Completion of Corrective Action at Sites 54-014(d) and 54-017 in PJ-SMA-18

August 28, 2014

NPDES PERMIT NO. NM0030759

LA-UR-14-26476

NPDES PERMIT NO. NM0030759 **LA-UR-14-26476**

LOS ALAMOS NATIONAL LABORATORY
CERTIFICATION OF COMPLETION OF CORRECTIVE ACTION

PF: J026 **PJ-SMA-18** **Sites: 54-014(d)**
54-017

The following certification of completion of corrective action was performed in accordance with NPDES Permit No NM0030759, Part I.E.1(b), which requires the Permittees (i.e., DOE and LANS) to submit "certified as-built drawings, that such measures have been properly installed to perform their function to totally eliminate exposure of pollutants to storm water" at a Site or Sites.

CERTIFICATION STATEMENT OF AUTHORIZATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

Environmental Programs
Corrective Actions Program
Los Alamos National Laboratory

8/27/2014
Date

Los Alamos Field Office
National Nuclear Security Administration

8-28-2014
Date

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Introduction

This certification documents the no exposure condition of Sites 54-014(d) and 54-017 [known as Solid Waste Management Units (SWMUs) 54-014(d) and 54-017 under the New Mexico Environment Department (NMED) Compliance Order on Consent (the Consent Order)] for completion of corrective action at site monitoring area (SMA) PJ-SMA-18 under Part 1.E.2(c) of National Pollutant Discharge Elimination System (NPDES) Permit No. NM0030759 (hereafter, the Permit), issued by the U.S. Environmental Protection Agency (EPA) to the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS), collectively, the Permittees. Sites 54-014(d) and 54-017, located within Technical Area 54 (TA-54) are listed as SWMUs in the 1990 SWMU Report (LANL 1990) based on the historical disposal of solid radioactive-, mixed-, and transuranic- (TRU-) contaminated waste. Sites 54-014(d) and 54-017 are associated with PJ-SMA-18 and are listed as High Priority Sites in Part I.E.4(a) of the Permit. The requirement for corrective action in Part I.E.1 was triggered by analytical data from a storm water sample collected from PJ-SMA-18 on July 25, 2013, that showed an exceedance of the target action level (TAL) for gross-alpha radioactivity.

The PJ-SMA-18 drainage area is located in the south-central portion of Los Alamos National Laboratory's (the Laboratory's) Area G and overlies portions of seven waste disposal pits (Pits 12, 13, 16, 18, and 20 through 22) and all four waste storage trenches (Trenches A, B, C, and D) included in Sites 54-014(d) and 54-017. The seven pits were closed and subsequently covered with crushed Bandelier Tuff between 1974 and 1979, in accordance with DOE radiological protection requirements. The waste storage trenches received TRU waste from 1974 to 1985 for retrievable storage. The waste in the trenches is stored in 30-gal. containers within concrete casks. The casks are covered with corrugated steel sheeting, 3.3 ft of crushed tuff, and 4 in. of topsoil.

As a result of the placement of the cover material, the wastes within the pits and trenches are not exposed to storm water. Attachment 1, PJ-SMA-18 As-Built Drawings, Pits 12, 13, 16, 18 and 20–22, Trenches A, B, C and D, presents documentation of the no exposure conditions. Maintenance of the cover material during ongoing surface activities to prevent exposure of the waste is required per DOE nuclear safety and radiological protection requirements until the final closure of Area G. Figure 1 is a 2011 aerial photograph of PJ-SMA-18 and the surrounding area depicting site conditions within the SMA and the location of associated waste disposal pits and trenches within Sites 54-014(d) and 54-017.

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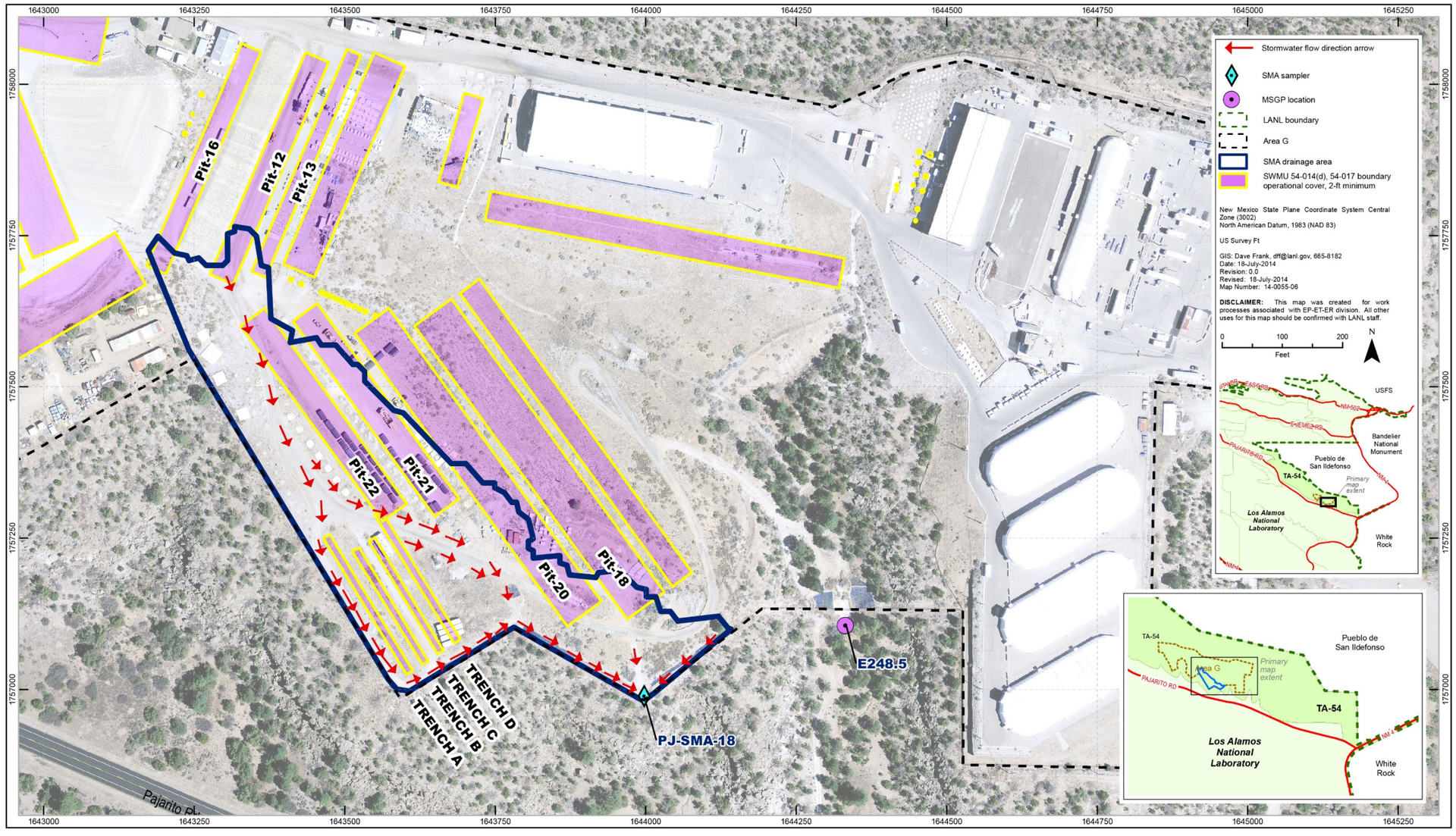

Figure 1 Location of PJ-SMA-18

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Site Description

Two historical industrial activity areas are associated with Permitted Feature (PF) J026, PJ-SMA-18: Sites 54-014(d) and 54-017.

