

# 2017 Update to the Site Discharge Pollution Prevention Plan, Revision 1

Los Alamos National Laboratory  
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## Water/Cañon de Valle Watershed

Receiving Waters:  
Cañon de Valle, Potrillo Canyon, Water Canyon, and Fence Canyon

**Volume 4**





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## 180.0 CDV-SMA-1.2: SWMUs 16-017(b)-99 and 16-029(k)

### 180.1 Site Descriptions

Two historical industrial activity areas are associated with V001, CDV-SMA-1.2: Sites 16-017(b)-99 and 16-029(k).

SWMU 16-017(b)-99 is a former HE machining building (former structure 16-93) that was located at TA-16. Constructed in 1950, the wooden building measured 20 ft wide × 60 ft long × 11 ft high and was surrounded by an earthen berm that was packed against steel pilings. The building was originally used for HE machining and later was used as an electroplating facility. By 1970, the building was used only for storage. Building 16-93 was removed in 1996.

SWMU 16-017(b)-99, along with numerous other SWMUs and AOCs, is part of Consolidated Unit 16-008(a)-99, the former 90s Line, and was investigated and remediated under the Consent Order as a single Site. Consent Order investigations are complete for SWMU 16-017(b). NMED granted the Site a COC without controls on August 1, 2016.

SWMU 16-029(k) consists of two former HE sumps that served the former electroplating building 16-93 at TA-16. Constructed in 1950, the 5-ft-wide × 15-ft-long × 5-ft-deep concrete sumps were situated on the northeast and southeast corners of the building. Two VCP drainlines extended north from each sump and eventually merged into a single drainline that continued for approximately 500 ft to an outfall located north of the K-Site Road. In the 1960s, the sumps were filled with gravel. The building, sumps, and drainlines were removed during D&D operations in 1996.

SWMU 16-029(k), along with numerous other SWMUs and AOCs, is part of Consolidated Unit 16-008(a)-99, the former 90s Line, and was investigated and remediated under the Consent Order as a single Site. Consent Order investigations are complete for SWMU 16-029(k). NMED granted the Site a COC without controls on August 1, 2016.

The project map (Figure 180-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 180.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 180-1).

**Table 180-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00102040012	Established Vegetation	-	X	X	-	B
V00103020008	Base Course Berm	-	X	-	X	CB
V00104060001	Rip Rap	-	X	X	-	CB
V00106010007	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.



### 180.3 Storm Water Monitoring

SWMUs 16-017(b)-99 and 16-029(k) are monitored within CDV-SMA-1.2. Following the installation of baseline control measures, a baseline storm water sample was collected on September 12, 2013 (Figures 180-2 and 180-3). The HE analytical results for this sample were rejected because of holding times. The remaining analytical results yielded no TAL exceedances.

An additional baseline storm water sample was collected on August 2, 2015 (Figures 180-2 and 180-3). In Figure 180-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this monitoring sample yielded no TAL exceedances. Baseline confirmation is complete for CDV-SMA-1.2 and the associated SWMUs 16-017(b)-99 and 16-029(k) because all applicable sampling results are below the applicable MTAL or ATAL.

No further sampling is required for CDV-SMA-1.2 for the duration of the IP.

### 180.4 Inspections and Maintenance

RG253 recorded six storm events at CDV-SMA-1.2 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 180-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62904	6-29-2017
Storm Rain Event	BMP-63415	7-25-2017
Storm Rain Event	BMP-64148	8-9-2017
Storm Rain Event	BMP-65106	8-29-2017
Storm Rain Event	BMP-65941	10-10-2017

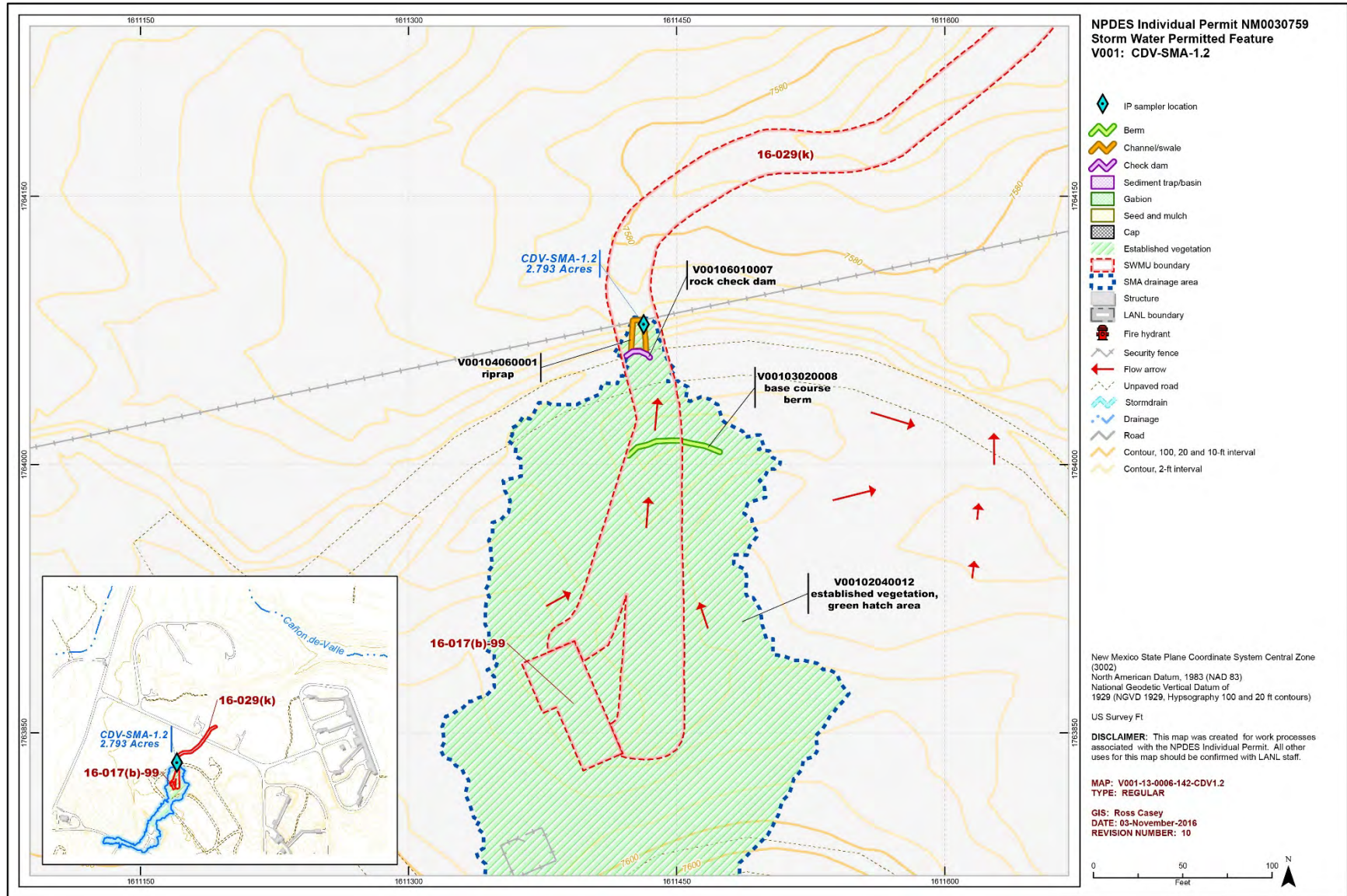
No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-1.2 in 2017.

### 180.5 Compliance Status

The Sites associated with CDV-SMA-1.2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 180-3 presents the 2017 compliance status.

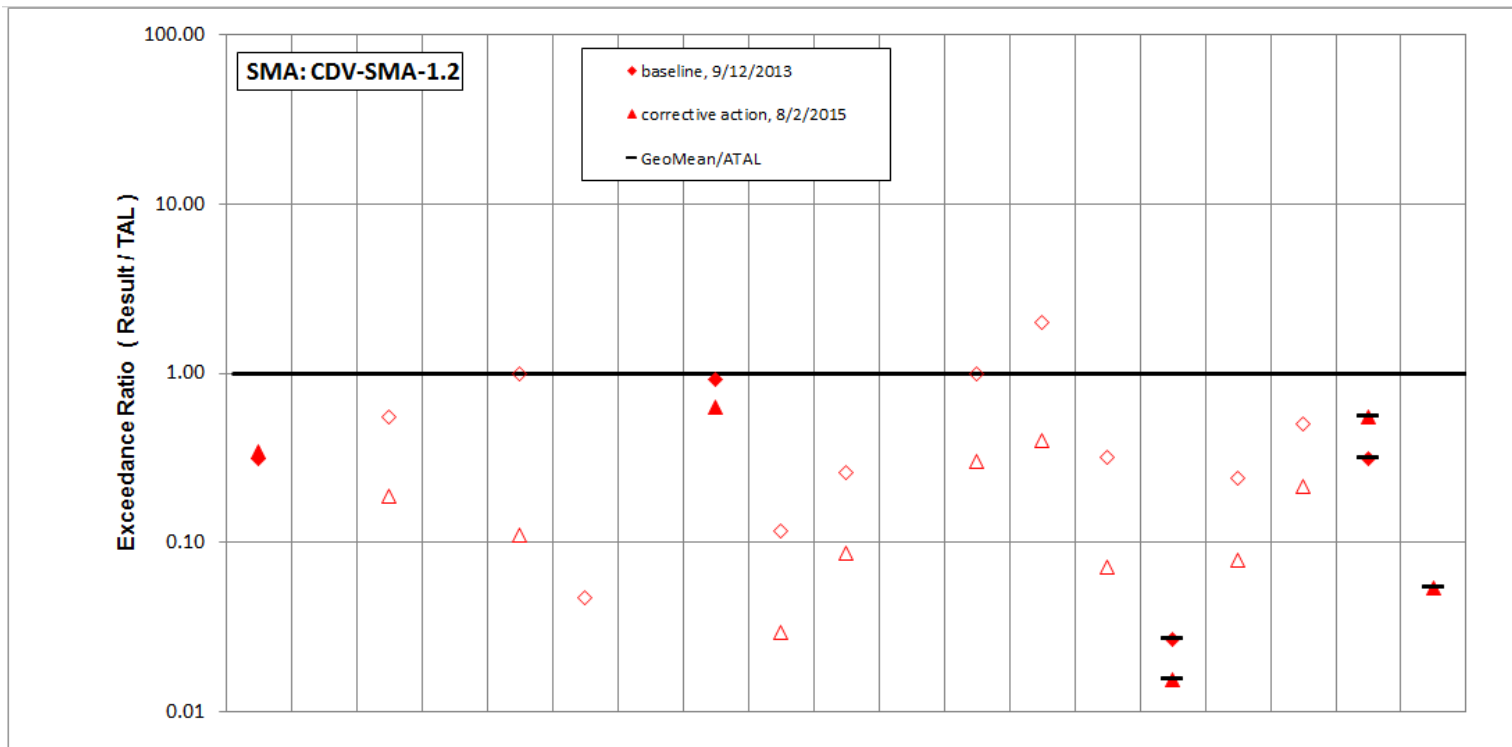
**Table 180-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-017(b)-99	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 9-14-2015. No additional sampling is necessary for this Site
SWMU 16-029(k)	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 9-14-2015. No additional sampling is necessary for this Site



**Figure 180-1 CDV-SMA-1.2 location map**

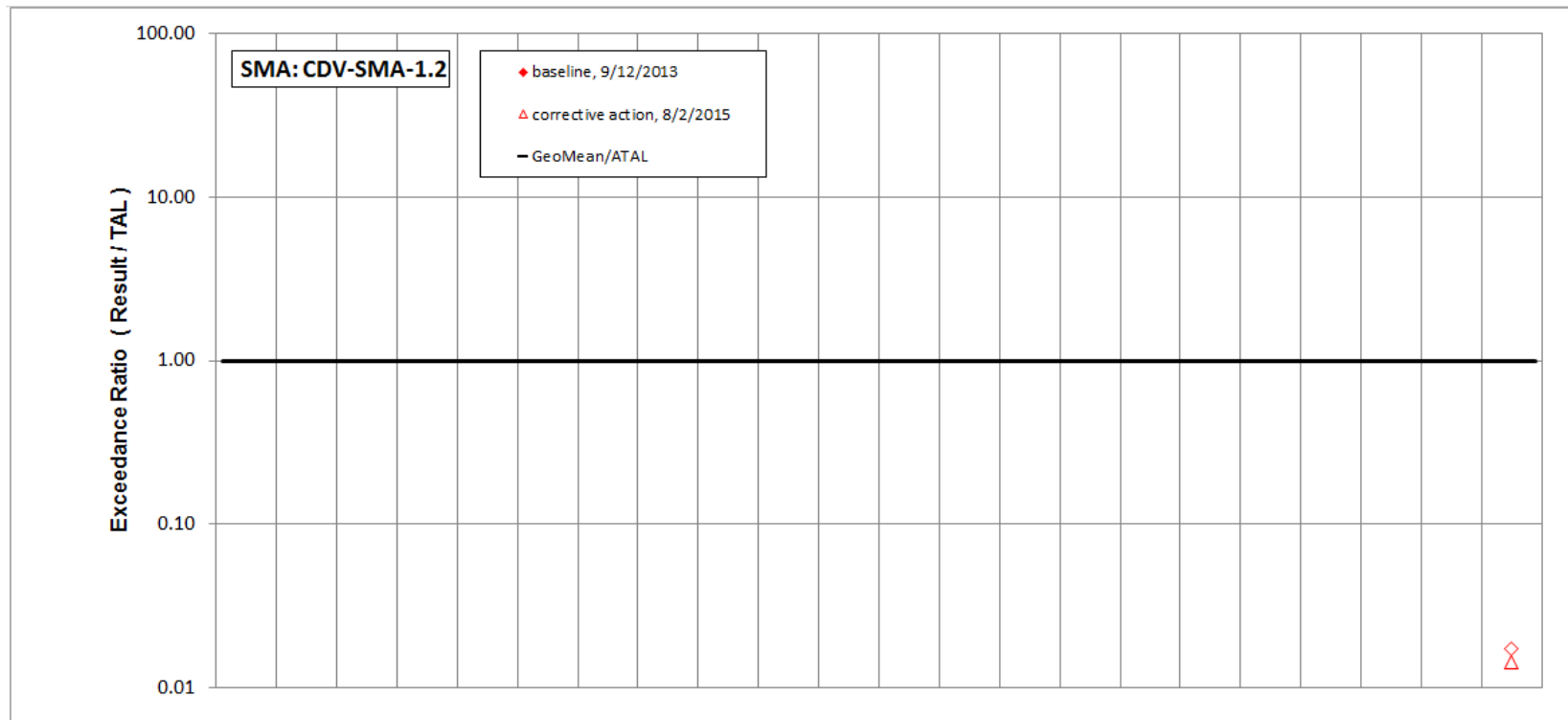




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	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
8/2/2015 result	260	2.18	1.7	21.8	0.11	2	1	2.69	0.5	0.067	0.733	1.5	0.2	0.45	1.55	3.3	0.002	8.24	1.61
result / TAL	0.35	0.0034	0.19	0.0044	0.11	0.01	0.001	0.63	0.029	0.087	0.0043	0.3	0.4	0.071	0.016	0.079	0.21	0.55	0.054
9/12/2013 result	233	3	5	29.2	1	10	1.68	3.95	2	0.2	1.35	5	1	2	2.66	10	0.005	4.7	0.236
result / TAL	0.31	0.005	0.56	0.0058	1	0.048	0.0017	0.92	0.12	0.26	0.0079	1	2	0.32	0.027	0.24	0.5	0.31	0.008

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 180-2 Inorganic analytical results summary plot for CDV-SMA-1.2**



	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	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
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
8/2/2015 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.287	-	-	-	0.287
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	-	-	0.014
9/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.153	-	-	-	0.347
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8E-04	-	-	-	0.017

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 180-3 Organic analytical results summary plot for CDV-SMA-1.2**



## **181.0 CDV-SMA-1.3: SWMUs 16-017(a)-99 and 16-026(m)**

### **181.1 Site Descriptions**

Two historical industrial activity areas are associated with V002, CDV-SMA-1.3: Sites 16-017(a)-99 and 16-026(m).

Site 16-017(a)-99 consists of a former HE machining building (structure 16-92) that was located at TA-16. Constructed in 1950, the wooden building measured 20 ft wide × 60 ft long × 11 ft high and was surrounded by an earthen berm that was packed against steel pilings. The building was originally used for HE machining and was later used to clean and refurbish HE-contaminated equipment. By 1970 the building was used entirely for storage. The building was removed in 1996. This Site was originally a component of SWMU 16-017, which consisted of a group of 24 structures within TA-16. During the 1999 Annual Unit Audit, SWMU 16-017 was split into 24 separate SWMUs to facilitate investigation. Structure 16-92 was given the individual SWMU identification of SWMU 16-017(a)-99 at that time.

SWMUs 16-017(a)-99 and 16-026(m), along with numerous other SWMUs and AOCs, are part of Consolidated Unit 16-008(a)-99, the former 90s Line, and were investigated under the Consent Order as a single Site. The same surface sampling data set applies to both Sites.

Consent Order investigations are complete for SWMU 16-017(a)-99. NMED granted the Site a COC without controls on August 1, 2016.

SWMU 16-026(m) consists of two outfalls from two sumps [SWMU 16-029(l)], located near the 90s Line Pond area at TA-16, that served former HE machining building 16-92. The sumps were located on the east and west sides of building 16-92. The eastern sump discharged to a VCP drainline that extended north and west to its discharge point approximately 260 ft north of the building. The western sump discharged to a VCP that extended north and then west of the building where it discharged to an open drainage channel. Constructed in 1950, the building was used for machining HE until 1955.

Subsequently, the building was used for cleaning and refurbishing HE-contaminated equipment. The sumps were filled with gravel during the mid-1960s, and by 1970 the building was devoted entirely to storage. The building, its sumps and drainlines were all removed in 1996. SWMUs 16-017(a)-99 and 16-026(m), along with numerous other SWMUs and AOCs, are part of Consolidated Unit 16-008(a)-99, the former 90s Line, and were investigated under the Consent Order as a single Site. The same surface sampling data set applies to both Sites.

Consent Order investigations are complete for SWMU 16-026(m). NMED granted the Site a COC without controls on August 1, 2016.

The project map (Figure 181-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **181.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 181-1).

**Table 181-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00202040003	Established Vegetation	-	X	X	-	B
V00203020002	Base Course Berm	-	X	-	X	CB

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 181.3 Storm Water Monitoring

SWMUs 16-017(a)-99 and 16-026(m) are monitored within CDV-SMA-1.3. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 181-2 and 181-3). In Figure 181-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 34.7 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 16-017(a)-99:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow (i.e., less than 3 ft bgs) 1996 VCA and 2006 Consent Order soil samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because these constituents are not associated with historical Site activities.

#### *SWMU 16-026(m):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow (i.e., less than 3 ft bgs) 1996 VCA and 2006 Consent Order soil samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because these constituents are not associated with historical Site activities.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 181-2 and 181-3. 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 181-2 and 181-3.

Monitoring location CDV-SMA-1.3 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.



All the analytical results for these samples are reported in the 2013 Annual Report.

### 181.4 Inspections and Maintenance

RG253 recorded six storm events at CDV-SMA-1.3 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 181-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62905	6-29-2017
Storm Rain Event	BMP-63416	7-25-2017
Storm Rain Event	BMP-64149	8-9-2017
Storm Rain Event	BMP-65107	8-29-2017
Storm Rain Event	BMP-65942	10-10-2017

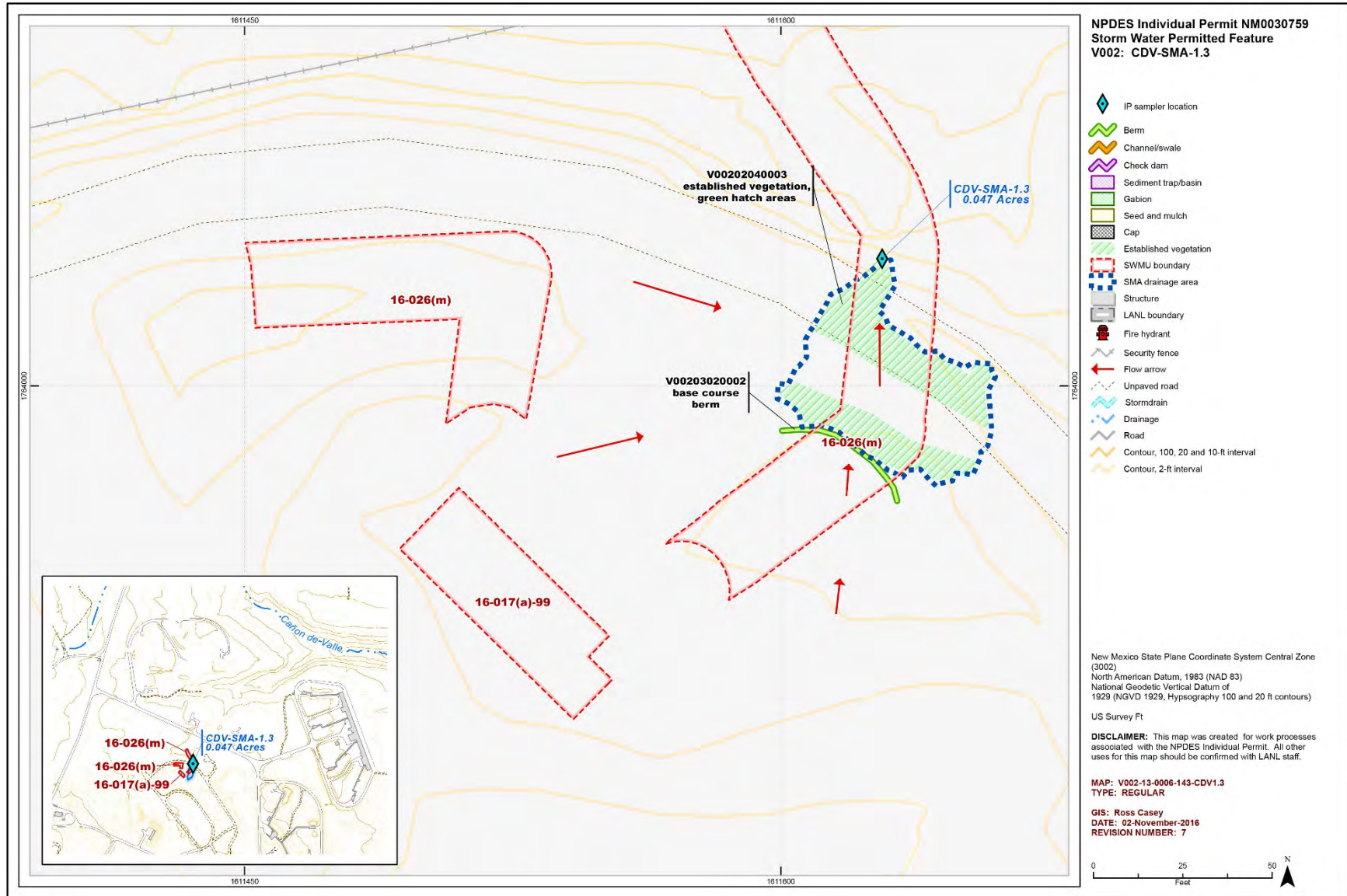
No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-1.3 in 2017.

