G
			2/1), moist clay. BZA at 9.0 ft BGS = 0.0 ppm. Cuttings from 8.6
			ft to 10.0 ft BGS are moderate yellowish-brown (10YR 5/4) to dark
			yellowish-brown (10YR 4/2), thinly laminated shale plus some
			filter sand. Estimate top of weathered bedrock at 8.6 ft BGS.
	1214	1254	At 11.3 ft BGS. Break for lunch.
	1254	1318	Continue reaming wellbore. Ream from 11.3 ft to 12.9 ft BGS.
			BZA at 12.8 ft BGS = 0.0 ppm. Cuttings from 10.0 ft to 12.9 ft BGS
			consist of blackish-red (5R 2/2) and medium dark gray (N4), thinly
			laminated shale. Estimate top of fresh bedrock at 10.0 ft BGS.
			Beta/gamma scan of cuttings = 70 cpm for the entire interval.
	1318	1416	Auger refusal at 12.9 ft BGS. Trip out augers. Appears as though
			augers may have deviated from wellbore while reaming. Tag
			bottom of borehole at 6.8 ft BGS (6.1 ft of fill), however, able to
			push tremie pipe through thin mud to 12.6 ft BGS. Calculate a
			borehole volume to 4.0 ft BGS of 3.0 cubic ft, equivalent to
			2.5 sacks of Type I cement.
	1416	1500	Crew departs for grouting supplies.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-216</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>West Bear Creek Valley</u>		DATE: START: <u>3-22-95</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>3-23-95</u>	
HELPERS: <u>H. Hall/D. Willford - Highland Drilling Co.</u>		METHOD: <u>A</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-22-95	0808	0850	Arrive at GW-216 site. Note: well was previously referred to as "unidentified." In scratching around the wellhead, a cover was found with the label, "U.S.G.S. GW-216." The well consists of 8.0-in. inside diameter (ID) PVC casing with a stick-up of 0.3 ft. Measure water level at 3.4 ft below ground surface (BGS). Tag bottom (firm) at 10.7 ft BGS. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50-60 cpm.
	0850	0950	Dump a load of gravel on site. Spread gravel in ditch to support the drill rig jacks.
	0950	1000	Move drill rig (Ingersoll-Rand XL-750) onto location.
	1000	1100	Stand-by. Waiting until an issue which arose during the plugging and abandonment of a well approximately 15 ft north of GW-216 is resolved.
	1100	1112	Issue resolved. Will not use drill rig to P&A GW-216 (plan to fill well casing with cement). Move drill rig off location.
	1112	1159	Break up concrete "pad" and dig around casing. Dig down to 0.9 ft BGS. Calculate a casing volume of 3.4 cubic ft, equivalent to 2.9 sacks of Type I cement.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-447</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Gum Branch Road Area</u>		DATE: START: <u>4-17-95</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>4-18-95</u>	
HELPER: <u>J. Monger - Highland Drilling Co.</u>		METHOD: <u>A</u>	
DRILL: <u>Ford 455 Backhoe with McMillen Diggerhead</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-17-95	1214	1230	Arrive at GW-447 site. Unlock protective casing cover, and open well. Measure water level; well is dry. Tag bottom of well at 8.5 ft below ground surface (BGS). Set up site. Background radiological scan of location: alpha = 0 cpm (wet), beta/gamma = 70-80 cpm. Break up concrete pad and remove fragments.
	1230	1233	Remove 3.1 ft of 7.0-in. outside diameter (OD) steel protective casing (casing had been set 0.6 ft into the pad).
	1233	1237	Wrap a chain around the well casing stick-up, and easily pull out 5.0 ft of 2.37-in. OD PVC casing, and 5.0 ft of 2.37-in. OD slotted PVC screen with no cap on the end.
	1237	1245	Rig up with 8-in. diameter, solid-stem augers; lead flyte is 5.4 ft long, subsequent flytes are 5.0 ft long.
	1245	1300	Commence reaming the wellbore. Ream from 0.0 ft to 10.4 ft BGS. Breathing zone analysis (BZA) at 3.4 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 1.5 ft BGS are pale yellowish-brown (10YR 6/2) to pale brown (5YR 5/2) topsoil with very light gray (N6) cement fragments. Begin to see filter sand at 5.0 ft BGS. BZA at 7.0 ft BGS = 0.0 ppm. Encounter moisture at 9.0 ft BGS. Top of weathered rock at 9.5 ft BGS. Cuttings from 1.5 ft to 9.5 ft BGS are dark yellowish-orange (10YR 6/6) clay and light brown (5YR 6/4) to grayish-orange (10YR 7/4), fine- to medium-grained filter sand.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-545</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 6
LOCATION: <u>Landfill VI</u> DRILLERS: <u>H. Hall/R. Phillips - Highland Drilling Co.</u> HELPERS: <u>G. Shillings/J. Monger - Highland Drilling Co.</u> DRILL: <u>Ingersoll-Rand XL-750</u>		DATE: START: <u>2-1-95</u> FINISH: <u>2-7-95</u> METHOD: <u>A</u> LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-1-95	0820	0915	Arrive at GW-545 site. The drill rig is on site, already positioned over the well. The crew had rigged up the lead section of washover pipe: 6.5-in. outside diameter (OD), 5.5-in. inside diameter (ID); 23.8 ft long; table height = 2.3 ft. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 40 cpm. W. Thedford (HSEA) on site. Crew arrives.
	0915	0928	W. Thedford conducts pre-work site-specific health and safety briefing. Emphasis on cold stress dangers and equipment safety.
	0928	1000	W. Thedford conducts a detailed inspection of the drill rig, oversight assists and logs the activity in the fieldbook. Driller demonstrates two methods of shutting off drill rig power, then demonstrates new winch operation.
	1000	1015	Measure water level in well at 63.5 ft below ground surface (BGS). Tag bottom of well (firm) at 67.2 ft BGS. The Subsurface Data Base (Y/TS-881/R2) reports the total depth of GW-545 to be 67.0 ft. Fuel drill rig.
	1015	1028	Commence over wash. Over wash casing from 0.0 ft to 20.0 ft BGS using compressed air only. Concrete pad cracks, then breaks when washover bit is about halfway through it. Breathing zone analysis (BZA) at 2.5 ft BGS = 0.0 ppm. Lower explosive limit (LEL) reading at 8.5 ft BZA <1% (5.8 ppm). BZA at 15.5 ft BGS = 0.0 ppm. Cuttings from 0.0 ft to 20.0 ft BGS consist

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-545</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 6
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-1-95	1000	1015	primarily of light gray (N7) cement fragments with a small amount
(cont.)	(cont.)		of light brown (5YR 5/6), stiff clay. Some stainless steel fragments
			were observed in the cuttings and may be from a centralizer.
			Beta/gamma scan of cuttings = 50 cpm for the interval.
	1028	1131	At 20.0 ft BGS. Clean out borehole.
	1131	1141	Over wash casing from 20.0 ft to 40.0 ft BGS using compressed
			air only. BZA at 24.7 ft BGS = 0.0 ppm. Cuttings from 20.0 ft to
			40.0 ft BGS are a continuation of the 0.0 ft to 20.0 ft interval. Beta/
			gamma scan of cuttings = 40 cpm for the interval.
	1141	1204	At 40.0 ft BGS. Clean out borehole.
	1204	1233	Break for lunch.
	1233	1259	Continue over wash. Over wash casing from 40.0 ft to 60.5 ft BGS.
			BZA at 47.0 ft BGS = 0.0 ppm. Washover pipe begins rubbing on
			the casing at approximately 50 ft BGS. Cuttings from 40.0 ft to
			55.0 ft continue to be the cement fragments and stainless steel
			fragments as above. Cuttings from 55.0 ft to 60.5 ft BGS consist
			of light brown (5YR 6/4) to grayish-orange (5YR 7/2), dry, filter
			sand. No obvious bentonite seal in this well. Beta/gamma scan
			of the cuttings = 45 cpm for the interval.
	1259	1310	At 60.5 ft BGS. Clean out borehole. Break connection between
			washover pipe and subadapter, and clamp at borehole collar.
			Plan to trip out washover pipe tomorrow. Secure site and depart.
2-2-95	0814	0845	Arrive at GW-545 site. Give site-specific health and safety briefing
			to new Highland Drilling Co. helper, J. Monger. Remove subadapter
			from top of washover pipe. Top of well casing is 7.0 feet below the

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-545</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 6
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-2-95			top of the washover pipe (approximately 6 ft BGS).
(cont.)			
	0845	1018	Begin fishing for the well casing. Hook securely onto casing and pull out. Extract a total of 58.8 ft of 4.5-in. OD stainless steel casing. All that was recovered of the screen was the collar at the top of the screen (0.4 ft) and a small amount of the screen wire.
	1018	1123	Trip the washover pipe out of the hole.
	1123	1157	Break for lunch.
	1157	1230	Gather up reaming tools and steam clean.
	1230	1247	Rig up with a 9 7/8-in. diameter tricone bit on a stabilizer; table height = 2.2 ft.
	1247	1335	Commence reaming. Ream the borehole from 0.0 ft to 43.0 ft BGS using compressed air only. BZA at 8.0 ft BGS = 0.0 ppm. LEL reading at 12.0 ft BGS <1% (4.9 ppm). BZA at 25.0 ft BGS = 0.1 ppm. LEL reading at 31.0 ft BGS <1% (4.6 ppm). Cuttings from 0.0 ft to 30.0 ft BGS consist of approximately equal amounts of light gray (N7) cement fragments and light brown (5YR 5/6), dry, stiff clay with pale yellowish-orange (10YR 8/6) chert. The amount of clay increases with depth. BZA at 35.0 ft BGS = 0.0 ppm. The clay is becoming moist (sticky) and it is difficult to keep the borehole clean. LEL reading at 39.0 ft BGS <1% (4.1 ppm). BZA at 42.0 ft BGS = 0.0 ppm. Cuttings from 30.0 ft to 43.0 ft BGS are light brown (5YR 5/6) to moderate brown (5YR 4/4), moist, sticky clay with pale yellowish-orange (10YR 8/6) chert; and light gray (N7) cement fragments (although cement fragments rarely observed below 41.0 ft BGS). Between 36.0 ft and 38.0 ft, the cuttings consisted mostly of moderate yellowish-brown (10YR

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-545</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 4 of 6
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
2-2-95			5/4), soft, moist, sticky clay. Beta/gamma scan of cuttings range
(cont.)			from 40 to 50 cpm for the entire interval.
	1335	1350	At 43.0 ft BGS. Clean out borehole. Trip all the way out to clean
			the hole.
	1350	1430	Move auxiliary air compressor to site and connect in-line with drill
			rig compressor.
	1430	1440	Trip back into borehole, have to re-drill the last 5 ft of the borehole
			due to fill/debris.
	1440	1509	Continue reaming. Ream the borehole from 43.0 ft to 68.0 ft BGS
			using compressed air only (drill rig and auxiliary compressors).
			BZA at 46.0 ft BGS = 0.0 ppm. Definite increase of chert in returns
			at 52.0 ft BGS. Rig chatter at 52.5 ft BGS, suspect weathered
			bedrock. Cuttings from 43.0 ft to 52.5 ft BGS area continuation of
			the previous interval. Continued ratty drilling to 55.0 ft, where
			fresh competent rock (bedrock) is encountered. Cuttings from
			52.5 ft to 55.0 ft BGS consist primarily of pale yellowish-orange
			(10YR 8/6) and very pale orange (10YR 8/2) chert. BZA at 55.0 ft
			BGS (sulfurous odor) = 0.5 ppm. Observe screen wire strands in
			returns beginning at 62.0 ft BGS. Encounter moisture at 63.0 ft
			BGS. BZA at 66.0 ft BGS = 0.2 ppm. Cuttings from 55.0 ft to
			68.0 ft BGS are predominantly pale yellowish-brown (10YR 6/2)
			and olive gray (5Y 4/1), massive, very finely crystalline dolostone;
			plus fine-grained filter pack sand, and stainless steel screen wire
			strands. Beta/gamma scan of cuttings = 70 cpm for the interval.
2-2-95	1509	1603	At 68.0 ft BGS. Clean out borehole. Bit keeps hanging up in the

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-545WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 5 of 6

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
(cont.)			hole, suspect that the majority of the screen wire is tangled around the bit.
	1603	1612	Bit is stuck. Plan to use a foam (alcohol-based soap/water) mixture to raise the cuttings and clean the hole better tomorrow.
			Use of foam approved by HSEA. Secure site and depart.
2-3-95	0850	0930	Arrive at GW-545 site. Crew brings water supply on site. Fuel auxiliary compressor. Conduct pre-work equipment inspections. Mix foam (Quik-Foam™)/water solution.
	0930	0950	Circulating foam/water solution through rods, working to free the bit.
	0950	1030	Bit is free. Trip out, rig down bit and stabilizer assembly (no screen fragments wrapped around bit as originally suspected). Tag bottom of borehole at 61.6 ft BGS (6.4 ft of fill); will not try to clean borehole further. Calculate a borehole volume to 4.0 ft BGS of 30.6 cubic ft, equivalent to 26.0 sacks of Type I cement.
	1030	1042	Run 1.5-in. OD PVC tremie pipe into the borehole to 57.0 ft BGS.
	1042	1144	Mix and pump-tremie 15 sacks (17.7 cubic ft) of neat, Type I Portland cement (grout weight = 12.4 lbs/gal) into the borehole.
	1144	1202	Break for lunch.
	1202	1234	Mix and pump-tremie an additional 10 sacks (11.8 cubic ft) of neat, Type I Portland, cement (grout weight = 12.2 lbs/gal) into the borehole. The bottom drops out while pumping this batch, and the cement in the borehole drops out of sight.
2-3-95	1234	1257	Pull out tremie pipe. Clean up. The cement level appears to be

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>GW-545</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 6 of 6
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
(cont.)			about 44 ft BGS. Secure rods in carousel, lower mast. Oversight departs. Crew to remain and demobilize drill rig.
2-6-95	0820	0828	Arrive at GW-545 sight. Tag cement level at 54.7 ft BGS (approximately even with top of bedrock). Plan to plug at least 10 ft of the borehole with bentonite. Calculate a minimum of 8 sacks for a 10-ft plug.
	0928	0941	Crew arrives. Slowly pour 8, 50-lb sacks of 3/8-in. Shur-Plug™ bentonite chips into the borehole. Unhydrated bentonite to 42.0 ft BGS. Pour 40 gals. of potable water into borehole to hydrate bentonite. Bentonite to hydrate a minimum of 4 hrs. Secure site and depart.
	1326	1330	Return to GW-545 site. Tag bentonite level at 42.0 ft BGS (no vertical swelling). Calculate a borehole volume to 4.0 ft BGS of 20.1 cubic ft, equivalent to 17.0 sacks of Type I cement.
	1330	1332	Run 1.5-in. OD PVC tremie pipe into borehole to 39.0 ft BGS.
	1332	1440	Mix and pump-tremie 14 sacks (16.5 cubic ft) of neat, Type I Portland cement (grout weight = 13.0 lbs/gal) into the borehole. Circulate water, then 100% cement.
	1440	1507	Pull out tremie pipe. Clean up. Secure site and depart.
2-7-95	0759	0900	At GW-545 site. Tag cement level at 6.6 ft BGS. K. Jago (HSEA) approves capping borehole with cement level greater than 4 ft BGS. Crew arrives, cap borehole with clay soil.
			P&A of well GW-545 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>LL/HAZ-04</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Gum Branch Road Area</u>		DATE: START: <u>4-24-95</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>4-26-95</u>	
HELPER: <u>G. Shillings/J. Monger - Highland Drilling Co.</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	
4-24-95	1036	1100	At LL/HAZ-04 site. Using dozer to level several high spots.
			Uncap the well; organic vapors in well headspace = 0.0 ppm.
			Measure water level at 6.7 ft below ground surface (BGS). Tag
			bottom of the well at 24.4 ft BGS. Note: the Subsurface Data Base
			(Y/TS-981/R2) reports the total depth of well LL/HAZ-04 to be
			25.0 ft. Background radiological scan of location: alpha = 0 cpm,
			beta/gamma = 60 cpm.
	1100	1150	Move drill rig onto location, and position over the well (with aid of
			a bulldozer). Set up site.
	1150	1248	Break for lunch.
	1248	1331	Driller departs to get a bit. Break up concrete pad, exposing
			6.5-in. outside diameter (OD) PVC casing.
	1331	1339	Driller returns. Start drill rig. Raise mast.
	1339	1416	Attach a jawed clamp to the casing collar and attempt to pull out
			the casing; casing fractures around the clamp. Try 2 more times
			with identical results. Attempt to pull out casing using clamp
			attached to a clevis in the drill head with similar results. Attempt
			to pull out casing by wrapping a chain around the stick-up; casing
			breaks off. Plan to drill up the casing while reaming the wellbore.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>LL/HAZ-04</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-24-95	1416	1418	Rig up with a 7 7/8-in. diameter tricone bit on a subadapter; total
(cont.)			length = 4.2 ft, table height = 1.9 ft.
	1418	1424	Commence drilling up casing and reaming wellbore to fresh
			material using compressed air only. Drill/ream from 0.0 ft to 2.3 ft
			BGS.
	1424	1448	At 2.3 ft BGS, already in well sand pack. Trip out. Break 7 7/8-in.
			diameter bit from subadapter. Thread on 8 3/4-in. diameter tricone
			bit onto the subadapter; total length remains at 4.2 ft, table height
			remains at 1.9 ft.
	1448	1509	Continue drilling up casing/reaming wellbore using compressed
			air only. Drill/ream from 0.0 ft to 27.3 ft BGS. Breathing zone
			analysis (BZA) at 4.2 ft BGS = 0.1 ppm. Begin to return water at
			5.0 ft BGS. Top of weathered bedrock at 8.5 ft BGS. Cuttings from
			0.0 ft to 8.5 ft BGS are light brown (5YR 5/6) to moderate brown
			(5YR 4/4), stiff clay; white (N9) PVC; and medium- to fine-grained
			filter sand. BZA at 11.5 ft BGS = 0.0 ppm. Additional moisture at
			16.3 ft BGS. BZA at 17.8 ft BGS = 0.0 ppm. Top of fresh bedrock
			at 18.8 ft BGS. Cuttings from 8.5 ft to 18.8 ft BGS are dark
			yellowish-brown (10YR 4/2) to dusky yellow (5Y 6/4), weathered
			and stained, thinly laminated shale. Encounter a lens of weathered
			rock from 20.3 ft to 20.8 ft: light olive gray (5Y 5/2) shale. Cuttings
			from 18.8 ft to 20.3 ft consist of medium dark gray (N4) to medium
			bluish-gray (5B 5/1), thinly laminated shale. BZA at 22.8 ft BGS =
			0.0 ppm. Encounter more moisture at 23.3 ft BGS. More weathered
			rock from 25.3 ft to 25.8 ft BGS: light olive gray (5Y 5/2) shale; and
			dusky brown (5R 2/2) weathered, bedded, sandy siltstone. Cuttings
			from 20.8 ft to 25.3 ft and from 25.8 ft to 27.3 ft BGS are the same
			as the 18.8- to 20.3-ft interval. Beta/gamma scan of cuttings range
			from 60 to 80 cpm for the entire reamed interval.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. LL/HAZ-04WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 3 of 3