Site 54-014(d) consist of four waste storage trenches (Trenches A, B, C, and D). Site 54-017 consists of 19 inactive subsurface radioactive waste disposal pits located within Area G in the eastern portion of the Laboratory immediately north of Pajarito Road. Area G is a 63-acre area that houses active radioactive and mixed waste container storage units and repackaging and characterization facilities and active and inactive radioactive waste disposal pits and shafts.

The PJ-SMA-18 drainage area overlies portions of seven of the disposal pits comprising Site 54-017 (Pits 12, 13, 16, 18, and 20 through 22) and all four of the waste storage trenches comprising Site 54 014(d) (Trenches A, B, C, and D). The waste disposal pits operated between 1974 and 1979 and received solid radioactive, mixed, and TRU-contaminated waste. The disposal pits currently have a minimum of 3 ft of soil cover over the buried wastes.

Site 54-014(d) trenches received TRU waste from 1974 to 1985 for retreivable storage. Trenches A and B were constructed between January and March 1974. Both trenches were excavated to a depth of 6 ft and width of 4 ft, but Trench A was excavated a length of approximately 262 ft while Trench B was excavated a length of approximately 219 ft. Trench C was excavated in September 1976 and is the the same length and width as Trench B, but it was excavated to a depth of 8 ft. Excavation of Trench D began in September 1978, and this trench was excavated to a length of 250 ft and to a depth of 10 ft. The TRU waste placed in these trenches is packaged in 30-gal. containers inside concrete casks. Following placement of the 30-gal. containers within the casks, the casks were sealed and covered with corrugated steel sheeting, 3.3 ft of crushed tuff, and 4 in. of topsoil. The surface was reseeded with native grasses.

Figure 2 shows the evolution of a typical subsurface disposal pit at Area G and Site 54-017. Before initial excavation of the first pits, Area G was an undeveloped mesa-top consisting of piñon-juniper woodlands. The mesa top was covered with a thin layer of soil underlain by Bandelier Tuff bedrock. The Bandelier Tuff was deposited during volcanic eruptions and is composed of pumice, minor rock fragments, and crystals supported in an ashy matrix. Pits were excavated into tuff, which was crushed and stockpiled separately from the pit area to prevent contact with the waste. While pits were open, construction guidelines mandated that runon from rainfall on the surrounding mesa area did not enter the pits (Rogers 1977b).The pits were filled with alternating layers of waste and crushed tuff. First, waste was placed in the bottom of the pit. Following placement, the waste layer was covered with crushed tuff and compacted with heavy equipment effectively filling void spaces within the waste providing an even, consolidated surface for the placement of the next layer of waste. This practice ensured the waste was contained within the disposal pit, preventing storm water runoff during the operational life of each pit.

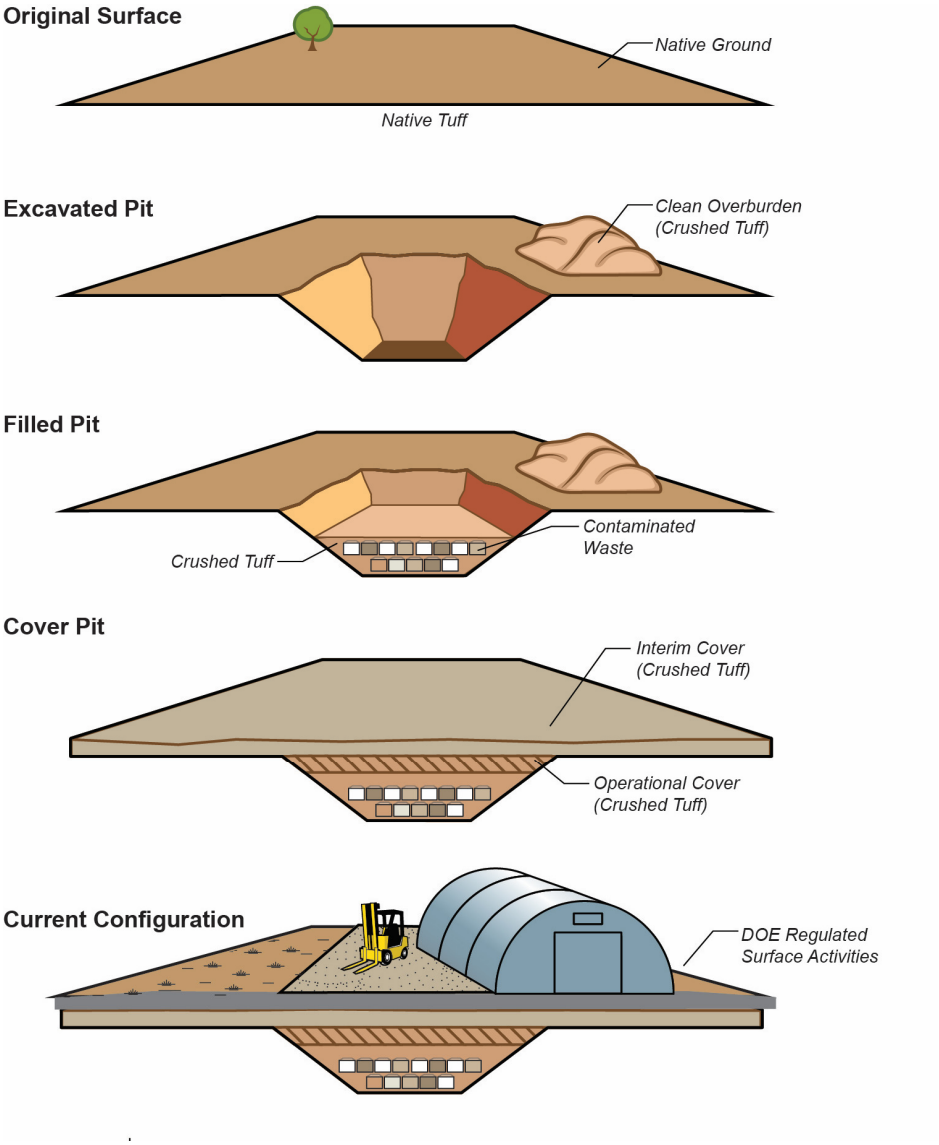

Figure 2 Typical disposal pit evolution at Area G

Present facility infrastructure within the boundary of PJ-SMA-18 has resulted in less than 1% of the area above the corresponding pits and trenches being covered with impervious infrastructure.