### 181.5 Compliance Status

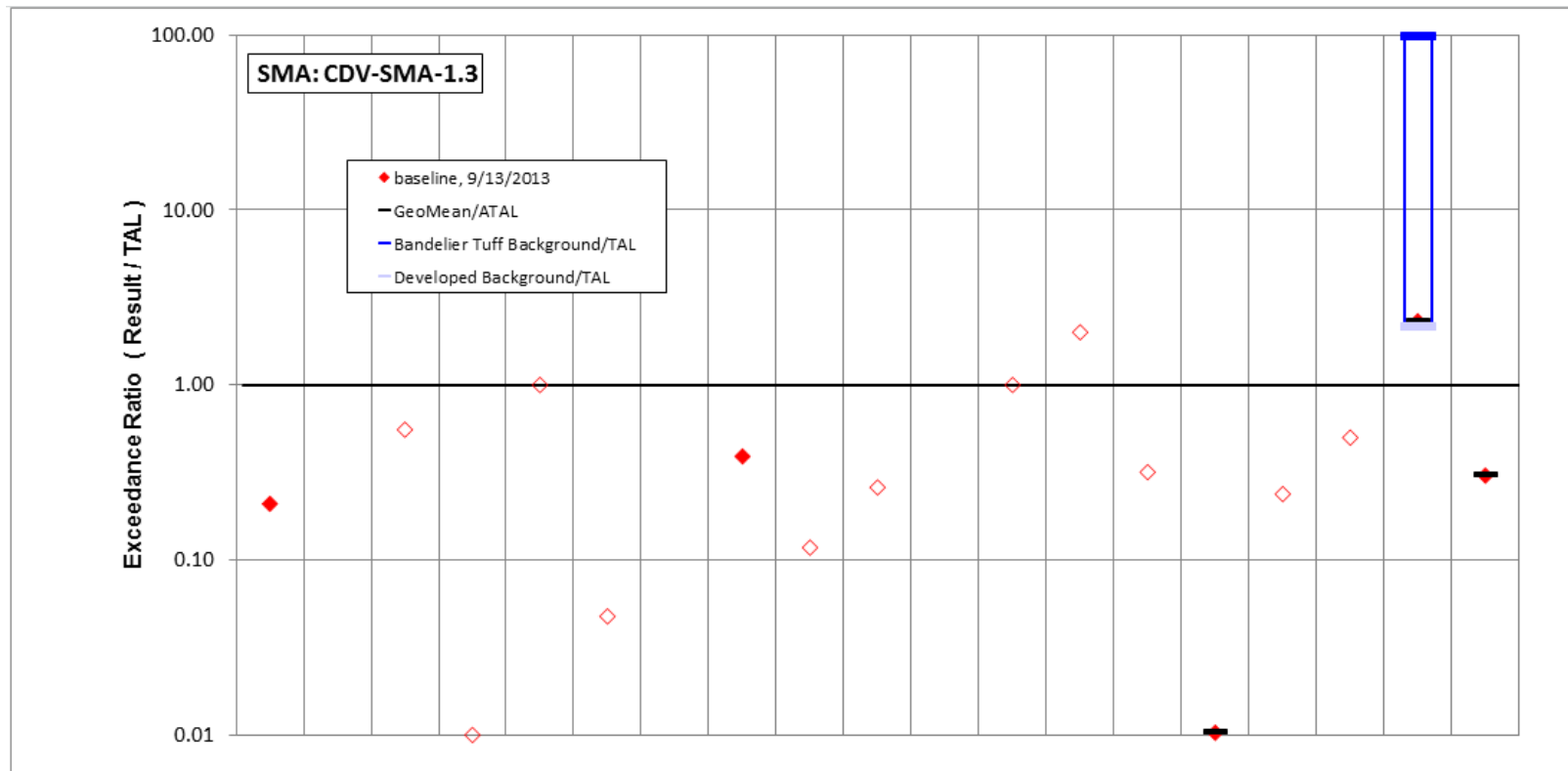
The Sites associated with CDV-SMA-1.3 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 181-3 presents the 2017 compliance status.

**Table 181-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-017(a)-99	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, September 26, 2016, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Two [2] Sites [16-017(a)-99 and 16-026(m)] in CDV-SMA-1.3 Following Certificates of Completion from the New Mexico Environment Department."
SWMU 16-026(m)	Request for an Extension from Force Majeure Event	Corrective Action Complete	LANL, September 26, 2016, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action for Two [2] Sites [16-017(a)-99 and 16-026(m)] in CDV-SMA-1.3 Following Certificates of Completion from the New Mexico Environment Department."



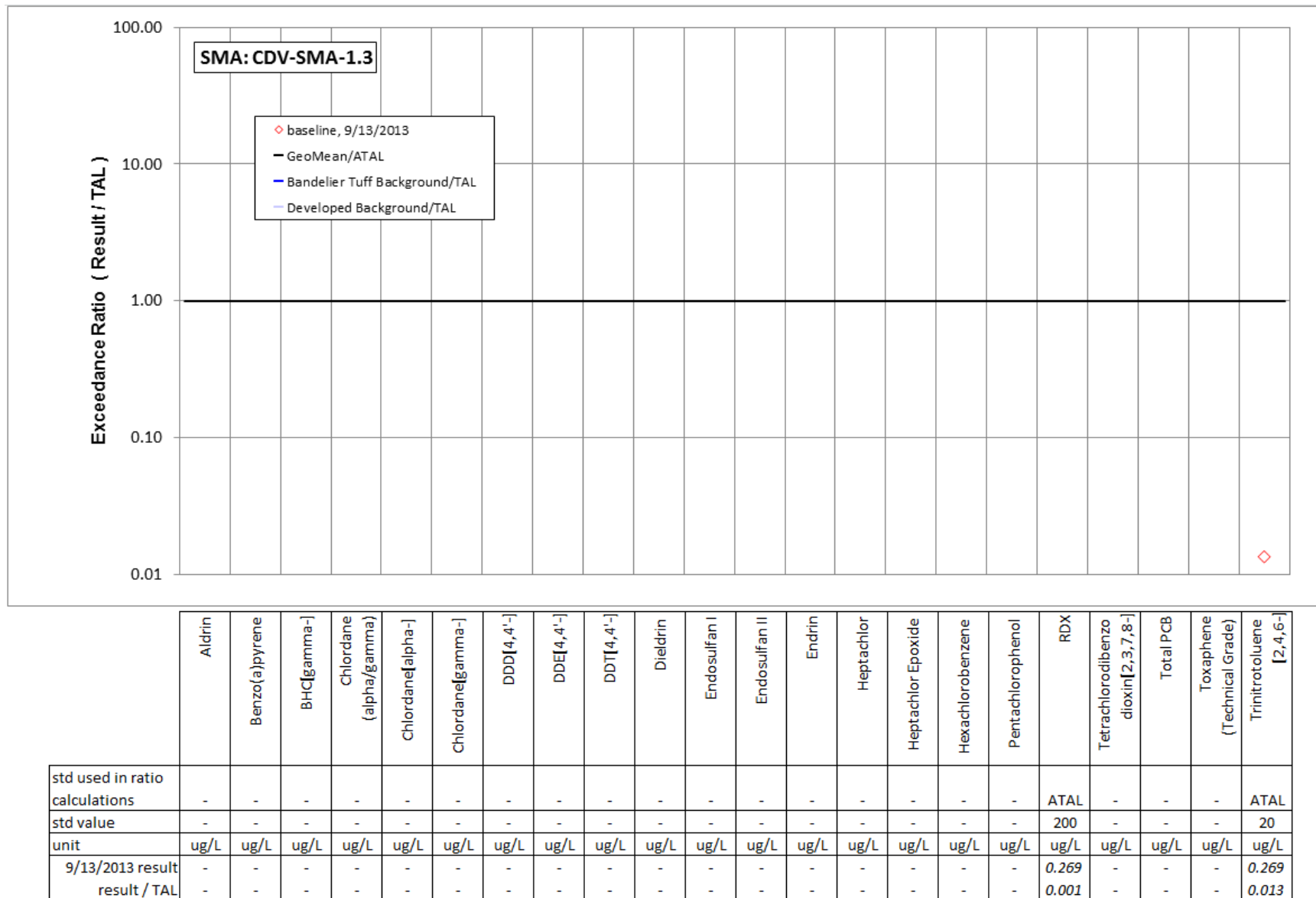




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>9/13/2013 result</b>	157	1.21	5	50	1	10	1.51	1.68	2	0.2	0.665	5	1	2	1.03	10	0.005	<b>34.7</b>	9.1
result / TAL	0.21	0.0019	0.56	0.01	1	0.048	0.0015	0.39	0.12	0.26	0.0039	1	2	0.32	0.01	0.24	0.5	2.3	0.3

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 181-2 Inorganic analytical results summary plot for CDV-SMA-1.3**



Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 181-3 Organic analytical results summary plot for CDV-SMA-1.3**

## **182.0 CDV-SMA-1.4: SWMUs 16-020, 16-026(l), 16-028(c), and 16-030(c)**

### **182.1 Site Descriptions**

Four historical industrial activity areas are associated with V003, CDV-SMA-1.4: Sites 16-020, 16-026(l), 16-028(c), and 16-030(c).

SWMU 16-020 is a formerly permitted outfall (EPA 06A037) located 300 ft south of former building 16-222 in the northern portion of TA-16. From 1951 to 1979, the outfall received untreated effluent from the sink and floor drains in photoprocessing building 16-222 and discharged to a drainage channel that empties into Cañon de Valle. In 1979, a silver recovery unit was installed to treat the photoprocessing solutions before discharge. Discharges to the outfall ceased when building 16-222 was decommissioned in 1995. In 2000, approximately 200 yd<sup>3</sup> of soil was removed from the outfall area as part of an IM. After soil removal, the outfall and a portion of the drainage channel were stabilized with rock pavements, check dams, and straw wattles. Building 16-222 underwent D&D in 2003. The outfall drainline is still in place.

Consent Order investigations have not yet begun for this Site; however, decision-level data are available from confirmation samples collected following the 2000 IM conducted at SWMU 16-020. SWMU 16-020 will be sampled during the future Cañon de Valle Aggregate Area TA-16 investigation.

SWMU 16-026(l) consists of two former outfalls that were located on the east side of former x-ray building 16-220 in the northern portion of TA-16. Both outfalls received storm water discharges from separate roof drains. Engineering records state that neither the drainline nor the outfall could be located in the field. Building 16-220 underwent D&D in 2003.

Consent Order investigations have not yet begun for this Site; no decision-level data are available for SWMU 16-026(l). SWMU 16-026(l) will be sampled during the future Cañon de Valle Aggregate Area TA-16 investigation.

SWMU 16-028(c) is a former NPDES-permitted outfall (04A070) and drainline that received discharges from eight floor drains in former building 16-220. Wastewater included noncontact cooling water, chiller condensate, periodic discharges from an HE vacuum pump, and wash water from cleaning building floors. The 6-in. VCP drainline discharged to an outfall located in a rocky ditch southeast of the building and flowed to a flat grassy field. The floor drains in former building 16-220 were plugged in 1991, and the outfall was removed from the Laboratory's NPDES permit on September 19, 1997. Building 16-220 underwent D&D in 2003. The outfall drainline is likely still in place.

Consent Order investigations have not yet begun for this Site; no decision-level data are available for SWMU 16-028(c). SWMU 16-028(c) will be sampled during the future Cañon de Valle Aggregate Area TA-16 investigation.

SWMU 16-030(c) consists of three former outfalls from four roof drains at a former rest house (former structure 16-222) at TA-16. The 1990 SWMU report describes SWMU 16-030(c) as consisting of two outfalls originating from roof drains located on the northwest and northeast corners of building 16-222. Engineering drawings show that building 16-222 had four roof drains located at each roof corner that discharged to three outfalls. The roof drain on the northeast corner of the building discharged via a 6-in. VCP to an outfall located approximately 65 ft southeast of building 16-222. The northwest corner roof drain discharged via a 6-in. VCP to an outfall located approximately 20 ft west of building 16-222. The southeast and southwest corner roof drains were connected to a 6-in. VCP that discharged to an outfall located approximately 15 ft southwest of building 16-222. Building 16-222 was constructed in 1953 and underwent D&D in 2003. All surface and subsurface structures were removed in 2003.

Consent Order investigations were not conducted at SWMU 16-030(c). Based on the available data, no COPCs were identified. Therefore, NMED issued a COC without controls for SWMU 16-030(c) in January 2008.



The project map (Figure 182-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## 182.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 182-1).

Enhanced controls were installed and certified on May 12, 2014, and submitted to EPA on May 30, 2014, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 182-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00302040069	Established Vegetation	-	X	X	-	B
V00303010066	Earthen Berm	X	-	-	X	B
V00303010070	Earthen Berm	X	-	-	X	EC
V00303010071	Earthen Berm	-	X	-	X	EC
V00303010072	Earthen Berm	-	X	-	X	EC
V00303020017	Base Course Berm	X	-	-	X	CB
V00303120087	Rock Berm	X	-	-	X	B
V00305020068	Sediment Basin	X	-	-	X	B
V00305020073	Sediment Basin	X	-	-	X	EC
V00305020074	Sediment Basin	X	-	-	X	EC
V00305020075	Sediment Basin	X	-	-	X	EC
V00305020076	Sediment Basin	X	-	-	X	EC
V00306010012	Rock Check Dam	-	X	-	X	CB
V00306010039	Rock Check Dam	-	X	-	X	B
V00306010040	Rock Check Dam	-	X	-	X	B
V00306010043	Rock Check Dam	X	-	-	X	B
V00306010057	Rock Check Dam	X	-	-	X	B
V00306010058	Rock Check Dam	-	X	-	X	B
V00306010059	Rock Check Dam	-	X	-	X	B
V00306010060	Rock Check Dam	-	X	-	X	B
V00306010061	Rock Check Dam	-	X	-	X	B
V00306010062	Rock Check Dam	-	X	-	X	B
V00306010063	Rock Check Dam	-	X	-	X	B
V00306010064	Rock Check Dam	-	X	-	X	B
V00306010065	Rock Check Dam	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 182.3 Storm Water Monitoring

SWMUs 16-020, 16-026(I), 16-028(c), and 16-030(c) are monitored within CDV-SMA-1.4. Following the installation of baseline control measures, a baseline storm water sample was collected on September 10, 2012 (Figure 182-2). In Figure 182-2, cadmium and selenium are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Silver concentration of 7.86 µg/L (MTAL is 0.5 µg/L).

In addition, weak acid dissociable cyanide analysis was not performed on the September 10, 2012, sample. The sample bottle for cyanide was not correctly preserved, and the cyanide test was cancelled. Future storm water samples collected at CDV-SMA-1.4 will be analyzed for weak acid dissociable cyanide.

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 16-020:*

- Silver is known to be associated with industrial materials historically managed at the Site. Silver was detected above BVs in 20 of 20 shallow IM confirmation samples at a maximum concentration 720 times the soil BV.

#### *SWMU 16-026(I):*

- Silver is not known to be associated with industrial materials historically managed at the Site. Decision-level data are not available for SWMU 16-026(I). However, a likely source of the cyanide TAL exceedance is SWMU 16-020, a former outfall located 300 ft south of former building 16-222 that received untreated effluent from the sink and floor drains in photoprocessing building 16-222 and discharged to a drainage channel that empties into Cañon de Valle. The SWMU 16-020 outfall is downstream of SWMU 16-026(I) and directly upstream of the SMA sampler.

#### *SWMU 16-028(c):*

- Silver is not known to be associated with industrial materials historically managed at the Site. Decision-level data are not available for SWMU 16-028(c). However, a likely source of the cyanide TAL exceedance is SWMU 16-020, a former outfall located 300 ft south of former building 16-222 that received untreated effluent from the sink and floor drains in photoprocessing building 16-222 and discharged to a drainage channel empties into Cañon de Valle. The SWMU 16-020 outfall is downstream of SWMU 16-028(c) and directly upstream of the SMA sampler.

#### *SWMU 16-030(c):*

- Silver is not known to be associated with industrial materials historically managed at the Site. Decision-level data are not available for SWMU 16-030(c).

The TAL exceedance was also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs. BVs are expressed as UTLs using the approved EPA method for calculating BVs.

- Silver—The silver UTL from sediment derived from Bandelier Tuff was not calculated because the number of detected values was not sufficient to allow calculation of a UTL value in the baseline metals concentration study. Therefore, a comparison with the background silver UTL could not be made.

All of the analytical results for these samples are reported in the 2012 Annual Report.

### 182.4 Inspections and Maintenance

RG253 recorded six storm events at CDV-SMA-1.4 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 182-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62906	7-3-2017
Storm Rain Event	BMP-63417	7-25-2017
Storm Rain Event	BMP-64150	8-8-2017
Storm Rain Event	BMP-65108	8-29-2017
Storm Rain Event	BMP-65943	10-10-2017

No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-1.4 in 2017.

### 182.5 Compliance Status

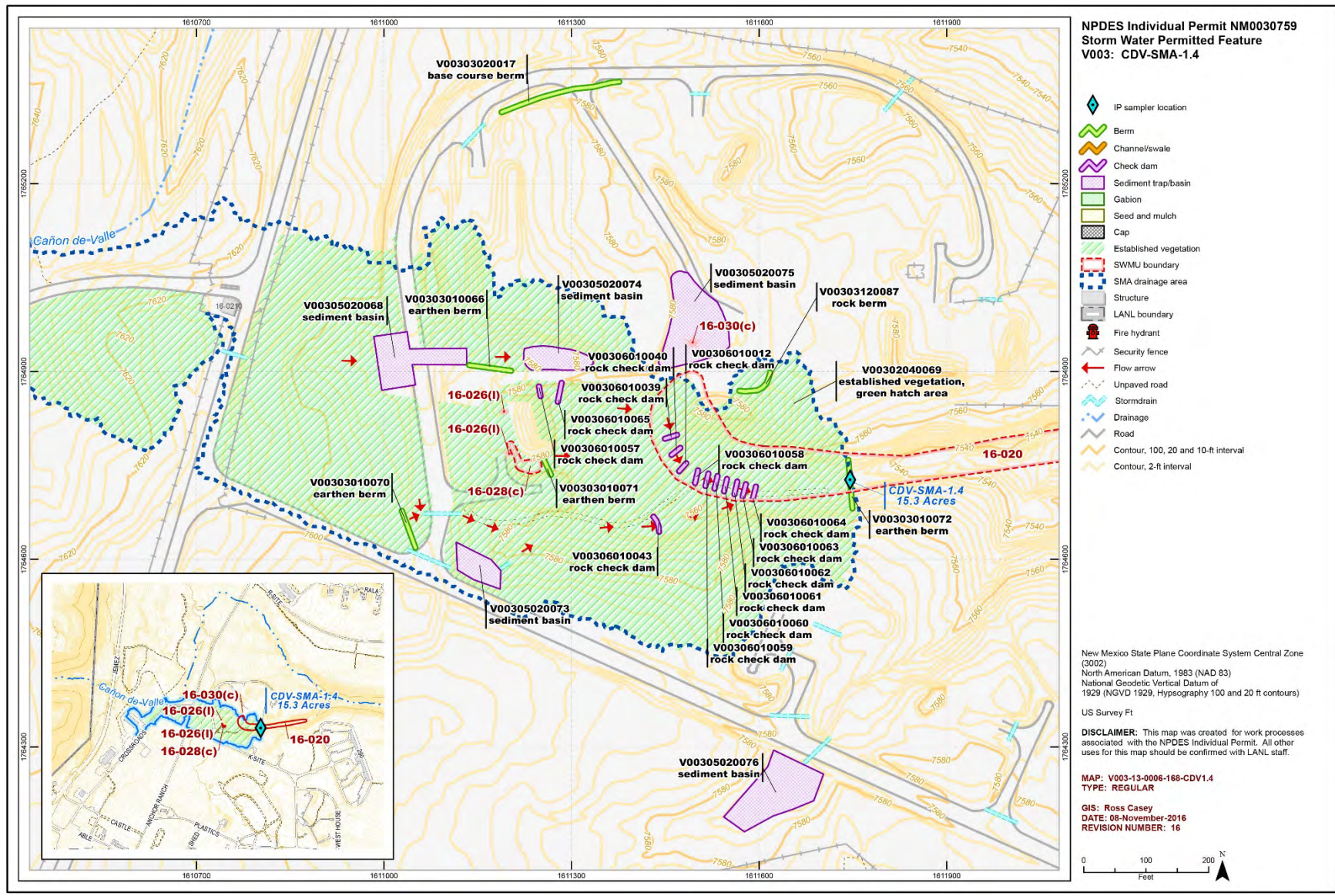
The Sites associated with CDV-SMA-1.4 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 182-3 presents the 2017 compliance status.

**Table 182-3 Compliance Status during 2017**

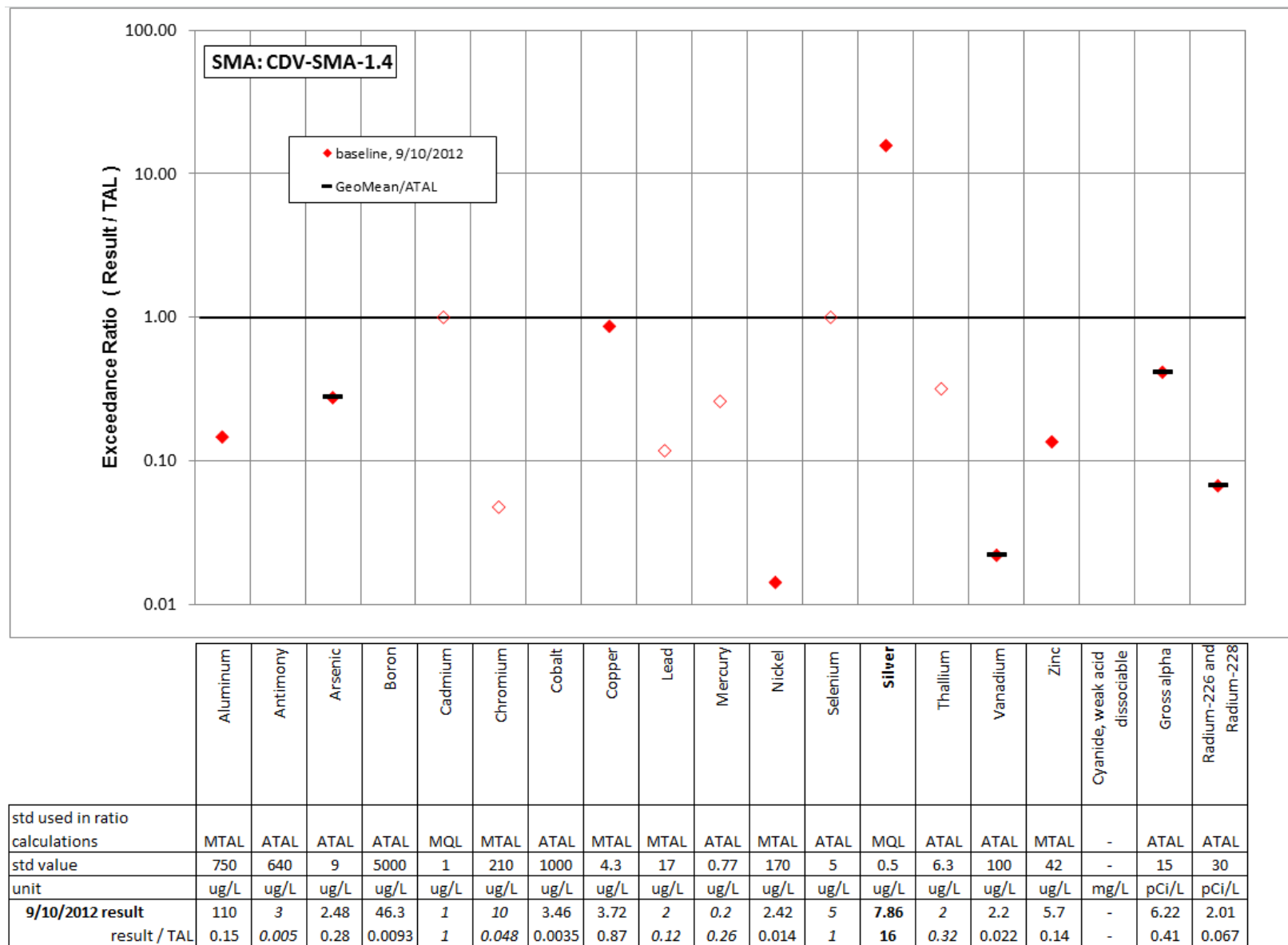
Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-020	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, May 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (CDV-SMA-1.4, CHQ-SMA-1.03, Pratt-SMA-1.05, T-SMA-1)."
SWMU 16-026(l)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, May 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (CDV-SMA-1.4, CHQ-SMA-1.03, Pratt-SMA-1.05, T-SMA-1)."
SWMU 16-028(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, May 30, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas (CDV-SMA-1.4, CHQ-SMA-1.03, Pratt-SMA-1.05, T-SMA-1)."
SWMU 16-030(c)	Request to remove Site from the Permit Corrective Action Complete	Request to remove Site from the Permit Corrective Action Complete	LANL, October 14, 2015, "NPDES Permit No. NM0030759-Request Deletion of Six Sites Planned for Deletion from the Individual Permit for Storm Water."  LANL, November 29, 2012, "Submittal of Completion of Corrective Action for Twelve Monitoring Sites."  LANL, August 21, 2013, "Resubmittal of Completion of Corrective Action for Twelve Site Monitoring Areas."