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-24-95 (cont.)	1509	1526	At 27.3 ft BGS. Clean out borehole. Trip out, rig down bit/subadaptor assembly. Tag bottom of borehole at 25.1 ft BGS (2.2 ft of fill). Calculate borehole volume of 8.8 cubic ft, equivalent to 7.5 sacks of Type I cement.
	1526	1534	Secure rods in carousel. Lower mast.
	1534	1553	Run 1.5-in. OD PVC tremie pipe into the borehole to 19.0 ft BGS. Secure site and depart.
4-25-95	0848	0909	Arrive at LL/HAZ-04 site. Crew performs pre-work equipment inspections. Gather tools, etc. Move drill rig off location.
	0909	0915	Move grouting equipment and supplies to site.
	0915	1000	Mix and pump-tremie 8 sacks (9.4 cubic ft) of Type I Portland cement (average grout weight of 12.7 lbs/gal) into the borehole. Circulate water, then 100% cement.
	1000	1021	Pull out tremie pipe, clean up. Secure site and depart.
4-26-95	1202	1209	At LL/HAZ-04 site. Tag cement level at 4.3 ft BGS. K. Jago (HSEA) approves capping borehole with cement level greater than 4 ft BGS. Cap borehole with clay soil.
			P&A of LL/HAZ-04 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>LL/HAZ-15</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 5
LOCATION: <u>Gum Branch Road Area</u>		DATE: START: <u>4-25-95</u>	
DRILLER: <u>R. Phillips - Highland Drilling Co.</u>		FINISH: <u>4-28-95</u>	
HELPERS: <u>G. Shillings/J. Monger - Highland Drilling Co.</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	
4-25-95	1300	1319	Arrive at LL/HAZ-15 site. Well consists of 2 3/8-in. outside diameter (OD) PVC well casing inside 6 5/8-in. OD steel protective casing. Water level is at top of protective casing (1.6 ft above ground surface). PVC well casing (stick-up = 1.6 ft) enters the ground slanted, so it may be logical to conclude the hole may not be plumb. Cut off 0.9 ft of the protective casing (new stick-up = 0.7 ft).
	1319	1342	Move drill rig onto location, and position over well. Set up site. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm.
	1342	1400	Raise mast, observe that rig is not perfectly centered over the well. Lower mast, re-position over the well, and raise mast again.
	1400	1430	Steam clean a 6 1/2-in. diameter bit on a subadapter. Tag bottom of well: tape to 250 ft below ground surface (BGS), end of tape: well is deeper than tape. Subsurface Data Base (Y/TS-881/R2) reports total depth of LL/HAZ-15 to be 375.0 ft BGS.
	1430	1444	Thread the bit/subadapter assembly to drill head. Break bit loose. Thread a 5 7/8-in. diameter tricone bit onto subadapter (check valve is not functioning, will not use); total length of bit/subadapter assembly = 2.4 ft, table height = 2.4 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>LL/HAZ-15</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-25-95	1444	1505	Commence drilling up well casing using compressed air only. Drill
(cont.)			from 0.0 ft to approximately 14 ft BGS. Observe water returns
			immediately. The concrete pad and attached protective casing
			move as the bit passes below the casing. Breathing zone analysis
			(BZA) at 2.2 ft and 8.8 ft BGS, both read 0.0 ppm. Observe
			weathered shale in the returns at about 9.0 ft BGS (the wellbore
			is deflecting out from under the bit). Cuttings from 0.0 ft to 9.0 ft
			BGS are: grayish-black (N2) and medium gray (N5), cavatose/
			vesicular cement fragments; and white (N9) PVC fragments.
			Encounter moisture at 13.5 ft BGS. Cuttings from 9.0 ft to 14.0 ft
			BGS are: moderate yellowish-brown (10YR 5/4) to moderate olive
			brown (5Y 4/4), weathered, thinly laminated shale.
	1505	1540	Stop drilling. Trip out of the hole. Shut off drill rig. Conclude that
			the bit is no longer on the wellbore because wellbore is not plumb.
			Discuss options with driller. Probe for open casing with tremie
			pipe, unsuccessfully. Plan to tilt rig slightly to match wellbore
			alignment, and try to encounter wellbore again tomorrow. Secure
			site and depart.
4-26-95	0834	0850	Arrive at LL/HAZ-15 site. Crew performs pre-work equipment
			inspections.
	0850	0903	Rig down bit/subadapter assembly. T. Harrison and L. Davidson
			(both of HSW) onsite, and will be onsite for the duration of well
			LL/HAZ-15 P&A activities. Pull out remaining protective casing
			(total of 1.5 ft) and concrete pad together.
	0903	0907	Rig back up with the bit/subadapter assembly. The table height
			remains at 2.4 ft. Tilt drill rig slightly to follow apparent wellbore
			deviation.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>LL/HAZ-15</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 5
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-26-85 (cont.)	0907	0950	Commence drilling using compressed air only. Drill from 0.0 ft to 28.0 ft BGS. BZA at 5.0 ft BGS = 0.0 ppm. Encounter water at 9.0 ft BGS. BZA at 15.0 ft BGS = 0.0 ppm. LEL reading at 19.6 ft BGS <1% (4.2 ppm). Observe a musty odor at 23.5 ft BGS: BZA = 0.1 ppm. Cuttings from 0.0 ft to 28.0 ft BGS are predominantly pale yellowish-brown (10YR 6/2) to light olive gray (5Y 5/2) to moderate olive brown (5Y 4/4), weathered and stained shale; with medium light gray (N6) and grayish-black (N2) cement fragments; and PVC fragments which begin at 9.7 ft BGS. Observe wood fragments in the returns at approximately 14 ft BGS. Beta/gamma scan of cuttings range from 50 to 70 cpm for interval. Cuttings indicate bit is following the wellbore.
	0950	0953	Return drill rig to level in an attempt to continue in the wellbore.
	0953	1026	Resume drilling. Drill from 28.0 ft to 31.5 ft BGS using compressed air only. BZA at 28.6 ft BGS = 0.0 ppm. LEL reading at 30.8 ft BGS <1% (2.8 ppm). Cuttings from 27.0 ft to 31.5 ft BGS are medium dark gray (N4), thinly laminated shale; and rare cement fragments. Absence of PVC in returns: conclude bit has deviated from wellbore. Shut off drill rig.
	1026	1115	Call to K. Jago (HSEA), report status. Plan to ream wellbore with a bit much larger than needed to try and drill up more of the PVC casing. Review paperwork (H&S checklist, Waste Mgmt. Plan) with HSW auditors. Depart site.
	1225	1239	Return to LL/HAZ-15 site. Start drill rig. Trip out tools, rig down the 5 7/8-in. diameter bit/subadapter assembly. Rig up with an 8 3/4-in. diameter bit on a subadapter; total length = 4.2 ft, table height = 2.4 ft.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. LL/HAZ-15WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 4 of 5

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-26-85	1239	1300	Commence reaming the wellbore. Ream from 0.0 ft to 4.5 ft BGS.
(cont.)			Very hard drilling at 3.8 ft BGS, observe metal fragments in returns.
			Cuttings from 0.0 ft to 4.5 ft BGS consists mainly of moderate
			brown (5YR 4/4) to light brown (5YR 5/6), clayey subsoil and
			medium gray (N5) cement fragments.
	1300	1345	Stop drilling. Trip out and examine borehole: the bit has encountered
			a section of metal casing.
	1345	1408	Attach a jawed clamp to section of casing, and attempt to pull out:
			casing comes out fairly easily. Extract a 2.3-ft section of 8.5-in. OD
			steel casing full of cement with a section of 1-in. diameter PVC
			casing extending through the cement. More 1-in. PVC casing
			remains in the borehole, but appears to deflect in the opposite
			direction as the LL/HAZ-15 well casing (possibly another well had
			been installed in the same borehole).
	1408	1412	Trip tools back into borehole.
	1412	1459	Continue reaming wellbore. Ream from 4.5 ft to 35.2 ft BGS using
			compressed air only. Top of weathered rock at 8.5 ft BGS.
			Cuttings from 4.5 ft to 8.5 ft BGS are the same as the 0.0 to 4.5-ft
			interval. Encounter water at 12.5 ft BGS. Lost circulation briefly at
			21.5 ft BGS. Increase in water production at approximately 26.0 ft
			BGS. BZA at 30.4 ft BGS = 0.1 ppm. Top of fresh rock at 31.0 ft
			BGS. Cuttings from 8.5 ft to 31.0 ft BGS consist predominantly of
			light olive gray (5Y 5/2) to moderate olive brown (5Y 4/4), thinly
			laminated, weathered shale; with medium dark gray (N4) cement
			fragments and PVC fragments from near the end of the interval
			only. Cuttings from 31.0 ft to 35.2 ft BGS are: medium dark gray

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. LL/HAZ-15WELL PLUGGING AND ABANDONMENT
ACTIVITY/PROGRESS REPORT - continued

PAGE 5 of 6

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-26-95 (cont.)			(N4), thinly laminated shale plus rare PVC and cement fragments. Beta/gamma scan cuttings range 50 to 60 cpm for the entire interval.
	1459	1514	At 35.2 ft BGS. No longer reaming the wellbore. Plan to stop here as per K. Jago's direction. Clean out borehole. Trip out, rig down bit/subadapter assembly. Tag bottom of borehole at 34.7 ft BGS (0.5 ft of fill). Plan to grout borehole tomorrow.
	1514	1548	Clean up. Secure site and depart.
4-27-95	0834	0838	Arrive at LL/HAZ-15 site. Tag bottom of borehole again at 34.0 ft BGS (an additional 0.7-ft accumulation of fill overnight). Calculate a borehole volume to 4.0 ft BGS of 12.6 cubic ft, equivalent to 10.7 sacks of Type I cement.
	0838	0858	Run 1.5-in. OD PVC tremie pipe into borehole to 29.0 ft BGS.
	0858	1038	Mix and pump-tremie 12 sacks (14.2 cubic ft) of neat, Type I Portland cement (with an average grout weight of 12.7 lbs/gal) into the borehole. Circulate water, then 100% cement.
	1038	1135	Pull out tremie pipe. Clean up. Breakdown drilling rig for demobilization. Oversight departs.
4-28-95	0823	0846	At LL/HAZ-15 site. Tag cement level at 4.7 ft BGS. Cap borehole with clay soil (approval to cap borehole at this depth given by S. Jones - HSEA).
			P&A of well LL/HAZ-15 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>OR-03</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 3
LOCATION: <u>Gum Branch Road</u>		DATE: START: <u>3-23-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>3-27-95</u>	
HELPERS: <u>R. Phillips/G. Shillings - Highland Drilling Co.</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	
3-23-95	0824	0944	Arrive at OR-03 site. Well consists of 2.0-in. outside diameter (OD) PVC casing with a stick-up of 2.9 ft. Measure water level at 4.8 ft below ground surface (BGS). Tag bottom of well (firm) at 101.0 ft BGS, 1.0 ft deeper than depth reported in the Subsurface Data Base (Y/TS-881/R2). Use backhoe to clear a portion of the bank to position the rig jacks.
	0944	1019	Move drill rig onto location and position over the well.
	1019	1036	Raise mast. Cut off 2.2 ft of the casing stick-up. Wrap a lifting strap around the casing stick-up and attempt to pull out the casing. The casing breaks off. Cut casing off flush with the ground surface, plan to drill up casing while reaming borehole. Recover a total of 3.0 ft to 2.0-in. OD, schedule 80 PVC casing. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm.
	1036	1041	Rig up with a 6 1/4-in. tricone bit on a subadapter; total length = 2.6 ft, table height = 2.4 ft.
	1041	1137	Commence reaming the wellbore and drilling up the casing using compressed air only. Ream/drill from 0.0 ft to 102.2 ft BGS. Breathing zone analysis (BZA) at 2.0 ft BGS = 0.0 ppm. Top of weathered rock at 4.2 ft BGS. Cuttings from 0.0 ft to 4.2 ft BGS consist of dusky yellowish-brown (10YR 2/2), moist topsoil with organic detritus; pale yellowish-brown (10YR 6/2) to grayish-

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>OR-03</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 2 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-23-95			orange (10YR 7/4), moist, clayey subsoil with weathered shale
(cont.)			fragments; medium dark gray (N4) cement fragments; and PVC
			fragments. Top of fresh rock at 7.0 ft BGS. Cuttings from 4.2 ft
			to 7.0 ft BGS are dark yellowish-brown (10YR 4/2) to light olive
			gray (5Y 5/2), weathered and stained, thinly laminated shale; pale
			yellowish-brown (10YR 6/2), weathered, massive, finely crystalline
			micrite; and PVC fragments. Begin returning water at 8.0 ft BGS.
			BZA at 10.2 ft BGS = 0.0 ppm. More water at 11.7 ft BGS. Lower
			explosive limit (LEL) reading at 20.7 ft BGS <1% (6.8 ppm).
			Increase in water production at 21.7 ft BGS. Do not see any more
			PVC fragments beyond the bottom of the first rod (25.2 ft BGS).
			BZA at 31.2 ft BGS = 0.0 ppm. LEL reading at 39.7 ft BGS <1%
			(9.5 ppm). BZA at 47.7 ft BGS = 0.0 ppm. LEL reading at 55.0 ft
			BGS <1% (14.0 ppm). BZA at 65.2 ft, 81.7 ft, and 95.2 ft BGS all
			read 0.0 ppm. Increase in water production: 84-85 ft BGS.
			Cuttings from 7.0 ft to 102.2 ft BGS begin as predominantly
			grayish-black (N2) to dark greenish-gray (5G 4/1), thinly laminated
			shale (70-80%) with brownish-black (5YR 2/1) to olive black
			(5Y 2/1), massive, pelletal micrite with occasional sparite blebs.
			The lithology remains generally the same, with the micrite
			predominating by interval end. Along with increasing limestone
			amounts, the amount of granular calcite is observed to increase.
			Also observed a small amount of light brownish-gray (5YR 6/1),
			very finely crystalline, massive micrite from near the top of the
			interval, and moderate blue green (BG 4/6) rubber fragments
			from near the bottom of the interval. Beta/gamma scan of cuttings
			range from 50-70 cpm for the entire interval.
	1137	1212	At 102.2 ft BGS. Clean out the borehole. Trip out, rig down bit/
			sub-adaptor assembly. Tag bottom of the borehole at 100.7 ft
			BGS (1.5 ft of fill). A 17.2-ft long piece of PVC comes out of the

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>OR-03</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT - continued			PAGE 3 of 3
DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
3-23-95			bore while tripping out (a minimum of 21.4 ft of PVC casing recovered from this well).
(cont.)			
	1212	1226	Secure carousel and lower mast. Move drill rig off site. Calculate a borehole volume to 4.0 ft BGS of 20.3 cubic ft, equivalent to 17.2 sacks of Type I cement.
	1226	1300	Break for lunch.
	1300	1307	Run 1.5-in. OD PVC tremie pipe into borehole to 88.0 ft BGS.
	1307	1352	Mix and pump-tremie 12 sacks (14.2 cubic ft) of neat, Type I Portland cement (grout weight = 12.0 lbs/gal) into borehole. Circulate water, then 100% cement.
	1352	1408	Pull out tremie pipe. Clean up. Dismantle site and depart.
3-24-95	0736	0740	At OR-03 site. Tag cement level at 10.3 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 1.3 cubic ft, equivalent to 1.1 sacks of Type I cement. Depart site.
	0857	1012	Return to OR-03 site. Mix and pour 2 sacks (2.4 cubic ft) of neat, Type I Portland cement directly into the borehole. Liquid cement to ground surface. Depart site.
3-27-95	0855	0813	At OR-03 site. Tag cement level at 1.2 ft BGS. Cap remaining borehole with cuttings and gravel because of close proximity to road. Depart.
			P&A of well OR-03 is complete.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>S3-1</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>6-19-95</u>	
HELPER: <u>J. Gailaher - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-19-95	0915	0931	Arrive at Piezometer S3-1 site. Piezometer consists of 2 3/8-in. outside diameter (OD) PVC casing (open at top, but covered with a plastic bag). Casing stick-up = 2.0 ft. Piezometer has a plywood sheet pad. Organic vapors in well headspace = 0.9 ppm. Measure water level at 7.6 ft below ground surface (BGS). Tag bottom of well at 24.2 ft BGS. Plan to plug water-bearing interval of casing with bentonite aggregate, then fill remaining casing to ground surface with cement (this P&A method authorized by HSEA to minimize waste). Background radiological scan of location: alpha = 0 cpm, beta/gamma = 70 cpm. Cut off the casing stick-up below the ground surface (2.2 ft removed), and remove plywood pad.
	0931	0947	Slowly pour approximately 33 lbs of 3/8-in. bentonite aggregate into the well, filling the water column. Unhydrated bentonite to 0.9 ft BGS. Bentonite to hydrate a minimum of 4 hrs. Beta/gamma scan of removed casing and plywood = 80 cpm. Depart site.
	1412	1421	Return to S3-1 site. Tag hydrated bentonite level at 0.9 ft BGS (no vertical swell). Mix and pour approximately 1 gallon of neat, Type I Portland cement into the well. Liquid cement fills the well to the ground surface. Depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>S3-3</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>6-19-95</u>	
HELPER: <u>J. Gaffner - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-19-95	1102	1109	Arrive at Piezometer S3-3 site. Piezometer consists of 2 3/8-in. outside diameter (OD) PVC casing (open at top, but covered with a plastic bag). Casing stick-up = 1.9 ft. Piezometer has a plywood sheet pad. Organic vapors in well headspace = 0.0 ppm. Measure water level at 5.9 ft below ground surface (BGS). Tag bottom of well (solid) at 6.2 ft BGS. Plan to plug water column portion of the well with bentonite aggregate, then fill the remaining casing to the ground surface with cement (this P&A method authorized by HSEA to minimize waste). Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm.
	1109	1112	Unscrew the top 2.8 ft of casing and remove plywood pad. Slowly pour approximately 2 lbs of 3/8-in. bentonite aggregate into the well, filling the water column. Unhydrated bentonite to 5.6 ft BGS. Bentonite to hydrate approximately 4 hrs. Beta/gamma scan of removed casing and plywood = 50 cpm. Depart site.
	1439	1446	Return to S3-3 site. Tag hydrated bentonite level at 5.3 ft BGS (bentonite swelled 0.3 ft). Mix and pour approximately 4 gallons of neat, Type I Portland cement into the well. Liquid cement fills the well to the ground surface. Depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>S3-5</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>6-20-95</u>	
HELPER: <u>J. Gallaher - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-19-95	1335	1357	Arrive at Piezometer S3-5 site. Piezometer consists of 2 3/8-in. outside diameter (OD) PVC casing (open at top, but covered with a plastic bag). Casing stick-up = 3.3 ft. Piezometer has a plywood sheet pad. Organic vapors in well headspace = 0.0 ppm. Measure water level at 3.9 ft below ground surface (BGS). Tag bottom of well at 7.0 ft BGS. Plan to plug the water column portion of the well with bentonite aggregate, then fill the remaining casing to the ground surface with cement (this P&A method authorized by HSEA to minimize waste). Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60 cpm.
	1357	1404	Cut off the casing stick-up below the ground surface (3.8 ft removed), and remove plywood pad. Slowly pour approximately 12 lbs of 3/8-in. bentonite aggregate into the well, filling the water column. Unhydrated bentonite to 3.3 ft BGS. Bentonite to hydrate for a minimum of 4 hrs. Beta/gamma scan of removed casing and plywood = 60 cpm. Depart site.
6-20-95	1423	1434	Return to S3-5 site. Tag hydrated bentonite level at 3.2 ft BGS (bentonite swelled 0.1 ft). Mix and pour approximately 3 gallons of neat, Type I Portland cement into the well. Liquid cement fills the well to the ground surface. Depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>S3-6</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>6-19-95</u>	
HELPER: <u>J. Gallaher - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-19-95	1036	1047	Arrive at Piezometer S3-6 site. Piezometer consists of 2 3/8-in. outside diameter (OD) PVC casing (open at top, but covered with a plastic bag). Casing stick-up = 1.9 ft. Piezometer has a plywood sheet pad. Organic vapors in well headspace = 0.5 ppm. Measure water level at 9.0 ft below ground surface (BGS). Tag bottom of well (solid) at 20.6 ft BGS. Plan to plug water column portion of the well with bentonite aggregate, then fill the remaining casing to the ground surface with cement (this P&A method authorized by HSEA to minimize waste). Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm.
	1047	1102	Cut off the casing stick-up below the ground surface (2.5 ft removed), and remove plywood pad. Slowly pour approximately 25 lbs of 3/8-in. bentonite aggregate into the well, filling the water column. Unhydrated bentonite to 4.2 ft BGS. Bentonite to hydrate approximately 4 hrs. Beta/gamma scan of removed casing and plywood = 60 cpm. Depart site.
	1431	1439	Return to S3-6 site. Tag hydrated bentonite level at 4.2 ft BGS (no vertical swell). Mix and pour approximately 4 gallons of neat, Type I Portland cement into the well. Liquid cement fills the well to the ground surface. Depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>S3-7</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>6-19-95</u>	
HELPER: <u>J. Gallaher - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-19-95	1014	1024	Arrive at Piezometer S3-7 site. Piezometer consists of 2 1/4-in. outside diameter (OD) thin-walled PVC casing (open at top, but covered with a plastic bag). Casing stick-up = 2.6 ft. Piezometer has a plywood sheet pad. Organic vapors in well headspace = 0.7 ppm. Measure water level at 12.7 ft below ground surface (BGS). Tag bottom of well at 27.7 ft BGS. Plan to plug the water column portion of the well with bentonite aggregate, then fill the remaining casing to the ground surface with cement (this P&A method authorized by HSEA to minimize waste). Background radiological scan of location: alpha = 0 cpm, beta/gamma = 50 cpm.
	1024	1036	Cut off the casing stick-up below the ground surface (3.1 ft removed), and remove plywood pad. Slowly pour approximately 33 lbs of 3/8-in. bentonite aggregate into the well, filling the water column. Unhydrated bentonite to 6.9 ft BGS. Bentonite to hydrate approximately 4 hrs. Beta/gamma scan of removed casing and plywood = 60 cpm. Depart site.
	1426	1431	Return to S3-7 site. Tag hydrated bentonite level at 6.8 ft BGS (bentonite swelled 0.1 ft). Mix and pour approximately 4 gallons of neat, Type I Portland cement into the well. Liquid cement fills the well to the ground surface. Depart.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>S3-8</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>	
DRILLER: <u>H. Hall - Highland Drilling Co.</u>		FINISH: <u>6-19-95</u>	
HELPER: <u>J. Gallaher - Highland Drilling Co.</u>		METHOD: <u>C</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
6-19-95	0947	0959	Arrive at Piezometer S3-8 site. Piezometer consists of 2 3/8-in. outside diameter (OD) PVC casing (open at the top, but covered with a plastic bag). Casing stick-up = 1.9 ft. Piezometer has a plywood sheet pad. Organic vapors in well headspace = 0.0 ppm. Measure water level at 9.3 ft below ground surface (BGS). Tag bottom of well at 28.4 ft BGS. Plan to plug the water column portion of the well with bentonite aggregate, then fill the remaining casing to ground surface with cement (this P&A method authorized by HSEA to minimize waste). Background radiological scan of location: alpha = 0 cpm, beta/gamma = 60 cpm.
	0959	1014	Cut off the casing stick-up below the ground surface (2.4 ft removed), and remove plywood pad. Slowly pour approximately 38 lbs of 3/8-in. bentonite into the well, filling the water column. Unhydrated bentonite to 4.8 ft BGS. Bentonite to hydrate a minimum of 4 hrs. Beta/gamma scan of removed casing and plywood = 60 cpm. Depart site.
	1421	1426	Return to S3-8 site. Tag hydrated bentonite level at 4.8 ft BGS (no vertical swell). Mix and pour approximately 4 gallons of neat, Type I Portland cement into the well. Liquid cement fills the well to the ground surface. Depart.