Waste placement operation protocol for Pits 12, 13, 16, 18, and 20–22 at Site 54-017 required wastes to be placed no closer than within 2 ft of the existing land surface (Rogers, 1977b; LASL 1965). The remaining capacity of each pit was filled and compacted with crushed tuff. This final layer of fill/tuff is known as the operational cover. Waste disposal operations at disposal pits (i.e., that portion of

Site 54-017 within the PJ-SMA-18 drainage area) were complete and the pits covered by 1979. Following the closure of the waste pits, additional activities at Area G provided added cover thickness over the pits. This cover is identified as the interim cover and was the result of grading and stabilization activities to control erosion that began in the mid-1970s and the placement of additional fill over the Site to support the more recent construction of facilities and infrastructure to support ongoing low-level waste management operations in Area G..

Storm Water Monitoring under the Permit

Storm water runoff from the area above portions of the subsurface pits and storage trenches comprising Sites 54-014(d) and 54-017 is monitored within PJ-SMA-18. Following the installation of baseline control measures, one baseline storm water sample was collected on July 25, 2013. Analytical results received September 13, 2013, from this sample yielded one TAL exceedance:

Table 1
TAL Exceedances in Storm Water Samples Collected at Sites 54-014(d) and 54-017

Analyte	Result	Maximum TAL	Exceedance Ratio	Date
Gross-alpha Radioactivity	23.6 pCi/L	15 pCi/L	1.6	7/25/2013

The TAL exceedance for monitoring location PJ-SMA-18 was evaluated against the appropriate storm water background values, which consist of “Bandelier Tuff background” for undisturbed SMAs or “developed background” for SMAs in urban settings. Background values are expressed as upper tolerance limits (UTLs), which were determined using the recommendations provided in ProUCL 4.1, an EPA-developed statistical software package (available at http://www.epa.gov/nerlesd1/databases/datahome.htm). UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figures 3 and 4. UTLs developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features, and are labeled “Developed Background” in Figures 3 and 4.

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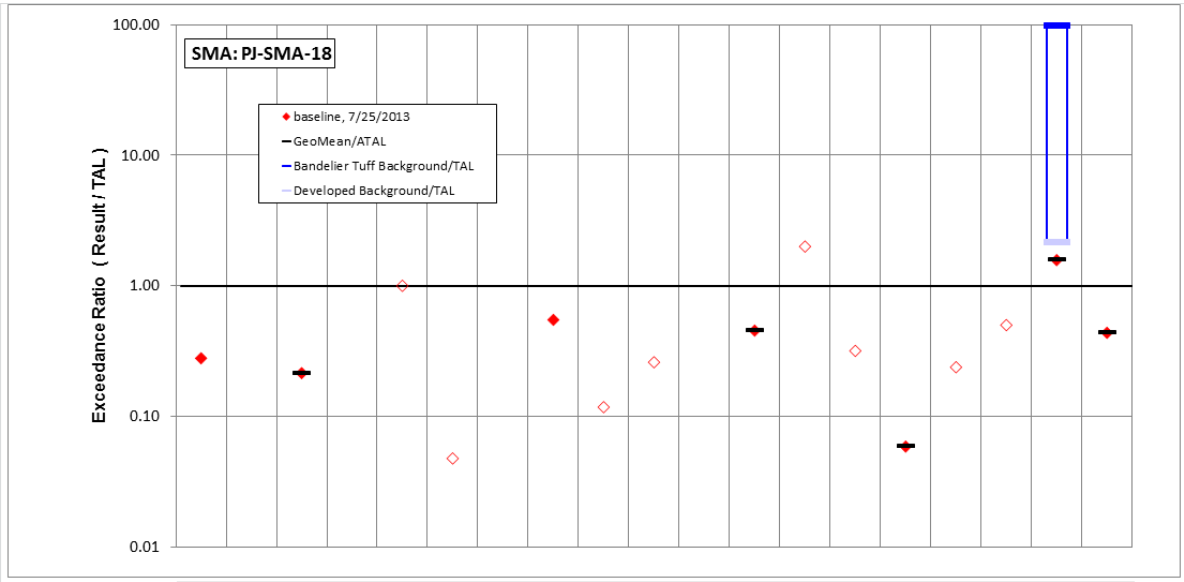

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	**Silver**	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/25/2013 result	209	*3*	1.93	19.7	*1*	*10*	2	2.36	*2*	*0.2*	1.49	2.27	***1***	*2*	5.87	*10*	*0.005*	**23.6**	13.1
result / TAL	0.28	*0.005*	0.21	0.0039	*1*	*0.048*	0.002	0.55	*0.12*	*0.26*	0.0088	0.45	***2***	*0.32*	0.059	*0.24*	*0.5*	**1.6**	0.44

Bold font indicates result>TAL; italic font indicates undetected results; "-" is used if no analytical results were available.

Figure 3 Inorganic analytical results summary plot for PJ-SMA-18

Figures 3 and 4 present the analytical results in a manner that allows direct comparison with the TALs as defined in the Permit. Data are presented in one or more plots. The first plot contains results for all metals, weak acid dissociable cyanide, and gross-alpha and radium radioactivity, and the second presents the results for organic compounds, if analyzed. The organic plot is presented only if one or more groups of organic compounds were analyzed in the storm water sample collected at the Sites and associated SMA per the requirements set forth in Appendix B of the Permit.

Analytical results for each analyte presented on the plots are normalized by calculating an exceedance ratio. This ratio is defined as the analytical result divided by applicable TAL. Thus, results exceeding the TAL will be greater than an exceedance ratio of 1.0. The exceedance ratios are plotted on a log scale to allow the viewing of a larger range of values. Each individual sample is represented by a symbol of a different color and shape. A solid symbol on the plot represents a result that is detected above the practical quantitation limit (PQL), while an empty symbol represents a value that is considered a nondetect. An empty symbol is a nondetect value represented graphically by the PQL.