**Figure 182-1 CDV-SMA-1.4 location map**



Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 182-2 Inorganic analytical results summary plot for CDV-SMA-1.4

## 183.0 CDV-SMA-1.45: SWMU 16-026(i)

### 183.1 Site Descriptions

One historical industrial activity area is associated with V004, CDV-SMA-1.45: Site 16-026(i).

SWMU 16-026(i) consists of a former outfall and drainline from former x-ray building 16-224 at TA-16. Finished packaged HE components were x-rayed in building 16-224 and returned to adjacent resthouses for storage; in some cases, HE components were unwrapped before they were x-rayed. Reportedly, HE dust and small chips would periodically break off unpackaged components during the x-ray process and could have entered the floor drains. Floor drains in building 16-224 discharged to an outfall northeast of former building 16-224; the discharges consisted of small volumes of washdown water discharged onto a gradual, grass-covered slope. The floor drains in building 16-224 were plugged in 1991; building 16-224 underwent D&D in 2003.

Consent Order investigations have not yet begun; no decision-level data are available for SWMU 16-026(i). SWMU 16-026(i) will be sampled during the future Cañon de Valle Aggregate Area TA-16 investigation.

The project map (Figure 183-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 183.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 183-1).

Enhanced controls were installed and certified on July 15, 2012, and submitted to EPA on July 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 183-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00402040005	Established Vegetation	-	X	X	-	B
V00403010004	Earthen Berm	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 183.3 Storm Water Monitoring

SWMU 16-026(i) is monitored within CDV-SMA-1.45. Following the installation of baseline control measures, a baseline confirmation sample was collected on August 21, 2011 (Figure 183-2). Inorganic analytical results from this baseline sample yielded the following TAL exceedance:

- Gross-alpha activity of 17.8 pCi/L (ATAL is 15 pCi/L).

Exceedances are typically evaluated by comparing the results from soil samples collected at the Site during Consent Order investigations with the storm water TAL exceedances to determine whether the exceedance may be related to historical industrial activities.



*SWMU 16-026(i):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. No decision-level data are available for SWMU 16-026(i).

The TAL exceedance was also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 183-2. 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 Figure 183-2.

Monitoring location CDV-SMA-1.45 receives storm water run-on from locations with sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha background UTL for locations with sediment derived from Bandelier Tuff is 1490 pCi/L. The 2012 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2011 Annual Report.

### 183.4 Inspections and Maintenance

RG253 recorded six storm events at CDV-SMA-1.45 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 183-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62907	7-3-2017
Storm Rain Event	BMP-63418	7-25-2017
Storm Rain Event	BMP-64151	8-8-2017
Storm Rain Event	BMP-65109	8-29-2017
Storm Rain Event	BMP-65944	10-10-2017

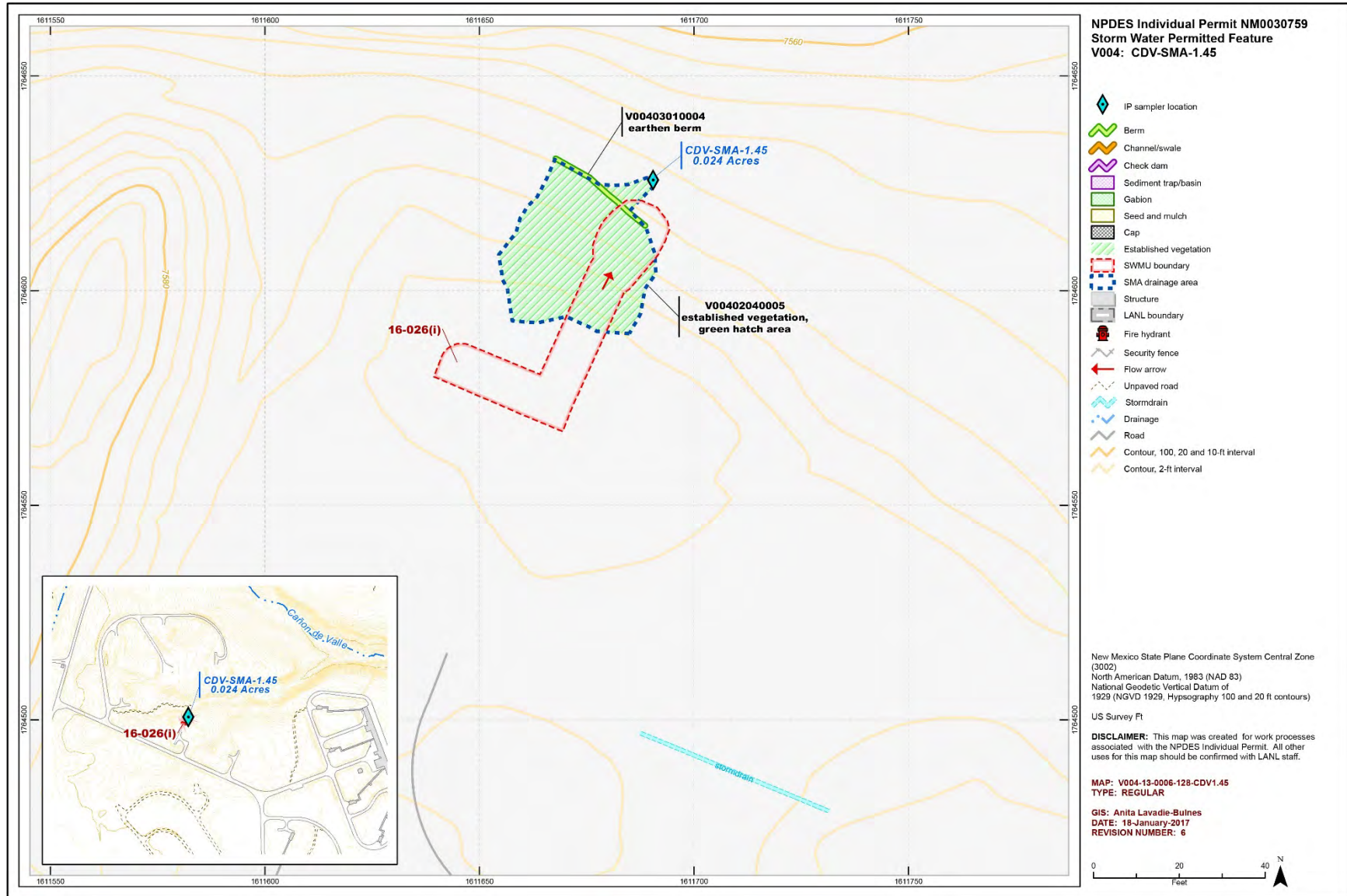
No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-1.45 in 2017.

**183.5 Compliance Status**

The Site associated with CDV-SMA-1.45 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 183-3 presents the 2017 compliance status.

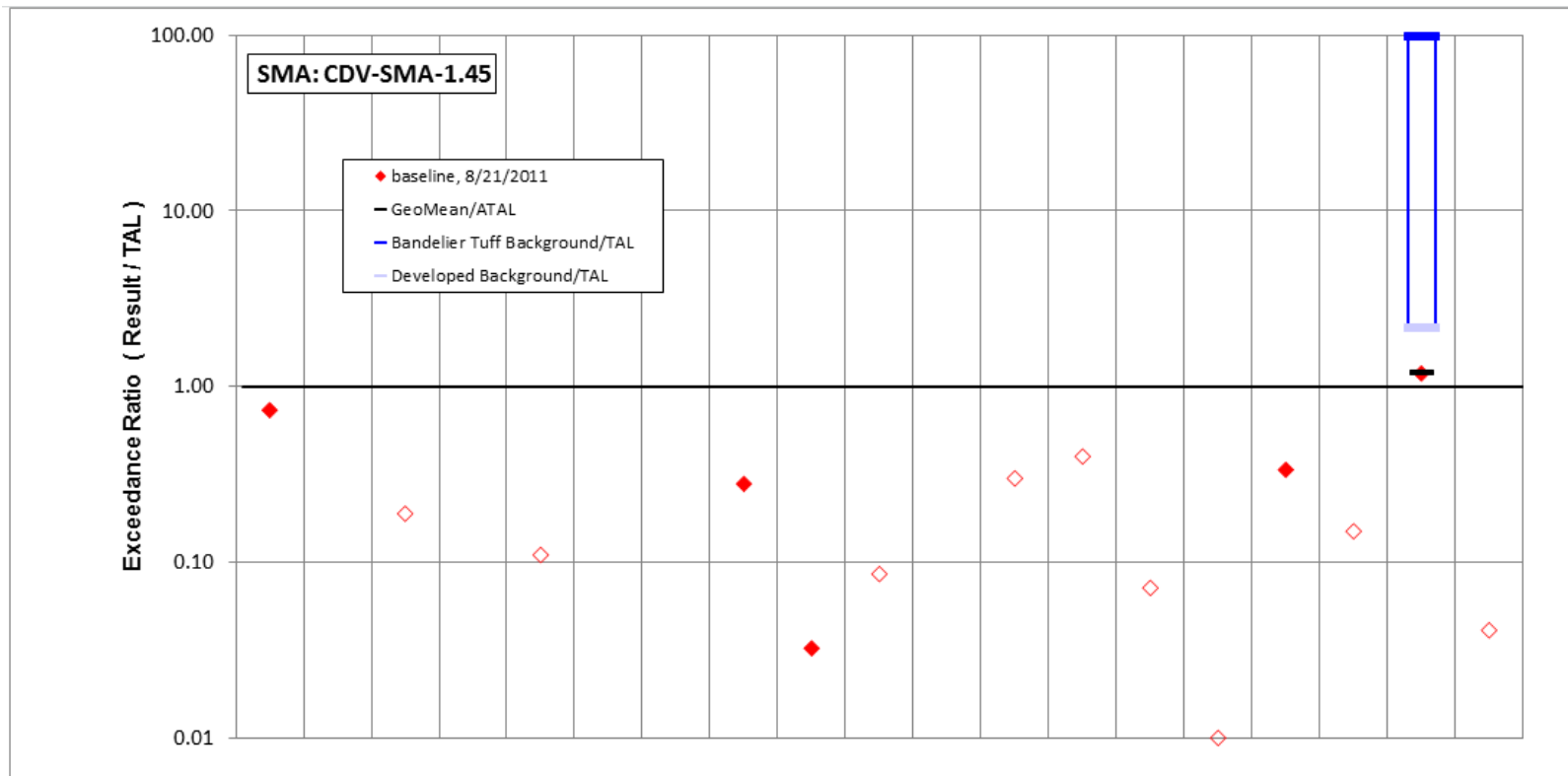
**Table 183-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-026(i)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	July 25, 2012, "Submittal of Certification of Installation of Enhanced Control Measures for Twelve Site Monitoring Areas."



**Figure 183-1 CDV-SMA-1.45 location map**





	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>8/21/2011 result</b>	550	1	1.7	15	0.11	2	2	1.2	0.55	0.066	0.5	1.5	0.2	0.45	1	14.1	0.002	<b>17.8</b>	1.23
result / TAL	0.73	0.002	0.19	0.003	0.11	0.01	0.002	0.28	0.032	0.086	0.003	0.3	0.4	0.071	0.01	0.34	0.15	1.2	0.041

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 183-2 Inorganic analytical results summary plot for CDV-SMA-1.45

## 184.0 CDV-SMA-1.7: SWMU 16-019

### 184.1 Site Descriptions

One historical industrial activity area is associated with V005, CDV-SMA-1.7: Site 16-019.

SWMU 16-019, MDA R, consists of the original World War II S-Site Burning Ground and associated inactive waste disposal site. Located at TA-16 north of building 16-260 and south of Cañon de Valle, the MDA was used to burn HE wastes and began operating in the mid-1940s. Initially, the HE wastes were burned directly on the ground surface in an area cleared of grass and shrubs. By 1949, burning operations were conducted in three adjacent shallow burn pits, each approximately 75 ft<sup>2</sup>, constructed in the eastern portion of the MDA, approximately 150 ft from the edge of the canyon.



Burning operations at MDA R ceased in the early 1950s when the buildings composing the 260 Line were constructed. During the construction of the 260 Line, the burn pits were backfilled with material from the associated berms and the entire area was leveled. In May 2000, the Cerro Grande fire burned over MDA R and continued to burn underground within the MDA for several weeks. As part of emergency response and fire-suppression efforts, portions of the MDA were excavated and stabilized and erosion-control measures were installed. The area is currently covered with grasses, small trees, and shrubs.

Consent Order investigations have not yet begun for SWMU 16-019. Decision-level data are available from investigation sampling conducted during 1997, 1998, and 2000. SWMU 16-019 will be sampled during the future Cañon de Valle Aggregate Area TA-16 investigation.

The project map (Figure 184-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 184.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 184-1).

Enhanced controls were installed and certified on September 4, 2015, and submitted to EPA on September 10, 2015, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 184-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00501060035	Erosion Control Blanket	-	X	X	-	B
V00502040016	Established Vegetation	-	X	X	-	B
V00503010027	Earthen Berm	-	X	-	X	EC
V00503010028	Earthen Berm	-	X	-	X	EC
V00503020034	Base Course Berm	X	-	-	X	B
V00503060025	Straw Wattle	-	X	-	X	EC
V00503060032	Straw Wattle	-	X	-	X	B
V00504010018	Earthen Channel/Swale	X	-	X	-	EC
V00504040017	Culvert	X	-	X	-	EC
V00504040036	Culvert	-	X	X	-	B
V00504060015	Rip Rap	-	-	X	-	CB
V00504060026	Rip Rap	-	-	X	-	EC
V00504060039	Rip Rap	-	X	X	-	B
V00504080033	TRM-Lined Swale	X	-	X	-	B
V00506010006	Rock Check Dam	-	X	-	X	CB
V00506010008	Rock Check Dam	X	-	-	X	CB
V00506010009	Rock Check Dam	X	-	-	X	CB
V00506010010	Rock Check Dam	X	-	-	X	CB
V00506010013	Rock Check Dam	X	-	-	X	CB
V00506010014	Rock Check Dam	X	-	-	X	CB
V00506010019	Rock Check Dam	X	-	-	X	EC
V00506010020	Rock Check Dam	X	-	-	X	EC
V00506010022	Rock Check Dam	X	-	-	X	EC
V00506010029	Rock Check Dam	-	X	-	X	EC
V00506010030	Rock Check Dam	-	X	-	X	EC
V00506010031	Rock Check Dam	-	X	-	X	EC
V00506020023	Log Check Dam	-	X	-	X	EC
V00506040038	Energy Dissipater	-	X	-	X	B
V00507010037	Gabion	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 184.3 Storm Water Monitoring

SWMU 16-019 is monitored within CDV-SMA-1.7. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 184-2 and 184-3). In Figure 184-2, cadmium and selenium are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 11 µg/L (MTAL is 4.3 µg/L),
- Cyanide, weak acid dissociable concentration of 0.0175 mg/L (MTAL is 0.01 mg/L),
- Gross-alpha activity of 36.9 pCi/L (ATAL is 15 pCi/L), and
- RDX concentration of 908 µg/L (ATAL is 200 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 16-019:*

- Copper is potentially associated with industrial materials historically managed at the Site. Copper was detected above BVs in 6 of the 44 shallow (i.e., less than 3 ft bgs) 1998 and 2000 RFI soil samples collected at the Site at a maximum concentration 1563 times the soil BV.
- Cyanide is not known to be associated with industrial materials historically managed at the Site. None of the 44 shallow 1998 and 2000 RFI samples were analyzed for cyanide.
- RDX is known to be associated with industrial materials historically managed at the Site. RDX was detected in 16 of 44 shallow soil samples at a maximum concentration 2577% of the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. None of the 44 shallow 1998 and 2000 RFI samples were analyzed for alpha-emitting radionuclides.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 184-2 and 184-3. 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 184-2 and 184-3.

Monitoring location CDV-SMA-1.7 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is greater than this value.
- Cyanide, weak acid dissociable—The cyanide, weak acid dissociable, UTL from undisturbed Bandelier Tuff storm water run-on was not calculated.



- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.
- RDX—The RDX UTL from undisturbed Bandelier Tuff was not calculated. Therefore, no comparison to RDX background values in storm water could be made.

All the analytical results for these samples are reported in the 2013 Annual Report.

#### 184.4 Inspections and Maintenance

RG253 recorded six storm events at CDV-SMA-1.7 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 184-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62908	6-27-2017
Storm Rain Event	BMP-63419	7-21-2017
Storm Rain Event	BMP-64152	8-1-2017
Storm Rain Event	BMP-65110	8-25-2017
Storm Rain Event	BMP-65945	10-12-2017

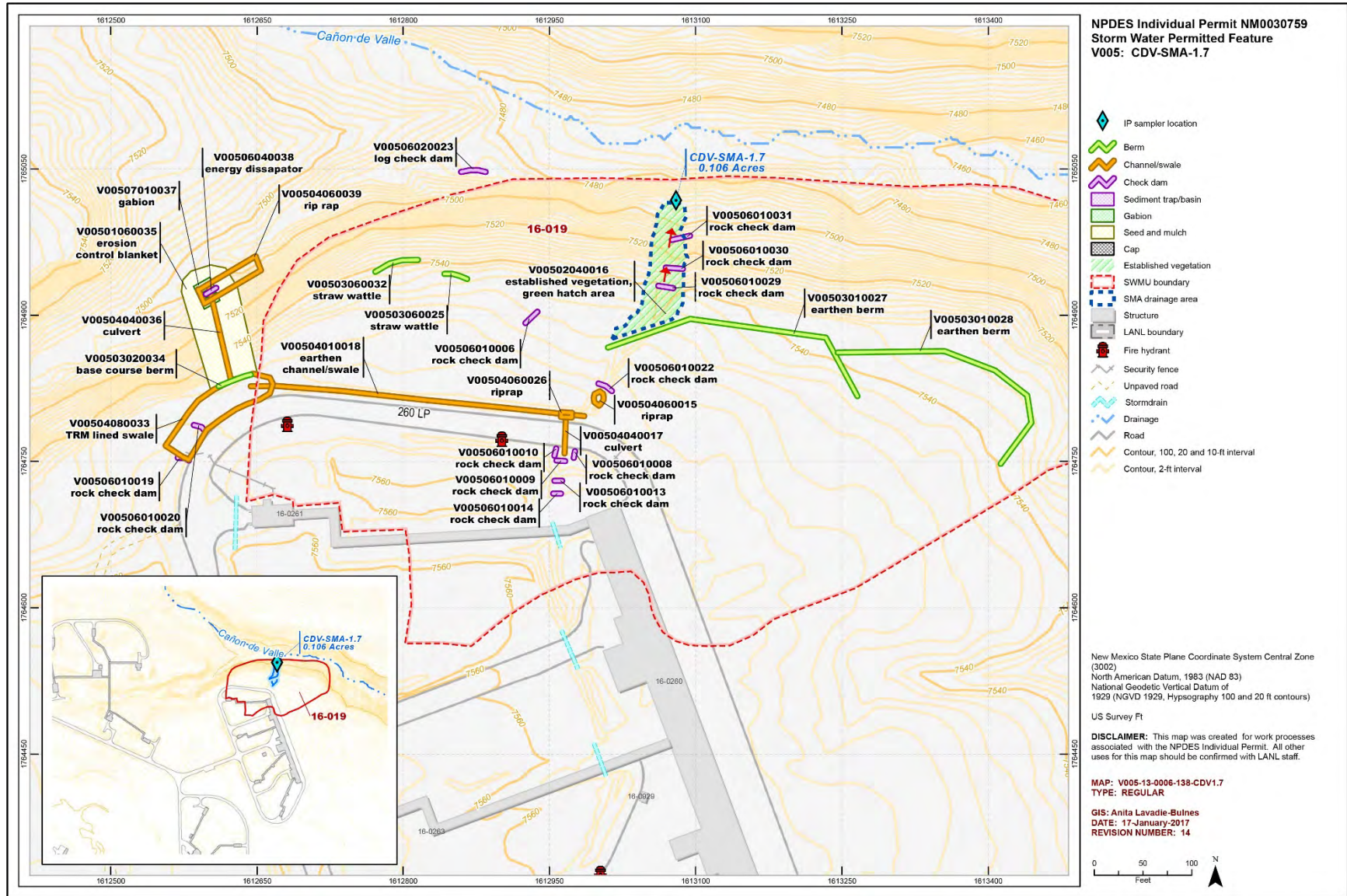
No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-1.7 in 2017.