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM			WELL NO. <u>Unident. B</u>
WELL PLUGGING AND ABANDONMENT ACTIVITY/PROGRESS REPORT			PAGE 1 of 2
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-11-95</u>	
DRILLER: <u>G. Shillings - Highland Drilling Co.</u>		FINISH: <u>4-12-95</u>	
HELPER: <u>H. Hall - Highland Drilling Co.</u>		METHOD: <u>A</u>	
DRILL: <u>-NA-</u>		LOGGED BY: <u>Timothy Coffey - SAIC</u>	

DATE	TIME		ACTIVITY/COMMENTS
	START	FINISH	
4-11-95	1230	1232	At an unidentified well at the Ash Disposal Basin. Well consists of 4.5-in. outside diameter (OD) PVC casing broken off at the ground surface (the well had been first discovered when the backhoe accidentally drove over it). Measure water level at 7.0 ft below ground surface (BGS). Tag apparent bottom of well (solid) at 19.3 ft BGS. Well will be referred to as Unidentified Well B. Background radiological scan of location: alpha = 0 cpm, beta/gamma = 80 cpm. NOTE: This well is located on the ash field which is suspected of being incapable of supporting a drill rig. This well to be decommissioned by removing the casing and allowing the wellbore to cave in naturally. If the bore remains open, it may be plugged with bentonite aggregate to within 4 ft of ground surface, as per HSEA.
	1232	1235	Move Ford 455 backhoe onto site, and set up.
	1235	1240	Attach a jawed clamp to casing and attempt to pull out; casing comes out easily. Extract a total of 19.6 ft of 4.5-in. OD, schedule 40 PVC casing slotted over the bottom 5.0 ft. Beta/gamma scan of the casing = 50-60 cpm. Tag bottom of the bore at 19.2 ft BGS. Calculate a borehole volume to 4.0 ft BGS of 1.7 cubic ft, equivalent to 2.4 sacks of bentonite aggregate. Depart site.
	1407	1410	Return to Unidentified Well B site. Borehole has collapsed to approximately 7 ft BGS. Pour 1, 50-lb sack of 3/8-in. Shur-Plug™ bentonite aggregate into the bore. Unhydrated bentonite level is

APPENDIX B
PLUGGING AND ABANDONMENT DIAGRAMS

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1008

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S-3 Ponds

DATE: START: 6-19-95

COORDINATES: N29933 E52128

FINISH: 6-20-95

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: -NA-

DRILLER: H. Haß

HELPER: J. Galtaher

REASON FOR P&A: Obsolete well.

P&A METHOD: C DEVIATIONS FROM METHOD: Casing stick-up removed and remaining casing plugged in place with bentonite and cement with HSEA approval.

WELL CONSTRUCTION SUMMARY*

Note: Some of the information in this section obtained from field observations.

P&A SUMMARY

REAMED DIA: -NA-

DRILLED/REAMED DEPTH: -NA-

PLUG MATERIAL: Bentonite/Cement

CAP MATERIAL: Clay Soil

*Information source: Subsurface Data Base (Y/TS-881/R2)

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1034</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Bear Creek Burial Grounds</u>	DATE: START: <u>5-11-95</u>	
COORDINATES: <u>N29953 E42436</u>	FINISH: <u>5-16-95</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>R. Phillips</u>	HELPERS: <u>R. Jones/J. Gallaher</u>	
REASON FOR P&A: <u>Sampling pump stuck inside well.</u>		
P&A METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>PVC well casing drilled up and wellbore reamed in one pass, with HSEA approval.</u>		

WELL CONSTRUCTION SUMMARY*		P&A SUMMARY																		
<p>Note: Some of the information in this section obtained from field observations.</p> <table border="0"> <tr> <td>CONDUCTOR HOLE DIA: <u>-NA-</u></td> <td>DEPTH <u>-NA-</u></td> </tr> <tr> <td>SURFACE CONDUCTOR TYPE: <u>None</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>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>+9.1 ft</u> BOTTOM <u>35.0 ft</u></td> </tr> <tr> <td>SEAL: <u>-NA-</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td>FILTER PACK: <u>Sand</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</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</u></td> </tr> </table>		CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>	SURFACE CONDUCTOR TYPE: <u>None</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>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>+9.1 ft</u> BOTTOM <u>35.0 ft</u>	SEAL: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	FILTER PACK: <u>Sand</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</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</u>		<p>REAMED DIA: <u>8 3/4 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>46.6 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p>
CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>																			
SURFACE CONDUCTOR TYPE: <u>None</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>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>+9.1 ft</u> BOTTOM <u>35.0 ft</u>																			
SEAL: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																			
FILTER PACK: <u>Sand</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</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</u>
		<p>CAP DEPTH: <u>1.8 ft</u> DIA: <u>8 3/4 in.</u></p> <p>PLUG DEPTH: <u>41.4 ft</u> COLLAPSE/FILL DEPTH: <u>46.6 ft</u></p>																		

*Information source: Subsurface Data Base (Y/TS-881/R2).

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1100

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Ash Disposal BasinDATE: START: 4-5-95COORDINATES: N26365 E57018FINISH: 4-7-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. HallHELPERS: R. Phillips/G. ShillingsREASON FOR P&A: Obsolete well of substandard construction.P&A METHOD: A DEVIATIONS FROM METHOD: Drill up casing and ream wellbore in one pass; use bentonite chips for partial plug of reamed wellbore, with HSEA approval.

WELL CONSTRUCTION SUMMARY

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 7 7/8 in.

DRILLED/REAMED

DEPTH: 28.6 ftPLUG MATERIAL: Cement/
Shur-Plug™CAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1101

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Ash Disposal Basin

DATE: START: 4-4-95

COORDINATES: N26317 E57154

FINISH: 4-8-95

REFERENCE POINT FOR MEASUREMENTS: Ground Surface

PREPARED BY: Timothy Coffey - SAIC

DRILLING COMPANY: Highland Drilling Company

DRILL: Ingersoll-Rand XL-750

DRILLER: H. Hall

HELPERS: R. Phillips/G. Shillings

REASON FOR P&A: Obsolete well of substandard construction.

P&A METHOD: A DEVIATIONS FROM METHOD: Drill up casing and ream
wellbore in one pass, with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 7 7/8 in.

DRILLED/REAMED

DEPTH: 29.6 ft

PLUG MATERIAL: Cement

CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1102

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Ash Disposal BasinDATE: START: 4-3-95COORDINATES: N28345 E57089FINISH: 4-5-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. HallHELPERS: R. Phillips/G. ShillingsREASON FOR P&A: Obsolete well of substandard construction.P&A METHOD: A DEVIATIONS FROM METHOD: Drilled up casing
while reaming wellbore; did not drill/ream to 1 ft beyond TD, with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 7 7/8 in.
 DRILLED/REAMED DEPTH: 52.0 in.
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1103</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Ash Disposal Basin</u>	DATE: START: <u>3-31-95</u>	
COORDINATES: <u>N26352 E57056</u>	FINISH: <u>4-3-95</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>H. Hall</u>	HELPERS: <u>R. Phillips/D. Willford</u>	
REASON FOR P&A: <u>Obsolete well of substandard construction.</u>		
P&A METHOD: <u>A</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;">SURFACE CONDUCTOR 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>6.5 in.</u></div> <div style="margin-left: 20px;">TOP <u>0.0 ft</u> BOTTOM <u>25.0 ft</u></div> </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>PVC/#40</u> DIA: <u>2.37-in. OD</u></div> <div style="margin-left: 20px;">TOP <u>+2.4 ft</u> BOTTOM <u>20.0 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SEAL: <u>Bentonite</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;">FILTER PACK: <u>Sand</u></div> <div style="margin-left: 20px;">TOP <u>18.9 ft</u> BOTTOM <u>25.0 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SCREEN TYPE: <u>PVC/#101</u> DIA: <u>2.37-in. OD</u></div> <div style="margin-left: 20px;">TOP <u>20.0 ft</u> BOTTOM <u>25.0 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">TOTAL DEPTH: <u>25.0</u></div> </div>	<div style="margin-bottom: 10px;"> REAMED DIA: <u>7 7/8 in.</u> DRILLED/REAMED DEPTH: <u>27.1 in.</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>1.7 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>7 7/8 in.</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">COLLAPSE/FILL</div> <div style="margin-left: 20px;">DEPTH: <u>26.3 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">TOTAL DEPTH: <u>27.1 ft</u></div> </div> </div>	

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1104

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Ash Disposal BasinDATE: START: 3-31-95COORDINATES: N26348 E57061FINISH: 4-4-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. HallHELPERS: R. Phillips/G. ShillingsREASON FOR P&A: Obsolete well of substandard construction.P&A METHOD: A DEVIATIONS FROM METHOD: Well casing drilled up while reaming wellbore to less than 1 ft beyond TD with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 7 7/8 in.
 DRILLED/REAMED DEPTH: 56.6 in.
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1105</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Ash Disposal Basin</u>	DATE: START: <u>3-28-95</u>	
COORDINATES: <u>N26265 E57054</u>	FINISH: <u>3-30-95</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>H. Hall</u>	HELPERS: <u>R. Phillips/G. Shillings</u>	
REASON FOR P&A: <u>Obsolete well of substandard construction.</u>		
P&A METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Wellbore not reamed to 1 ft beyond TD, partial plug of bentonite, all with HSEA approval.</u>		
WELL CONSTRUCTION SUMMARY	P&A SUMMARY
<div style="margin-top: 10px;"> <p>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u> TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>BOREHOLE DIA: <u>3.0 in.</u> TOP <u>0.0 ft</u> BOTTOM <u>56.4 ft</u></p> <p>FILLER: <u>Cement</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> TOP <u>+1.8 ft</u> DIA: <u>2.37-in. OD</u> BOTTOM <u>46.4 ft</u></p> <p>SEAL: <u>Bentonite</u> TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>FILTER PACK: <u>Sand</u> TOP <u>44.7 ft</u> BOTTOM <u>56.4 ft</u></p> <p>SCREEN TYPE: <u>PVC/s/V.01</u> TOP <u>46.4 ft</u> DIA: <u>2.37-in. OD</u> BOTTOM <u>56.4 ft</u></p> <p>TOTAL DEPTH: <u>56.4</u></p> </div>	<p>REAMED DIA: <u>7 7/8 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>27.8 in.</u></p> <p>PLUG MATERIAL: <u>Shur-Plug™/Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> <div style="margin-top: 20px;"> <div style="margin-top: 10px;"> <p>CAP DEPTH: <u>1.0 ft</u></p> <p>DIA: <u>7 7/8 in.</u></p> <p>PLUG DEPTH: <u>13.2 ft</u></p> <p>Shur-Plug™ bentonite DEPTH: <u>21.5 ft</u></p> <p>COLLAPSE/FILL DEPTH: <u>27.8 ft</u></p> <p>Original wellbore filled with debris DEPTH: <u>56.4 ft</u></p> </div> </div>	

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1106

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Ash Disposal BasinDATE: START: 3-30-95COORDINATES: N26266 E57071FINISH: 4-3-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. HallHELPERS: R. Phillips/G. ShillingsREASON FOR P&A: Obsolete well of substandard construction.P&A METHOD: A DEVIATIONS FROM METHOD: Wellbore not reamed
to 1 ft beyond TD, partial plug of bentonite, all with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 8.0 in.
 DRILLED/REAMED
 DEPTH: 34.7 in.
 PLUG MATERIAL: Shur-Plug™/Cement
 CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1107</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Ash Disposal Basin</u> COORDINATES: <u>N28184 E57055</u> REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>	DATE: START: <u>4-10-95</u> FINISH: <u>4-12-95</u> PREPARED BY: <u>Timothy Coffey - SAIC</u>	
DRILLING COMPANY: <u>Highland Drilling Company</u> DRILLER: <u>D. Willford</u>	DRILL: <u>Ford 455 Backhoe with McMillen Diggerhead</u> HELPERS: <u>R. Phillips/G. Shillings</u>	
REASON FOR P&A: <u>Obsolete well of substandard construction.</u>		
P&A METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Did not ream to 1 ft beyond TD (auger refusal at 11.5 ft BGS), with HSEA approval.</u>		
WELL CONSTRUCTION SUMMARY	P&A SUMMARY
<div style="margin-top: 10px;"> <p>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> TOP <u>-NA-</u> DIA: <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>BOREHOLE DIA: <u>3.0-in.</u> TOP <u>0.0 ft</u> BOTTOM <u>32.2 ft</u></p> <p>FILLER: <u>Cement</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> TOP <u>+2.3 ft</u> DIA: <u>2.37-in. OD</u> BOTTOM <u>22.2 ft</u></p> <p>SEAL: <u>Bentonite</u> TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>FILTER PACK: <u>Sand</u> TOP <u>20.5 ft</u> BOTTOM <u>32.2 ft</u></p> <p>SCREEN TYPE: <u>PVC/sl/.01</u> TOP <u>22.2 ft</u> DIA: <u>2.37-in. OD</u> BOTTOM <u>32.2 ft</u></p> <p>TOTAL DEPTH: <u>32.2</u></p> </div>	<p>REAMED DIA: <u>8 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>11.5 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> <div style="margin-top: 10px;"> <div style="margin-top: 10px;"> <p>CAP DEPTH: <u>1.4 ft</u></p> <p>PLUG DIA: <u>8.0 in.</u></p> <p>DEPTH: <u>11.3 ft</u></p> <p>Collapse/fill DEPTH: <u>11.5 ft</u></p> <p>DIA: <u>6.5 in.</u></p> <p>DEPTH: <u>31.5 ft</u></p> </div> </div>	
<p>-NA-: Not Applicable/Not Available</p>		

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 1108

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Ash Disposal BasinDATE: START: 4-10-95COORDINATES: N26185 E57048FINISH: 4-12-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: D. WilfordHELPERS: R. Phillips/G. ShillingsREASON FOR P&A: Obsolete well of substandard construction.P&A METHOD: A DEVIATIONS FROM METHOD: None.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 8 in.
 DRILLED/REAMED
 DEPTH: 10.4 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>1109</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Ash Disposal Basin</u>	DATE: START: <u>4-11-95</u>	
COORDINATES: <u>N26399 E57148</u>	FINISH: <u>4-12-95</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>-NA-</u>	
DRILLER: <u>G. Shillings</u>	HELPERS: <u>H. Hall</u>	
REASON FOR P&A: <u>Obsolete well of substandard construction.</u>		
P&A METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Wellbore not reamed to fresh material; use Shur-Plug™ bentonite for plug; capped with native materials (fly ash), with HSEA approval.</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;">SURFACE CONDUCTOR 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>6.5 in.</u></div> <div style="margin-left: 20px;">TOP <u>0.0 ft</u> BOTTOM <u>41.8 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">FILLER: <u>Fly ash</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>2.37-in. OD</u></div> <div style="margin-left: 20px;">TOP <u>+2.2 ft</u> BOTTOM <u>29.4 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SEAL: <u>Bentonite</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;">FILTER PACK: <u>Sand</u></div> <div style="margin-left: 20px;">TOP <u>17.0 ft</u> BOTTOM <u>41.8 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SCREEN TYPE: <u>PVC/51/.01</u> DIA: <u>2.37-in. OD</u></div> <div style="margin-left: 20px;">TOP <u>29.4 ft</u> BOTTOM <u>39.4 ft</u></div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">TOTAL DEPTH: <u>41.8</u></div> </div>	<div style="margin-bottom: 10px;"> REAMED DIA: <u>-NA-</u> DRILLED/REAMED DEPTH: <u>-NA-</u> PLUG MATERIAL: <u>Shur-Plug™</u> CAP MATERIAL: <u>Fly ash</u> </div> <div style="margin-bottom: 10px;"> <div style="margin-left: 20px;"> CAP DEPTH: <u>2.4 ft</u> DIA: <u>2.37 in.</u> </div> </div> <div> <div style="margin-left: 20px;"> DEPTH: <u>36.3 ft</u> COLLAPSE/FILL DEPTH: <u>40.0 ft</u> </div> </div>	

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. 1110
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Ash Disposal Basin</u>	DATE: START: <u>4-11-95</u>	
COORDINATES: <u>N26489 E57173</u>	FINISH: <u>4-12-95</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>-NA-</u>
DRILLER: <u>G. Shillings</u> HELPERS: <u>H. Hall</u>		
REASON FOR P&A: <u>Obsolete well of substandard construction.</u>		
P&A METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Did not ream wellbore to fresh material; use Shur-Plug™ bentonite for plug; cap bore with native materials (fly ash), with HSEA approval.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
		REAMED DIA: <u>-NA-</u> DRILLED/REAMED DEPTH: <u>-NA-</u> PLUG MATERIAL: <u>Shur-Plug™</u> CAP MATERIAL: <u>Fly ash</u>
-NA-: Not Applicable/Not Available		

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-03</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Exxon Nuclear Site</u>	DATE: START: <u>11-28-94</u>	
COORDINATES: <u>N29333.2 E22032.82</u>	FINISH: <u>11-30-94</u>	
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>	PREPARED BY: <u>T. Coffey - SAIC</u>	
DRILLING COMPANY: <u>Highland Drilling Co.</u>	DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>	
DRILLER: <u>G. Shillings</u>	HELPER: <u>R. Phillips</u>	
REASON FOR P&A: <u>Loss of well security/substandard construction.</u>		
P&A: METHOD: <u>D</u> DEVIATIONS FROM METHOD: <u>Remove well casing, ream wellbore to auger refusal, and grout with approval from HSEA.</u>		
WELL CONSTRUCTION SUMMARY	P&A SUMMARY	
Note: Some of the information in this section obtained from field observations.
REAMED DIA: <u>8.0 in.</u> EXCAVATED DEPTH: <u>8.7 ft</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Clay soil</u>	
-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-25

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11-30-94COORDINATES: N30341 E23425FINISH: 12-2-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: T. Coffey - SAICDRILLING COMPANY: Highland Drilling Co.DRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: G. ShillingsHELPER: R. PhillipsREASON FOR P&A: Loss of well security/substandard construction.P&A: METHOD: D DEVIATIONS FROM METHOD: Extract some well casing,
ream wellbore (including casing) to auger refusal, and grout with approval from HSEA.