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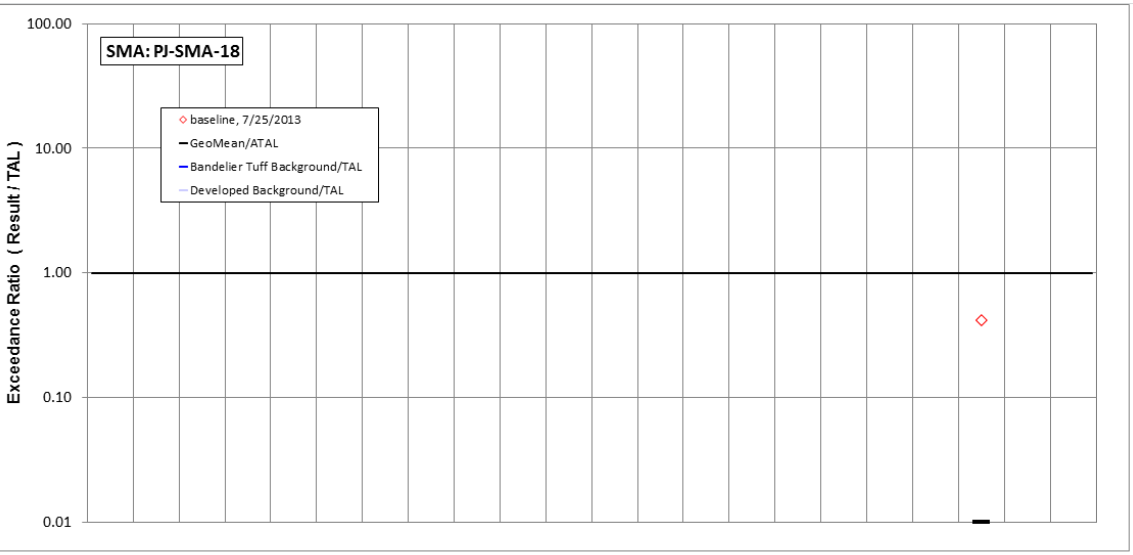

	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	-	-
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6E-04	-	-
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
7/25/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*3E-04*	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.42*	-	-

Bold font indicates result>TAL; italic font indicates undetected results; "-" is used if no analytical results were available.

Figure 4 Organic analytical results summary plot for PJ-SMA-18

Monitoring location PJ-SMA-18 receives runoff from developed areas (base-course roads/parking areas, concrete pads); landscape consisting of crushed Bandelier Tuff to backfill the inactive waste disposal pits and to provide additional cover over the subsurface pits and shafts; and from the undeveloped drainage directly upstream of the SMA sampler. See Attachment 1 for details of the surface cover within the SMA drainage area.

Gross-alpha radioactivity in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed urban landscape is 32.5 pCi/L. The 2013 gross-alpha result is below these two values and, therefore, is within the range of background values expected for this Site.

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Corrective Action Control Measure Description

Because of the nature of the wastes disposed of and stored at Sites 54-014(d) and 54-017, no exposure has been a key element of radiological protection and nuclear safety requirements since disposal and storage activities began. In addition to being SWMUs, the inactive, subsurface disposal pits and and storage trenches comprising Sites 54-014(d) and 54-017 are regulated by DOE because of their radionuclide inventory. The radiological protection requirements established for these inactive pits and storage trenches essentially require no exposure to potential receptors (e.g., members of the public) to the radionuclides in the wastes with the pits and trenches. As explained in more detail below, these “no exposure” requirements under DOE regulations are fundamentally identical to the corrective action requirements for storm water control measures that prevent contamination of storm water by eliminating exposure to pollutants.

Sites 54-014(d) and 54-017 are located within Area G at TA-54. Area G is a low-level radioactive waste (LLW) disposal and TRU waste storage facility regulated by DOE under the Atomic Energy Act, as implemented by DOE Order 435.1, Radioactive Waste Management. DOE Order 435.1 contains specific performance objectives related to radiological protection of the public that all LLW disposal and TRU waste storage facilities must meet. These performance objectives include limits on radiological dose to members of the public during operation of the disposal facility and after closure. LLW disposal facilities must conduct a performance assessment and composite analysis to demonstrate performance objectives will be met during operation and for a period 1000 yr after closure. The performance assessment evaluates the dose associated with LLW disposed of at the facility, and the composite analysis considers all other sources of radioactive material that may contribute to dose to the public. TRU waste disposal is only authorized at the off-site Waste Isolation Pilot Plant (WIPP) facility and all TRU wastes currently stored at Area G must be removed and transported to WIPP prior to closure of Area G.

The performance assessment is used to develop a closure plan for the facility that specifies how the facility will be closed in a manner that ensures performance objectives will be met. DOE Order 435.1 and its implementing manual and guidance also require the facility to be operated in a manner that adheres to the requirements and limitations contained in and derived from the closure plan and performance assessment. Compliance with the performance objectives is predicated on isolation of the disposed and stored waste from the accessible environment, which is fundamentally identical to storm water control measures that prevent contamination of storm water by eliminating exposure to pollutants. The LLW and TRU wastes regulated by DOE under Order 435.1 are also the source of potential storm water pollutants regulated by EPA under the Permit. Therefore, actions taken by the Laboratory to meet DOE radiological protection requirements also satisfy the requirements for control measures that totally eliminate exposure of pollutants to storm water contained in Section E.2(c) of the Permit.

Preventing exposure to waste before final site closure is accomplished through implementation of various Laboratory procedures, including EP-AP-2202, Revision 2, Pit and Shaft Design, Construction, and Operational Closure; EP-DOP-2216, Revision 0, TA-54 Area G Low Level Waste Disposal and Pit/Shaft Deactivation; and EP-AREAG-FO-DOP-0213, Revision 4, TA-54 Area G Inactive Pit and Shaft

Quarterly SR and Shaft Quarterly ISI. Relevant requirements implemented through these procedures include the following:

- Preventing runoff from entering the pit while it is in use (EP-AP-2202, Section 7.1.2)
- Preventing operational LLW from being disposed higher than 3 m (9 ft 10 in.) below the rim of the pit (EP-DOP-2216, Section 3)
- Preventing low-activity bulk soils and debris from environmental restoration and decontamination and decommissioning activities from being disposed higher than 0.3 m (1 ft) below the interface of site surface soils and the underlying intact tuff (EP-DOP-2216, Section 3)
- Performing quarterly inspections of inactive pits for signs of significant erosion, subsidence, or other signs of loss of cover and implementing corrective actions if deficiencies are noted (EP-AREAG-FO-DOP-0213)

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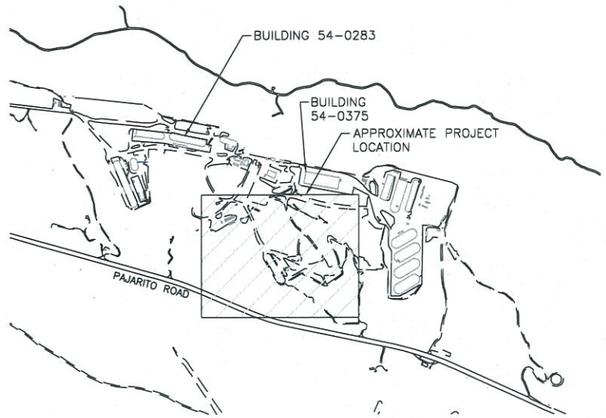
Attachment 1

PJ-SMA-18 As-Built Drawings, Pits 12, 13, 16, 18 and 20-22 and Trenches A, B, C and D