#### 184.5 Compliance Status

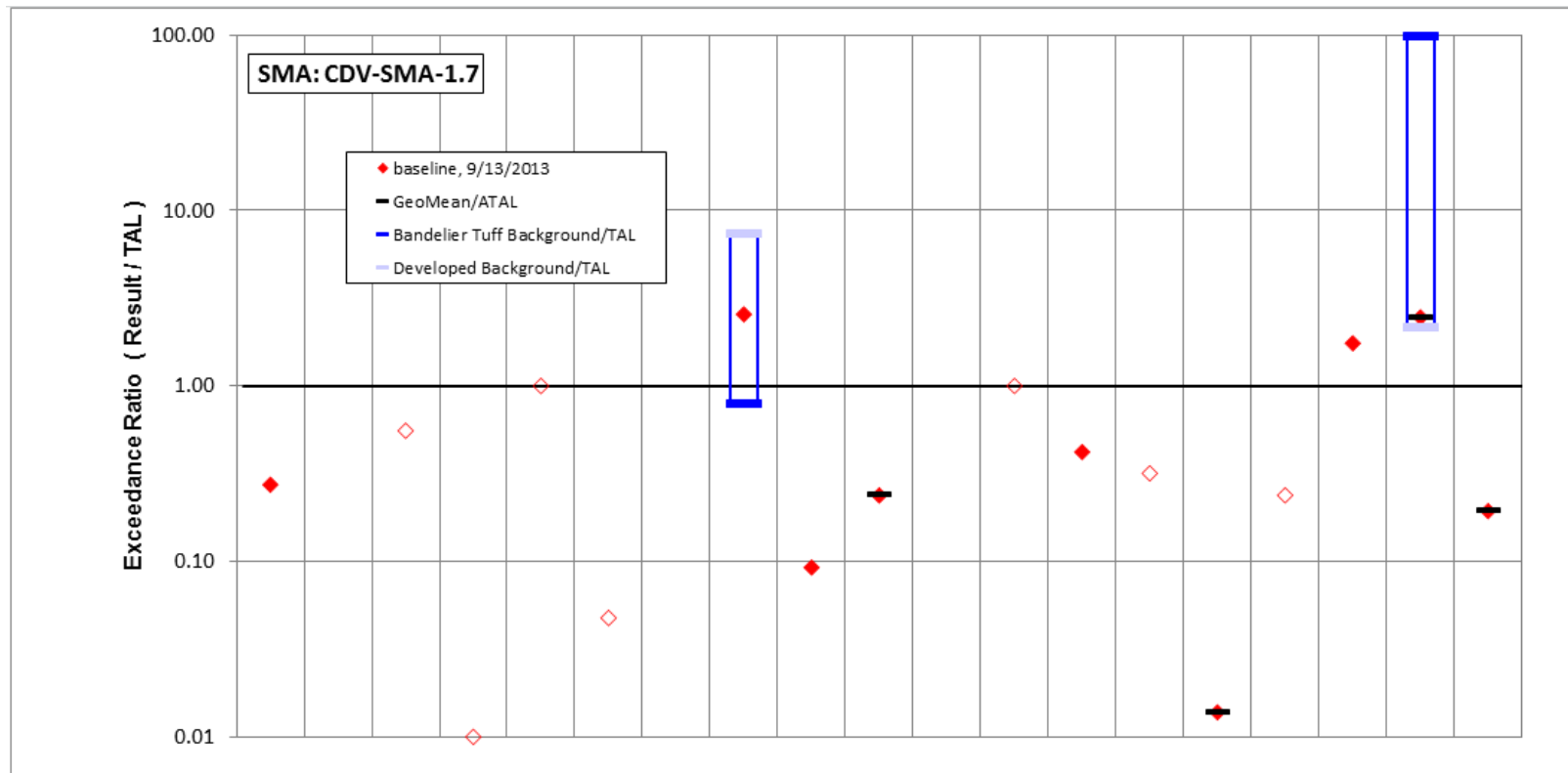
The Site associated with CDV-SMA-1.7 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 184-3 presents the 2017 compliance status.

**Table 184-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-019	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."



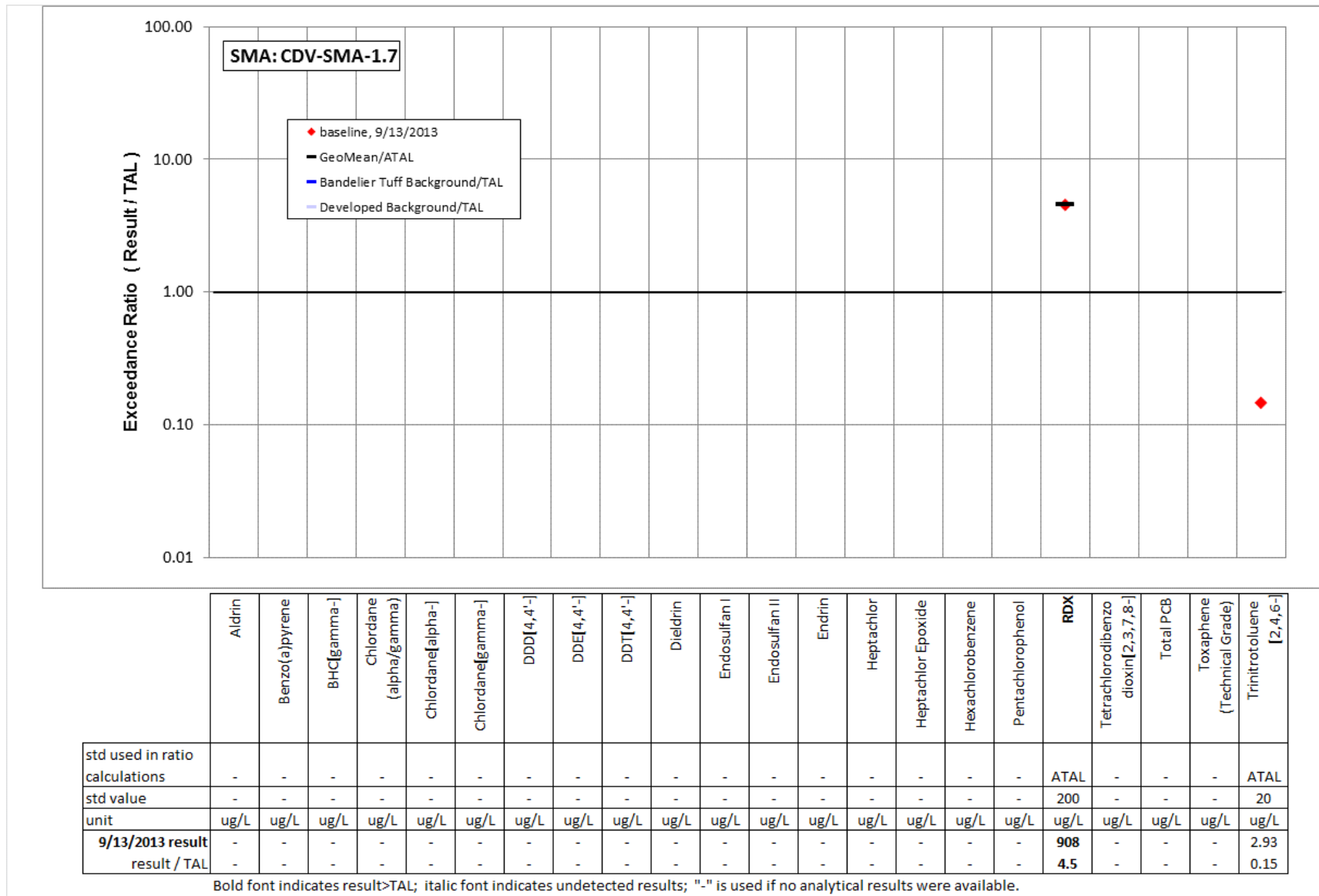
**Figure 184-1 CDV-SMA-1.7 location map**



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>9/13/2013 result</b>	205	3	5	50	1	10	5	<b>11</b>	1.57	0.183	0.659	5	0.21	2	1.38	10	<b>0.0175</b>	<b>36.9</b>	5.8
result / TAL	0.27	0.005	0.56	0.01	1	0.048	0.005	2.6	0.092	0.24	0.0039	1	0.42	0.32	0.014	0.24	<b>1.8</b>	2.5	0.19

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 184-2 Inorganic analytical results summary plot for CDV-SMA-1.7**



**Figure 184-3 Organic analytical results summary plot for CDV-SMA-1.7**



## **185.0 CDV-SMA-2: SWMU 16-021(c)**

### **185.1 Site Descriptions**

One historical industrial activity area is associated with V006, CDV-SMA-2: Site 16-021(c).

SWMU 16-021(c) consists of a formerly NPDES-permitted outfall (the 260 Outfall) for 13 HE sumps [SWMU 16-003(k)] that served HE machining building 16-260 at TA-16. Wastewater from the sumps flowed through a concrete trough to the outfall, located approximately 200 ft east of the building. Discharge from the outfall flowed to a settling pond that was approximately 50 ft long and 20 ft wide and that was located approximately 45 ft below the outfall. The drainage channel continued approximately 600 ft northeast from the outfall to the bottom of Cañon de Valle. A 15-ft near-vertical cliff is located approximately 400 ft from the outfall and marks the break between the upper and lower drainage channels. Building 16-260 was constructed in 1951 to process and machine HE. Wastewater from machining operations contained dissolved HE and entrained HE cuttings. Wastewater treatment consisted of routing the water to 13 settling sumps to recover entrained HE cuttings. In 1994, outfall discharge volumes were measured at several million gallons per year. The discharge volumes were likely higher during the 1950s when HE-production output from building 16-260 was substantially greater than it was in the 1990s. In the past, barium had been a constituent of certain HE formulations, and thus barium was also present in the outfall wastewater from building 16-260. Discharge to the outfall continued until 1996 when the sumps were plugged. The outfall was removed from the NPDES permit in January 1998.

During an IM conducted in 2000 and 2001, more than 1300 yd<sup>3</sup> of contaminated soil was removed from the former settling pond and drainage channel. A low-permeability cap consisting of a 20-in.-thick crushed tuff/bentonite mixture was installed on top of the former settling pond during the IM. A CMI conducted in 2009 and 2010 included the removal of soil and tuff contaminated with HE and other constituents in the former 260 Outfall channel and in the alluvial systems of Cañon de Valle and Martin Spring Canyon, confirmation sampling, and installation of four HE treatment systems. Risk-assessment results for the 260 Outfall drainage channel indicate the Site meets residential risk levels. Groundwater contamination continues to be assessed, monitored, and treated.

Consent Order soil investigations for the SWMU 16-021(c) drainage channel are complete. Corrective actions for SWMU 16-021(c) are now being addressed under the Consent Order as part of the CME/CMI for the 260 Outfall.

The project map (Figure 185-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **185.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 185-1).

**Table 185-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00602040013	Established Vegetation	-	X	X	-	B
V00603010006	Earthen Berm	-	X	-	X	CB
V00603010007	Earthen Berm	X	-	-	X	CB
V00603010008	Earthen Berm	X	-	-	X	CB
V00603010009	Earthen Berm	X	-	-	X	CB
V00603010010	Earthen Berm	X	-	-	X	CB
V00604060003	Rip Rap	-	X	X	-	CB
V00606010002	Rock Check Dam	-	X	-	X	CB
V00608020012	Rock Cap	-	X	X	-	CB

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 185.3 Storm Water Monitoring

SWMU 16-021(c) is monitored within CDV-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figures 185-2 and 185-3). In Figures 185-2 and 185-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 18.2 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 16-021(c):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. None of the Consent Order soil samples were analyzed for alpha-emitting radionuclides.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 185-2 and 185-3. 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 185-2 and 185-3.

Monitoring location CDV-SMA-2 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2013 Annual Report.

#### 185.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-2 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 185-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62401	6-19-2017
Storm Rain Event	BMP-62912	6-27-2017
Storm Rain Event	BMP-63424	7-21-2017
Storm Rain Event	BMP-64156	8-1-2017
Storm Rain Event	BMP-66230	10-12-2017

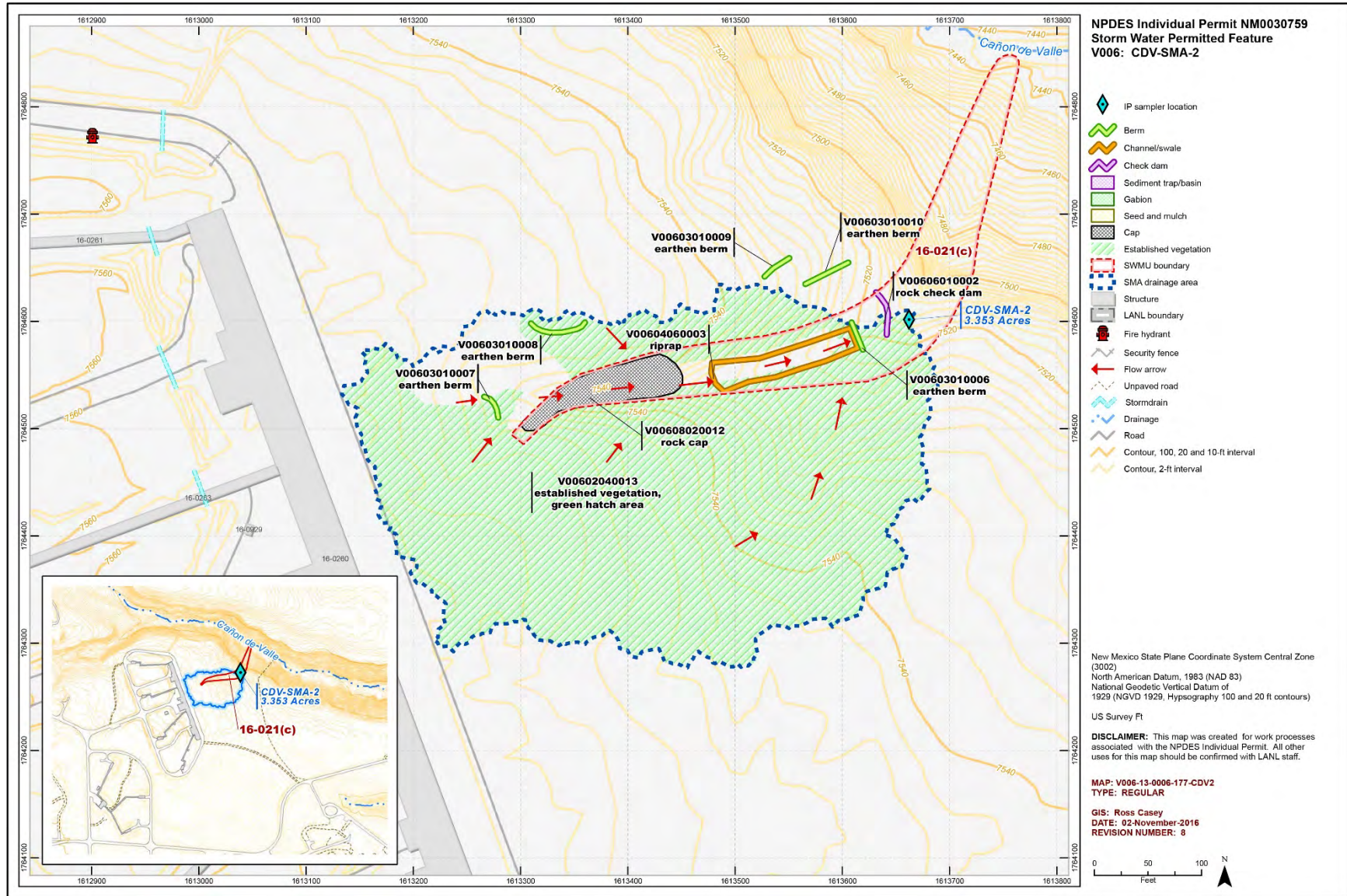
No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-2 in 2017.

#### 185.5 Compliance Status

The Site associated with CDV-SMA-2 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 185-3 presents the 2017 compliance status.

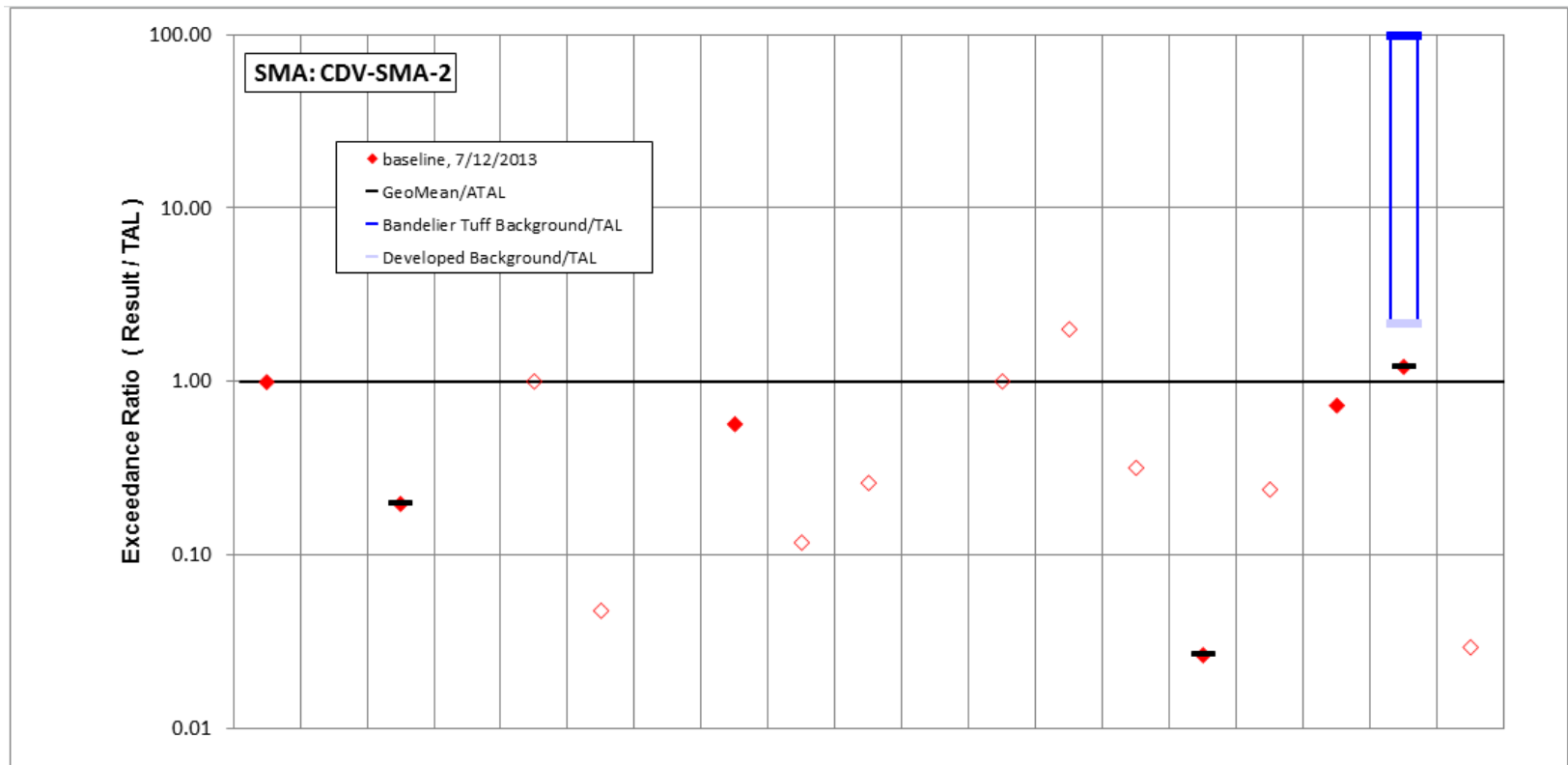
**Table 185-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-021(c)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."



**Figure 185-1 CDV-SMA-2 location map**

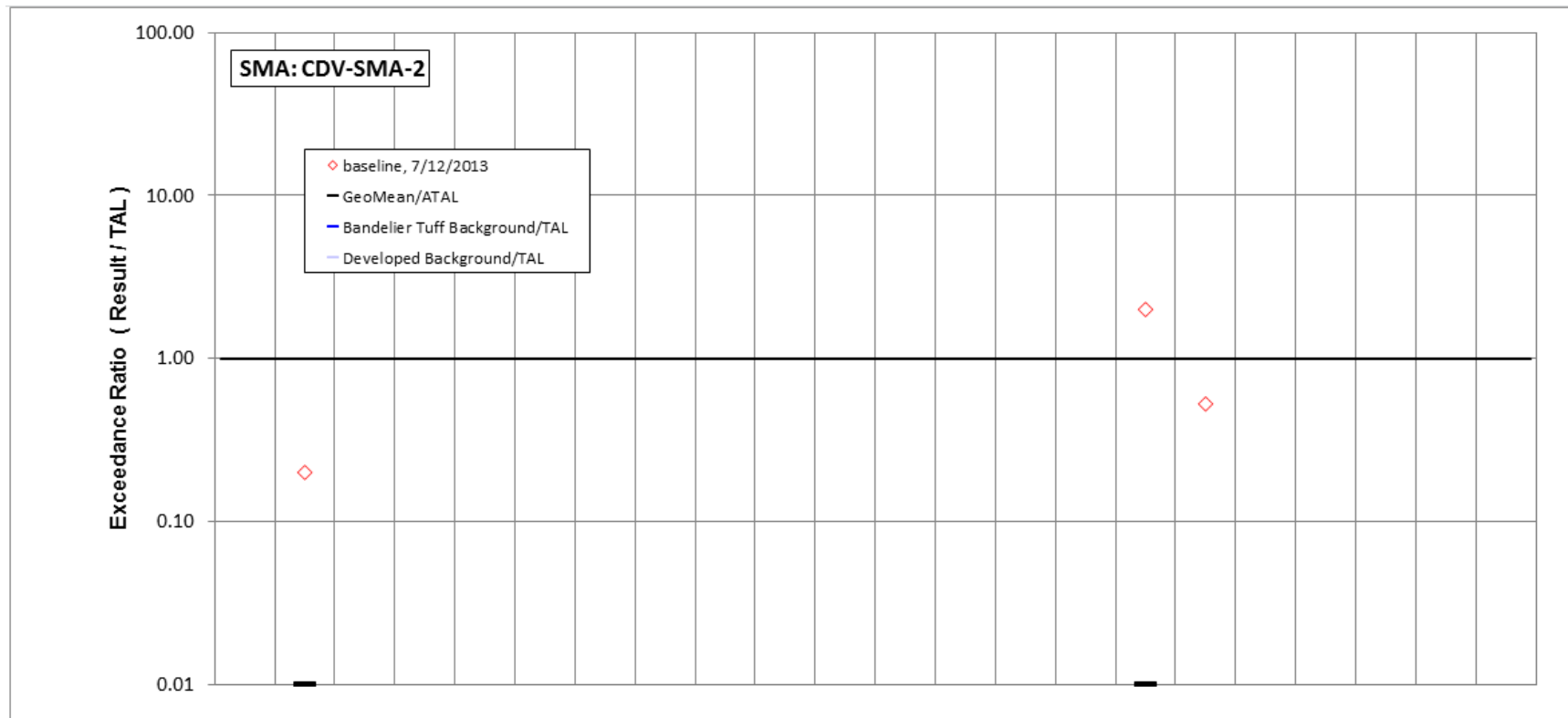




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/12/2013 result</b>	743	3	1.77	33.7	1	10	5.1	2.44	2	0.2	1.52	5	1	2	2.64	10	0.0073	18.2	0.879
result / TAL	0.99	0.005	0.2	0.0067	1	0.048	0.005	0.57	0.12	0.26	0.0089	1	2	0.32	0.026	0.24	0.73	1.2	0.029

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 185-2 Inorganic analytical results summary plot for CDV-SMA-2**



	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	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	-	-	-	-	-	-
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	-	-	-	-	-	-
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	ug/L
7/12/2013 result	-	<b>1</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>10</b>	<b>10</b>	-	-	-	-	-	-
result / TAL	-	<b>0.2</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>2</b>	<b>0.53</b>	-	-	-	-	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 185-3 Organic analytical results summary plot for CDV-SMA-2

## **186.0 CDV-SMA-2.3: SWMUs 13-001, 13-002, 16-003(n), 16-003(o), 16-029(h), and 16-031(h)**

### **186.1 Site Descriptions**

Six historical industrial activity areas are associated with V007, CDV-SMA-2.3: Sites 13-001, 13-002, 16-003(n), 16-003(o), 16-029(h), and 16-031(h).

SWMU 13-001 is an inactive firing site located east of former building 16-340. The firing site is associated with firing activities conducted at P-Site (former TA-13). The area contains shrapnel and debris, including firing cables, lead balls, and chunks of steel and copper.

Consent Order sampling is complete for SWMU 13-001. All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs except for two detections of arsenic in two subsurface tuff samples. SWMU 13-001 has been recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, which was submitted to NMED in 2015. SWMU 13-001 will be eligible for a COC upon approval of the report by NMED.