WELL CONSTRUCTION SUMMARY

Note: Some of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 8.0 in.
 EXCAVATED DEPTH: 17.4 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-30</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Exxon Nuclear Site</u>	DATE: START: <u>11-21-94</u>	
COORDINATES: <u>N29840 E20549</u>	FINISH: <u>11-23-94</u>	
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>	PREPARED BY: <u>T. Coffey - SAIC</u>	
DRILLING COMPANY: <u>Highland Drilling Co.</u>	DRILL: <u>Ford 455 Backhoe with McMillan Diggerhead</u>	
DRILLER: <u>G. Shillings</u>	HELPERS: <u>H. Hall/R. Phillips</u>	
REASON FOR P&A: <u>Loss of well security/substandard construction.</u>		
P&A METHOD: <u>D</u> DEVIATIONS FROM METHOD: <u>Pull out well casing, ream wellbore with solid stem augers to refusal, and grout reamed borehole with HSEA approval.</u>		
WELL CONSTRUCTION SUMMARY	P&A SUMMARY	
Note: Some of the information in this section obtained from field observations.
<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: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SURFACE CONDUCTOR 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: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">BOREHOLE DIA: <u>-NA-</u></div> <div style="margin-left: 20px;">TOP <u>0.0 ft</u> BOTTOM <u>-NA-</u></div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">FILLER: <u>-NA-</u></div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">CASING TYPE: <u>PVC/#40/SI</u> DIA: <u>1.75-in. OD</u></div> <div style="margin-left: 20px;">TOP <u>+1.4 ft</u> BOTTOM <u>18.8 ft</u></div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">OPEN HOLE DIA: <u>3.0 in.</u></div> <div style="margin-left: 20px;">TOP <u>-NA-</u> BOTTOM <u>104.0 ft</u></div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">TOTAL DEPTH: <u>104.0</u></div> </div>	REAMED DIA: <u>8.0 in.</u> EXCAVATED DEPTH: <u>12.4 ft</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Clay soil</u>	
<div style="text-align: center;">-NA-: Not Applicable/Not Available</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>1.0 ft</u></div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">PLUG</div> <div style="margin-left: 20px;">DIA: <u>8.0 in.</u> DEPTH: <u>12.4 ft</u></div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Unplugged wellbore</div> <div style="margin-left: 20px;">DIA: <u>3.0 in.</u></div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Sediment</div> <div style="margin-left: 20px;">DEPTH: <u>70.3 ft</u></div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">TOTAL DEPTH: <u>104.0 ft</u></div> </div>	

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-31

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11/10/84COORDINATES: N 30182 E19520FINISH: 11/11/84REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: S. L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLERS: G. ShillingsHELPERS: R. Phillips/H. HallREASON FOR P&A: Loss of well security/substandard constructionP&A METHOD: D DEVIATIONS FROM METHOD: Extract well
casing, ream well bore to auger refusal, and grout with approval from HSEA

WELL CONSTRUCTION SUMMARY

Note: Some of the information in this section obtained
from field observations.

P&A SUMMARY

REAMED DIA: 8.0 in.
 DRILLED/REAMED
 DEPTH: 8.9 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-32</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-15-94</u>
COORDINATES: <u>N30183 E19080</u>		FINISH: <u>11-15-94</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>T. Coffey - SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Co.</u>		DRILL: <u>-NA-</u>
DRILLER: <u>R. Phillips</u> HELPERS: <u>G. Shillings/H. Hall</u>		
REASON FOR P&A: <u>Loss of well security/substandard construction.</u>		
P&A: METHOD: <u>D</u> DEVIATIONS FROM METHOD: <u>Excavate around wellhead to 1.5 ft BGS, remove casing, and refill pit with clay soil as per HSEA.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Note: Some of the information in this section obtained from field observations.</p> <p>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u> TOP <u>-NA-</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>PVC/#40/SI</u> TOP <u>+0.7 ft</u> DIA: <u>1.25-in. OD</u> BOTTOM <u>62.4 ft</u></p> <p>OPEN HOLE DIA: <u>3.0-in.</u> TOP <u>-NA-</u> BOTTOM <u>100.2 ft</u></p> <p>TOTAL DEPTH: <u>100.2 ft.</u></p> <p>-NA-: Not Applicable/Not Available</p>		<p>REAMED DIA: <u>-NA-</u></p> <p>EXCAVATED DEPTH: <u>1.5 ft</u></p> <p>PLUG MATERIAL: <u>-NA-</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> <p>CAP</p> <p>DEPTH: <u>1.5 ft</u></p> <p>Unplugged wellbore</p> <p>DIA: <u>3.0 in.</u></p> <p>DEPTH: <u>100.2 ft</u></p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-33

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11-14-94COORDINATES: N30294 E19602FINISH: 11-14-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: T. Coffey - SAICDRILLING COMPANY: Highland Drilling Co.DRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: G. ShillingsHELPERS: R. Phillips/H. HallREASON FOR P&A: Loss of well security/substandard construction.P&A: METHOD: D DEVIATIONS FROM METHOD: Reamed wellbore and
drilled up PVC casing with 8.0-in. diameter augers to refusal and grouted, with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: Some of the information in this section obtained from field observations.

REAMED DIA: 8.0 in.DRILLED/REAMED
DEPTH: 10.6 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-34</u>																						
WELL PLUGGING AND ABANDONMENT DIAGRAM																								
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-15-94</u>																						
COORDINATES: <u>N30538 E19600</u>		FINISH: <u>11-15-94</u>																						
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>T. Coffey - SAIC</u>																						
DRILLING COMPANY: <u>Highland Drilling Co.</u>		DRILL: <u>-NA-</u>																						
DRILLER: <u>R. Phillips</u> HELPERS: <u>G. Shillings/H. Hall</u>																								
REASON FOR P&A: <u>Loss of well security/substandard construction.</u>																								
P&A METHOD: <u>D</u> DEVIATIONS FROM METHOD: <u>Excavate around well-head to 2 ft BGS, extract 11 ft of water pipe/casing, and refill pit with HSEA approval.</u>																								
WELL CONSTRUCTION SUMMARY		P&A SUMMARY																						
<p>Note: Some of the information in this section obtained from field observations.</p> <table style="width: 100%; border: none;"> <tr> <td style="border: 1px solid black; padding: 2px;">CONDUCTOR HOLE DIA: <u>-NA-</u></td> <td style="text-align: right;">DEPTH <u>-NA-</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u></td> <td style="text-align: right;">TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">BOREHOLE DIA: <u>3.0 in.</u></td> <td style="text-align: right;">TOP <u>0.0 ft</u> BOTTOM <u>126.3 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">FILLER: <u>-NA-</u></td> <td></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">CASING TYPE: <u>Steel</u> DIA: <u>1.0-in. ID</u></td> <td style="text-align: right;">TOP <u>+2.0 ft</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">OPEN HOLE DIA: <u>3.0 in.</u></td> <td style="text-align: right;">TOP <u>0.0 ft</u> BOTTOM <u>126.3 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">TOTAL DEPTH: <u>126.3 ft</u></td> <td></td> </tr> </table> <p style="text-align: center;">-NA-: Not Applicable/Not Available</p>		CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>	SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	BOREHOLE DIA: <u>3.0 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>126.3 ft</u>	FILLER: <u>-NA-</u>		CASING TYPE: <u>Steel</u> DIA: <u>1.0-in. ID</u>	TOP <u>+2.0 ft</u> BOTTOM <u>-NA-</u>	OPEN HOLE DIA: <u>3.0 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>126.3 ft</u>	TOTAL DEPTH: <u>126.3 ft</u>		<p>REAMED DIA: <u>-NA-</u></p> <p>EXCAVATED DEPTH: <u>2.0 ft</u></p> <p>PLUG MATERIAL: <u>-NA-</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> <table style="width: 100%; border: none;"> <tr> <td style="border: 1px solid black; padding: 2px;">CAP</td> <td style="text-align: right;">DEPTH: <u>2.0 ft</u></td> </tr> <tr> <td colspan="2" style="text-align: center;">Water pipe of unknown length and depths remaining in unplugged borehole.</td> </tr> <tr> <td style="text-align: right;">DIA: <u>3.0 in.</u></td> <td></td> </tr> <tr> <td style="text-align: right;">DEPTH: <u>126.3 ft</u></td> <td></td> </tr> </table>	CAP	DEPTH: <u>2.0 ft</u>	Water pipe of unknown length and depths remaining in unplugged borehole.		DIA: <u>3.0 in.</u>		DEPTH: <u>126.3 ft</u>	
CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>																							
SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																							
BOREHOLE DIA: <u>3.0 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>126.3 ft</u>																							
FILLER: <u>-NA-</u>																								
CASING TYPE: <u>Steel</u> DIA: <u>1.0-in. ID</u>	TOP <u>+2.0 ft</u> BOTTOM <u>-NA-</u>																							
OPEN HOLE DIA: <u>3.0 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>126.3 ft</u>																							
TOTAL DEPTH: <u>126.3 ft</u>																								
CAP	DEPTH: <u>2.0 ft</u>																							
Water pipe of unknown length and depths remaining in unplugged borehole.																								
DIA: <u>3.0 in.</u>																								
DEPTH: <u>126.3 ft</u>																								

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-36

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11-4-94COORDINATES: N30231 E19795FINISH: 11-9-94REFERENCE POINT FOR MEASUREMENTS: Ground surfacePREPARED BY: S. L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: G. ShillingsHELPERS: R. Phillips/H. HallREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: D DEVIATIONS FROM METHOD: Grout borehole to
4 ft below surface casing, extract well casing, ream well bore to auger refusal, and grout with approval
from HSEA.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: Some of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

REAMED DIA: 8 in.
 DRILLED/REAMED
 DEPTH: 15.0 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-39</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-22-94</u>
COORDINATES: <u>N30728 E19793</u>		FINISH: <u>11-22-94</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>T. Coffey - SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Co.</u>		DRILL: <u>-NA-</u>
DRILLER: <u>R. Phillips</u>		HELPERS: <u>G. Shillings/H. Hall</u>
REASON FOR P&A: <u>Loss of well security/substandard construction.</u>		
P&A: METHOD: <u>D</u> DEVIATIONS FROM METHOD: <u>Unscrew top section of water pipe/well casing; leave site as flowing spring as per HSEA.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>Note: Some of the information in this section obtained from field observations.</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p>CONDUCTOR HOLE DIA: <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>PVC/#40</u> DIA: <u>4.6-in. OD</u></p> <p>BOREHOLE DIA: <u>-NA-</u></p> <p>FILLER: <u>-NA-</u></p> <p>CASING TYPE: <u>Steel</u> DIA: <u>1.0-in. ID</u></p> <p>OPEN HOLE DIA: <u>3.0-in.</u></p> <p>TOTAL DEPTH: <u>157.8 ft</u></p> </div> <div style="width: 45%;"> <p>DEPTH <u>-NA-</u></p> <p>TOP <u>+0.9 ft</u> BOTTOM <u>0.9 ft</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>-NA-</u></p> <p>TOP <u>+2.7 ft</u> BOTTOM <u>-NA-</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>157.8 ft</u></p> </div> </div>		<p>REAMED DIA: <u>-NA-</u></p> <p>EXCAVATED DEPTH: <u>-NA-</u></p> <p>PLUG MATERIAL: <u>-NA-</u></p> <p>CAP MATERIAL: <u>-NA-</u></p>
<p>-NA-: Not Applicable/Not Available</p>		<p>Ground Surface</p> <p>Water pipe from 13.1 ft BGS to unknown depth remaining in open wellbore.</p> <p>DIA: <u>3.0 in.</u></p> <p>DEPTH: <u>157.8 ft</u></p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-40

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11-15-94COORDINATES: N30962 E19678FINISH: 11-15-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: T. Coffey - SAICDRILLING COMPANY: Highland Drilling Co.DRILL: -NA-DRILLER: R. PhillipsHELPERS: G. Shillings/H. HallREASON FOR P&A: Loss of well security/substandard construction.P&A: METHOD: D DEVIATIONS FROM METHOD: Excavate around wellhead to 1.3 ft BGS, break of casing at base of pit, and refill pit with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: Some of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

REAMED DIA: -NA-
 EXCAVATED DEPTH: 1.3 ft
 PLUG MATERIAL: -NA-
 CAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-41</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Exxon Nuclear Site</u> COORDINATES: <u>N30536 E20079</u> REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		DATE: START: <u>11-17-94</u> FINISH: <u>11-21-94</u> PREPARED BY: <u>T. Coffey - SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Co.</u> DRILLER: <u>H. Hall</u> HELPERS: <u>R. Phillips/G. Shillings</u>		DRILL: <u>Ingersoll-Rand XL-750</u>
REASON FOR P&A: <u>Loss of well security/substandard construction.</u>		
P&A: METHOD: <u>D</u> DEVIATIONS FROM METHOD: <u>Unable to extract all of water pipe/casing, grout reamed portion of borehole only with HSEA approval.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
Note: Some of the information in this section obtained from field observations.		REAMED DIA: <u>6 1/2 in.</u> EXCAVATED DEPTH: <u>41.7 ft</u> PLUG MATERIAL: <u>Cement</u> CAP MATERIAL: <u>Clay soil</u>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>PVC/#40</u> TOP <u>0.0 ft</u> DIA: <u>4.5-in. OD</u> BOTTOM <u>20.0 ft</u></p> <p>BOREHOLE DIA: <u>-NA-</u> TOP <u>0.0 ft</u> FILLER: <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>CASING TYPE: <u>Steel</u> TOP <u>+2.7 ft</u> DIA: <u>1.0-in. ID</u> BOTTOM <u>-NA-</u></p> <p>OPEN HOLE DIA: <u>3.0 in.</u> TOP <u>-NA-</u> BOTTOM <u>276.0 ft</u></p> <p>TOTAL DEPTH: <u>276.0 ft.</u></p> <p style="text-align: center;">-NA-: Not Applicable/Not Available</p> </div> <div style="width: 45%;"> <p>CAP DEPTH: <u>2.8 ft</u></p> <p>PLUG DIA: <u>6.5 in.</u></p> <p>DEPTH: <u>37.6 ft</u> Collapse DEPTH: <u>41.7 ft</u></p> <p>DIA: <u>3.0 in.</u></p> <p>Water pipe of unknown length and depths remaining in unplugged borehole</p> <p>DEPTH: <u>276.0 ft</u></p> </div> </div>		

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-42

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 9-30-94COORDINATES: N 30728 E20086FINISH: 11-8-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: S. L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. PhillipsHELPERS: H. Hall/J. GallaherREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: D DEVIATIONS FROM METHOD: Not able to
grout bottom of borehole, reamed to 20 ft below top of fresh rock as per HSEA.

WELL CONSTRUCTION SUMMARY

Note: Some of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 6 1/4 in.DRILLED/REAMED
DEPTH: 56.0 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-50

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11-29-94COORDINATES: N28270 E19793FINISH: 11-30-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: T. Coffey - SAICDRILLING COMPANY: Highland Drilling Co.DRILL: Ford 455 backhoe with
McMillan DiggerheadDRILLER: G. ShillingsHELPER: R. PhillipsREASON FOR P&A: Loss of well security/substandard construction.P&A: METHOD: D DEVIATIONS FROM METHOD: Remove well casing,
ream wellbore to auger refusal, and grout with approval from HSEA.

WELL CONSTRUCTION SUMMARY

Note: Some of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 8.0 in.EXCAVATED DEPTH: 13.5 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM
WELL NO. BC-62
WELL PLUGGING AND ABANDONMENT DIAGRAM
LOCATION: Exxon Nuclear Site
DATE: START: 11-14-94
COORDINATES: N30495 E19599
FINISH: 11-15-94
REFERENCE POINT FOR MEASUREMENTS: Ground Surface
PREPARED BY: T. Coffey - SAK
DRILLING COMPANY: Highland Drilling Company
DRILL: Ford 455 Backhoe w/
McMillan Diggerhead
DRILLER: G. Shillings
HELPERS: R. Phillips/H. Hall
REASON FOR P&A: Loss of well security/substandard construction
P&A: METHOD: D **DEVIATIONS FROM METHOD:** Reamed wellbore and drilled up PVC casing with 8.0-in. diameter augers to refusal and grouted with HSEA approval
WELL CONSTRUCTION SUMMARY

Note: Some of the information in this section obtained from field observation.

NA: Not Applicable/Not Available

P&A SUMMARY
REAMED DIA: 8.0 in.
DRILLED/REAMED DEPTH: 10.8 ft.
PLUG MATERIAL: Cement
CAP MATERIAL: Clay Soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-12 (BC-86)

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 6-22-84COORDINATES: N30382 E20103FINISH: 9-15-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLERS: H. Hall/R. PhillipsHELPERS: J. Monger/D. WilfordREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: D DEVIATIONS FROM METHOD: Open interval grouted without conditioning borehole; ream to 5.1 ft below casing and grout with HSEA approval

WELL CONSTRUCTION SUMMARY

Note: Most of the information in this section obtained from field observations.

P&A SUMMARY

REAMED DIA: 6 1/8 in.DRILLED/REAMED DEPTH: 42.8 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-14

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11/3/94COORDINATES: N30266 E19796FINISH: 11/9/94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: S. L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: G. ShillingsHELPERS: R. Phillips/H. HallREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: B DEVIATIONS FROM METHOD: Extract well casing,
ream well bore to auger refusal, and grout with approval from HSEA

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: All of the information in this section obtained from field observations.

REAMED DIA: 8.0 in.
 DRILLED/REAMED DEPTH: 12.5 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-15

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 10-3-94COORDINATES: N30281 E19795FINISH: 11-8-94REFERENCE POINT FOR MEASUREMENTS: Ground surfacePREPARED BY: S. L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. PhillipsHELPERS: H. Hall/G. Shillings/J. GallaherREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: B DEVIATIONS FROM METHOD: Ream wellbore approximately 5 ft. beyond tagged depth of well with HSEA approval.

WELL CONSTRUCTION SUMMARY

Note: All of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 8 3/4 in.DRILLED/REAMED DEPTH: 22.2 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-17

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11/11/94COORDINATES: N 30180 E19641FINISH: 11/14/94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: S. L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: G. ShillingsHELPERS: R. Phillips/H. HallREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: C DEVIATIONS FROM METHOD: Extract some well
casing, ream well bore to auger refusal, and grout with approval from HSE&A

WELL CONSTRUCTION SUMMARY

Note: All of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 8.0 in.DRILLED/REAMED
DEPTH: 7.9 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM
WELL NO. BCU-18
WELL PLUGGING AND ABANDONMENT DIAGRAM
LOCATION: Exxon Nuclear Site
DATE: START: 11/11/94
COORDINATES: N 30149 E19622
FINISH: 11/14/94
REFERENCE POINT FOR MEASUREMENTS: Ground Surface
PREPARED BY: S. L. Abston - SAIC
DRILLING COMPANY: Highland Drilling Company
DRILL: Ford 455 Backhoe with
McMillan Diggerhead
DRILLER: G. Shillings
HELPERS: R. Phillips/H. Hall
REASON FOR P&A: Loss of well security/substandard construction
P&A: METHOD: C **DEVIATIONS FROM METHOD:** Extract some well
casing, ream well bore to auger refusal, and grout with approval from HSEA
WELL CONSTRUCTION SUMMARY

Note: All of the information in this section obtained from field observations.

P&A SUMMARY
REAMED DIA: 8.0 in.
DRILLED/REAMED DEPTH: 7.6 ft BGS
PLUG MATERIAL: Cement
CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-19

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11-10-94COORDINATES: N 30181 E19600FINISH: 11-11-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: S. L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: G. ShillingsHELPERS: R. Phillips/H. HallREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: CDEVIATIONS FROM METHOD: Extract some well
casing, ream well bore to auger refusal, and grout with approval from HSEA

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: All of the information in this section obtained from field observations.

REAMED DIA: 8.0 in.DRILLED/REAMED DEPTH: 8.4 ft BGSPLUG MATERIAL: CementCAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-21

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 9-26-94COORDINATES: N30392 E19791FINISH: 10-4-94REFERENCE POINT FOR MEASUREMENTS: Ground surfacePREPARED BY: S. L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. Phillips/H. HallHELPERS: J. GallaherREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: B DEVIATIONS FROM METHOD: Grout open interval without conditioning wellbore, ream to approximately 20 ft below top of fresh bedrock and grout; with HSEA approval.

WELL CONSTRUCTION SUMMARY

Note: All of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 8 3/4 in.DRILLED/REAMED DEPTH: 35 ftPLUG MATERIAL: CementCAP MATERIAL: Clay

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-22

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 11-15-94COORDINATES: N30671 E19806FINISH: 11-15-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: T. Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: -NA-DRILLER: R. PhillipsHELPERS: G. Shillings/H. HallREASON FOR P&A: Loss of well security/substandard construction.P&A: METHOD: C DEVIATIONS FROM METHOD: Section of loose PVC screen/casing removed from creek bank; creek bank restored to original condition as per HSEA.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: All of the information in this section was obtained from field observations.