PJ-SMA-18 AS-BUILT DRAWINGS

PITS 12,13,16,18, AND 20-22, TRENCHES A,B,C AND D



LOCATION PLAN
SCALE: NONE TA-54

LIST OF DRAWINGS

REVISION NUMBER	SHEET NUMBER	DISCIPLINE SHEET NUMBER	DRAWING TITLE
0	1	G-0001	TITLE SHEET
0	2	C-0001	LEGEND, ABBREVIATIONS, AND GENERAL NOTES
0	3	C-1000	PLAN VIEW
0	4	C-1001	LAND CLASSIFICATION ABOVE PITS & SHAFTS WITHIN PJ-SMA-18
0	5	C-3000	PIT SECTION VIEW
0	6	C-3001	TRENCH SECTION VIEW

NO	DATE	CLASS REV	ADC	DESCRIPTION	DWN	DES	CHKD	SUB	APP

ENVIRONMENTAL PROGRAMS

PJ-SMA-18 AS-BUILT DRAWINGS

TITLE SHEET

BLDG NA TA-54

DRAWN E.FERNANDEZ 8/19/14
DESIGN G. ODOHM
CHECKED T.KOSTROBALA
DATE 8-19-14

SUBMITTED APPROVED FOR RELEASE

Los Alamos NATIONAL LABORATORY
PO Box 1663
Los Alamos, New Mexico 87545

SHEET G-0001
1 OF 6

CLASSIFICATION REVIEWER DATE

PROJECT ID 102891
DRAWING NO C-57038
REV 0

LEGEND

NORTH ORIENTATION SYMBOL

10' 5' 0 5' 10'
1"=10'-0"
GRAPHIC SCALE

A
C-5001
SECTION TAG

SECTION END LINE

7300
EXISTING CONTOUR

MISC EXISTING STRUCTURE

SWMU BOUNDARY

SMA BOUNDARY

EXISTING EARTH/TUFF

INTERIM COVER

OPERATIONAL COVER

CONTAMINATED WASTE/CRUSHED TUFF LAYERS

SOIL

ABBREVIATIONS

BLDG	– BUILDING
DWG	– DRAWING
E	– EASTING
EL	– ELEVATION
FT	– FOOT OR FEET
INV	– INVERT
LF	– LINEAR FEET
MAX	– MAXIMUM
MIN	– MINIMUM
N	– NORTHING
NAD	– NORTH AMERICAN DATUM
NGVD	– NATIONAL GEODETIC VERTICAL DATUM
NMDOT	– NEW MEXICO DEPARTMENT OF TRANSPORTATION
SMA	– STORM WATER MANAGEMENT AREA
TYP	– TYPICAL

LIST OF REFERENCES

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LASL (LOS ALAMOS SCIENTIFIC LABORATORY), JULY 27, 1977e. "MATERIALS DISPOSAL AREAS, AREA G PIT SECTIONS FOR PIT 20, TA-54." ENGINEERING DRAWING R-5024, LOS ALAMOS , NEW MEXICO. (LASL 1977, 76099)

LASL (LOS ALAMOS SCIENTIFIC LABORATORY), JULY 27, 1977f. "MATERIALS DISPOSAL AREAS, AREA G PIT SECTIONS FOR PIT 21, TA-54." ENGINEERING DRAWING R-5025, LOS ALAMOS, NEW MEXICO. (LASL 1977, 76099)

LASL (LOS ALAMOS SCIENTIFIC LABORATORY), JULY 27, 1977g. "MATERIALS DISPOSAL AREAS, AREA G PIT SECTIONS FOR PIT 22, TA-54. "ENGINEERING DRAWING R-5026, LOS ALAMOS, NEW MEXICO (LASL 1977, 76099)

LASL (LOS ALAMOS SCIENTIFIC LABORATORY), JULY 27, 1965. "MATERIALS DISPOSAL AREAS, STANDARD PIT SPECIFICATIONS" ENGINEERING DRAWING C-25703, LOS ALAMOS , NEW MEXICO. (LASL 1965, 249234)

ROGERS, M.A., JUNE 1977. "HISTORY AND ENVIRONMENTAL SETTING OF LASL NEAR-SURFACE LAND DISPOSAL FACILITIES FOR RADIOACTIVE WASTES (AREAS A, B, C, D, E, F, G, AND T)," VOL. I, LOS ALAMOS SCIENTIFIC LABORATORY REPORT LA-6848-MS, LOS ALAMOS, NEW MEXICO (ROGERS 1977, 005707)

ROGERS, M.A., JUNE 1977. "HISTORY AND ENVIRONMENTAL SETTING OF LASL NEAR-SURFACE LAND DISPOSAL FACILITIES FOR RADIOACTIVE WASTES (AREAS A, B, C, D, E, F, G, AND T)," VOL. II, LOS ALAMOS SCIENTIFIC LABORATORY REPORT LA-6848-MS, LOS ALAMOS, NEW MEXICO (ROGERS 1977, 005708)