SWMU 13-002 is an inactive surface disposal area located east of former building 16-340. The disposal area contains debris and shrapnel associated with firing activities conducted at P-Site (former TA-13). A portion of the TA-16 WWTP [Consolidated Unit 16-004(a)-99] is located above the southern tip of the surface disposal area.

Consent Order sampling is complete for SWMU 13-002. All detected inorganic and organic chemical concentrations from Consent Order samples were below residential SSLs. SWMU 13-002 was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, which was submitted to NMED in 2015. SWMU 13-002 will be eligible for a COC upon approval of the report by NMED.

SWMU 16-003(n) consists of a former sump that was located on the exterior northeast wall of former building 16-342 at TA-16. Installed in the early 1950s, the sump was constructed of reinforced concrete and measured approximately 3.5 ft wide × 6.5 ft long × 3 ft deep. The sump received effluent from building 16-342, an HE-processing building, and discharged to a former NPDES-permitted outfall (EPA 05A062) located in Fishladder Canyon, a tributary of Cañon de Valle. The outfall was removed from the Laboratory's NPDES permit effective July 31, 1996. Building 16-342, the sump, and drainlines were decommissioned in 1999 and underwent D&D in 2004 and 2005.

Consent Order sampling is complete for SWMU 16-003(n). SWMU 16-003(n) meets industrial risk levels. The Site was recommended for corrective action complete in the approved 2009 Phase II investigation report for the TA-16-34 complex.

SWMU 16-003(o) consists of the six former HE sumps and an outfall associated with the former explosives synthesis building (structure 16-340) at TA-16. The sumps were connected to the former NPDES-permitted outfall via a 10-in. VCP, which originally discharged to a hill slope east of building 16-340. Building 16-340 was used to produce the plastics explosive PBX. VOCs were used in this preparation, but most VOCs were distilled during the processing. The remaining solvents historically were discharged with the wastewater to the sumps. In the late 1980s, a trough functioning as an air stripper was installed at the outfall and was designed to trap and volatilize residual solvents in the wastewater. The air stripper resembled a fish ladder, and it discharged approximately 250 ft east of the sumps into Fishladder Canyon, a tributary of Cañon de Valle. The outfall was removed from the Laboratory's NPDES permit on July 20, 1998. Building 16-340, the sumps, and drainlines were decommissioned in 1999 and underwent D&D in 2004 and 2005, when all aboveground and subsurface

structures and contaminated soil were removed. Approximately 100 yd<sup>3</sup> of soil was removed from SWMU 16-003(o).

Consent Order sampling is complete for SWMU 16-003(o). SWMU 16-003(o) meets industrial risk levels. Alluvial wells downgradient of SWMU 16-003(o) continue to be monitored. The Site was recommended for corrective action complete in the approved 2009 investigation report.

SWMU 16-029(h) consists of an inactive outfall and two inactive/former drainlines (one known and one suspected) from the HE sump [AOC 16-003(p)], located on the south side of former building 16-478. The known drainline exits the southeast corner of the sump and extends 80 ft east of the sump to the rim of Cañon de Valle. This drainline discharged directly into Cañon de Valle before it was plugged in 1987. A second drainline is suspected to be present. The second drainline is reportedly a French drain that extends south of the sump. Former building 16-478 was used as a bunker, utility room, control room, and high-speed machining room for tests on experimental HE. When the building was removed in 2005, the sump was left in place. During the investigation activities conducted in 2009 and 2010, no evidence of the French drain was found.

Consent Order sampling is complete for SWMU 16-029(h). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs, except for two detections of arsenic in two subsurface tuff samples. SWMU 16-029(h) was recommended for additional sampling to define the extent of contamination for one or more inorganic and/or organic chemicals in the S-Site Aggregate Area supplemental investigation report, submitted to NMED in 2015.

SWMU 16-031(h) consists of a former NPDES-permitted outfall (EPA04A134) located approximately 300 ft northeast of former building 16-340. The outfall received discharges only from the sink and floor drain of a utility room (engineering drawing ENG-C-14851) within former structure 16-478. The outfall received discharges from only the former utility room. Structure 16-478 (formerly structure 13-4) was used for photographing explosives tests and was later modified for testing the effects of machining HE remotely. In July 1995, building 16-478 was decommissioned and subsequently underwent D&D in 2005.

Consent Order sampling is complete for SWMU 16-031(h). All detected inorganic and organic chemical concentrations from Consent Order samples were below residential SSLs. SWMU 16-031(h) was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, which was submitted to NMED in 2015. SWMU 16-031(h) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 186-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## **186.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 186-1).



**Table 186-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00702040021	Established Vegetation	-	X	X	-	B
V00703010027	Earthen Berm	-	X	-	X	B
V00703060028	Straw Wattle	-	X	-	X	B
V00703060030	Straw Wattle	-	X	-	X	B
V00703060031	Straw Wattle	X	-	-	X	B
V00703120026	Rock Berm	-	X	-	X	B
V00706010019	Rock Check Dam	X	-	-	X	B
V00706010020	Rock Check Dam	X	-	-	X	B
V00706010024	Rock Check Dam	-	X	-	X	B
V00706010025	Rock Check Dam	-	X	-	X	B
V00707010002	Gabions	-	X	-	X	CB

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 186.3 Storm Water Monitoring

SWMUs 13-001, 13-002, 16-003(n), 16-003(o), 16-029(h), and 16-031(h) are monitored within CDV-SMA-2.3. As part of extended baseline monitoring, a baseline storm water sample was collected on July 20, 2015 (Figure 186-2). This confirmation monitoring sample was collected to determine if corrective action was required. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 54.4 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 13-001:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for uranium isotopes, which are alpha emitters. Americium-241 was detected slightly above BV/FV in 2 out of 27 samples (maximum activity of 0.0394 pCi/g versus 0.013 pCi/g) at SWMU 13-001.

#### *SWMU 13-002:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for uranium isotopes, which are alpha emitters. Alpha-emitting radionuclides were not detected above BVs or FVs in any of the 0 to 3 ft bgs samples collected at SWMU 13-002.

*SWMU 16-003(n):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Samples from 0 to 3 ft bgs were not analyzed for gross-alpha activity or uranium isotopes.

*SWMU 16-003(o):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Soil samples were not analyzed using gamma spectroscopy but were analyzed for isotopic uranium (alpha emitters). Uranium isotopes were detected above BVs/FVs in 25 out of 67 samples (0 to 3 ft bgs). Activities were almost 5 times the BV/FV for uranium-234.

*SWMU 16-029(h):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for uranium isotopes, which are alpha emitters. Americium-241 was detected slightly above FV in 3 out of 17 samples (maximum activity of 0.0246 pCi/g vs. 0.013 pCi/g) at SWMU 16-029(h).

*SWMU 16-031(h):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for uranium isotopes, which are alpha emitters. Alpha-emitting radionuclides were not detected above BVs or FVs in any of the 0 to 3 ft bgs samples collected at SWMU 16-031(h).

TAL exceedance was also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 186-2. 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 Figure 186-2.

Monitoring location CDV-SMA-2.3 receives storm water run-on from mostly landscape consisting of Bandelier Tuff sediment. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha background UTL for locations with 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 landscape is 32.5 pCi/L. The 2015 gross-alpha result is between these two values.

All the analytical results for this sample are reported in the 2015 Annual Report.

### 186.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-2.3 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 186-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62402	6-20-2017
Storm Rain Event	BMP-62913	7-3-2017
Storm Rain Event	BMP-63425	7-24-2017
Storm Rain Event	BMP-64157	8-9-2017
Storm Rain Event	BMP-66231	10-17-2017

No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-2.3 in 2017.

### 186.5 Compliance Status

The Sites associated with CDV-SMA-2.3 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 186-3 presents the 2017 compliance status.

**Table 186-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 13-001	Corrective Action Initiated	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 - Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 13-002	Corrective Action Initiated	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 - Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-003(n)	Corrective Action Initiated	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 - Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-003(o)	Corrective Action Initiated	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 - Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-029(h)	Corrective Action Initiated	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 - Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-031(h)	Corrective Action Initiated	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 - Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."



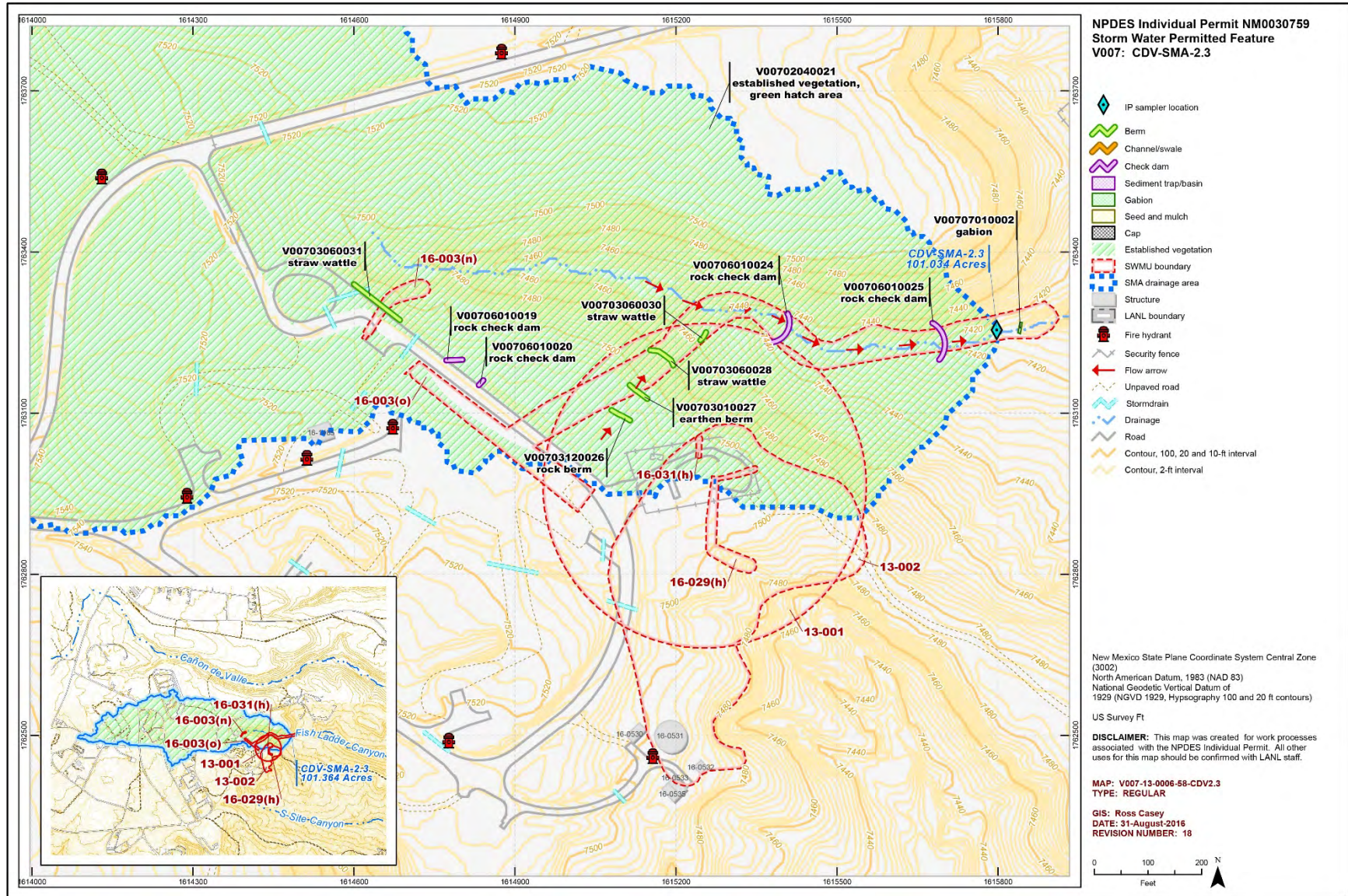
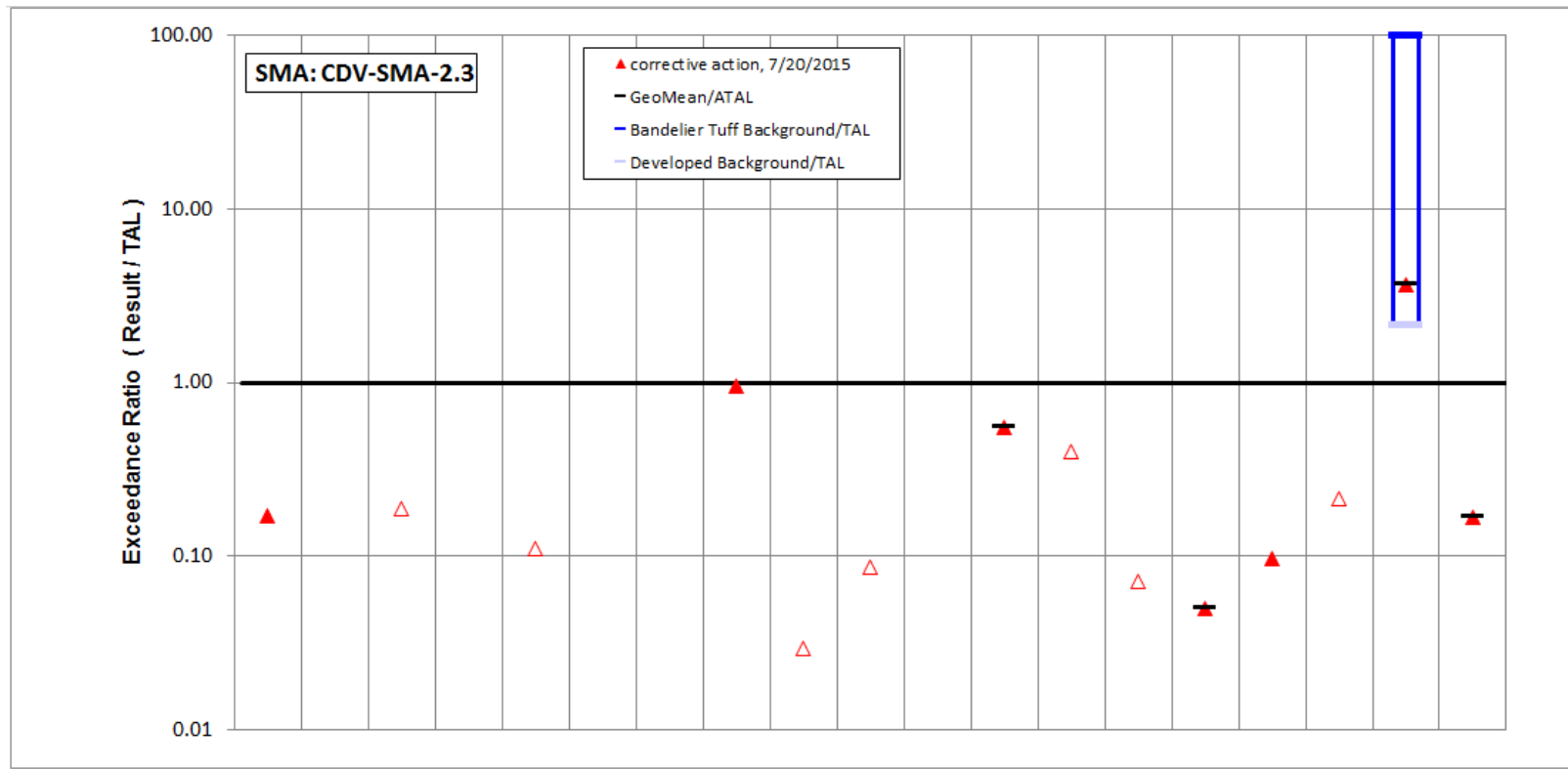


Figure 186-1 CDV-SMA-2.3 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	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
<b>7/20/2015 result</b>	129	1	1.7	16.8	0.11	2	1	4.13	0.5	0.067	0.698	2.74	0.2	0.45	5.03	4.06	0.002	<b>54.4</b>	5.04
result / TAL	0.17	0.002	0.19	0.0034	0.11	0.01	0.001	0.96	0.029	0.087	0.0041	0.55	0.4	0.071	0.05	0.097	0.21	3.6	0.17

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 186-2 Inorganic analytical results summary plot for CDV-SMA-2.3**



## 187.0 CDV-SMA-2.41: SWMU 16-018

### 187.1 Site Descriptions

One historical industrial activity area is associated with V008, CDV-SMA-2.41: Site 16-018.

SWMU 16-018 is the former location of MDA P, north of the TA-16 Burning Ground near the south rim of Cañon de Valle. MDA P operated from 1950 to 1984 as a disposal site for debris remaining from burning HE and HE-contaminated material at TA-16. Concrete and construction debris were deposited directly on the slopes leading down into the canyon. Other materials were burned at one of the nearby open-burn units, and the resulting debris or residue was pushed over the mesa rim into the canyon. The western area of MDA P primarily received construction debris from the demolition of World War II-era buildings; the eastern area received debris and residue from the open-burn units. MDA P underwent RCRA closure between 1999 and 2005. During closure, approximately 55,000 yd<sup>3</sup> of soil, rock, metal, and concrete debris was excavated from MDA P. Of this quantity, 21,506 yd<sup>3</sup> of soil was disposed of as hazardous waste. The remainder of this quantity consisted of industrial waste soils, concrete and metal debris that was recycled or managed as industrial waste, and rock that was decontaminated and then



CDV-SMA-2.41, Rip Rap, V00804060010 (photo ID 8793-4r)

used as riprap within TA-16. Other excavated waste included 3947 lb of asbestos-containing material; 888 containers of unknown content; 95 miscellaneous metal objects; 3240 lb of LLW; 5389 lb of mixed waste; and various smaller quantities of HE, HE-contaminated debris, and residuals from treating HE. Scrap metal and concrete were shipped to recycling facilities. Contaminated soils and industrial wastes were shipped to off-site solid waste landfills. Solid, nonhazardous wastes were disposed of at MDA J.

Consent Order sampling has not been conducted at SWMU 16-018; however, decision-level data are available from confirmation samples collected during the RCRA closure of MDA P Site. The Site was segregated into zones (biological and exposed tuff) for cleanup and confirmation sampling purposes and a 30- x 30-ft sampling grid was placed over the entire Site.

The approved 2005 MDA P Site closure certification report concluded the nature and extent had been defined for chemicals and radionuclides detected at SWMU 16-018. The Site meets residential risk levels. NMED approved the SWMU 16-018 RCRA closure report in 2005. SWMU 16-018 was removed from the Laboratory's Hazardous Waste Facility Permit in 2010; therefore, this unit is no longer subject to the Consent Order.

The project map (Figure 187-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 187.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 187-1).

Enhanced controls were installed and certified on June 26, 2014, and submitted to EPA on July 11, 2014, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 187-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00802040015	Established Vegetation	-	X	X	-	B
V00803010013	Earthen Berm	-	X	-	X	EC
V00804010014	Earthen Channel/Swale	X	-	X	-	EC
V00804040011	Culvert	X	-	X	-	CB
V00804060010	Rip Rap	X	-	X	-	CB
V00806010012	Rock Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 187.3 Storm Water Monitoring

SWMU 16-018 is monitored within CDV-SMA-2.41. Following the installation of baseline control measures, a baseline confirmation sample was collected on August 21, 2011 (Figures 187-2 and 187-3). Analytical results from this baseline sample yielded the following TAL exceedances:

- Gross-alpha activity of 231 pCi/L (ATAL is 15 pCi/L) and
- PCB concentration of 24 ng/L (ATAL is 0.6 ng/L).

Following the installation of enhanced control measures at CDV-SMA-2.41, a corrective action storm water sample was collected on July 8, 2014 (Figures 187-2 and 187-3). Analytical results from this corrective action monitoring sample yielded the following TAL exceedances:

- Gross-alpha activity of 94.2 pCi/L (ATAL is 15 pCi/L) and
- PCB concentration of 25 ng/L (ATAL is 0.6 ng/L).

Exceedances are typically evaluated by comparing the results from soil samples collected at the Site during Consent Order investigations with the storm water TAL exceedances to determine whether the exceedance may be related to historical industrial activities.

#### *SWMU 16-018:*

- PCBs were potentially associated with industrial materials historically managed at SWMU 16-018. The PCB mixture (Aroclor-1260) was detected in 1 of 7 shallow soil confirmation samples collected at a concentration 2.8% of the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Confirmation samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for uranium isotopes, which are alpha emitters. Alpha-emitting radionuclides were not detected above BVs or FVs in any of the confirmation samples collected at SWMU 16-018.



TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 187-2 and 187-3. 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 187-2 and 187-3.

Monitoring location CDV-SMA-2.41 receives storm water run-on from locations with sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha background UTL for locations with sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 gross-alpha result is less than this value.
- PCB—The PCB baseline storm water UTL for locations with sediment derived from Bandelier Tuff is 11.7 ng/L. The 2011 PCB result is greater than this value.

All the analytical results for these samples are reported in the 2011 and 2014 Annual Reports.

#### 187.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-2.41 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 187-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62403	6-19-2017
Storm Rain Event	BMP-62914	6-29-2017
Storm Rain Event	BMP-63426	7-21-2017
Storm Rain Event	BMP-64158	8-7-2017
Storm Rain Event	BMP-66232	10-17-2017

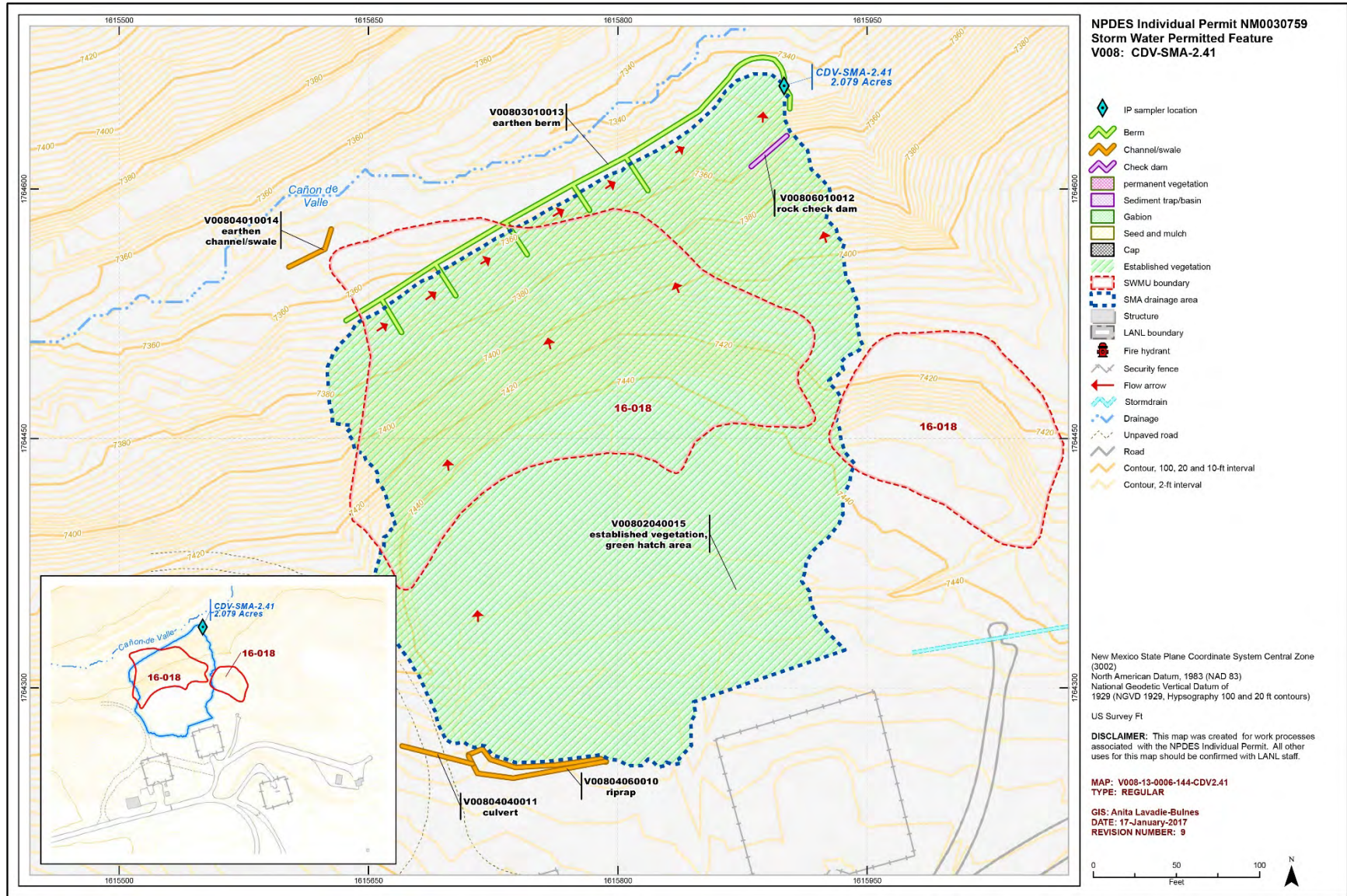
No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-2.41 in 2017.