NA: Not Applicable/Not Available

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

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-23</u>																												
WELL PLUGGING AND ABANDONMENT DIAGRAM																														
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-14-94</u>																												
COORDINATES: <u>N30643.5 E19828.1</u>		FINISH: <u>9-16-94</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>H. Hall</u>		HELPERS: <u>R. Phillips/J. Monger</u>																												
REASON FOR P&A: <u>Loss of well security/substandard construction</u>																														
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Casing extracted after reaming the well bore, leaving an unknown amount of casing in bore.</u>																														
WELL CONSTRUCTION SUMMARY		P&A SUMMARY																												
<p>Note: All of the information in this section obtained from field observations.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">CONDUCTOR HOLE DIA: <u>-NA-</u></td> <td style="width: 60%;">DEPTH <u>-NA-</u></td> </tr> <tr> <td>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td>BOREHOLE DIA.: <u>5.0 in.</u></td> <td>TOP <u>0.0 ft</u> BOTTOM <u>58.3 ft</u></td> </tr> <tr> <td>FILLER: <u>-NA-</u></td> <td></td> </tr> <tr> <td>CASING (WITH SCREEN) TYPE: <u>PVC/#80</u> DIA: <u>1.25-in. OD</u></td> <td>TOP <u>+0.6 ft</u> BOTTOM <u>9.2 ft</u></td> </tr> <tr> <td>SEAL: <u>-NA-</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td>FILTER PACK: <u>Gravel</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td>SCREEN TYPE: <u>PVC/slotted</u> DIA: <u>1.25-in. OD</u></td> <td>TOP <u>9.2 ft</u> BOTTOM <u>58.3 ft</u></td> </tr> <tr> <td>TOTAL DEPTH: <u>58.3 ft</u></td> <td></td> </tr> </table> <p style="font-size: small;">-NA-: Not Applicable/ Not Available * Apparent depth</p>		CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>	SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	BOREHOLE DIA.: <u>5.0 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>58.3 ft</u>	FILLER: <u>-NA-</u>		CASING (WITH SCREEN) TYPE: <u>PVC/#80</u> DIA: <u>1.25-in. OD</u>	TOP <u>+0.6 ft</u> BOTTOM <u>9.2 ft</u>	SEAL: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	FILTER PACK: <u>Gravel</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	SCREEN TYPE: <u>PVC/slotted</u> DIA: <u>1.25-in. OD</u>	TOP <u>9.2 ft</u> BOTTOM <u>58.3 ft</u>	TOTAL DEPTH: <u>58.3 ft</u>		<p>REAMED DIA: <u>6 1/4 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>63.4 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">CAP</td> <td style="width: 60%;">DEPTH: <u>1.0 ft</u></td> </tr> <tr> <td>PLUG</td> <td>DIA: <u>6 1/4 in.</u></td> </tr> <tr> <td></td> <td>DEPTH: <u>63.0 ft</u></td> </tr> <tr> <td></td> <td>COLLAPSE</td> </tr> <tr> <td></td> <td>DEPTH: <u>63.4 ft</u></td> </tr> </table>	CAP	DEPTH: <u>1.0 ft</u>	PLUG	DIA: <u>6 1/4 in.</u>		DEPTH: <u>63.0 ft</u>		COLLAPSE		DEPTH: <u>63.4 ft</u>
CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>																													
SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																													
BOREHOLE DIA.: <u>5.0 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>58.3 ft</u>																													
FILLER: <u>-NA-</u>																														
CASING (WITH SCREEN) TYPE: <u>PVC/#80</u> DIA: <u>1.25-in. OD</u>	TOP <u>+0.6 ft</u> BOTTOM <u>9.2 ft</u>																													
SEAL: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																													
FILTER PACK: <u>Gravel</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																													
SCREEN TYPE: <u>PVC/slotted</u> DIA: <u>1.25-in. OD</u>	TOP <u>9.2 ft</u> BOTTOM <u>58.3 ft</u>																													
TOTAL DEPTH: <u>58.3 ft</u>																														
CAP	DEPTH: <u>1.0 ft</u>																													
PLUG	DIA: <u>6 1/4 in.</u>																													
	DEPTH: <u>63.0 ft</u>																													
	COLLAPSE																													
	DEPTH: <u>63.4 ft</u>																													

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-24

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 9-15-94COORDINATES: N30646.9 E19840.2FINISH: 9-29-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. HallHELPERS: R. Phillips/J. MengerREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: C DEVIATIONS FROM METHOD: Casing drilled up while reaming the well bore with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: All of the information in this section obtained from field observations.

REAMED DIA: 6 1/4 in.
 DRILLED/REAMED
 DEPTH: 64.6 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-25

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 9-16-94COORDINATES: N30643.3 E19844.7FINISH: 9-29-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. HallHELPER: R. PhillipsREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: C DEVIATIONS FROM METHOD: Casing drilled up while reaming the well bore with HSEA approval.

WELL CONSTRUCTION SUMMARY

Note: All of the information in this section obtained from field observations.

P&A SUMMARY

REAMED DIA: 6 1/4 in.

DRILLED/REAMED

DEPTH: 63.5 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-26

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 9-19-94COORDINATES: N30645.1 E19844.4FINISH: 9-21-94REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: S.L. Abston - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. HallHELPERS: J. Gaffahan/R. PhillipsREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: C DEVIATIONS FROM METHOD: Drill up PVC casing and screen while reaming wellbore with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: All of the information in this section obtained from field observations.

-NA-: Not Applicable/
Not Available
*Apparent depth

REAMED DIA: 6 1/4 in.
 DRILLED/REAMED DEPTH: 65.8 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BCU-27

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Exxon Nuclear SiteDATE: START: 9-20-94COORDINATES: N30E 46.7 E19844.2FINISH: 9-29-94

Susan L. Abston

REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. PhillipsHELPERS: J. GallaherREASON FOR P&A: Loss of well security/substandard constructionP&A: METHOD: C DEVIATIONS FROM METHOD: Drill up PVC casing and screen while reaming wellbore with HSEA approval.

WELL CONSTRUCTION SUMMARY

Note: All of the information in this section obtained from field observations.

P&A SUMMARY

REAMED DIA: 6 1/4 in.

DRILLED/REAMED

DEPTH: 63.3 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

 WELL NO. BCU-28
WELL PLUGGING AND ABANDONMENT DIAGRAM

 LOCATION: Exxon Nuclear Site

 DATE: START: 9-22-94

 COORDINATES: N30648 E19844

 FINISH: 9-29-94

 REFERENCE POINT FOR MEASUREMENTS: Ground surface

 PREPARED BY: S. L. Abston - SAIC

 DRILLING COMPANY: Highland Drilling Company

 DRILL: Ingersoll-Rand XL-750

 DRILLERS: R. Phillips/H. Hall

 HELPER: J. Gallaher

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

 P&A: METHOD: C DEVIATIONS FROM METHOD: Ream wellbore and drill up PVC well casing in one pass with HSEA approval.
WELL CONSTRUCTION SUMMARY
P&A SUMMARY

Note: All of the information in this section obtained from field observations.

 REAMED DIA: 6 1/4 in.
 DRILLED/REAMED DEPTH: 64.1 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-29</u>																										
WELL PLUGGING AND ABANDONMENT DIAGRAM																												
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-26-94</u>																										
COORDINATES: <u>N30650 E19844</u>		FINISH: <u>10-3-94</u>																										
REFERENCE POINT FOR MEASUREMENTS: <u>Ground surface</u>		PREPARED BY: <u>S. L. Abston - SAIC</u>																										
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>																										
DRILLERS: <u>R. Phillips/H. Hall</u>		HELPER: <u>J. Gallaher</u>																										
REASON FOR P&A: <u>Loss of well security/substandard construction</u>																												
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Ream wellbore and drill up PVC well casing in one pass with HSEA approval.</u>																												
WELL CONSTRUCTION SUMMARY		P&A SUMMARY																										
<p>Note: All of the information in this section obtained from field observations.</p> <table border="0" style="width: 100%;"> <tr> <td style="border: 1px solid black; padding: 2px;">CONDUCTOR HOLE DIA: <u>-NA-</u></td> <td style="text-align: right;">DEPTH <u>-NA-</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u></td> <td style="text-align: right;">TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">BOREHOLE DIA.: <u>5.0 in</u></td> <td style="text-align: right;">TOP <u>0.0 ft</u> BOTTOM <u>59.2 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">FILLER: <u>-NA-</u></td> <td></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">CASING (WITH SCREEN) TYPE: <u>PVC/#80</u> DIA: <u>1.25-in. OD</u></td> <td style="text-align: right;">TOP <u>+0.7 ft</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SEAL: <u>-NA-</u></td> <td style="text-align: right;">TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">FILTER PACK: <u>-NA-</u></td> <td style="text-align: right;">TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">SCREEN TYPE: <u>PVC/#40/slot</u> DIA: <u>1.25-in. OD</u></td> <td style="text-align: right;">TOP <u>-NA-</u> BOTTOM <u>59.2 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">TOTAL DEPTH: <u>59.2 ft</u></td> <td></td> </tr> </table> <p style="font-size: small;">-NA-: Not Applicable/ Not Available * Apparent Depth</p>		CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>	SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	BOREHOLE DIA.: <u>5.0 in</u>	TOP <u>0.0 ft</u> BOTTOM <u>59.2 ft</u>	FILLER: <u>-NA-</u>		CASING (WITH SCREEN) TYPE: <u>PVC/#80</u> DIA: <u>1.25-in. OD</u>	TOP <u>+0.7 ft</u> BOTTOM <u>-NA-</u>	SEAL: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	FILTER PACK: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	SCREEN TYPE: <u>PVC/#40/slot</u> DIA: <u>1.25-in. OD</u>	TOP <u>-NA-</u> BOTTOM <u>59.2 ft</u>	TOTAL DEPTH: <u>59.2 ft</u>		<p>REAMED DIA: <u>6 1/4 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>64.2 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> <table border="0" style="width: 100%;"> <tr> <td style="border: 1px solid black; padding: 2px;">CAP</td> <td style="text-align: right;">DEPTH: <u>3.9 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">PLUG</td> <td style="text-align: right;">DIA: <u>6 1/4 in.</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">COLLAPSE</td> <td style="text-align: right;">DEPTH: <u>63.5 ft</u></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">TOTAL DEPTH: <u>64.2 ft</u></td> <td></td> </tr> </table>	CAP	DEPTH: <u>3.9 ft</u>	PLUG	DIA: <u>6 1/4 in.</u>	COLLAPSE	DEPTH: <u>63.5 ft</u>	TOTAL DEPTH: <u>64.2 ft</u>	
CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>																											
SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																											
BOREHOLE DIA.: <u>5.0 in</u>	TOP <u>0.0 ft</u> BOTTOM <u>59.2 ft</u>																											
FILLER: <u>-NA-</u>																												
CASING (WITH SCREEN) TYPE: <u>PVC/#80</u> DIA: <u>1.25-in. OD</u>	TOP <u>+0.7 ft</u> BOTTOM <u>-NA-</u>																											
SEAL: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																											
FILTER PACK: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																											
SCREEN TYPE: <u>PVC/#40/slot</u> DIA: <u>1.25-in. OD</u>	TOP <u>-NA-</u> BOTTOM <u>59.2 ft</u>																											
TOTAL DEPTH: <u>59.2 ft</u>																												
CAP	DEPTH: <u>3.9 ft</u>																											
PLUG	DIA: <u>6 1/4 in.</u>																											
COLLAPSE	DEPTH: <u>63.5 ft</u>																											
TOTAL DEPTH: <u>64.2 ft</u>																												

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. CO-2

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: N30086, E38510DATE: START: 3-16-95COORDINATES: N30086, E38510FINISHED: 3-20-95REFERENCE POINTS FOR MEASUREMENTS: Ground surfacePREPARED BY: Timothy Coffey (SAIC)DRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. CollinsHELPERS: R. Phillips/G. ShillingsREASON FOR P&A: Loss of well security/substandard construction.P&A METHOD: BDEVIATIONS FROM METHOD: None.

WELL CONSTRUCTION SUMMARY

Note: All of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

*: Apparent total depth.

P&A SUMMARY

REAMED DIA: 6 1/4 in.DRILLED/REAMED
DEPTH: 112.0 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. CO-4

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: West Bear Creek ValleyDATE: START: 3-15-95COORDINATES: N29410, E38525FINISHED: 3-17-95REFERENCE POINTS FOR MEASUREMENTS: Ground surfacePREPARED BY: Timothy Coffey (SAIC)DRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. Hall

HELPERS:

R. Phillips/G. ShillingsREASON FOR P&A: Loss of well security/substandard construction.P&A METHOD: BDEVIATIONS FROM METHOD: Wellbore not reamed to1 ft beyond TD, Shur-Plug™ used to bridge cavity with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: All of the information in this section obtained from field observations.

REAMED DIA: 6 1/4 in.DRILLED/REAMED
DEPTH: 50.4 ftPLUG MATERIAL: Shur-Plug™/
CementCAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

*: Apparent total depth.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-048

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial GroundsDATE: START: 6-5-95COORDINATES: N29386 E44241FINISH: 6-6-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: H. HallHELPERS: J. Gallahan/J. MongerREASON FOR P&A: Well was damaged.P&A METHOD: A DEVIATIONS FROM METHOD: Unable to ream wellbore
to 1 ft beyond TD; cap with cement level less than 1 ft BGS, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

P&A SUMMARY

Note: Some of the information in this section obtained
from field observations. REAMED DIA: 8.0 in.DRILLED/REAMED
DEPTH: 8.8 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

Information Source: Subsurface Data Base (Y/TS-881/R2).

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-049

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial GroundsDATE: START: 5-4-95COORDINATES: N29245 E44129FINISH: 5-8-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. JonesHELPERS: R. Phillips/G. ShillingsREASON FOR P&A: Sampling pump stuck inside well.P&A METHOD: A DEVIATIONS FROM METHOD: Unable to ream wellbore to 1 ft beyond well total depth, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

P&A SUMMARY

Note: Some of the information in this section obtained from field observations.

REAMED DIA: 8.0 in.

DRILLED/REAMED

DEPTH: 17.2 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

*Information Source: Subsurface Data Base (Y/TS-881/R2).

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-050

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial GroundsDATE: START: 5-2-95COORDINATES: N28074 E44101FINISH: 5-4-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. PhillipsHELPERS: R. Jones/G. ShillingsREASON FOR P&A: Well is dry during most of the year.P&A METHOD: A DEVIATIONS FROM METHOD: None.

WELL CONSTRUCTION SUMMARY*

P&A SUMMARY

Note: Some of the information in this section obtained from field observations.

REAMED DIA: 8.0 in.DRILLED/REAMED DEPTH: 16.2 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

*Information Source: Subsurface Data Base (Y/TS-881/R2).

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-051

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial GroundsDATE: START: 5-3-95COORDINATES: N29051 E43744FINISH: 5-5-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. PhillipsHELPERS: R. Jones/G. ShillingsREASON FOR P&A: Well is dry during most of the yearP&A METHOD: A DEVIATIONS FROM METHOD: With approval from HSEA, the wellbore was not reamed to 1 ft beyond total depth.

WELL CONSTRUCTION SUMMARY*

P&A SUMMARY

Note: Some of the information in this section obtained from field observations.

REAMED DIA: 8.0 in.

DRILLED/REAMED

DEPTH: 11.2 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

*Information Source: Subsurface Data Base (Y/TS-891/R2).

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL PLUGGING AND ABANDONMENT DIAGRAM

WELL NO. GW-060LOCATION: Bear Creek Burial GroundsDATE: START: 5-19-95COORDINATES: N28931 E43047FINISH: 5-23-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: R. PhillipsHELPERS: J. Gallaher/J. MongerREASON FOR P&A: Sampling pump stuck inside well.P&A METHOD: A DEVIATIONS FROM METHOD: Unable to remove all of casing/screen; or ream to 1 ft beyond TD. HSEA approves of deviation.

WELL CONSTRUCTION SUMMARY*

Note: Some of the information in this section obtained from field observations.

P&A SUMMARY

REAMED DIA: 6 1/2 in.DRILLED/REAMED DEPTH: 19.7 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil

*Information Source: Subsurface Data Base (Y/TS-881/R2).

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-096A

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Bear Creek Burial GroundsDATE: START: 5-5-95COORDINATES: N29254 E44116FINISH: 5-16-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLERS: R. Phillips/R. JonesHELPERS: G. Shillings/J. GallaherREASON FOR P&A: Well was obstructed by a stuck bailer.P&A METHOD: A DEVIATIONS FROM METHOD: Did not remove all casing/
screen; did not ream well bore to 1 ft beyond total depth, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

P&A SUMMARY

Note: Some of the information in this section obtained from field observations.

REAMED DIA: 8 3/4 in.DRILLED/REAMED DEPTH: 49.5 ftPLUG MATERIAL: CementCAP MATERIAL: Clay soil *Information Source: Subsurface Data Base (Y/TS-881/R2).
-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-182

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Chestnut Ridge Security PitDATE: START: 6-20-95COORDINATES: N28373 E57663FINISH: 6-21-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: -NA-DRILLER: R. PhillipsHELPER: H. HallREASON FOR P&A: Obsolete well/bottom of borehole collapsed.P&A METHOD: D DEVIATIONS FROM METHOD: Wellbore and cased portion grouted to top; man-hole access filled with concrete, with HSEA approval.

WELL CONSTRUCTION SUMMARY*

P&A SUMMARY

REAMED DIA: -NA-

DRILLED/REAMED
DEPTH: -NA-

PLUG MATERIAL: Bentonite/ Cement

CAP MATERIAL: Concrete

*Information source: Subsurface Data Base (Y/TS-88/R2)

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-209</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Bear Creek Valley, along Hwy. 95</u>		DATE: START: <u>11-1-94</u>
COORDINATES: <u>N31775 E27699</u>		FINISH: <u>11-8-94</u>
REFERENCE POINT FOR MEASUREMENTS: <u>Ground Surface</u>		PREPARED BY: <u>S.L. Abston-SAIC</u>
DRILLING COMPANY: <u>Highland Drilling Company</u>		DRILL: <u>Ingersoll-Rand XL-750</u>
DRILLER: <u>R. Phillips</u>		HELPERS: <u>J. Monger/H. Hall</u>
REASON FOR P&A: <u>Loss of well security/substandard construction</u>		
P&A: METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>None</u>		

WELL CONSTRUCTION SUMMARY	P&A SUMMARY
<p>Note: Some of the information in this section obtained from field observations.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 50%;"> <p>REAMED DIA: <u>8 1/4 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>49.1 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> </div> </div>	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CONDUCTOR HOLE DIA: <u>-NA-</u></p> <p>DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>BOREHOLE DIA: <u>8.0</u></p> <p>TOP <u>0.0 ft</u> BOTTOM <u>48.1 ft</u></p> <p>FILLER: <u>grout</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>2.37 in. OD</u></p> <p>TOP <u>+0.5 ft</u> BOTTOM <u>43.0 ft</u></p> <p>SEAL: <u>-NA-</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>FILTER PACK: <u>Sand</u></p> <p>TOP <u>42.0 ft</u> BOTTOM <u>48.1 ft</u></p> <p>SCREEN TYPE: <u>PVC/sw/.01</u> DIA: <u>2.37 in. OD</u></p> <p>TOP <u>43.0 ft</u> BOTTOM <u>48.1 ft</u></p> <p>TOTAL DEPTH: <u>48.1 ft</u></p> </div> <div style="width: 50%;"> <p>CAP</p> <p>DEPTH: <u>3.1 ft</u></p> <p>DIA: <u>8 1/4 in.</u></p> <p>PLUG</p> <p>DEPTH: <u>45.3 ft</u></p> <p>CAVE IN</p> <p>DEPTH: <u>49.1 ft</u></p> </div> </div>	<p>-NA-: Not Applicable/Not Available</p>

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-215

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: West Bear Creek ValleyDATE: START: 3-21-95COORDINATES: N29369 E9169FINISH: 3-22-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillan DiggerheadDRILLER: H. HallHELPER: R. PhillipsREASON FOR P&A: Loss of well security/substandard construction.P&A METHOD: A DEVIATIONS FROM METHOD: Did not ream larger
than original borehole; did not ream to 1 ft beyond well TD with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

REAMED DIA: 8.0 in.
 DRILLED/REAMED
 DEPTH: 12.9 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-216

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: West Bear Creek ValleyDATE: START: 3-22-95COORDINATES: N29384 E9170FINISH: 3-23-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: -NA-DRILLER: R. PhillipsHELPERS: H. Hall/D. WillifordREASON FOR P&A: Loss of well security/substandard construction.P&A METHOD: A DEVIATIONS FROM METHOD: Top 1.3 ft of casing removed; well grouted in place with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: Some of the information in this section obtained from field observations.

REAMED DIA: -NA-DRILLED/REAMED DEPTH: -NA-PLUG MATERIAL: CementCAP MATERIAL: Clay soil

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. GW-447

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Gum Branch Road AreaDATE: START: 4-17-95COORDINATES: N29894 E31745FINISH: 4-18-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: Ford 455 Backhoe with
McMillen DiggerheadDRILLER: G. ShillingsHELPER: J. MongerREASON FOR P&A: Dry wellP&A METHOD: A DEVIATIONS FROM METHOD: None.