GENERAL NOTES

1. IF THIS SHEET IS NOT 24" X 36" IT IS A REDUCED SIZE PLOT.

NO	DATE	CLASS REV	ADC	DESCRIPTION	DWN	DES	CHKD	SUB	APP

ENVIRONMENTAL PROGRAMS

PJ-SMA-18 AS-BUILT DRAWINGS

LEGEND, ABBREVIATION, AND GENERAL NOTES

DRAWN	E.FERNANDEZ	8/
DESIGN	G. FORDHAM	
CHECKED	T.KOSTRUBALA	
DATE	8.19.14	

BLDG NA TA-54

SUBMITTED PROJECT_ENGINEER

APPROVED FOR RELEASE PROJECT_TEAM_LEADER

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SHEET C-0001
2 OF 6

CLASSIFICATION CLASSIFICATION | REVIEWER REVIEWER | DATE

PROJECT ID 102891 | DRAWING NO C-57038 | REV 0

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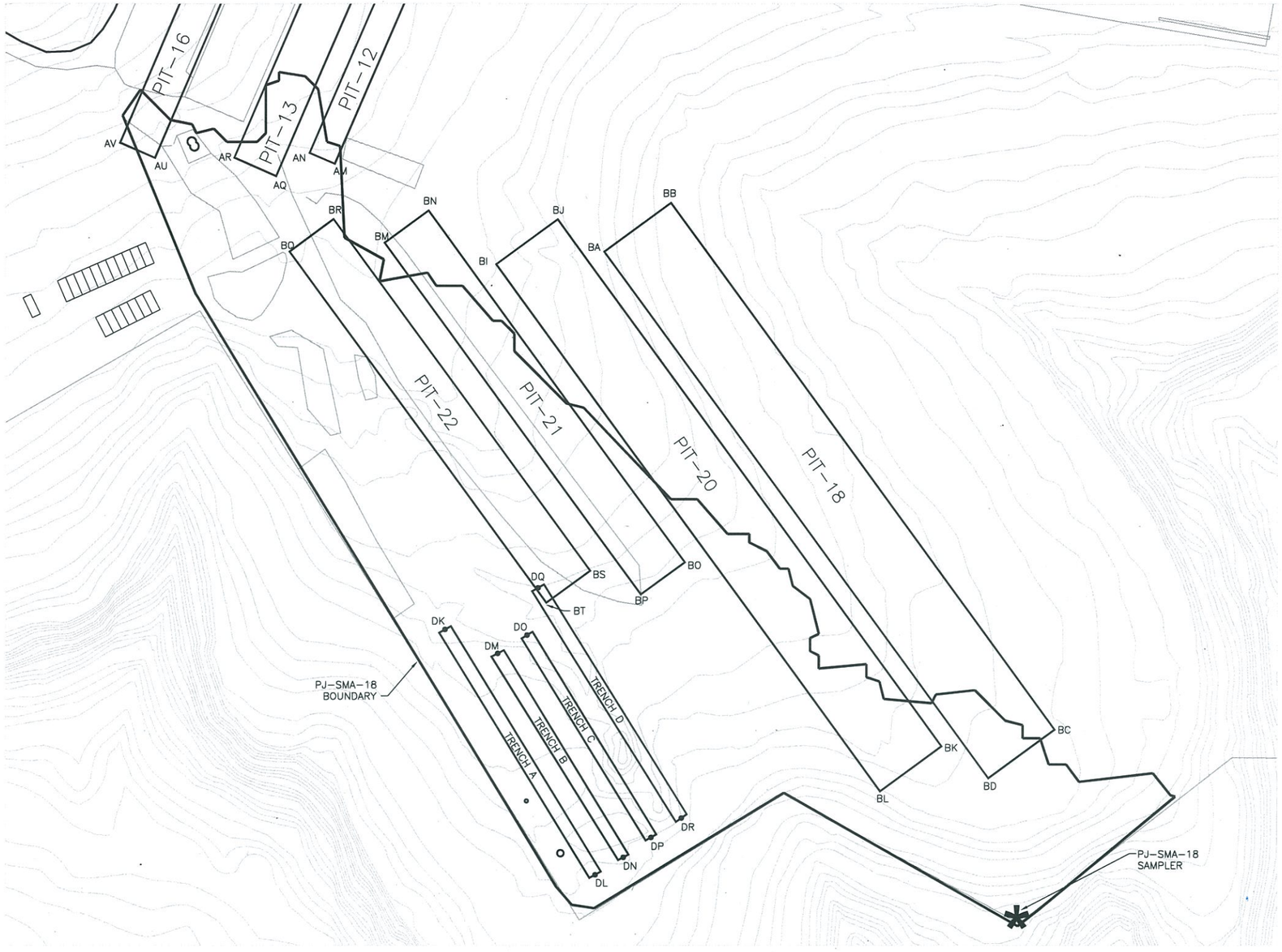

PLAN VIEW

0 50' 100'

1"=50'–0"

Point #	Easting	Northing
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AN	1643345.2	1757690.8
AQ	1643313.5	1757670.1
AR	1643275.0	1757686.9
AU	1643193.1	1757690.7
AV	1643170.1	1757700.6
BA	1643615.4	1757600.3
BB	1643676.7	1757645.1
BC	1644030.5	1757160.8
BD	1643969.1	1757116.0
BI	1643516.2	1757588.8
BJ	1643572.8	1757630.0
BK	1643926.1	1757145.4
BL	1643869.5	1757104.2
BM	1643413.7	1757608.4
BN	1643454.1	1757637.8
BO	1643689.8	1757314.8
BP	1643649.4	1757285.4
BQ	1643326.7	1757600.5
BR	1643367.1	1757630.0
BS	1643603.0	1757307.2
BT	1643562.7	1757277.7
DK	1643469.4	1757252.9
DL	1643607.8	1757027.7
DM	1643517.9	1757231.0
DN	1643633.6	1757043.7
DO	1643544.9	1757247.9
DP	1643658.9	1757061.8
DQ	1643555.0	1757291.4
DR	1643686.9	1757079.5