#### 187.5 Compliance Status

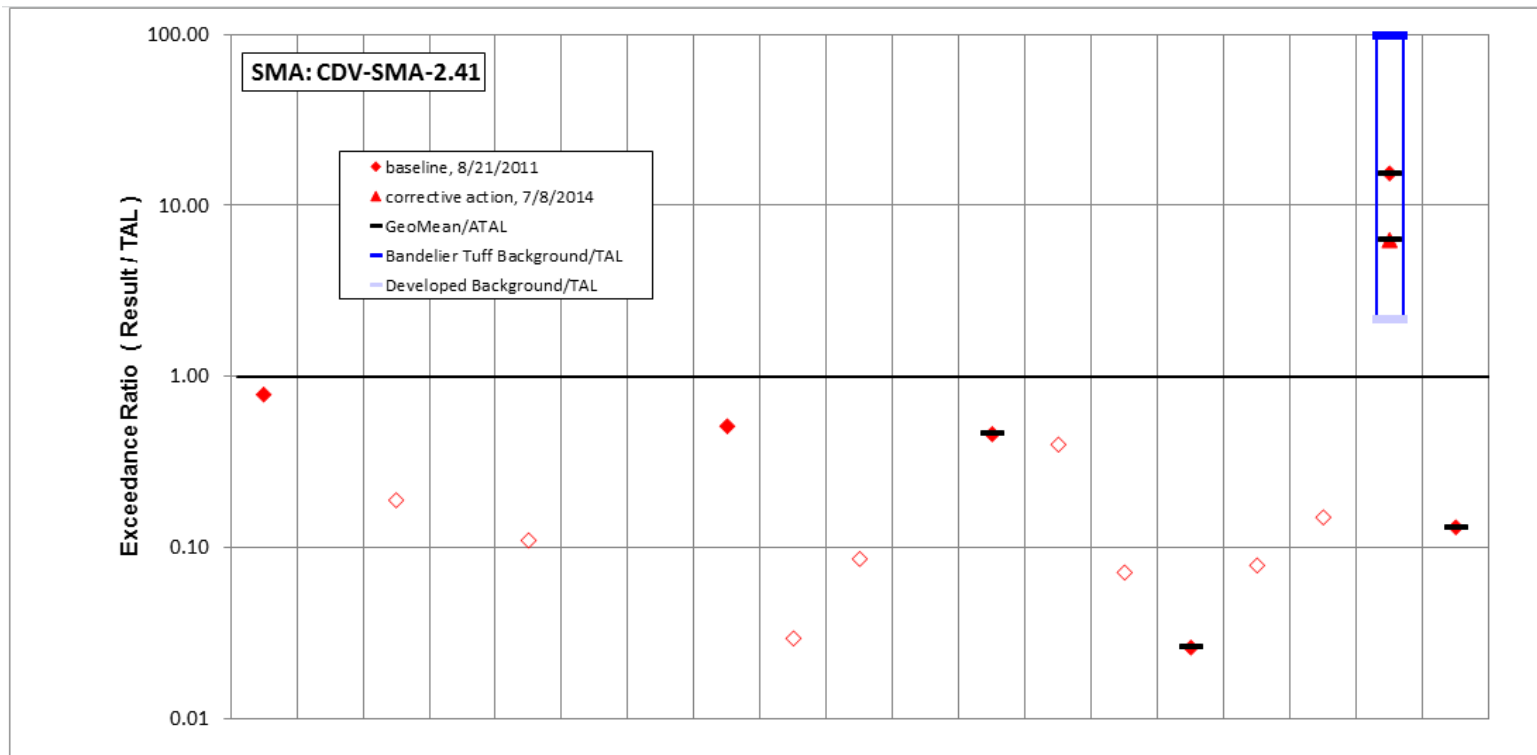
The Site associated with CDV-SMA-2.41 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 187-3 presents the 2017 compliance status.

**Table 187-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-018	<p>Enhanced Control Corrective Action Monitoring</p> <p>Request to Delete Site from the Permit</p>	<p>Enhanced Control Corrective Action Monitoring</p> <p>Request to Delete Site from the Permit</p>	<p>LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."</p> <p>LANL, October 21, 2015, "NPDES Permit No. NM0030759 - Request for Permit Modification Removal of Sites 16-010(b) (CDV-SMA-2.42), 16-010(c) (CDV-SMA-2.5), 16-010(d) (CDV-SMA-2.5), and 16-018 (CDV-SMA-2.41)."</p>



**Figure 187-1 CDV-SMA-2.41 location map**

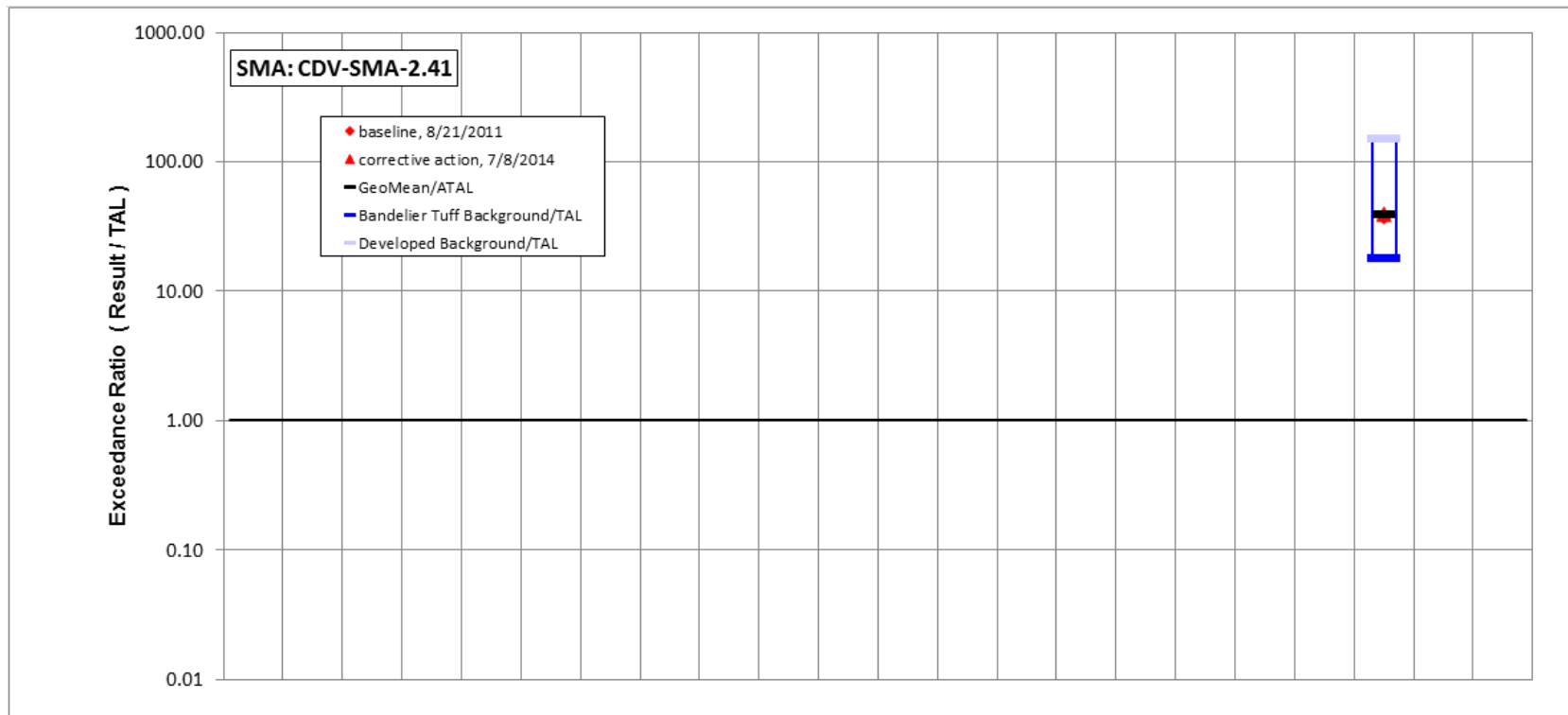


	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/8/2014 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>94.2</b>	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>6.3</b>	-
<b>8/21/2011 result</b>	588	<i>1</i>	<i>1.7</i>	34.1	<i>0.11</i>	2	3.8	2.2	0.5	<i>0.066</i>	<i>0.84</i>	2.3	0.2	<i>0.45</i>	2.6	3.3	<i>0.002</i>	<b>231</b>	3.94
result / TAL	0.78	<i>0.002</i>	<i>0.19</i>	0.0068	<i>0.11</i>	0.01	0.004	0.51	<i>0.029</i>	<i>0.086</i>	0.005	0.46	0.4	<i>0.071</i>	0.026	0.079	0.15	<b>15</b>	0.13

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 187-2 Inorganic analytical results summary plot for CDV-SMA-2.41**





	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-]	<b>Total PCB</b>	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
<b>7/8/2014 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.025</b>	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>40</b>	-	-
<b>8/21/2011 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.024</b>	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>38</b>	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 187-3 Organic analytical results summary plot for CDV-SMA-2.41

## **188.0 CDV-SMA-2.42: SWMU 16-010(b)**

### **188.1 Site Descriptions**

One historical industrial activity area is associated with V008A, CDV-SMA-2.42: Site 16-010(b).

SWMU 16-010(b) consists of a former flash pad (structure 16-387) that was located at the TA-16 Burning Ground. The flash pad was enclosed within a 100- × 100-ft fenced area and consisted of a layer of sand several inches thick over a soil base. The pad was built in 1951 and was used to flash-burn solid and scrap HE, HE-contaminated equipment and debris, and HE-contaminated combustible material. Sands and residues from flash pad operations were disposed of at MDA P (SWMU 16-019). The flash pad operated as a hazardous waste treatment unit under RCRA interim status and underwent RCRA closure between 1999 and 2005. Closure activities included removing the flash pad and associated debris and removing soil and bedrock below and next to the former pad. The former flash pad and MDA P were closed and remediated together along with adjacent SWMUs, known as Consolidated Unit 16-016(c)-99; for cleanup and closure purposes, the Sites were referred to as MDA P Site. Confirmation samples were collected as part of the closure of MDA P Site and included SWMU 16-010(b). The Site Closure Certification Report was approved by NMED on November 10, 2005. SWMU 16-010(b) has been removed from the list of corrective action units in the Laboratory’s Hazardous Waste Facility Permit; therefore, this unit is no longer subject to the Consent Order.

The project map (Figure 188-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **188.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 188-1).

Enhanced controls were installed and certified on September 28, 2015, and submitted to EPA on September 29, 2015, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 188-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V008A01030022	Hydromulch	-	-	X	-	EC
V008A02040020	Established Vegetation	-	X	X	-	B
V008A03010021	Earthen Berm	-	X	-	X	EC
V008A03010024	Earthen Berm	X	-	-	X	EC
V008A04040023	Culvert	-	-	X	-	EC
V008A04050025	Water Bar	X	-	X	-	B
V008A04060002	Rip Rap	-	X	X	-	CB
V008A04060005	Rip Rap	-	X	X	-	CB
V008A04060018	Rip Rap	X	-	X	-	B
V008A04060019	Rip Rap	-	X	X	-	B
V008A06010004	Rock Check Dam	-	X	-	X	CB
V008A06010017	Rock Check Dam	X	-	-	X	B
V008A07010003	Gabions	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 188.3 Storm Water Monitoring

SWMU 16-010(b) is monitored within CDV-SMA-2.42. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figures 188-2 and 188-3). In Figure 188-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 4.37 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 89.3 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 33 ng/L (ATAL is 0.6 ng/L).

Following enhanced controls installation, two corrective action monitoring storm water samples were collected on June 25, 2017, and October 5, 2017 (Figures 188-2 and 188-3). Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentration of 3470 µg/L (MTAL is 750 µg/L),
- Copper concentration of 5.51 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activities of 136 pCi/L and 29.2 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 34 ng/L and 26 ng/L (ATAL is 0.6 ng/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent. There are no Consent Order soil sampling data available for this Site.

*SWMU 16-010(b):*

- Based on site history and RCRA closure confirmation sampling, the Site is an unlikely source of the TAL exceedances for aluminum, copper, PCBs, and gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 188-2 and 188-3. 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 188-2 and 188-3.

Monitoring location CDV-SMA-2.42 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2017 is above these values.
- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2013 and 2017 are between these two values.
- Gross alpha—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 landscape is 32.5 pCi/L. The 2013 and one of the 2017 gross-alpha results are between these two values. One of the 2017 gross-alpha results is less than both these values.
- PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2013 and 2017 are between these values.

All the analytical results for these samples are reported in the 2013 and 2017 Annual Reports.

#### **188.4 Inspections and Maintenance**

RG257 recorded seven storm events at CDV-SMA-2.42 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.



**Table 188-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62407	6-19-2017
Storm Rain Event	BMP-62918	6-29-2017
Storm Rain Event	BMP-63430	7-21-2017
Storm Rain Event	BMP-64162	8-7-2017
Storm Rain Event	BMP-66236	10-17-2017
TAL Exceedance Inspection	COMP-67128	12-20-2017

No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-2.42 in 2017.

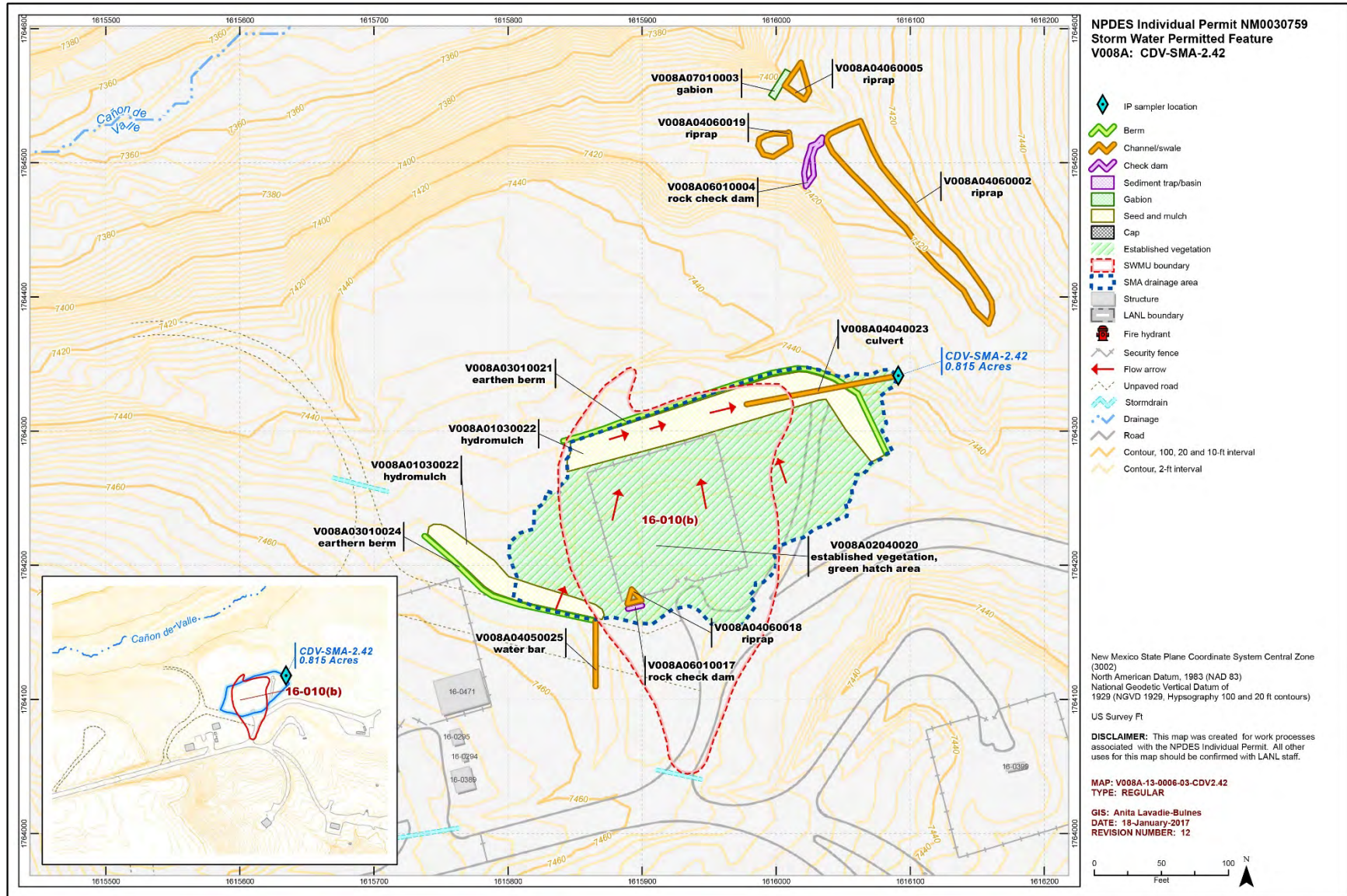
**188.5 Compliance Status**

The Site associated with CDV-SMA-2.42 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 188-3 presents the 2017 compliance status.

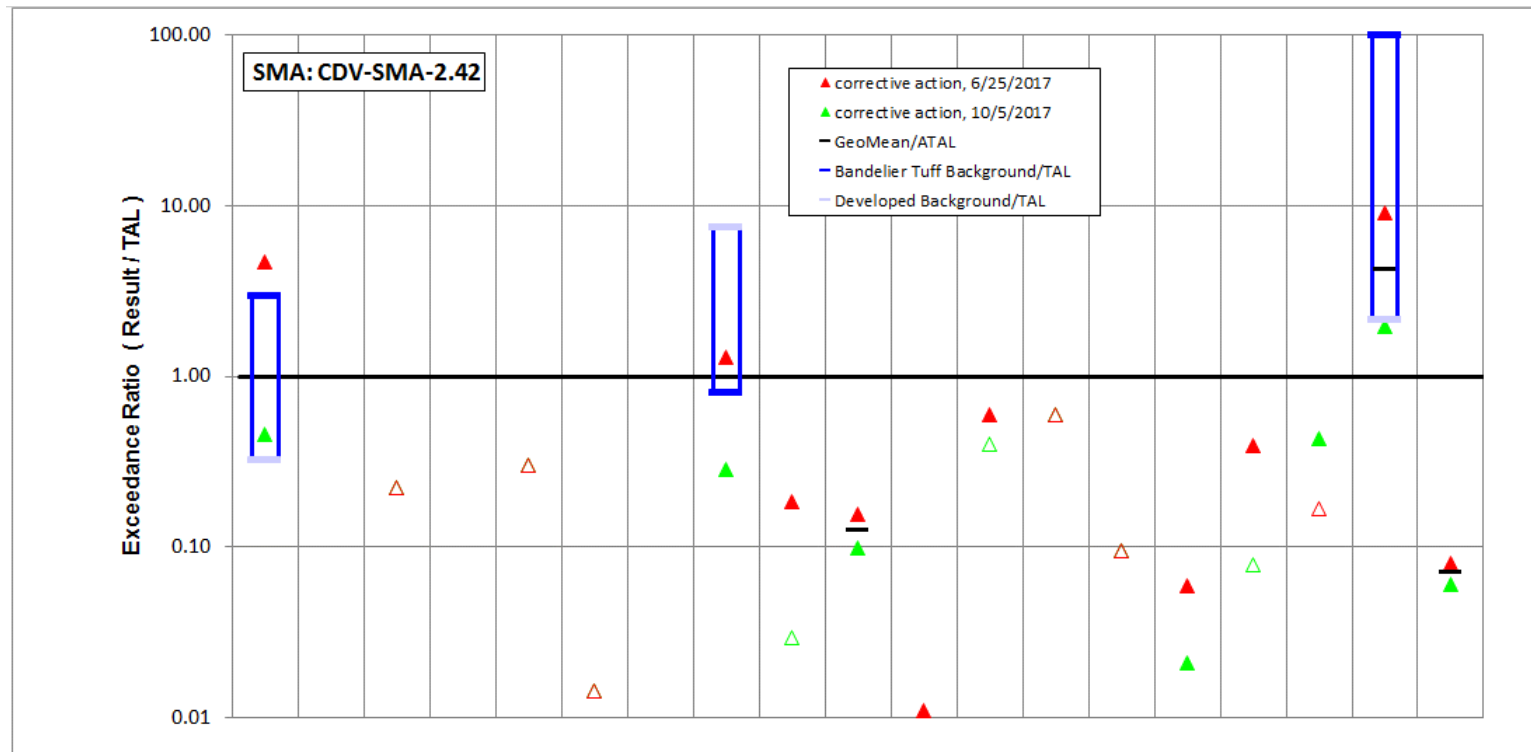
**Table 188-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-010(b)	Enhanced Control Corrective Action Monitoring  Request to Delete Site from the Permit	Alternatives Analysis Evaluation  Request to Delete Site from the Permit	Permittees are preparing an analysis of alternatives to complete corrective action.  LANL, October 21, 2015, "NPDES Permit No. NM0030759 - Request for Permit Modification Removal of Sites 16-010(b) (CDV-SMA-2.42), 16-010(c) (CDV-SMA-2.5), 16-010(d) (CDV-SMA-2.5), and 16-018 (CDV-SMA-2.41)."

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.