WELL CONSTRUCTION SUMMARY

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 8 in.
 DRILLED/REAMED
 DEPTH: 10.4 ft
 PLUG MATERIAL: Cement
 CAP MATERIAL: Clay soil

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>GW-545</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Landfill VI</u>	DATE: START: <u>2-1-95</u>	
COORDINATES: <u>N27641 E51729</u>	FINISH: <u>2-7-95</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>	
DRILLERS: <u>H. Hall/R. Phillips</u>	HELPERS: <u>G. Shillings/J. Monger</u>	
REASON FOR P&A: <u>Well had extremely low recharge rate.</u>		
P&A METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Use of Quik-Form™ to clean borehole; use of bentonite to partially plug reamed borehole; final cement > 4 ft BGS, with HSEA approval.</u>		

WELL CONSTRUCTION SUMMARY	P&A SUMMARY
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CONDUCTOR HOLE DIA: <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u></p> <p>BOREHOLE DIA.: 9.25 in.</p> <p>FILLER: Cement</p> <p>CASING (WITH SCREEN) TYPE: <u>SS/#304</u> DIA: <u>4.5-in. OD</u></p> <p>SEAL: -NA-</p> <p>FILTER PACK: Sand</p> <p>SCREEN TYPE: <u>SS/s/01</u> DIA: <u>4.5-in. OD</u></p> <p>TOTAL DEPTH: 67.0</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>67.0 ft</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>TOP <u>55.2 ft</u> BOTTOM <u>67.0 ft</u></p> <p>TOP <u>56.7 ft</u> BOTTOM <u>67.0 ft</u></p> </div> </div>	<p>REAMED DIA: <u>9 7/8 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>68.0 ft</u></p> <p>Shur-Plug™ PLUG MATERIAL: <u>cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CAP</p> <p>PLUG</p> <p>Shur-Plug™ bentonite</p> <p>COLLAPSE/FILL</p> </div> <div style="width: 45%;"> <p>DEPTH: <u>6.6 ft</u></p> <p>DIA: <u>9 7/8 in.</u></p> <p>DEPTH: <u>42.0 ft</u></p> <p>DEPTH: <u>61.6 ft</u></p> <p>DEPTH: <u>68.0 ft</u></p> </div> </div>

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>LL-HAZ-04</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>Gum Branch Road Area</u>		DATE: START: <u>4-24-95</u>
COORDINATES: <u>N29783 E32582</u>		FINISH: <u>4-26-95</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>R. Phillips</u>		HELPERS: <u>G. Shillings/J. Monger</u>
REASON FOR P&A: <u>Obsolete and substandard well construction</u>		
P&A METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Drilled up casing and reamed wellbore in one pass; borehole capped with cement greater than 4 ft BGS.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
<p>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> TOP <u>-NA-</u> DIA: <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>BOREHOLE DIA: <u>8 in.</u> TOP <u>0.0 ft</u> BOTTOM <u>25.0 ft</u></p> <p>FILLER: <u>None</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> TOP <u>+1.2 ft</u> DIA: <u>6.5-in. OD</u> BOTTOM <u>5.0 ft</u></p> <p>SEAL: <u>None</u> TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>FILTER PACK: <u>Sand</u> TOP <u>1.0 ft</u> BOTTOM <u>25.0 ft</u></p> <p>SCREEN TYPE: <u>PVC</u> TOP <u>5.0 ft</u> DIA: <u>6.5-in. OD</u> BOTTOM <u>25.0 ft</u></p> <p>TOTAL DEPTH: <u>25.0</u></p>		<p>REAMED DIA: <u>8 3/4 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>27.3 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p>
		<p>CAP DEPTH: <u>4.3 ft</u></p> <p>PLUG DIA: <u>8 3/4 in.</u></p> <p>DEPTH: <u>25.1 ft</u></p> <p>COLLAPSE/FILL DEPTH: <u>27.3 ft</u></p>

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>LL-HAZ-15</u>																		
WELL PLUGGING AND ABANDONMENT DIAGRAM																				
LOCATION: <u>Gum Branch Road Area</u>	DATE: START: <u>4-25-95</u>																			
COORDINATES: <u>N29780 E32153</u>	FINISH: <u>4-28-95</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: _____	HELPERS: _____																			
REASON FOR P&A: <u>Loss of well security/substandard construction.</u>																				
P&A METHOD: <u>A</u> DEVIATIONS FROM METHOD: <u>Unable to drill up all casing/ream wellbore to TD; cap with cement greater than 4 ft BGS, with HSEA approval.</u>																				
WELL CONSTRUCTION SUMMARY*		P&A SUMMARY
<p>Diagram showing the well construction from the surface down to the total depth of 375.0 ft. The well is shown as a vertical shaft with various components labeled on the right.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>CONDUCTOR HOLE DIA: <u>-NA-</u></td> <td>DEPTH <u>-NA-</u></td> </tr> <tr> <td>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td>BOREHOLE DIA.: <u>6.13 in.</u></td> <td>TOP <u>0.0 ft</u> BOTTOM <u>375.0 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>2.37-in. OD</u></td> <td>TOP <u>+1.6 ft</u> BOTTOM <u>362.0 ft</u></td> </tr> <tr> <td>SEAL: <u>-NA-</u></td> <td>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></td> </tr> <tr> <td>FILTER PACK: <u>Sand</u></td> <td>TOP <u>360.0 ft</u> BOTTOM <u>372.0 ft</u></td> </tr> <tr> <td>SCREEN TYPE: <u>PVC/sV.01</u> DIA: <u>2.37-in. OD</u></td> <td>TOP <u>362.0 ft</u> BOTTOM <u>372.0 ft</u></td> </tr> <tr> <td colspan="2">TOTAL DEPTH: <u>375.0</u></td> </tr> </table>		CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>	SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	BOREHOLE DIA.: <u>6.13 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>375.0 ft</u>	FILLER: <u>Cement</u>		CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>2.37-in. OD</u>	TOP <u>+1.6 ft</u> BOTTOM <u>362.0 ft</u>	SEAL: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>	FILTER PACK: <u>Sand</u>	TOP <u>360.0 ft</u> BOTTOM <u>372.0 ft</u>	SCREEN TYPE: <u>PVC/sV.01</u> DIA: <u>2.37-in. OD</u>	TOP <u>362.0 ft</u> BOTTOM <u>372.0 ft</u>	TOTAL DEPTH: <u>375.0</u>		<p>REAMED DIA: <u>8 3/4 in.</u></p> <p>DRILLED/REAMED DEPTH: <u>35.2 ft</u></p> <p>PLUG MATERIAL: <u>Cement</u></p> <p>CAP MATERIAL: <u>Clay soil</u></p>
CONDUCTOR HOLE DIA: <u>-NA-</u>	DEPTH <u>-NA-</u>																			
SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																			
BOREHOLE DIA.: <u>6.13 in.</u>	TOP <u>0.0 ft</u> BOTTOM <u>375.0 ft</u>																			
FILLER: <u>Cement</u>																				
CASING (WITH SCREEN) TYPE: <u>PVC/#40</u> DIA: <u>2.37-in. OD</u>	TOP <u>+1.6 ft</u> BOTTOM <u>362.0 ft</u>																			
SEAL: <u>-NA-</u>	TOP <u>-NA-</u> BOTTOM <u>-NA-</u>																			
FILTER PACK: <u>Sand</u>	TOP <u>360.0 ft</u> BOTTOM <u>372.0 ft</u>																			
SCREEN TYPE: <u>PVC/sV.01</u> DIA: <u>2.37-in. OD</u>	TOP <u>362.0 ft</u> BOTTOM <u>372.0 ft</u>																			
TOTAL DEPTH: <u>375.0</u>
<p>Diagram showing the well construction from the surface down to the total depth of 375.0 ft. The well is shown as a vertical shaft with various components labeled on the right.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>CAP</td> <td>DEPTH: <u>4.7 ft</u></td> </tr> <tr> <td>PLUG</td> <td>DIA: <u>8 3/4 in.</u></td> </tr> <tr> <td></td> <td>DEPTH: <u>34.0 ft</u></td> </tr> <tr> <td></td> <td>COLLAPSE/FILL</td> </tr> <tr> <td></td> <td>DEPTH: <u>35.2 ft</u></td> </tr> <tr> <td></td> <td>DIA: <u>6 1/8 in.</u></td> </tr> <tr> <td></td> <td>DEPTH: <u>375.0 ft</u></td> </tr> </table>		CAP	DEPTH: <u>4.7 ft</u>	PLUG	DIA: <u>8 3/4 in.</u>		DEPTH: <u>34.0 ft</u>		COLLAPSE/FILL		DEPTH: <u>35.2 ft</u>		DIA: <u>6 1/8 in.</u>		DEPTH: <u>375.0 ft</u>					
CAP	DEPTH: <u>4.7 ft</u>																			
PLUG	DIA: <u>8 3/4 in.</u>																			
	DEPTH: <u>34.0 ft</u>																			
	COLLAPSE/FILL																			
	DEPTH: <u>35.2 ft</u>																			
	DIA: <u>6 1/8 in.</u>																			
	DEPTH: <u>375.0 ft</u>																			

*Information Source: Subsurface Data Base (Y/TS-881/R2).
 -NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. OR-03

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Gum Branch RoadDATE: START: 3-23-95COORDINATES: N30074 E33117FINISHED: 3-27-95REFERENCE POINTS FOR MEASUREMENTS: Ground surfacePREPARED BY: Timothy Coffey (SAIC)DRILLING COMPANY: Highland Drilling CompanyDRILL: Ingersoll-Rand XL-750DRILLER: H. HallHELPERS: R. Phillips/G. ShillingsREASON FOR P&A: Loss of well security/substandard construction.P&A METHOD: BDEVIATIONS FROM METHOD: None.

WELL CONSTRUCTION SUMMARY

Note: Some of the information in this section obtained from field observations.

-NA-: Not Applicable/Not Available

P&A SUMMARY

REAMED DIA: 6 1/4 in.DRILLED/REAMED
DEPTH: 102.2 ftPLUG MATERIAL: CementCAP MATERIAL: Gravel/cuttings

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. S3-1
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>
COORDINATES: <u>N30427 E52537</u>		FINISH: <u>6-19-95</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>-NA-</u>
DRILLER: <u>H. Hall</u> HELPER: <u>J. Gallaher</u>		
REASON FOR P&A: <u>Obsolete well.</u>		
P&A METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Casing stick-up removed and remaining casing plugged in place to minimize waste, with HSEA approval.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
Note: Information in this section obtained from original field logbook.		REAMED DIA: <u>-NA-</u>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CONDUCTOR HOLE DIA: <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u></p> <p>BOREHOLE DIA.: <u>8-in.</u></p> <p>FILLER: <u>Bentonite</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC</u> DIA: <u>2.0-in. ID</u></p> <p>SEAL: <u>-NA-</u></p> <p>FILTER PACK: <u>-NA-</u></p> <p>SCREEN TYPE: <u>PVC / .01</u> DIA: <u>2.0-in. ID</u></p> <p>TOTAL DEPTH: <u>24.0</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>24.0 ft</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>TOP <u>12.8 ft</u> BOTTOM <u>24.0 ft</u></p> </div> </div>		<p>DRILLED/REAMED DEPTH: <u>-NA-</u></p> <p>PLUG MATERIAL: <u>Bentonite</u></p> <p>CAP MATERIAL: <u>Cement</u></p>
		<p>CAP DEPTH: <u>0.9 ft</u></p> <p>DIA: <u>8.0 in.</u></p> <p>PLUG</p> <p>Casing/Screen Left in Borehole</p> <p>Bentonite-filled well annulus</p> <p>DEPTH: <u>24.2 ft</u></p>

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. S3-3

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S-3 PondsDATE: START: 6-19-95COORDINATES: N30089 E52118FINISH: 6-19-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: -NA-DRILLER: H. HallHELPER: J. GaffnerREASON FOR P&A: Obsolete well.P&A METHOD: C DEVIATIONS FROM METHOD: Casing stick-up removed and remaining casing plugged in place to minimize waste, with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: Information in this section obtained from original field logbook.

REAMED DIA: -NA-DRILLED/REAMED
DEPTH: -NA-PLUG MATERIAL: BentoniteCAP MATERIAL: Cement

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>S3-5</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>S-3 Ponds</u>		DATE: START: <u>6-19-95</u>
COORDINATES: <u>N90381 E51802</u>		FINISH: <u>6-20-95</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>-NA-</u>
DRILLER: <u>H. Hall</u>	HELPER: <u>J. Gallaher</u>	
REASON FOR P&A: <u>Obsolete well.</u>		
P&A METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Casing stick-up removed and remaining casing plugged in place to minimize waste, with HSEA approval.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
Note: Information in this section obtained from original field logbook.		REAMED DIA: <u>-NA-</u>
<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div>CONDUCTOR HOLE DIA: <u>-NA-</u> DEPTH <u>-NA-</u></div> <div>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u> TOP <u>-NA-</u> BOTTOM <u>-NA-</u></div> <div>BOREHOLE DIA.: <u>8-in.</u> TOP <u>0.0 ft</u> BOTTOM <u>6.8 ft</u></div> <div>FILLER: <u>Bentonite</u></div> <div>CASING (WITH SCREEN) TYPE: <u>PVC</u> DIA: <u>2.0-in. ID</u> TOP <u>+3.3 ft</u> BOTTOM <u>1.7 ft</u></div> <div>SEAL: <u>-NA-</u> TOP <u>-NA-</u> BOTTOM <u>-NA-</u></div> <div>FILTER PACK: <u>Cuttings</u> TOP <u>1.0 ft</u> BOTTOM <u>-NA-</u></div> <div>SCREEN TYPE: <u>PVC / .01</u> DIA: <u>2.0-in. ID</u> TOP <u>1.7 ft</u> BOTTOM <u>6.9 ft</u></div> <div>TOTAL DEPTH: <u>8.8 ft</u></div> </div>		DRILLED/REAMED DEPTH: <u>-NA-</u> PLUG MATERIAL: <u>Bentonite</u> CAP MATERIAL: <u>Cement</u>
		<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div>CAP DEPTH: <u>3.2 ft</u></div> <div>DIA: <u>8.0 in.</u></div> <div>PLUG</div> <div>Casing/Screen Left in Borehole</div> <div>Bentonite-filled well annulus</div> <div>DEPTH: <u>7.0 ft</u></div> <div>COLLAPSE</div> <div>DEPTH: <u>8.8 ft</u></div> </div>

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. S3-6

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S-3 PondsDATE: START: 6-19-95COORDINATES: N30425 E51937FINISH: 6-19-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: -NA-DRILLER: H. HallHELPER: J. GallaherREASON FOR P&A: Obsolete well.P&A METHOD: C DEVIATIONS FROM METHOD: Casing stick-up removed and remaining casing plugged in place to minimize waste, with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: Information in this section obtained from original field logbook.

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

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>S3-7</u>
WELL PLUGGING AND ABANDONMENT DIAGRAM		
LOCATION: <u>S-3 Ponds</u>	DATE: START: <u>6-19-95</u>	
COORDINATES: <u>N30179 E51991</u>	FINISH: <u>6-19-95</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>-NA-</u>	
DRILLER: <u>H. Hall</u>	HELPER: <u>J. Gallaher</u>	
REASON FOR P&A: <u>Obsolete well.</u>		
P&A METHOD: <u>C</u> DEVIATIONS FROM METHOD: <u>Casing stick-up removed and remaining casing plugged in place to minimize waste, with HSEA approval.</u>		
WELL CONSTRUCTION SUMMARY		P&A SUMMARY
Note: Information in this section obtained from original field logbook.		REAMED DIA: <u>-NA-</u>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CONDUCTOR HOLE DIA: <u>-NA-</u></p> <p>SURFACE CONDUCTOR TYPE: <u>None</u> DIA: <u>-NA-</u></p> <p>BOREHOLE DIA: <u>8-in.</u></p> <p>FILLER: <u>Bentonite</u></p> <p>CASING (WITH SCREEN) TYPE: <u>PVC</u> DIA: <u>2.0-in. ID</u></p> <p>SEAL: <u>-NA-</u></p> <p>FILTER PACK: <u>Cuttings</u></p> <p>SCREEN TYPE: <u>PVC / .01</u> DIA: <u>2.0-in. ID</u></p> <p>TOTAL DEPTH: <u>27.4</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>27.4 ft</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>TOP <u>-NA-</u> BOTTOM <u>-NA-</u></p> <p>TOP <u>17.3 ft</u> BOTTOM <u>27.4 ft</u></p> </div> </div>		DRILLED/REAMED DEPTH: <u>-NA-</u> PLUG MATERIAL: <u>Bentonite</u> CAP MATERIAL: <u>Cement</u>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>CAP</p> <p>PLUG</p> <p>Casing/Screen Left in Borehole</p> <p>Bentonite-filled well annulus</p> </div> <div style="width: 45%;"> <p>DEPTH: <u>6.8 ft</u></p> <p>DIA: <u>8.0 in.</u></p> <p>DEPTH: <u>27.7 ft</u></p> </div> </div>		

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. S3-8

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: S-3 PondsDATE: START: 6-19-95COORDINATES: N30173 E52360FINISH: 6-19-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: -NA-DRILLER: H. HallHELPER: J. GallaherREASON FOR P&A: Obsolete well.P&A METHOD: C DEVIATIONS FROM METHOD: Casing stick-up removed and remaining casing plugged in place to minimize waste, with HSEA approval.

WELL CONSTRUCTION SUMMARY

Note: Information in this section obtained from original field logbook.

P&A SUMMARY

REAMED DIA: -NA-DRILLED/REAMED
DEPTH: -NA-PLUG MATERIAL: BentoniteCAP MATERIAL: Cement

-NA-: Not Applicable/Not Available

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. Unident. A

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Ash Disposal BasinDATE: START: 4-11-95COORDINATES: UnknownFINISH: 4-12-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: -NA-DRILLER: G. ShillingsHELPERS: H. HallREASON FOR P&A: Obsolete well of substandard construction.P&A METHOD: B DEVIATIONS FROM METHOD: Did not ream wellbore to fresh material; use Shur-Plug™ bentonite for plug; cap bore with native materials (fly ash), with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: All of the information in this section obtained from field observations.

REAMED DIA: -NA-

DRILLED/REAMED

DEPTH: -NA-PLUG MATERIAL: Shur-Plug™CAP MATERIAL: Fly ash

-NA-: Not Applicable/Not Available

*: Apparent total depth

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. Unident. B

WELL PLUGGING AND ABANDONMENT DIAGRAM

LOCATION: Ash Disposal BasinDATE: START: 4-11-95COORDINATES: UnknownFINISH: 4-12-95REFERENCE POINT FOR MEASUREMENTS: Ground SurfacePREPARED BY: Timothy Coffey - SAICDRILLING COMPANY: Highland Drilling CompanyDRILL: -NA-DRILLER: G. ShillingsHELPERS: H. HallREASON FOR P&A: Obsolete well of substandard construction.P&A METHOD: A DEVIATIONS FROM METHOD: Did not ream wellbore to fresh material; use Shur-Plug™ bentonite for plug; cap bore with native materials (fly ash), with HSEA approval.

WELL CONSTRUCTION SUMMARY

P&A SUMMARY

Note: All of the information in this section obtained from field observations.

REAMED DIA: -NA-
 DRILLED/REAMED DEPTH: -NA-
 PLUG MATERIAL: Shur-Plug™
 CAP MATERIAL: Fly ash

-NA-: Not Applicable/Not Available
 *: Apparent total depth

10

11

12

13

14

15

16

17

18

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 the 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 U.S. Environmental Protection Agency (EPA) and Martin Marietta Energy Systems, Inc., (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).

C.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 C.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 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-gt 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.

Table C.1. Y-12 Plant 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.

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.

C.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 to reduce the organic vapor content. Such treatment shall not exceed 5 working days. If reanalysis following aeration indicates the cuttings continue to exceed the organic vapor limits, they must be containerized and handled as above.

C.2.3 BEST MANAGEMENT PRACTICES FOR DRILL SITE DISPOSAL

Drill cuttings that do not exceed the field-screening criteria will be disposed of at the drill site, if practicable. BMP dictate 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 of 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.

C. 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 on-site geologist who conducts the screening. A copy of each form will be provided to the Project Manager of the GWPP within 2 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 criteria 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).

C.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 C.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 C.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.

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

WELL/BOREHOLE NO. 1034 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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>11.9*</u>	Date/Time	<u>5-12-95/1115</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/3.1 ppm</u>	Date/Time	<u>5-12-95/1113</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/60 cpm</u>	Date/Time	<u>5-12-95/1012</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>5-12-95/1011</u>	(<500 cpm above background)

* Elevated pH reading due to cement fragments in cuttings composite.

Weather: Partly cloudy Temp.: Upper 40s to low 70s°F.

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

Describe: Cuttings diverted into unlined cuttings pit onsite.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-12-95

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

WELL/BOREHOLE NO. 1100 SITE: Ash Disposal Basin

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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>11.8*</u>	Date/Time	<u>4-6-95/1219</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.2 ppm</u>	Date/Time	<u>4-6-95/1217</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/50 cpm</u>	Date/Time	<u>4-6-95/1109</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-6-95/1107</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Clear Temp.: Mid-30s to low-70s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 4-6-95

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

WELL/BOREHOLE NO. 1101 SITE: Ash Disposal Basin

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>Century-Foxboro OVA Model 128</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 values):

pH	<u>12.1*</u>	Date/Time	<u>4-5-95/1220</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/5.0 ppm**</u>	Date/Time	<u>4-5-95/1218</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/50 cpm</u>	Date/Time	<u>4-5-95/1107</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-5-95/1105</u>	(<500 cpm above background)

* Elevated pH reading due to cement fragments in cuttings composite.