NO	DATE	CLASS REV	ADC	DESCRIPTION	DWN	DES	CHKD	SUB	APP

ENVIRONMENTAL PROGRAMS

PJ–SMA–18 AS–BUILT DRAWINGS

PLAN VIEW

BLDG NA TA-54

DRAWN E.FERNANDEZ

DESIGN C. FORDHAM

CHECKED T.KOSTRUBALA

DATE 8.19.14

SUBMITTED

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SHEET C–1000

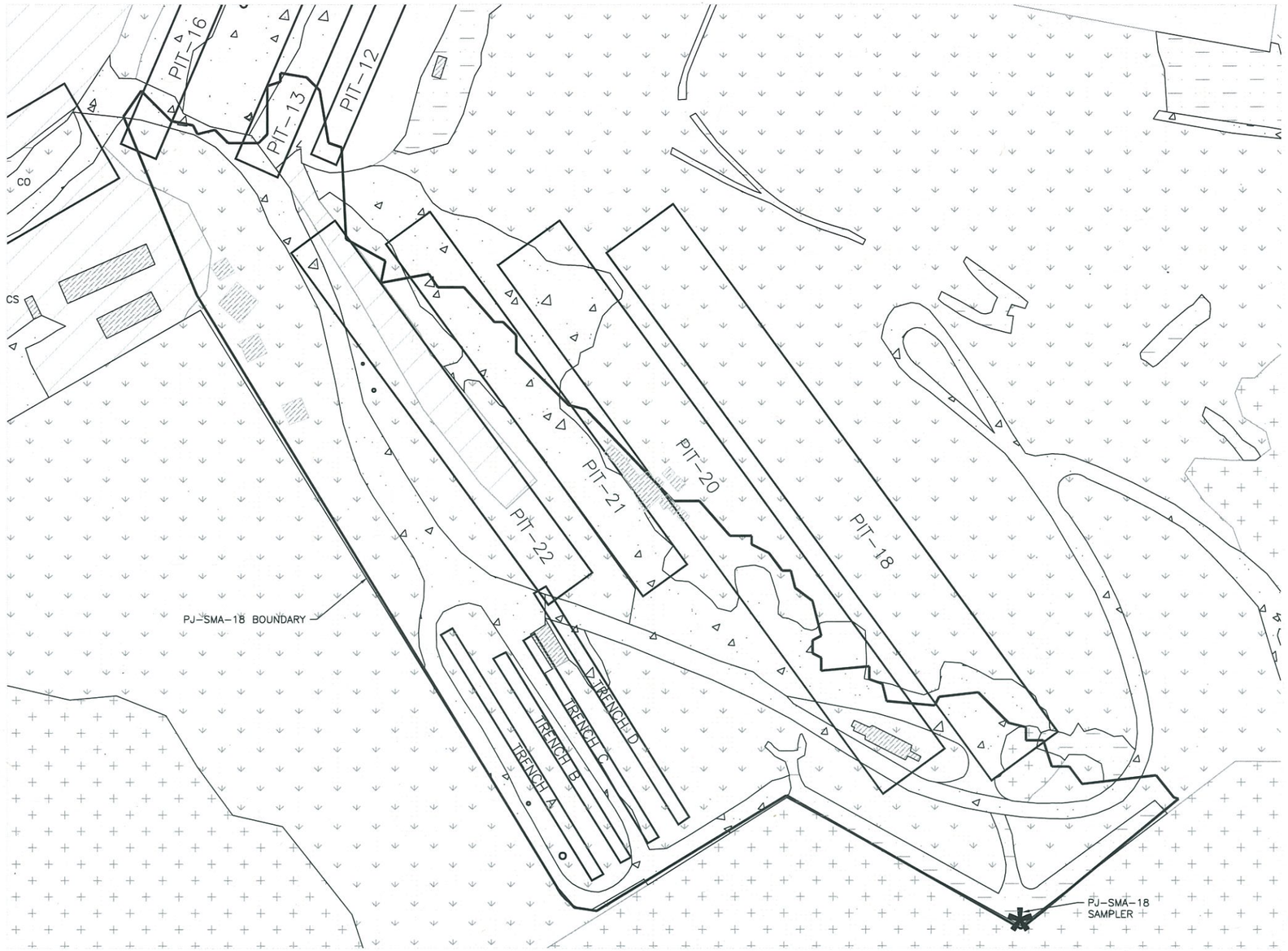
3 OF 6

CLASSIFICATION REVIEWER DATE

PROJECT ID 102891

DRAWING NO C–57038

REV 0



PLAN VIEW

0 50' 100'

1"=50'-0"

LAND CLASSIFICATION ABOVE PITS WITHIN THE PJ-SMA-18 BOUNDARY

SURFACE TYPE	PIT-12	PIT-13	PIT-16	PIT-18	PIT-20	PIT-21	PIT-22
ASPHALT	100	–	–	–	–	–	–
CHAMISA	–	–	–	–	–	–	–
CONCRETE	–	–	–	–	–	–	–
BASE COURSE	–	100	50	70	40	95	–
PINION JUNIPER	–	–	–	30	–	–	–
STRUCTURE	–	–	–	–	10	–	–
SPARSE GRASS	–	–	50	–	50	5	55
TUFF	–	–	–	–	–	–	–
BARE GROUND	–	–	–	–	–	–	45

NO	DATE	CLASS REV	ADC	DESCRIPTION	DWN	DES	CHKD	SUB	APP

ENVIRONMENTAL PROGRAMS

PJ-SMA-18 AS-BUILT DRAWINGS

LAND CLASSIFICATION ABOVE PITS AND TRENCHES WITHIN PJ-SMA-18

DRAWN E.FERNANDEZ 8/19/14

DESIGN C. FRAHAM

CHECKED T.KOSTRUBALA

DATE 8.19.14

BLDG NA TA-54

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SHEET C-1001

4 OF 6

CLASSIFICATION | REVIEWER | DATE

PROJECT ID 102891 | DRAWING NO C-57038 | REV 0

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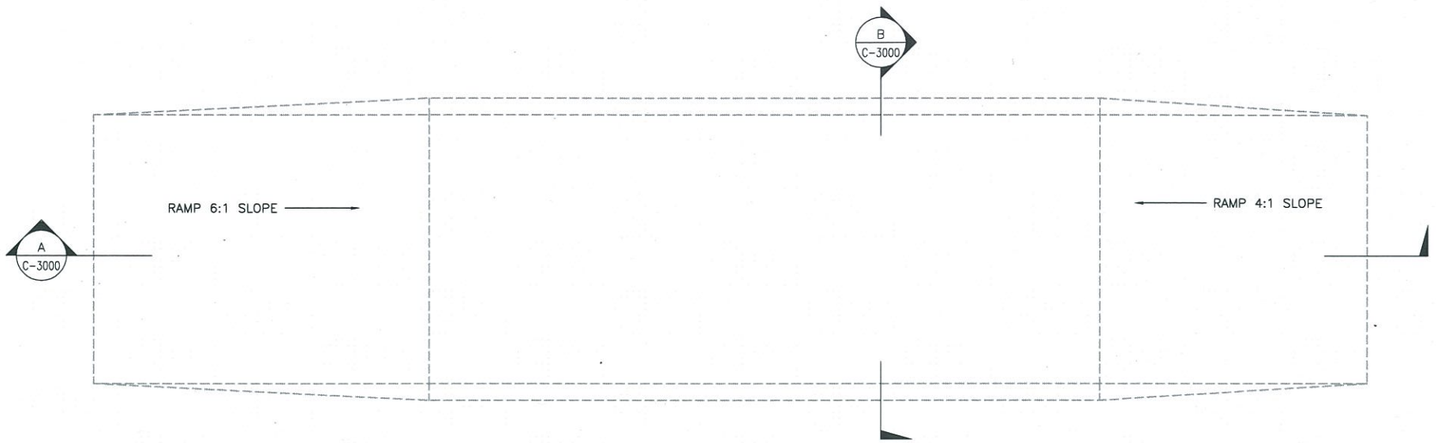
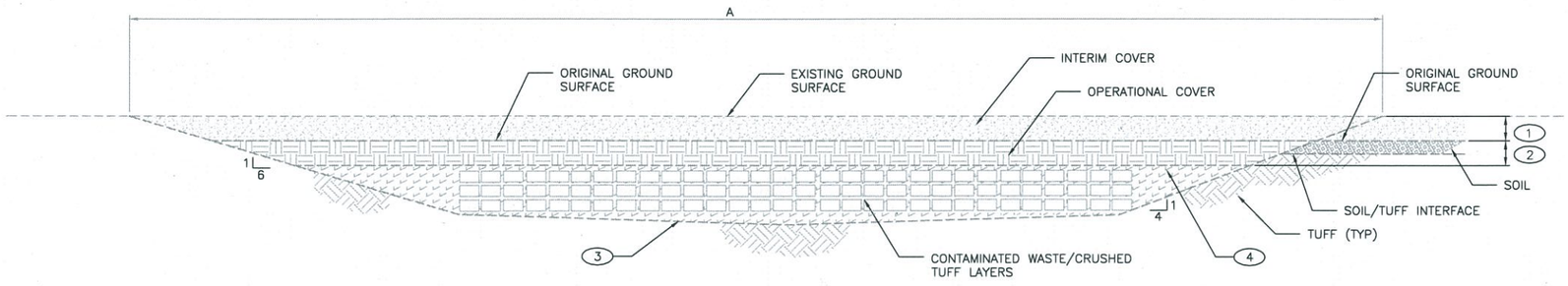
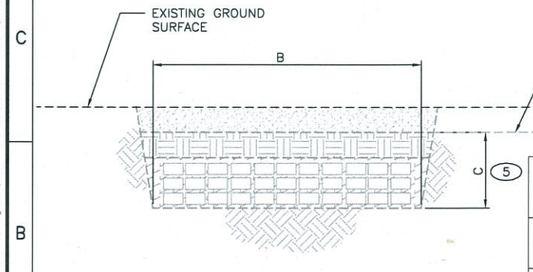