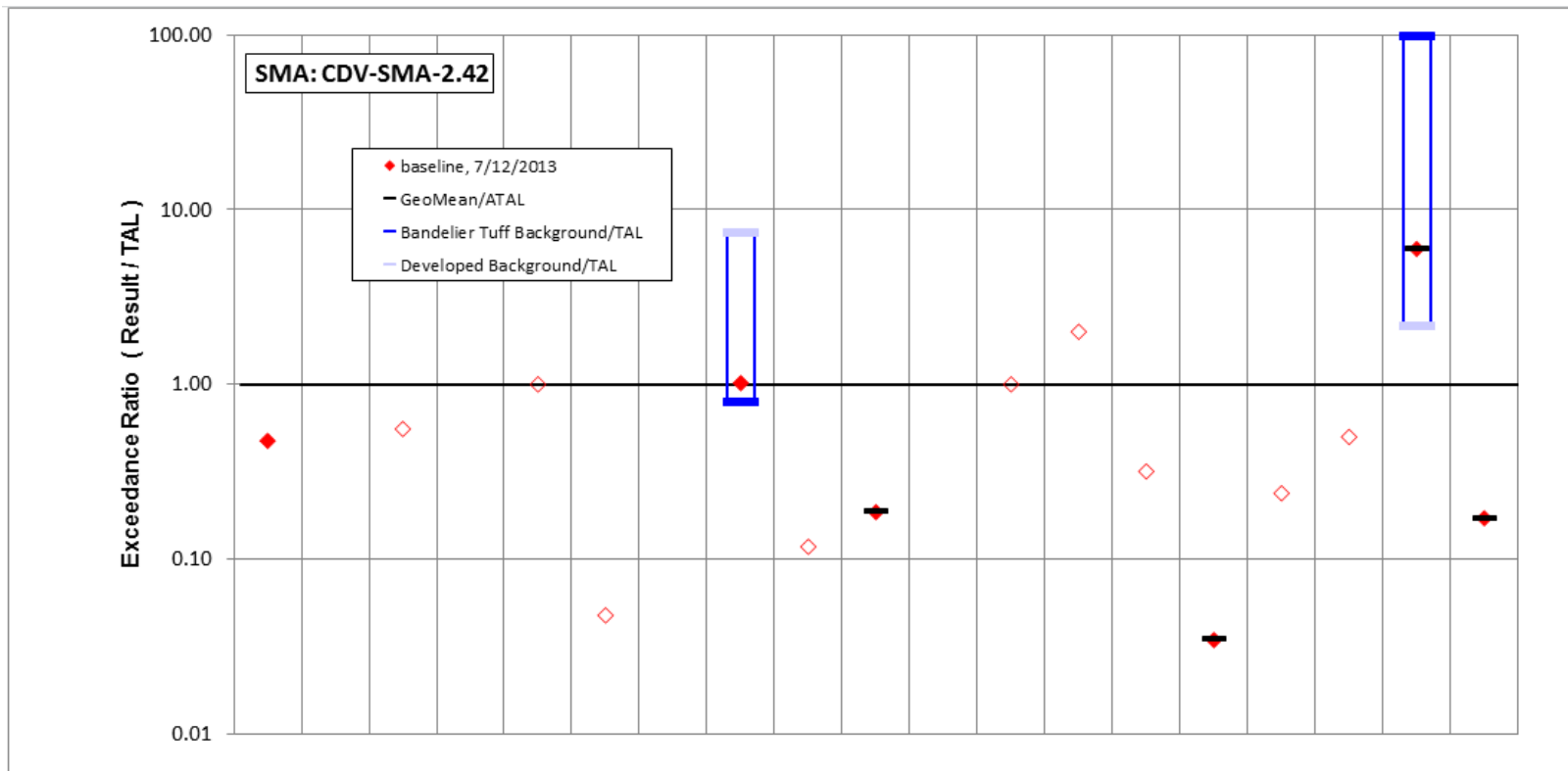
**Figure 188-1 CDV-SMA-2.42 location map**



	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
<b>10/5/2017 result</b>	340	1	2	15	0.3	3	1	1.23	0.5	0.076	0.6	2	0.3	0.6	2.1	3.3	0.0043	29.2	1.8
result / TAL	0.45	0.002	0.22	0.003	0.3	0.014	0.001	0.29	0.029	0.099	0.004	0.4	0.6	0.095	0.021	0.079	0.43	1.9	0.06
<b>6/25/2017 result</b>	3470	1	2	18.2	0.3	3	1	5.54	3.12	0.119	1.88	2.99	0.3	0.6	5.95	16.5	0.002	136	2.42
result / TAL	4.6	0.002	0.22	0.0036	0.3	0.014	0.001	1.3	0.18	0.15	0.011	0.6	0.6	0.095	0.06	0.39	0.17	9.1	0.081

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 188-2a Inorganic analytical results summary plot for CDV-SMA-2.42**

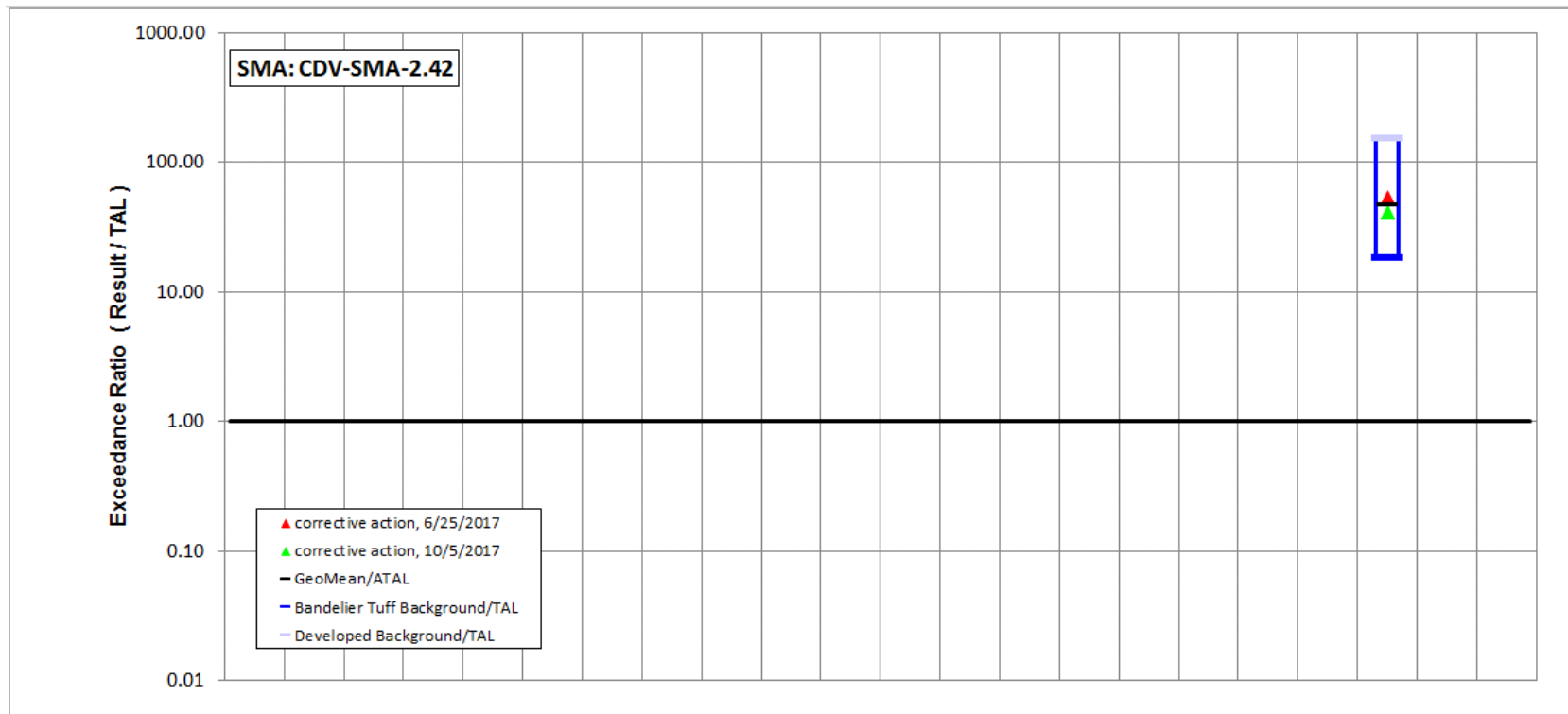


	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	Mercury	Nickel	Selenium	<b>Silver</b>	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/12/2013 result</b>	356	2.61	5	17.5	1	10	2.95	<b>4.37</b>	2	0.143	0.816	5	<b>1</b>	2	3.44	10	0.005	<b>89.3</b>	5.14
result / TAL	0.47	0.0041	0.56	0.0035	1	0.048	0.003	<b>1</b>	0.12	0.19	0.0048	1	<b>2</b>	0.32	0.034	0.24	0.5	<b>6</b>	0.17

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 188-2b Inorganic analytical results summary plot for CDV-SMA-2.42

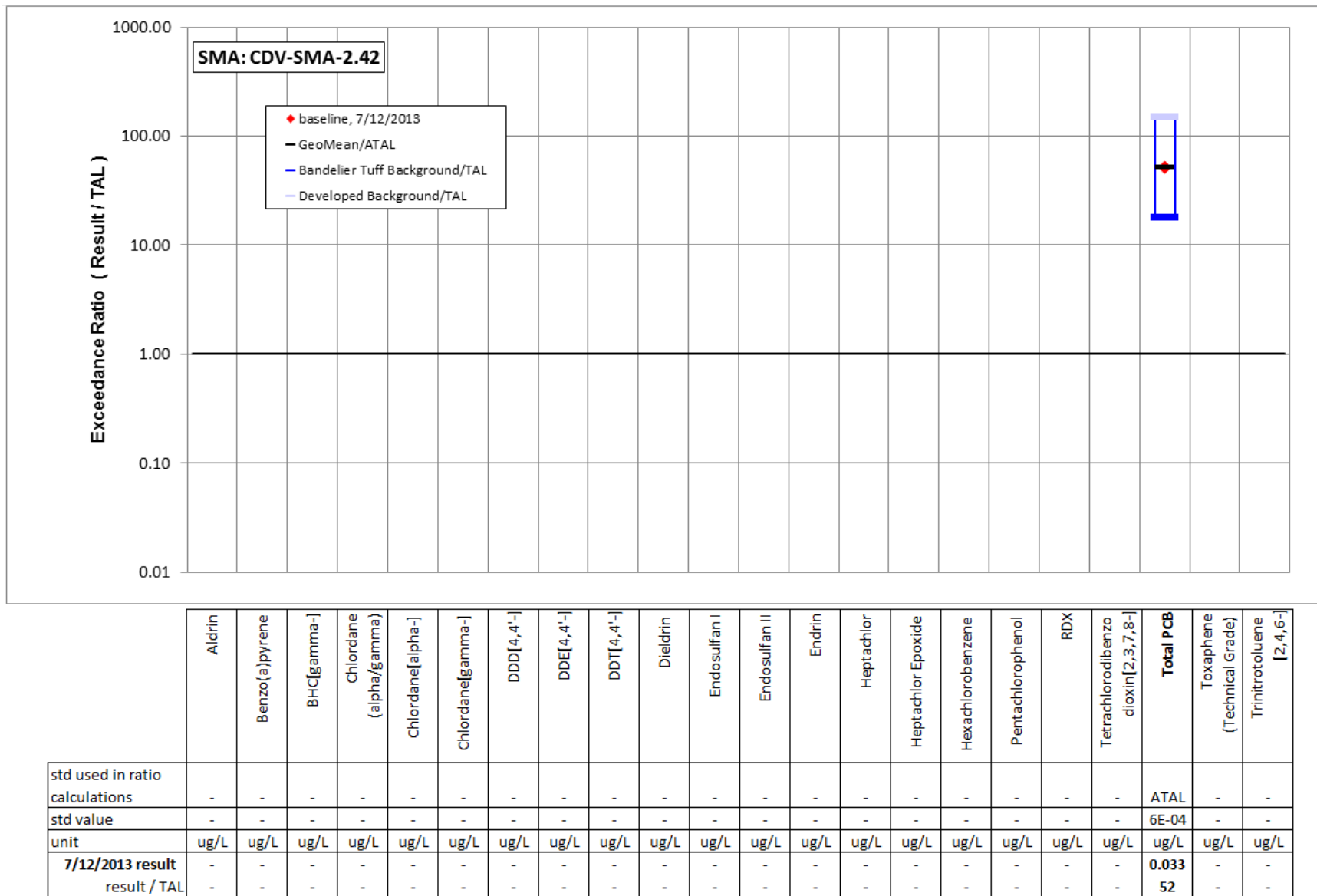




	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	<b>Total PCB</b>	Toxaphene (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
<b>10/5/2017 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.026</b>	-	-
<b>result / TAL</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>41</b>	-	-
<b>6/25/2017 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.034</b>	-	-
<b>result / TAL</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>53</b>	-	-

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 188-3a Organic analytical results summary plot for CDV-SMA-2.42**



Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 188-3b Organic analytical results summary plot for CDV-SMA-2.42

## **189.0 CDV-SMA-2.5: SWMUs 16-010(c), 16-010(d), and 16-028(a)**

### **189.1 Site Descriptions**

Three historical industrial activity areas are associated with V009, CDV-SMA-2.5: Sites 16-010(c), 16-010(d), and 16-028(a).

SWMU 16-010(c) is a former burn table that was converted to a flash pad/burn tray (structure 16-388) located at the TA-16 Burning Ground. The burn table was used to treat HE scrap. The 100- × 100-ft enclosed area consisted of a concrete pad that was used to unload explosives and a 16- × 4-ft metal tray that was approximately 2 ft above the ground surface. Scrap HE was placed on the tray and burned. The current flash pad consists of a 22- × 22-ft concrete pad set on a secondary containment area and surrounded on three sides by a concrete wall. Before treatment, the HE-contaminated wastes are placed on steel pallets or steel trays. Propane burners are used as heat sources to treat the wastes at the flash pad, which can be covered with a movable steel roof when the pad is not in use. The current burn tray consists of a stainless-steel kettle that is 30 in. in diameter and 24 in. high. Propane burners are used to treat HE-contaminated liquid wastes at the burn tray. The entire assembly, which can be covered with a retractable cover, is provided with secondary containment.

No investigations have been conducted at this Site. SWMU 16-010(c) is a formerly dual-regulated corrective action unit that was removed from the list of corrective action units in the Laboratory's Hazardous Waste Facility Permit in November 2010; therefore, this unit is no longer subject to the Consent Order.

SWMU 16-010(d) is a former burn table that was converted to a burn tray (structure 16-399) located at the TA-16 Burning Ground. The 100-ft<sup>2</sup> enclosed area consists of a concrete pad, a burn table that is approximately 2 ft above the ground surface, and a 16- × 4-ft metal tray situated on the table. Scrap HE is placed on the tray and burned. A metal-covered rain guard can be rolled back to expose the tray.

No investigations have been conducted at this Site. SWMU 16-010(d) was removed from the list of corrective action units in the Laboratory's Hazardous Waste Facility Permit in November 2010; therefore, this unit is no longer subject to the Consent Order.

SWMU 16-028(a) is the south drainage channel located at the TA-16 Burning Ground. The drainage channel is located south of the Burning Ground road and east of a water treatment shed (structure 16-363). The drainage receives runoff from the entire Burning Ground and flows into a tributary of Cañon de Valle.

Consent Order investigations have not yet begun for this Site; however, decision-level data from 1995 and 1997 RFIs are available for SWMU 16-028(a). Several inorganic chemicals were detected above BVs in shallow RFI samples, and PAHs and HE were detected at concentrations below residential SSLs. SWMU 16-028(a) will be sampled during the future Cañon de Valle Aggregate Area TA-16 investigation.

The project map (Figure 189-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **189.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 189-1).

**Table 189-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V00902040036	Established Vegetation	-	X	X	-	B
V00903010011	Earthen Berm	-	X	-	X	CB
V00903010043	Earthen Berm	X	-	-	X	B
V00903120034	Rock Berm	-	X	-	X	B
V00903120035	Rock Berm	-	X	-	X	B
V00903120038	Rock Berm	X	-	-	X	B
V00903120039	Rock Berm	X	-	-	X	B
V00903120040	Rock Berm	X	-	-	X	B
V00903120041	Rock Berm	X	-	-	X	B
V00903120042	Rock Berm	-	X	-	X	B
V00904060005	Rip Rap	X	-	X	-	CB
V00904060006	Rip Rap	-	X	X	-	CB
V00904060007	Rip Rap	X	-	X	-	CB
V00904060009	Rip Rap	X	-	X	-	CB
V00906010029	Rock Check Dam	X	-	-	X	B
V00906010030	Rock Check Dam	X	-	-	X	B
V00906010031	Rock Check Dam	X	-	-	X	B
V00906010044	Rock Check Dam	X	-	-	X	B
V00906010045	Rock Check Dam	-	X	-	X	B
V00906010046	Rock Check Dam	-	X	-	X	B
V00906010047	Rock Check Dam	X	-	-	X	B
V00906010048	Rock Check Dam	X	-	-	X	B
V00906010049	Rock Check Dam	-	X	-	X	B
V00906010050	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 189.3 Storm Water Monitoring

SWMUs 16-010(c), 16-010(d), and 16-028(a) are monitored within CDV-SMA-2.5. Following the installation of baseline control measures, baseline confirmation samples were collected on September 1, 2011, October 12, 2012, and July 26, 2013 (Figures 189-2 and 189-3). In Figures 189-2 and 189-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Inorganic and organic analytical results from these baseline samples yielded no TAL exceedances. Baseline confirmation is complete for CDV-SMA-2.5 and the associated SWMUs 16-010(c), 16-010(d), and 16-028(a) because all applicable sampling results are below the applicable MTAL or ATAL. No further sampling is required for CDV-SMA-2.5 for the duration of the IP.



### 189.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-2.5 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 189-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62404	6-19-2017
Storm Rain Event	BMP-62915	7-3-2017
Storm Rain Event	BMP-63427	7-24-2017
Storm Rain Event	BMP-64159	8-8-2017
Storm Rain Event	BMP-66233	10-17-2017

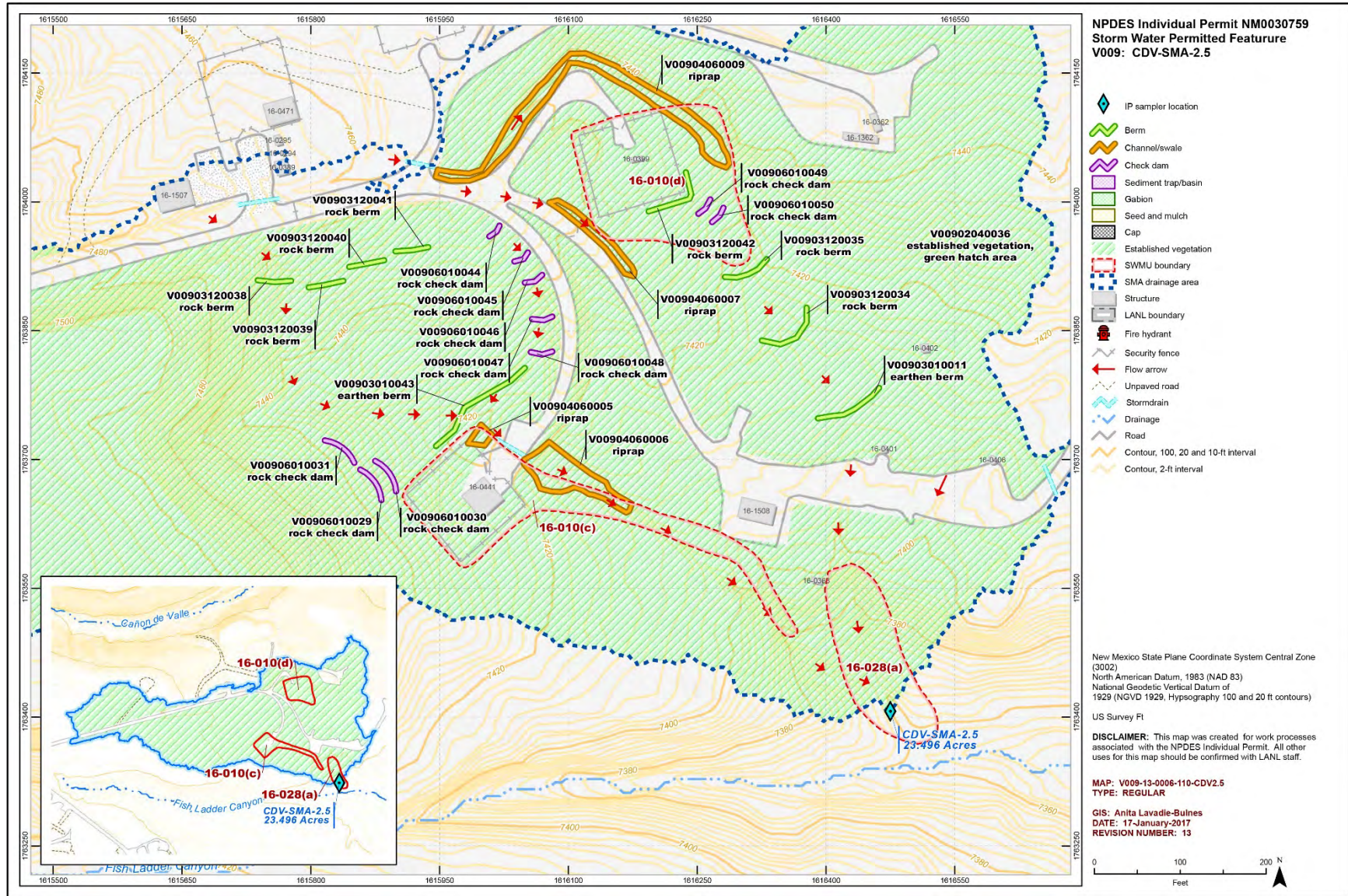
No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-2.5 in 2017.

### 189.5 Compliance Status

The Sites associated with CDV-SMA-2.5 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 189-3 presents the 2017 compliance status.