**Elevated organic vapors possibly due to ground and torn PVC casing fragments.

Weather: Mostly clear (high, thin clouds) Temp.: Low-30s to mid-60s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 4-5-95

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

WELL/BOREHOLE NO. 1102 SITE: Ash Disposal Basin

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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>12.0*</u>	Date/Time	<u>4-4-95/1240</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.4 ppm</u>	Date/Time	<u>4-4-95/1239</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/60 cpm</u>	Date/Time	<u>4-4-95/1112</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-4-95/1111</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Cloudy, then decreasing cloudiness. Temp.: Low-50s to low-70s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 4-4-95

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

WELL/BOREHOLE NO. 1103 SITE: Ash Disposal Basin

APPROX. VOLUME OF CUTTINGS: -NA-

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

pH meter	<u>X</u>	(model)	<u>Horba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>12.4*</u>	Date/Time	<u>3-31-95/1201</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.3 ppm</u>	Date/Time	<u>3-31-95/1200</u>	(<5.0 ppm above background)
Beta/Gamma	<u>30 cpm/50 cpm</u>	Date/Time	<u>3-31-95/1037</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>3-31-95/1035</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Partly cloudy to mostly cloudy. Temp.: Low-30s to low-60s °F

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 3-31-95

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

WELL/BOREHOLE NO. 1104 SITE: Ash Disposal Basin

APPROX. VOLUME OF CUTTINGS: -NA-

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

pH meter	<u>X</u>	(model)	<u>Hanba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA Model 128</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 Rate Meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>11.7*</u>	Date/Time	<u>4-3-95/1238</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/10.0 ppm**</u>	Date/Time	<u>4-3-95/1236</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/70 cpm</u>	Date/Time	<u>4-3-95/1121</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-3-95/1120</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

**High headspace reading probably from PVC casing. Cuttings allowed to aerate 24 hrs, resampled with following results: 0.8 ppm.

Weather: Clear, windy. Temp.: Low-30s to upper-60s °F

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 4-3-95

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

WELL/BOREHOLE NO. 1105 SITE Ash Disposal Basin

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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>11.9*</u>	Date/Time	<u>3-28-95/1612</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/1.5 ppm</u>	Date/Time	<u>3-28-95/1610</u>	(<5.0 ppm above background)
Beta/gamma	<u>30 cpm/50 cpm</u>	Date/Time	<u>3-28-95/1508</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>3-28-95/1506</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Clear Temp.: Low- to upper-60s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 3-28-95

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

WELL/BOREHOLE NO. 1106 SITE: Ash Disposal Basin

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>Century-Foxboro OVA Model 128</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 values):

pH	<u>12.1*</u>	Date/Time	<u>3-30-95/1325</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.5 ppm</u>	Date/Time	<u>3-30-95/1324</u>	(<5.0 ppm above background)
Beta/Gamma	<u>30 cpm/50 cpm</u>	Date/Time	<u>3-30-95/1222</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>3-30-95/1221</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Clear to partly cloudy, windy. Temp.: Low-30s to low-60s °F

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: Date: 3-30-95

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

WELL/BOREHOLE NO. 1107 SITE: Ash Disposal Basin

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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>11.0*</u>	Date/Time	<u>4-10-95/1547</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.7 ppm</u>	Date/Time	<u>4-10-95/1544</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/70 cpm</u>	Date/Time	<u>4-10-95/1501</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-10-95/1500</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Clear and warm. Temp.: Low-60s to low-80s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 4-10-95

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

WELL/BOREHOLE NO. 1108 SITE: Ash Disposal Basin

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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>10.6*</u>	Date/Time	<u>4-10-95/1540</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.2 ppm</u>	Date/Time	<u>4-10-95/1538</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/60 cpm</u>	Date/Time	<u>4-10-95/1434</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-10-95/1432</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Clear and warm. Temp.: Low-60s to low-80s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 4-10-95

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

WELL/BOREHOLE NO. BC-03 SITE: Exxon Nuclear 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 G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratameter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>8.8</u>	Date/Time	<u>11-28-94/1550</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/1.6 ppm</u>	Date/Time	<u>11-28-94/1548</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>60 cpm/60 cpm</u>	Date/Time	<u>11-28-94/1457</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-28-94/1455</u> (<500 cpm Above Background)

Weather: Cloudy early, then clearing; cool. Temp.: Low to upper-50s F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 11-28-94

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

WELL/BOREHOLE NO. BC-31 SITE: Exxon Nuclear 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 G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.7</u>	Date/Time	<u>11-10-94/1532</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>11-10-94/1536</u> (<5.0 ppm above background)
Beta/Gamma	<u>80 cpm/70-150 cpm</u>	Date/Time	<u>11-10-94/1351</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-10-94/1353</u> (<500 cpm above background)

Weather: Partly Cloudy Temp.: lower 50s to upper 50s °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: 11-10-94

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

WELL/BOREHOLE NO. BC-32 SITE: Exxon Nuclear Site

APPROX. VOLUME OF CUTTINGS: -NA-

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

pH meter	<u> </u>	(model)	<u>-NA-</u>
Organic vapor meter	<u> </u>	(model)	<u>-NA-</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>-NA-</u>	Date/Time	<u>-NA-</u> (4.0 - 10.5)
Organic vapors	<u>-NA-</u>	Date/Time	<u>-NA-</u> (<5.0 ppm)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>11-15-94/1240</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-15-94/1240</u> (<500 cpm Above Background)

Weather: Clear to partly cloudy. Temp.: Low-to-upper 60s F

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

Describe: Excavated material used to backfill pit after casing extraction.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 11-15-94

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

WELL/BOREHOLE NO. BC-33 SITE: Exxon Nuclear Site

APPROX. VOLUME OF CUTTINGS: -NA-

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

pH meter	<u>X</u>	(model)	<u>Hanba Model U-7</u>
Organic vapor meter	<u>X</u>	(model)	<u>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.8</u>	Date/Time	<u>11-14-94/1248</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/5.0 ppm*</u>	Date/Time	<u>11-14-94/1246</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>40 cpm/60 cpm</u>	Date/Time	<u>11-14-94/1008</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-14-94/1006</u> (<500 cpm Above Background)

* Initial headspace analysis measured 10.0 ppm. Sample was resealed and measured after 1 hr incubation with this result.

Weather: Mostly clear; increasing high clouds. Temp.: Mid-40s to low-70s F

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 11-14-94

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

WELL/BOREHOLE NO. BC-34 SITE: Exxon Nuclear Site

APPROX. VOLUME OF CUTTINGS: -NA-

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

pH meter	<u> </u>	(model)	<u>-NA-</u>
Organic vapor meter	<u> </u>	(model)	<u>-NA-</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>-NA-</u>	Date/Time	<u>-NA-</u> (4.0 - 10.5)
Organic vapors	<u>-NA-</u>	Date/Time	<u>-NA-</u> (<5.0 ppm)
Beta/Gamma	<u>50 cpm/50 cpm</u>	Date/Time	<u>11-15-94/0850</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-15-94/0850</u> (<500 cpm Above Background)

Weather: Clear to partly cloudy Temp.: Upper 40s

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

Describe: Excavated material, minus concrete "pad" fragments used to backfill pit around wellhead.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 11-15-94

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

WELL/BOREHOLE NO. BC-36 SITE: Exxon Nuclear 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>OVA Model 128</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>11-8-94/1325</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.6 ppm</u>	Date/Time	<u>11-8-94/1323</u>	(<5.0 ppm above background)
Beta/Gamma	<u>60 cpm/60 cpm</u>	Date/Time	<u>11-8-94/1240</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-8-94/1242</u>	(<500 cpm above background)

Weather: Mostly sunny Temp.: -70°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: 11-8-94

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

WELL/BOREHOLE NO. BC-40 SITE: Exxon Nuclear Site

APPROX. VOLUME OF CUTTINGS: -NA-

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

pH meter	<u> </u>	(model)	<u>-NA-</u>
Organic vapor meter	<u> </u>	(model)	<u>-NA-</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>-NA-</u>	Date/Time	<u>-NA-</u>	(4.0 - 10.5)
Organic vapors	<u>-NA-</u>	Date/Time	<u>-NA-</u>	(<5.0 ppm)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>11-15-94/1105</u>	(<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-15-94/1105</u>	(<500 cpm Above Background)

Weather: Clear to partly cloudy. Temp.: Low-to-upper 60s F

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

Describe: Excavated material used to backfill pit around wellhead.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 11-15-94

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

WELL/BOREHOLE NO. BC-41 SITE: Exxon Nuclear 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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.9</u>	Date/Time	<u>11-17-94/1255</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/1.7 ppm</u>	Date/Time	<u>11-17-94/1148</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>11-17-94/1154</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All readings</u> (<500 cpm Above Background)

Weather: Clear. Temp.: Low 50s to mid-60s F

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 11-17-94

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

WELL/BOREHOLE NO. BC-42 SITE: Exxon Nuclear 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>OVA Model 128</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>9-30-94/1644</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>9-30-94/1642</u> (<5.0 ppm above background)
Beta/Gamma	<u>70 cpm/70 cpm</u>	Date/Time	<u>9-30-94/1555</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-30-94/1553</u> (<500 cpm above background)

Weather: Partly Cloudy Temp.: ~ 60 - 70°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: 9-30-94

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

WELL/BOREHOLE NO. BC-50 SITE: Exxon Nuclear 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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.2</u>	Date/Time	<u>11-29-94/1339</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>11-29-94/1337</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>40 cpm/60 cpm</u>	Date/Time	<u>11-29-94/1231</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-29-94/1229</u> (<500 cpm Above Background)

Weather: Cloudy, breezy, and cool. Temp.: Low-30s to low-40s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 11-29-94

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

WELL/BOREHOLE NO. BC-62 SITE: Exxon Nuclear 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>Century-Foxboro OVA Model 128</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>9.5</u>	Date/Time	<u>11-14-94/1250</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.8 ppm</u>	Date/Time	<u>11-14-94/1247</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>11-14-94/1145</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-14-94/1142</u> (<500 cpm Above Background)

Weather: Mostly clear; increasing high clouds. Temp.: Mid-40s to low-70s FDISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/nDescribe: Cuttings discharged to ground surface.Onsite Geologist (print): Timothy Coffey - SAICSignature: Date: 11-14-94

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

WELL/BOREHOLE NO. BCU-12 (BC-66) SITE: Exxon Nuclear 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 with G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.7*</u>	Date/Time	<u>6-23-94/1419</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>All readings</u> (<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/60 cpm</u>	Date/Time	<u>6-23-94/1318</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All readings</u> (<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Partly to mostly cloudy and breezy Temp.: Upper 70s to upper 80s °FDISPOSITION: Drill-site Disposal ☒ Containerization
(Labeled?) y/nDescribe: Cuttings discharged to ground surface.Onsite Geologist (print): Timothy Coffey - SAICSignature: Date: 6-23-94

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

WELL/BOREHOLE NO. BCU-14 SITE: Exxon Nuclear 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 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>10.3</u>	Date/Time	<u>11-7-94/1626</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.1 ppm</u>	Date/Time	<u>11-7-94/1621</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50-60 cpm/50-60 cpm</u>	Date/Time	<u>11-7-94/1512</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-7-94/1514</u>	(<500 cpm above background)

Weather: Mostly Sunny Temp.: ~ 70 °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: 11-7-94

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

WELL/BOREHOLE NO. BCU-15 SITE: Exxon Nuclear 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 G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.4</u>	Date/Time	<u>10-4-94/1122</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/3.0 ppm</u>	Date/Time	<u>10-4-94/1120</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50 - 70 cpm/70 cpm</u>	Date/Time	<u>10-4-94/1000</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>10-4-94/1002</u>	(<500 cpm above background)

Weather: Mostly Sunny Temp.: 60s - 70s°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: 10-4-94

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

WELL/BOREHOLE NO. BCU-17 SITE: Exxon Nuclear 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 12B</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>8.1</u>	Date/Time	<u>11-11-94/1145</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/2.5 ppm</u>	Date/Time	<u>11-11-94/1145</u> (<5.0 ppm above background)
Beta/Gamma	<u>40 -50 cpm/50 cpm</u>	Date/Time	<u>11-11-94/1023</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-11-94/1025</u> (<500 cpm above background)

Weather: Partly cloudy Temp.: lower to upper 50s°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: 11-11-94

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

WELL/BOREHOLE NO. BCU-18 SITE: Exxon Nuclear 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>OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.5</u>	Date/Time	<u>11-11-94/1129</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>11-11-94/1127</u> (<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/40 cpm</u>	Date/Time	<u>11-11-94/0940</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-11-94/0942</u> (<500 cpm above background)

Weather: Partly Cloudy Temp.: lower 50s to upper 50s °FDISPOSITION: Drill-site Disposal X Containerization _____
(Labeled?) y/n

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Susan L. Abston - SAICSignature: Susan L. AbstonDate: 11-11-94

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

WELL/BOREHOLE NO. BCU-19 SITE: Exxon Nuclear 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 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>9.0</u>	Date/Time	<u>11-10-94/1541</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/1.1 ppm</u>	Date/Time	<u>11-10-94/1539</u> (<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/50 - 60 cpm</u>	Date/Time	<u>11-10-94/1421</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>11-10-94/1423</u> (<500 cpm above background)

Weather: Partly Cloudy Temp.: Lower to upper 50s °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: 11-10-94

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

WELL/BOREHOLE NO. BCU-21 SITE: Exxon Nuclear 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 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>*11.5</u>	Date/Time	<u>9-29-94/1550</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>9-29-94/1548</u>	(<5.0 ppm above background)
Beta/Gamma	<u>60 cpm/40 - 90 cpm</u>	Date/Time	<u>9-29-94/1326</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-29-94/1328</u>	(<500 cpm above background)

* High pH due to grout fragments in cuttings composite sample

Weather: Partly cloudy Temp.: -70-80°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: 9-29-94

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

WELL/BOREHOLE NO. BCU-23 SITE: Exxon Nuclear 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>Foxboro-Century OVA Model 128</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>9-14-94/1540</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.2 ppm</u>	Date/Time	<u>9-14-94/1537</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>50 cpm/90 cpm</u>	Date/Time	<u>9-14-94/1450</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-14-94/1448</u> (<500 cpm Above Background)

Weather: Clear to partly cloudy. Temp.: Mid-70s to mid-80s° F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 9-14-94

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

WELL/BOREHOLE NO. BCU-24 SITE: Exxon Nuclear 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>Century-Foxboro OVA Model 12B</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>9.5</u>	Date/Time	<u>9-15-94/1418</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>9-15-94/1416</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>60 cpm/80 cpm</u>	Date/Time	<u>9-15-94/1318</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-15-94/1316</u> (<500 cpm Above Background)

Weather: Clear to partly cloudy, warm. Temp.: Low-60s to low-80s°F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 9-15-94

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

WELL/BOREHOLE NO. BCU-25 SITE: Exxon Nuclear 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>Century-Foxboro OVA Model 128</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>9-16-94/1451</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>9-16-94/1449</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>60 cpm/100 cpm</u>	Date/Time	<u>9-16-94/1346</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-16-94/1344</u> (<500 cpm Above Background)

Weather: Clear to partly cloudy. Temp.: Low-60s to low-80s°F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 9-16-94

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

WELL/BOREHOLE NO. BCU-26 SITE: Exxon Nuclear 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 G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.4</u>	Date/Time	<u>9-19-94/1414</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/4.8 ppm</u>	Date/Time	<u>9-19-94/1412</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>40 cpm/50 cpm</u>	Date/Time	<u>9-19-94/1308</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-19-94/1306</u> (<500 cpm Above Background)

Weather: Clear, sunny. Temp.: -80° 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: 9-19-94

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

WELL/BOREHOLE NO. BCU-27 SITE: Exxon Nuclear 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 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>11.3*</u>	Date/Time	<u>9-20-94/1459</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>9-20-94/1457</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>9-20-94/1315</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-20-94/1317</u> (<500 cpm Above Background)

Weather: Clear, sunny. Temp.: ~80°F

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

*Elevated pH reading due to grout fragments in the cuttings composite.

Describe: Cuttings discharged to ground surface.

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

Signature: *Susan L Abston*

Date: 9-20-94

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

WELL/BOREHOLE NO. BCU-28 SITE: Exxon Nuclear 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 G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>10.1</u>	Date/Time	<u>9-22-94/1152</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>9-22-94/1150</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>60 cpm/90 cpm</u>	Date/Time	<u>9-22-94/1045</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-22-94/1043</u> (<500 cpm Above Background)

Weather: Clear Temp.: Mid 70s°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: 9-22-94

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

WELL/BOREHOLE NO. BCU-29 SITE: Exxon Nuclear 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 G-M Pancake Probe</u>
Alpha meter	<u>X</u>	(model)	<u>Ludlum Model 12 Count Ratameter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (Background/Maximum Observed Values):

pH	<u>9.8</u>	Date/Time	<u>9-26-94/1352</u> (4.0 - 10.5)
Organic vapors	<u>0.2 ppm/0.0 ppm</u>	Date/Time	<u>9-26-94/1350</u> (<5.0 ppm Above Background)
Beta/Gamma	<u>70 cpm/80 cpm</u>	Date/Time	<u>9-26-94/1207</u> (<100 cpm Above Background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>9-26-94/1209</u> (<500 cpm Above Background)

Weather: Clear, sunny. Temp.: 65°F - 75°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: 9-26-94

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

WELL/BOREHOLE NO. CO-2 SITE: West Bear Creek ValleyAPPROX. 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>Century-Foxboro OVA Model 128</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 value):

pH	<u>9.2</u>	Date/Time	<u>3-16-95/1504</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.6 ppm</u>	Date/Time	<u>3-16-95/1502</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/50 cpm</u>	Date/Time	<u>3-16-95/1401</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>3-16-95/1359</u>	(<500 cpm above background)

Weather: Clear and warm Temp.: Mid-50's to low-70's FDISPOSITION: Drill-site Disposal X Containerization _____
(Labeled?) y/nDescribe: Cuttings discharged to ground surface.Onsite Geologist (print): Timothy Coffey - SAICSignature: Date: 3-16-95

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

WELL/BOREHOLE NO. CO-4 SITE: West Bear Creek Valley

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>Century-Foxboro OVA Model 12B</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 value):

pH	<u>6.6</u>	Date/Time	<u>3-15-95/1440</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.2 ppm</u>	Date/Time	<u>3-15-95/1438</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>3-15-95/1335</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>3-15-95/1333</u>	(<500 cpm above background)

Weather: Clear and warm Temp.: Mid-50's to upper-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: 3-15-95

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

WELL/BOREHOLE NO. GW-048 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>Century-Foxboro OVA Model 128</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 values):

pH	<u>8.3</u>	Date/Time	<u>6-5-95/1333</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>6-5-95/1331</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/50 cpm</u>	Date/Time	<u>6-5-95/1218</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>6-5-95/1217</u>	(<500 cpm above background)

Weather: Partly cloudy, warm, and humid. Temp.: Upper 60s to low 80s °F.

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

Describe: Cuttings discharged to ground surface:

Onsite Geologist (print) Timothy Coffey - SAIC

Signature:

Date: 6-5-95

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

WELL/BOREHOLE NO. GW-049 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>Century-Foxboro OVA Model 128</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 values):

pH	<u>11.8*</u>	Date/Time	<u>5-5-95/1239</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/1.4 ppm</u>	Date/Time	<u>5-5-95/1237</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/80 cpm</u>	Date/Time	<u>5-5-95/1134</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>5-5-95/1133</u>	(<500 cpm above background)

* Elevated pH reading due to cement fragments in cuttings composite.

Weather: Mostly cloudy to partly cloudy Temp.: Low 50s to upper 60s°F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: Date: 5-5-95

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

WELL/BOREHOLE NO. GW-050 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>Century-Foxboro OVA Model 125</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 values):

pH	<u>11.3*</u>	Date/Time	<u>5-3-95/1244</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.4 ppm</u>	Date/Time	<u>5-3-95/1242</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/50 cpm</u>	Date/Time	<u>5-3-95/1136</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>5-3-95/1134</u>	(<500 cpm above background)

* Elevated pH reading due to cement fragments in cuttings composite.

Weather: Fog early, then clear. Temp.: Low 40s to low 60s°F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-3-95

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

WELL/BOREHOLE NO. GW-051 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>Century-Foxboro OVA Model 128</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 values):

pH	<u>9.7</u>	Date/Time	<u>5-4-95/1214</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.2 ppm</u>	Date/Time	<u>4-24-95/1212</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/50 cpm</u>	Date/Time	<u>5-4-95/0948</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>5-4-95/0946</u>	(<500 cpm above background)

Weather: Clear with increasing cloudiness. Temp.: Upper 40s to low 60s°F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: Date: 5-4-95

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

WELL/BOREHOLE NO. GW-060 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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>11.3*</u>	Date/Time	<u>5-19-95/1619</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.2 ppm</u>	Date/Time	<u>5-19-95/1617</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/40 cpm</u>	Date/Time	<u>5-19-95/1545</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>5-19-95/1543</u>	(<500 cpm above background)

* Elevated pH reading due to cement fragments in cuttings composite.