STANDARD PIT PLAN



A C-3000 SECTION VIEW
SCALE: NONE



B C-3000 SECTION VIEW
SCALE: NONE

PIT DIMENSION TABLE (FT)

DIMENSION ID	PIT-12	PIT-13	PIT-16	PIT-18	PIT-20	PIT-21	PIT-22
A	400	400	400	600	600	400	400
B	31	40	25	75	75	57	57
C	28	28	32	40	40	27	33
SOURCE: LANL ENGINEERING DRAWING	R-5016 (LASL 1977A)	R-5017 (LASL 1977B)	R-5020 (LASL 1977C)	R-5022 (LASL 1977D)	R-5024 (LASL 1977E)	R-5025 (LASL 1977F)	R-5026 (LASL 1977G)

GENERAL NOTES

1. IF THIS SHEET IS NOT 24" X 36" THEN IT IS A REDUCED SIZE PLOT.
2. STANDARD PIT LAYOUT AND SECTION VIEW DEPICTION FROM LANL ENGINEERING DRAWING, C-25703 (LASL 1965, XXXXXX).
3. SEE SHEET C-1000 FOR PIT CORNER NORTHING/EASTING LOCATIONS.
4. PIT DIMENSIONS ESTABLISHED FROM PIT SURVEYS AND DEPICTED IN LANL ENGINEERING DRAWINGS FOR EACH SPECIFIC PIT. SEE DIMENSION TABLE FOR DRAWING REFERENCE.

KEYED NOTES

(1) INTERIM COVER CONSISTS OF CRUSHED TUFF COVERED BY THE EXISTING ACTIVE WASTE MANAGEMENT OPERATIONS SURFACE (E.G. ASPHALT PADS, STORAGE BUILDINGS/DOMES, AND ROADS). DEPTH FROM EXISTING GROUND SURFACE TO ORIGINAL GROUND SURFACE VARIES FOR EACH PIT LOCATION. EXISTING GROUND SURFACE MAY BE DEFINED BY ASPHALT, CONCRETE, COVER SOIL, OR BUILDINGS.

(2) OPERATIONAL COVER CONSISTS OF CRUSHED TUFF. DEPTH FROM ORIGINAL GROUND SURFACE TO CONTAMINATED WASTE / CRUSHED TUFF LAYERS NOT TO BE LESS THAN 2 FEET PER USGS 1965 PIT CONSTRUCTION GUIDELINES LETTER. HISTORICAL RECORDS INDICATE ACTUAL DEPTHS TYPICALLY EXCEED 2 FT MINIMUM (M.A. ROGERS, 1977).

(3) PIT BOTTOM SLOPE VARIES. SEE R-SERIES DRAWING FOR SLOPES. TYPICAL SLOPE SHOWN.

(4) PER USGS 1965 PIT CONSTRUCTION GUIDELINES, "WASTES ARE TO BE BURIED IN THE CONFINES OF NATURAL TUFF. THE WASTES SHOULD BE BURIED BELOW THE SOIL ZONE WITHIN THE TUFF."

(5) DIMENSION "C" IS THE MAXIMUM DIMENSION AS MEASURED FROM THE PIT BOTTOM TO THE ORIGINAL GROUND SURFACE.

NO	DATE	CLASS REV	ADC	DESCRIPTION	DWN	DES	CHKD	SUB	APP

ENVIRONMENTAL PROGRAMS

PJ-SMA-18 AS-BUILT DRAWINGS

PIT SECTION VIEW

BLDG NA TA-54

DRAWN E.FERNANDEZ 8/19/14
DESIGN G. FERGHAM
CHECKED T.KOSTRABALA
DATE 8.19.14

SUBMITTED

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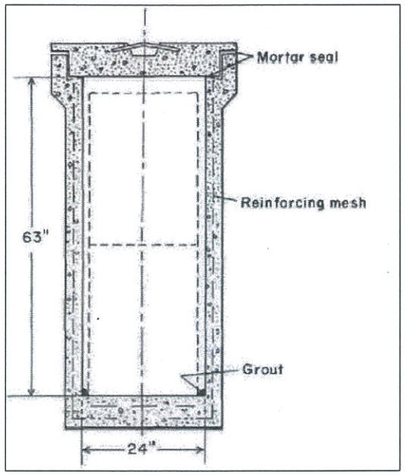
Los Alamos, New Mexico 87545

SHEET C-3000
5 OF 6

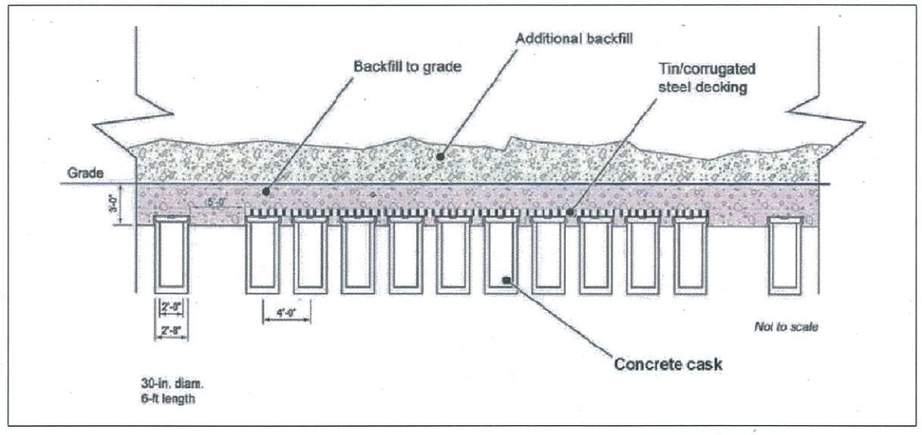
CLASSIFICATION	REVIEWER	DATE
PROJECT ID 102891	DRAWING NO C-57038	REV 0

GENERAL NOTES

1. IF THIS SHEET IS NOT 24" X 36" THEN IT IS A REDUCED SIZE PLOT.
2. CONCRETE CASK CONSTRUCTION DETAILS AND DESCRIPTION OF METHODS FOR BURIAL OF THE CASKS, FROM ROGERS 1977.



TYPICAL SECTION VIEW OF CONCRETE CASK



TYPICAL ELEVATION OF CASK ARRAY IN TRENCHES A– D

SCALE: NONE

NO	DATE	CLASS REV	ADC	DESCRIPTION	DWN	DES	CHKD	SUB	APP

ENVIRONMENTAL PROGRAMS

PJ–SMA–18 AS–BUILT DRAWINGS

TRENCH SECTION VIEW

BLDG NA TA–54

DRAWN E.FERNANDEZ

DESIGN G. FORMAN

CHECKED T.KOSTRUBALA

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SHEET C–3001

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CLASSIFICATION | REVIEWER | DATE

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