Weather: Partly cloudy and breezy Temp.: Low 60s to low 70s°F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 5-19-95

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

WELL/BOREHOLE NO. GW-096A 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>Century-Foxboro OVA Model 128</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 values):

pH	<u>10.0</u>	Date/Time	<u>5-8-95/1624</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>All Readings</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/80 cpm</u>	Date/Time	<u>5-8-95/1110</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u>	(<500 cpm above background)

Weather: 5-8-95: Mostly clear, breezy. Temp.: 5-8-95: Low 50s to upper-70s °F.
5-9-95: Cloudy with scattered showers. Temp.: 5-9-95: Upper 50s to mid-60s °F.

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

Describe: Cuttings diverted into an unlined pit onsite.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: Date: 5-10-95

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

WELL/BOREHOLE NO. GW-209 SITE: Bear Creek Valley, along Hwy. 95

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 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>11-1-94/1718</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>11-1-94/1718</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40-60 cpm/50 cpm</u>	Date/Time	<u>11-1-94/1555</u>	(<100 cpm above background)
Alpha	<u>0-30 cpm/0 cpm</u>	Date/Time	<u>11-1-94/1557</u>	(<500 cpm above background)

Weather: Partly cloudy Temp.: 40s to 60s°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: 11-1-94

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

WELL/BOREHOLE NO. GW-215 SITE: West Bear Creek ValleyAPPROX. 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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum value):

pH	<u>10.4</u>	Date/Time	<u>3-21-95/1437</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>3-21-95/1435</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/60 cpm</u>	Date/Time	<u>3-21-95/1335</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>3-21-95/1333</u>	(<500 cpm above background)

Weather: Partly cloudy to clear, windy. Temp.: Low-40s to mid-60s °F.DISPOSITION: Drill-site Disposal X Containerization _____
(Labeled?) y/nDescribe: Cuttings discharged to ground surface.Onsite Geologist (print): Timothy Coffey - SAICSignature: Date: 3-21-95

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

WELL/BOREHOLE NO. GW-447 SITE: Gum Branch Road 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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>11.5*</u>	Date/Time	<u>4-17-95/1430</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/2.5 ppm</u>	Date/Time	<u>4-17-95/1428</u>	(<5.0 ppm above background)
Beta/Gamma	<u>60 cpm/70 cpm</u>	Date/Time	<u>4-17-95/1326</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-17-95/1324</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: Cloudy/rainy. Temp.: Low- to upper-50s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 4-17-95

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

WELL/BOREHOLE NO. GW-545 SITE: Landfill VI

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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>12.3*</u>	Date/Time	<u>2-2-95/1517</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/2.6 ppm</u>	Date/Time	<u>2-2-95/1637</u>	(<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/55 cpm</u>	Date/Time	<u>2-1-95/1305</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All readings</u>	(<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: 2-1-95: clear 2-2-95: cloudy with light rain Temp.: 2-1-95: upper 20s to upper 40s °F 2-2-95: low 40s to low 50s °F

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: Date: 2-2-95

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

WELL/BOREHOLE NO. LL/HAZ-04 SITE: Gum Branch Road 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>Century-Foxboro OVA Model 128</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 values):

pH	<u>7.4</u>	Date/Time	<u>4-24-95/1618</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.1 ppm</u>	Date/Time	<u>4-24-95/1616</u>	(<5.0 ppm above background)
Beta/Gamma	<u>60 cpm/60 cpm</u>	Date/Time	<u>4-24-95/1538</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>4-24-95/1538</u>	(<500 cpm above background)

Weather: Cloudy, windy, and cold Temp.: Low- to mid-50s °F.DISPOSITION: Drill-site Disposal X Containerization
(Labeled?) y/nDescribe: Cuttings discharged to ground surface.Onsite Geologist (print): Timothy Coffey - SAICSignature: Date: 4-24-95

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

WELL/BOREHOLE NO. LL/HAZ-15 SITE: Gum Branch Road 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>Century-Foxboro OVA Model 128</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 Rate meter with Scintillation Tube Probe</u>

FIELD SCREENING RESULTS (background/maximum values):

pH	<u>11.3*</u>	Date/Time	<u>4-25-95/1621</u> <u>4-26-95/1223</u> (4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.6 ppm</u>	Date/Time	<u>4-26-95/1222</u> (<5.0 ppm above background)
Beta/Gamma	<u>40 cpm/80 cpm</u>	Date/Time	<u>4-26-95/1530</u> (<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>All Readings</u> (<500 cpm above background)

*Elevated pH reading due to cement fragments in cuttings composite.

Weather: 4-25-95: clear to partly cloudy. 4-26-95: clear to mostly clear. Temp.: 4-25-95: upper-30s to low-60s °F.
4-26-95: mid-30s to mid-60s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature: Date: 4-26-95

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

WELL/BOREHOLE NO. OR-03 SITE: Gum Branch Rd.

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>Century-Foxboro OVA Model 128</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 value):

pH	<u>10.4</u>	Date/Time	<u>3-23-95/1300</u>	(4.0 - 10.5)
Organic vapors	<u>0.0 ppm/0.0 ppm</u>	Date/Time	<u>3-23-95/1258</u>	(<5.0 ppm above background)
Beta/Gamma	<u>50 cpm/70 cpm</u>	Date/Time	<u>3-23-95/1159</u>	(<100 cpm above background)
Alpha	<u>0 cpm/0 cpm</u>	Date/Time	<u>3-23-95/1157</u>	(<500 cpm above background)

Weather: Mostly cloudy to partly cloudy, windy. Temp.: Mid-50s to mid-70s °F.

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

Describe: Cuttings discharged to ground surface.

Onsite Geologist (print): Timothy Coffey - SAIC

Signature:

Date: 3-23-95

APPENDIX E
EQUIPMENT DECONTAMINATION SUMMARIES

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM	PROBE NO. <u>1034</u>			
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY	INSTALLATION ☐ P&A ☒			
LOCATION: <u>Bear Creek Burial Grounds</u> DATE: START: <u>5-11-95</u> DECONTAMINATION CREW: <u>R. Jones/J. Gallaher</u> FINISH: <u>5-16-95</u>				
EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	5-11-95	5-11-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	5-11-95	5-11-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	5-12-95*	5-12-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)	[REDACTED]			
COMMENTS: <u>*Steam clean pit/subadapter assembly.</u>				

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

PROBE NO. 1100

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

INSTALLATION

P&A

LOCATION: Ash Disposal Basin

DATE: START: 4-5-95

DECONTAMINATION CREW: H. Hall/G. Shillings

FINISH: 4-7-95

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XI-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	4-5-95	4-5-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	4-5-95	4-5-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	4-5-95	4-5-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Silters, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		PROBE NO <u>1102</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-3-95</u>	
DECONTAMINATION CREW: <u>G. Shillings/ H. Hall</u>		FINISH: <u>4-5-95</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	4-3-95	4-3-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	4-3-95	4-3-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	4-3-95	4-3-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM	PROBE NO. <u>1103</u>
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY	INSTALLATION ☐ P&A ☒

LOCATION: <u>Ash Disposal Basin</u>	DATE: START: <u>3-31-95</u>
DECONTAMINATION CREW: <u>H. Hall/G. Shillings</u>	FINISH: <u>4-3-95</u>

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	3-30-95	3-31-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	3-30-95	3-31-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	3-31-95	3-31-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

PROBE NO. 1105

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

INSTALLATION ☐P&A ☒

LOCATION: Ash Disposal Basin

DATE: START: 3-28-95

DECONTAMINATION CREW: H. HALLG. Shillings

FINISH: 3-30-95

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	3-24-95	3-28-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	3-24-95	3-28-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	3-24-95	3-28-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centrifizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMPROBE NO. 1108**EQUIPMENT DECONTAMINATION INSPECTION SUMMARY**INSTALLATION ☐P&A ☒LOCATION: Ash Disposal BasinDATE: START: 3-30-95DECONTAMINATION CREW: G. ShillingsFINISH: 4-8-95

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	3-24-95	3-28-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Balls, Clevis, Chains, Etc.)	3-24-95	3-28-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	3-24-95/ 3-30-95*	3-28-95/ 3-30-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Benders, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS: Decontamination between wells 1105 and 1108 waived by B. McMaster (HSEA/UT).

*Augers steamcleaned.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		PROBE NO. <u>1107</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Ash Disposal Basin</u>		DATE: START: <u>4-10-95</u>	
DECONTAMINATION CREW: <u>G. Shillings</u>		FINISH: <u>4-12-95</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe w/McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	4-10-95	4-10-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevys, Chains, Etc.)	4-10-95	4-10-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	4-10-95	4-10-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Controlizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bafers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

PROBE NO. 1108

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

INSTALLATION ☐P&A ☒LOCATION: Ash Disposal BasinDATE: START: 4-10-95DECONTAMINATION CREW: G. ShillingsFINISH: 4-12-95

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe w/McMillen Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	4-10-95*	4-10-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	4-10-95*	4-10-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	4-10-95*	4-10-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Benders, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS: *Steam cleaning of augers, tools, etc. between wells 1107 and 1108 waived by K. Jago (HSEA).

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-03</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-28-94</u>	
DECONTAMINATION CREW <u>G. Shillings/R. Phillips</u>		FINISH: <u>11-30-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe with McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-22-94	11-28-94	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)	11-22-94	11-28-94	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-22-94	11-28-94	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	---	---	---
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	---	---	---
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	---	---	---
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:
--

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-30</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-21-94</u>	
DECONTAMINATION CREW <u>G. Shillings/H. Hall</u>		FINISH: <u>11-23-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 with McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-14-94	11-21-94	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	11-14-94	11-21-94	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-14-94	11-21-94	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC - 31</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-10-94</u>	
DECONTAMINATION CREW: <u>H. Hall/G. Shillings</u>		FINISH: <u>11-11-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 w/McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-9-94	11-10-94	Pass	SLA
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	11-9-94	11-10-94	Pass	SLA
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-9-94	11-10-94	Pass	SLA
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-33</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-14-94</u>	
DECONTAMINATION CREW <u>G. Shillings/H. Hall</u>		FINISH: <u>11-15-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe with McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-11-94	11-14-94	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	11-11-94	11-14-94	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-11-94	11-14-94	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-38</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-4-94</u>	
DECONTAMINATION CREW: <u>H. Hall/G. Shillings</u>		FINISH: <u>11-9-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG Ford 455 Backhoe w/ McMullan Diggerhead (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-8-94	11-8-94	Pass	SLA
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)	11-8-94	11-8-94	Pass	SLA
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-8-94	11-8-94	Pass	SLA
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. BC-39

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

INSTALLATION ☐
P&A ☒LOCATION: Exxon Nuclear SiteDATE: START: 11-22-94DECONTAMINATION CREW -NA-FINISH: 11-22-94

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG _____ (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	-NA-	—	—	—
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	-NA-	—	—	—
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	-NA-	—	—	—
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballars, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-50</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-29-94</u>	
DECONTAMINATION CREW <u>G. Shillings/R. Phillips</u>		FINISH: <u>11-30-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe with McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-29-94	11-29-94	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	11-29-94	11-29-94	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-29-94	11-29-94	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BC-82</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-14-94</u>	
DECONTAMINATION CREW <u>G. Shillings/H. Hall</u>		FINISH: <u>11-15-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe/McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-14-94	11-14-94	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clavis, Chains, Etc.)	11-14-94	11-14-94	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-14-94	11-14-94	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMWELL NO. BCU-12 (BC-66)**EQUIPMENT DECONTAMINATION INSPECTION SUMMARY**INSTALLATION ☐
P&A ☒LOCATION: Exxon Nuclear SiteDATE: START: 6-22-94DECONTAMINATION CREW H. Hall/J.MongerFINISH: 9-15-94

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand X1-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	6-22-94	6-22-94	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	6-22-94	6-22-94	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	6-22-94	6-22-94	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	- NA -	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	- NA -	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	- NA -	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				
COMMENTS:				

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-14</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-3-94</u>	
DECONTAMINATION CREW: <u>H. Hall/G. Shillings</u>		FINISH: <u>11-9-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 w/McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-4-94	11-7-94	Pass	SLA
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)	11-4-94	11-7-94	Pass	SLA
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-4-94	11-7-94	Pass	SLA
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	---	---	---
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	---	---	---
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	---	---	---
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-17</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-11-94</u>	
DECONTAMINATION CREW <u>H. Hall</u>		FINISH: <u>11-14-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe w/McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-11-94	11-11-94	Pass	SLA
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	11-11-94	11-11-94	Pass	SLA
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-11-94	11-11-94	Pass	SLA
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-18</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-10-94</u>	
DECONTAMINATION CREW: <u>H. Hall</u>		FINISH: <u>11-10-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 w/McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-10-94	11-10-94	Pass	SLA
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	11-10-94	11-10-94	Pass	SLA
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-10-94	11-10-94	Pass	SLA
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-21</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-26-94</u>	
DECONTAMINATION CREW: <u>H. Hall/J. Galtaher</u>		FINISH: <u>10-4-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	9-26-94	9-26-94	Pass	SLA
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	9-26-94	9-26-94	Pass	SLA
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	9-26-94	9-26-94	Pass	SLA
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:
--

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-22</u>		
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒		
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>11-15-94</u>		
DECONTAMINATION CREW <u>-NA-</u>		FINISH: <u>11-15-94</u>		

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>(Mast, Chassis, Cables, Carousel, Hoses, Etc.)</u>	-NA-	—	—	—
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)	-NA-	—	—	—
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	-NA-	—	—	—
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG <u>(Mast, Chassis, Cables, Hoses, Etc.)</u>	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-23</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-14-94</u>	
DECONTAMINATION CREW <u>H. Hall/J. Monger</u>		FINISH: <u>9-16-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Camusel, Hoses, Etc.)	6-22-94	9-14-94	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	6-22-94	9-14-94	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	6-22-94	9-14-94	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-27</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-20-94</u>	
DECONTAMINATION CREW <u>H. Hall/J. Monger</u>		FINISH: <u>9-29-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	9-15-94*	9-15-94*	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)	9-15-94*	9-15-94*	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	9-15-94*	9-15-94*	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	---	---	---
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	---	---	---
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	---	---	---
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS: Last date of equipment decontamination at this location. W. Thedford (HSEA) waives steam-cleaning requirement between individual wells within this cluster.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. <u>BCU-28</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Exxon Nuclear Site</u>		DATE: START: <u>9-22-94</u>	
DECONTAMINATION CREW <u>H. Hall/J. Monger</u>		FINISH: <u>9-29-94</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	9-15-94*	9-15-94*	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)	9-15-94*	9-15-94*	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	9-15-94*	9-15-94*	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS: *Last date of equipment decontamination at this location. W. Thedford (HSEA) waives steam-cleaning requirement between individual wells within this cluster.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. 8CU-29

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

INSTALLATION ☐P&A ☒ LOCATION: Exxon Nuclear SiteDATE: START: 9-26-94DECONTAMINATION CREW H. Hall/J. MongerFINISH: 10-03-94

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	9-15-94*	9-15-94*	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Balls, Clavis, Chains, Etc.)	9-15-94*	9-15-94*	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	9-15-94*	9-15-94*	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS: *Last date of equipment decontamination at this location. W. Thedford (HSEA) waives steam-cleaning
requirement between individual wells in this cluster.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		PROBE NO. <u>CO-2</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>West Bear Creek Valley</u>		DATE: START: <u>3-16-95</u>	
DECONTAMINATION CREW <u>R. Phillips/H. Hall</u>		FINISH: <u>3-20-95</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	3-15-95	3-16-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	3-15-95	3-16-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	3-15-95	3-16-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		PROBE NO <u>GW-048</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>6-5-95</u>	
DECONTAMINATION CREW: <u>G. Shillings/R.Jones</u>		FINISH: <u>6-6-95</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe with McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	6-5-95	6-5-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)	6-5-95	6-5-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	6-5-95	6-5-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

PROBE NO. GW-050

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

INSTALLATION ☐
P&A ☒LOCATION: Bear Creek Burial GroundsDATE: START: 5-2-95DECONTAMINATION CREW: G. Shillings/J. MongerFINISH: 5-4-95

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	4-27-95	5-2-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	4-27-95	5-2-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	5-3-95*	5-3-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS: *Steam clean augers only.

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		PROBE NO. <u>GW-051</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Bear Creek Burial Grounds</u>		DATE: START: <u>5-3-95</u>	
DECONTAMINATION CREW: <u>G. Shillings/R. Jones</u>		FINISH: <u>5-5-95</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	5-3-95	5-3-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	5-3-95	5-3-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	5-3-95	5-3-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Bafers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAMWELL NO. GW-209**EQUIPMENT DECONTAMINATION INSPECTION SUMMARY**INSTALLATION ☐
P&A ☒LOCATION: Bear Creek Valley, along Hwy. 95DATE: START: 11-1-94DECONTAMINATION CREW: H. Hall/J. MongerFINISH: 11-8-94

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	11-1-94	11-1-94	Pass	SLA
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	11-1-94	11-1-94	Pass	SLA
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	11-1-94	11-1-94	Pass	SLA
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

PROBE NO. GW-215

EQUIPMENT DECONTAMINATION INSPECTION SUMMARY

INSTALLATION ☐P&A ☒LOCATION: West Bear Creek ValleyDATE: START: 3-21-95DECONTAMINATION CREW: G. ShillingsFINISH: 3-22-95

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe w/McMillan Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	2-28-95	3-21-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Cleave, Chains, Etc.)	2-28-95	3-21-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	2-28-95	3-21-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		PROBE NO. <u>GW-447</u> INSTALLATION ☐ P&A ☒		
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY				
LOCATION: <u>Gum Branch Road Area</u> DECONTAMINATION CREW: <u>G. Shillings/J. Monger</u> 		DATE: START: <u>4-17-95</u> FINISH: <u>4-18-95</u>		
EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ford 455 Backhoe w/McMillen Diggerhead</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	4-17-95	4-17-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	4-17-95	4-17-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	4-17-95	4-17-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				
COMMENTS:				

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		PROBE NO. <u>GW-545</u>		
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒		
LOCATION: <u>Landfill VI</u>		DATE: START: <u>2-1-95</u>		
DECONTAMINATION CREW: <u>G. Shillings/ H. Hall</u>		FINISH: <u>2-7-95</u>		

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	1-31-95	2-1-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Bells, Clevis, Chains, Etc.)	1-31-95	2-1-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	1-31-95/ 2-2-95	2-1-95/ 2-2-95	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Ballers, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		PROBE NO. <u>LL-HAZ-15</u>	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☒	
LOCATION: <u>Gum Branch Road Area</u>		DATE: START: <u>4-25-95</u>	
DECONTAMINATION CREW: <u>G. Shillings/J. Monger</u>		FINISH: <u>4-28-95</u>	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG <u>Ingersoll-Rand XL-750</u> (Mast, Chassis, Cables, Carousel, Hoses, Etc.)	4-25-95	4-25-95	Pass	TJC
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)	4-25-95	4-25-95	Pass	TJC
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)	4-25-95/ 4-26-95*	4-25-95/ 4-26-95*	Pass	TJC
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)	-NA-	—	—	—
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)	-NA-	—	—	—
DEVELOPMENT TOOLS (Tubing, Benders, Pumps, Etc.)	-NA-	—	—	—
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS: *Use an 8 3/4-in. diameter bit and subadapter assembly.

APPENDIX F
WELL LOCATION MAP

NOTICE

Page(s) size did not permit electronic reproduction. Information may be purchased by the general public from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161 (Area Code 703-487-4650). DOE and DOE contractors may purchase information by contacting DOE's Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831, Attn: Information Services (Area Code 423-576-8401).

DISTRIBUTION

DEPARTMENT OF ENERGY

P. A. Hoffman
L. M. Sparks

HEALTH, SAFETY, ENVIRONMENT AND ACCOUNTABILITY DIVISION

S. M. Field
W. K. Jago
S. B. Jones
E. B. Rundle
W. P. Carlton
File - EMD - RC

ENGINEERING DIVISION

W. E. Manrod/J. D. Long

ENVIRONMENTAL RESTORATION DIVISION

V. J. Brumback
H. L. King
C. S. Walker

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, DOE-OVERSITE

R. Benfield (3)

UNIVERSITY OF TENNESSEE

B. W. McMaster

ENVIRONMENTAL SCIENCES DIVISION

R. D. Dreier
D. D. Huff
C. T. Rightmire
D. B. Watson

WASTE MANAGEMENT DIVISION

P. F. Waldschlager
M. L. Willoughby

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

T. J. Coffey
S. Selecman

A. K. Lee/DOE-OSTI (2)
Y-12 Central Files