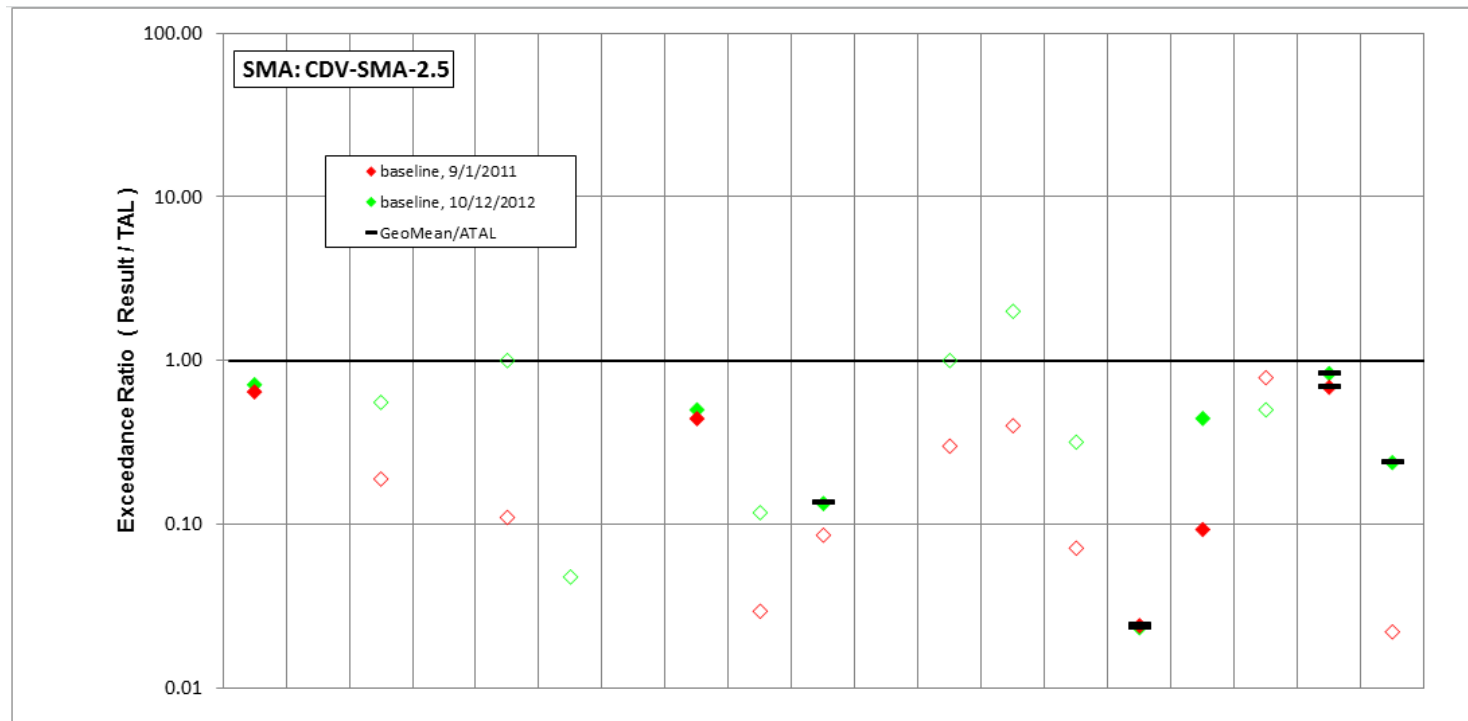
**Table 189-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-010(c)	Request to Delete Site from the Permit	Request to Delete Site from the Permit	October 21, 2015, "NPDES Permit No. NM0030759 - Request for Permit Modification Removal of Sites 16-010(b) (CDV-SMA-2.42), 16-010(c) (CDV-SMA-2.5), 16-010(d) (CDV-SMA-2.5), and 16-018 (CDV-SMA-2.41)."
	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 8-29-2013. No additional sampling is necessary for this Site
SWMU 16-010(d)	Request to Delete Site from the Permit	Request to Delete Site from the Permit	October 21, 2015, "NPDES Permit No. NM0030759 - Request for Permit Modification Removal of Sites 16-010(b) (CDV-SMA-2.42), 16-010(c) (CDV-SMA-2.5), 16-010(d) (CDV-SMA-2.5), and 16-018 (CDV-SMA-2.41)."
	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 8-29-2013. No additional sampling is necessary for this Site
SWMU 16-028(a)	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 8-29-2013. No additional sampling is necessary for this Site



**Figure 189-1 CDV-SMA-2.5 location map**

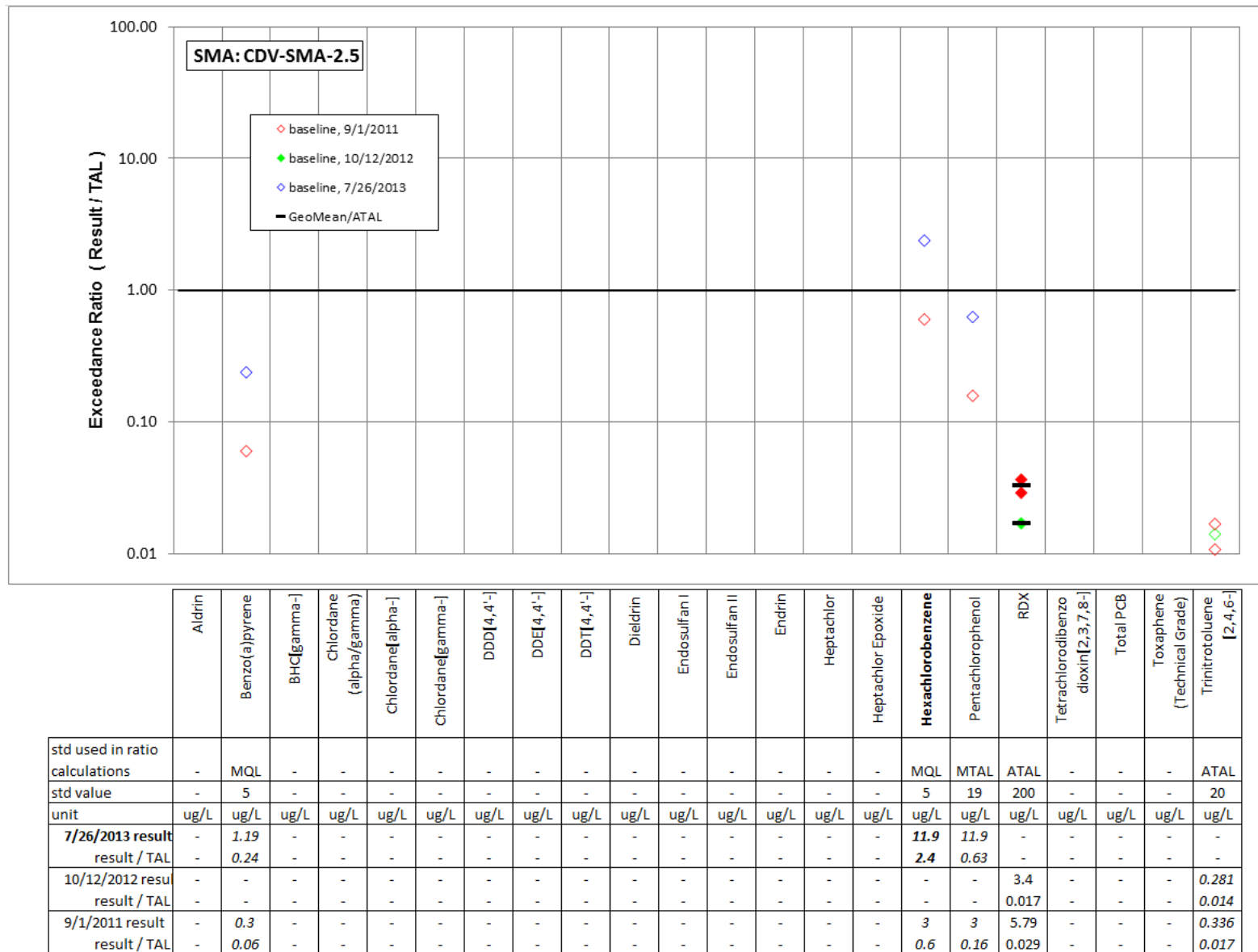




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
7/26/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/12/2012 result	534	3	5	17.4	1	10	1.94	2.15	2	0.103	1.04	5	1	2	2.33	18.6	0.005	12.5	7.14
result / TAL	0.71	0.005	0.56	0.0035	1	0.048	0.0019	0.5	0.12	0.13	0.0061	1	2	0.32	0.023	0.44	0.5	0.83	0.24
9/1/2011 result	483	1	1.7	18.4	0.11	2	2.8	1.9	0.5	0.066	1	1.5	0.2	0.45	2.4	3.9	0.008	10.3	0.66
result / TAL	0.64	0.002	0.19	0.0037	0.11	0.01	0.0028	0.44	0.029	0.086	0.0059	0.3	0.4	0.071	0.024	0.093	0.79	0.69	0.022

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 189-2 Inorganic analytical results summary plot for CDV-SMA-2.5**



Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 189-3 Organic analytical results summary plot for CDV-SMA-2.5



## 190.0 CDV-SMA-2.51: SWMU 16-010(i)

### 190.1 Site Descriptions

One historical industrial activity area is associated with V009A, CDV-SMA-2.51: Site 16-010(i).

SWMU 16-010(i) is structure 16-392, an inactive burn pad that previously was a filter bed that received wash water from the basket-wash facility. The wash water was received through a trough (structure 16-1136). Filtered wash water from the basket-wash facility collected within perforated piping along the bottom of the filter bed and drained via gravity through a pipe to an adjacent outfall southeast of the filter bed. The filter bed was modified to a burn pad to burn suspected uranium-contaminated objects. The basket-wash facility and discharge trough were removed in 2003; the filter bed is still in place. SWMU 16-010(i), along with numerous other SWMUs and AOCs, is a component of Consolidated Unit 16-010(h)-99, the Burning Ground structures.

Consent Order sampling has not been conducted at SWMU 16-010(i); however, decision-level data are available from soil samples collected under the 1995 RFI. SWMU 16-010(i) will be sampled during the future Cañon de Valle Aggregate Area TA-16 investigation.

The project map (Figure 190-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 190.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 190-1).

**Table 190-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V009A02040029	Established Vegetation	-	X	X	-	B
V009A03020005	Base Course Berm	X	-	-	X	CB
V009A03020012	Base Course Berm	X	-	-	X	CB
V009A03060030	Straw Wattle	X	-	-	X	B
V009A03060031	Straw Wattle	X	-	-	X	B
V009A06010003	Rock Check Dam	-	X	-	X	CB
V009A06010004	Rock Check Dam	-	X	-	X	CB
V009A06010006	Rock Check Dam	X	-	-	X	CB
V009A06010013	Rock Check Dam	-	X	-	X	CB
V009A06010014	Rock Check Dam	-	X	-	X	CB
V009A06010015	Rock Check Dam	-	X	-	X	CB
V009A06010016	Rock Check Dam	X	-	-	X	CB
V009A06030017	Juniper Bales	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 190.3 Storm Water Monitoring

SWMU 16-010(i) is monitored within CDV-SMA-2.51. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 190-2 and 190-3). In Figures 190-2 and 190-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 16.4 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 16-010(i):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at the Site. Shallow (i.e., less than 3 ft bgs) 1995 RFI samples collected at the Site were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides. However, samples were analyzed for total uranium, which has alpha-emitting isotopes. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 190-2 and 190-3. 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 190-2 and 190-3.

Monitoring location CDV-SMA-2.51 receives storm water run-on from developed environments, including roads, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—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 landscape is 32.5 pCi/L. The 2013 gross-alpha result is less than both these values.

All the analytical results for these samples are reported in the 2013 Annual Report.

### 190.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-2.51 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 190-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62408	6-19-2017
Storm Rain Event	BMP-62919	7-3-2017
Storm Rain Event	BMP-63431	7-21-2017
Storm Rain Event	BMP-64163	8-8-2017
Storm Rain Event	BMP-66237	10-17-2017

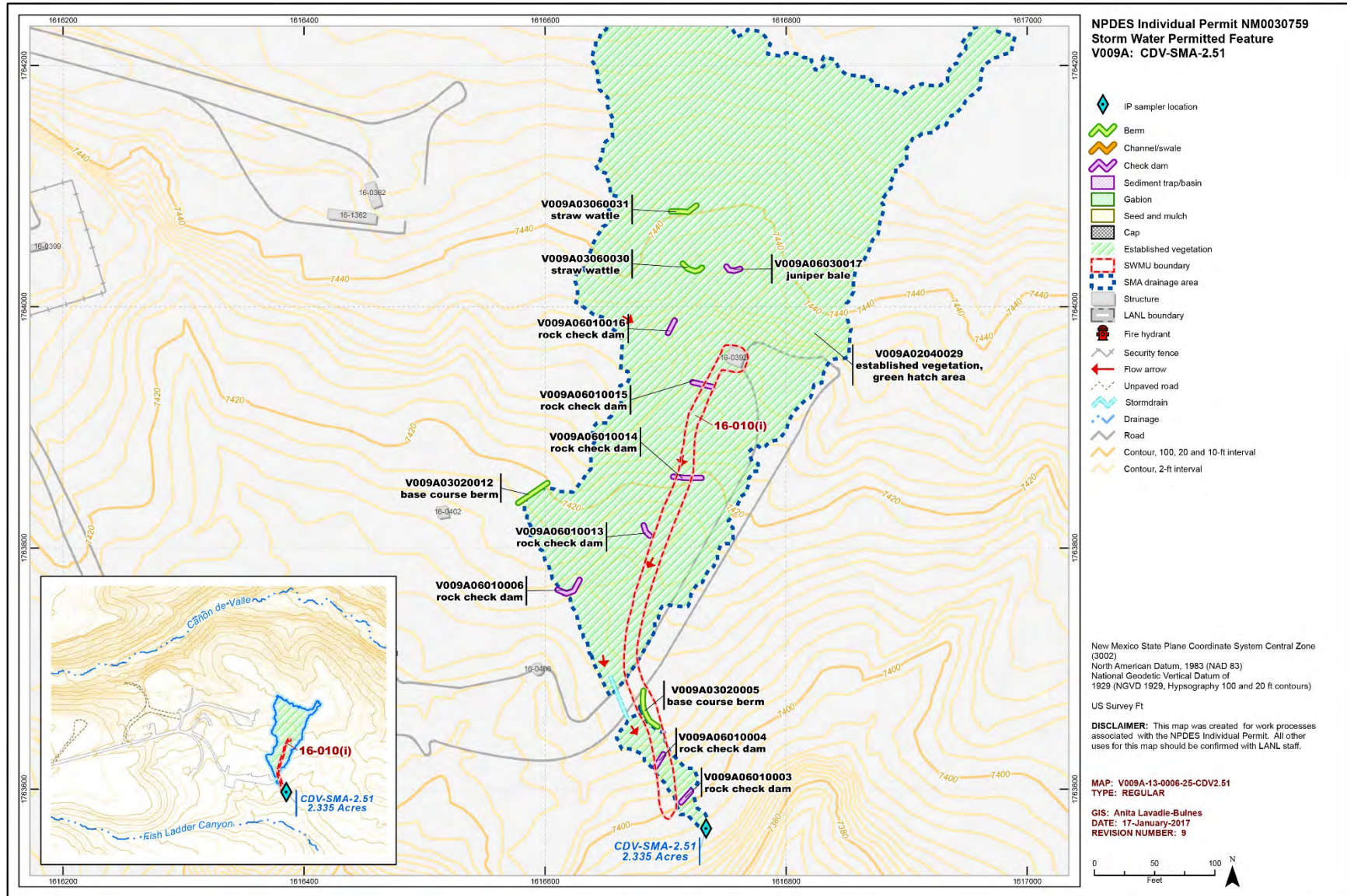
No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-2.51 in 2017.

### 190.5 Compliance Status

The Site associated with CDV-SMA-2.51 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 190-3 presents the 2017 compliance status.

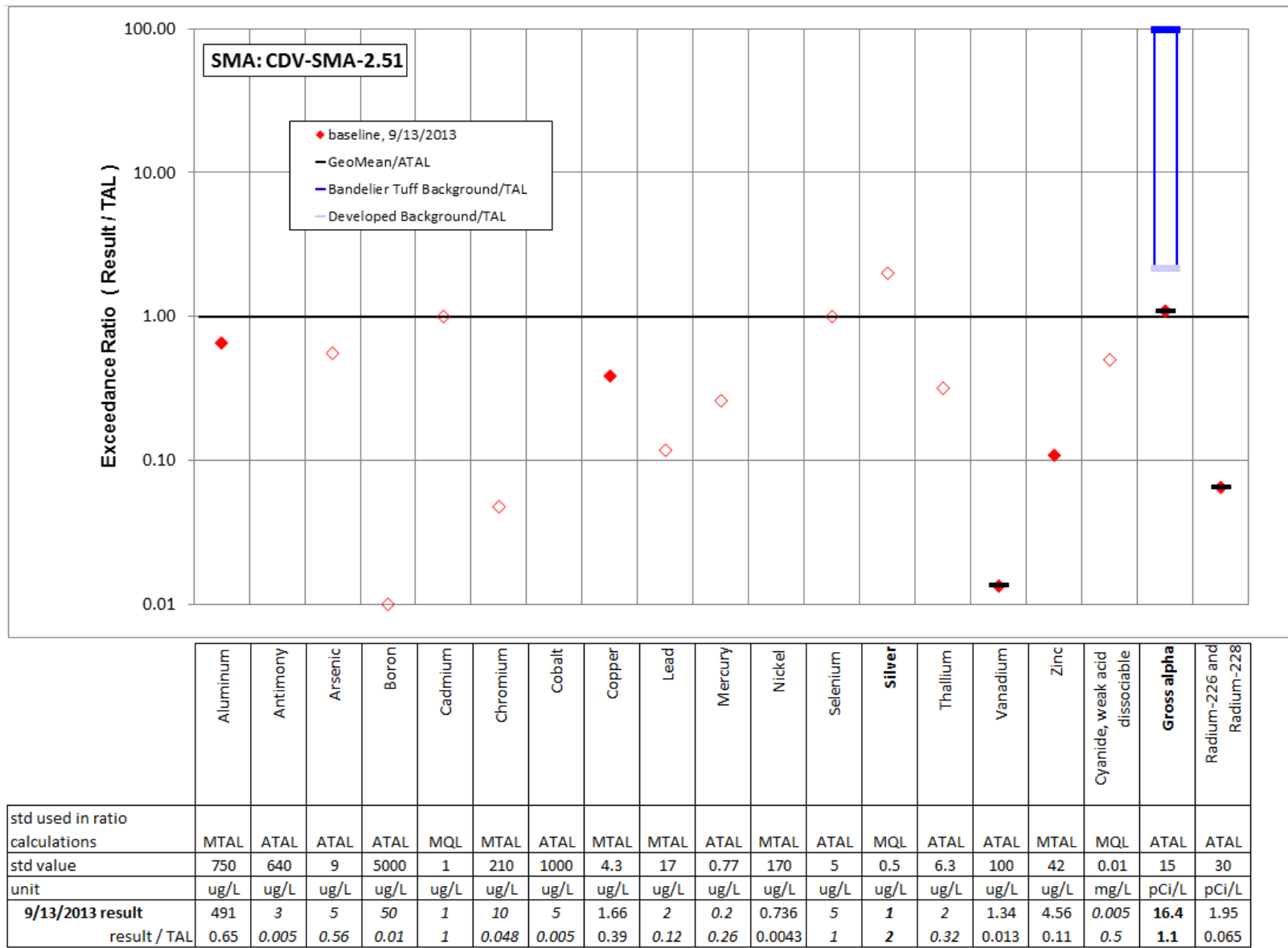
**Table 190-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-010(i)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."



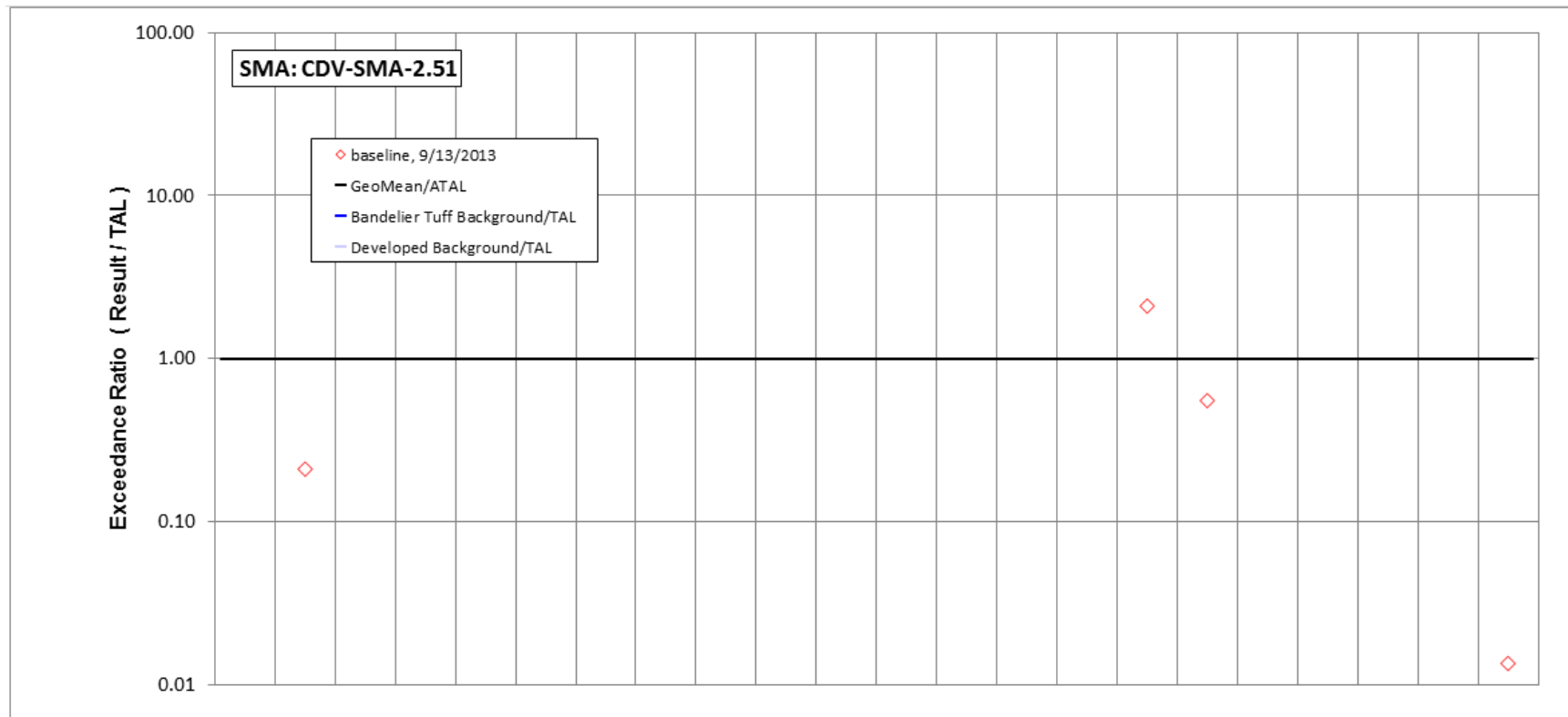
**Figure 190-1 CDV-SMA-2.51 location map**





Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 190-2 Inorganic analytical results summary plot for CDV-SMA-2.51**



	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	<b>Hexachlorobenzene</b>	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]	
std used in ratio calculations	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	ATAL	-	-	-	-	ATAL
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	200	-	-	-	-	20
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	ug/L
9/13/2013 result	-	1.05	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>10.5</b>	10.5	0.277	-	-	-	-	0.27
result / TAL	-	0.21	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>2.1</b>	0.55	0.001	-	-	-	-	0.014

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 190-3 Organic analytical results summary plot for CDV-SMA-2.51

## 191.0 CDV-SMA-3: SWMU 14-009

### 191.1 Site Descriptions

One historical industrial activity area is associated with V010, CDV-SMA-3: Site 14-009.

SWMU 14-009 is a surface disposal area located south and west of building 14-43 at TA-14. The disposal area measures approximately 30 × 140 ft and consists of sand and ruptured sandbags used during explosives tests performed at nearby firing sites [SWMUs 14-002(a) and 14-002(b)].

Phase I Consent Order investigation is complete for SWMU 14-009. SWMU 14-009 was recommended for corrective action complete without controls in the supplemental investigation report for Cañon de Valle Aggregate Area TA-14, submitted to NMED in 2016. SWMU 14-009 will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 191-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 191.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 191-1).

Enhanced controls were installed and certified on July 18, 2012, and submitted to EPA on July 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 191-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V01002040013	Established Vegetation	-	X	X	-	B
V01003010010	Earthen Berm	-	X	-	X	EC
V01003010011	Earthen Berm	-	X	-	X	EC
V01003120005	Rock Berm	X	-	-	X	CB
V01003120009	Rock Berm	-	X	-	X	CB
V01006010004	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 191.3 Storm Water Monitoring

SWMU 14-009 is monitored within CDV-SMA-3. Following the installation of baseline control measures, a baseline confirmation sample was collected on August 21, 2011 (Figure 191-2 and 191-3). Inorganic analytical results from this baseline sample yielded the following TAL exceedance:

- Gross-alpha activity of 33.4 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

**SWMU 14-009:**

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for uranium isotopes, all of which are alpha-emitting radionuclides. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

The TAL exceedance was also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 191-2 and 191-3. 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 191-2 and 191-3.



Monitoring location CDV-SMA-3 receives storm water run-on from sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha background UTL for locations with sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2011 Annual Report.

**191.4 Inspections and Maintenance**

RG257 recorded seven storm events at CDV-SMA-3 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.



**Table 191-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62405	6-14-2017
Storm Rain Event	BMP-62916	6-27-2017
Storm Rain Event	BMP-63428	7-26-2017
Storm Rain Event	BMP-64160	8-3-2017
Storm Rain Event	BMP-66234	10-16-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 191-3 Maintenance during 2017**

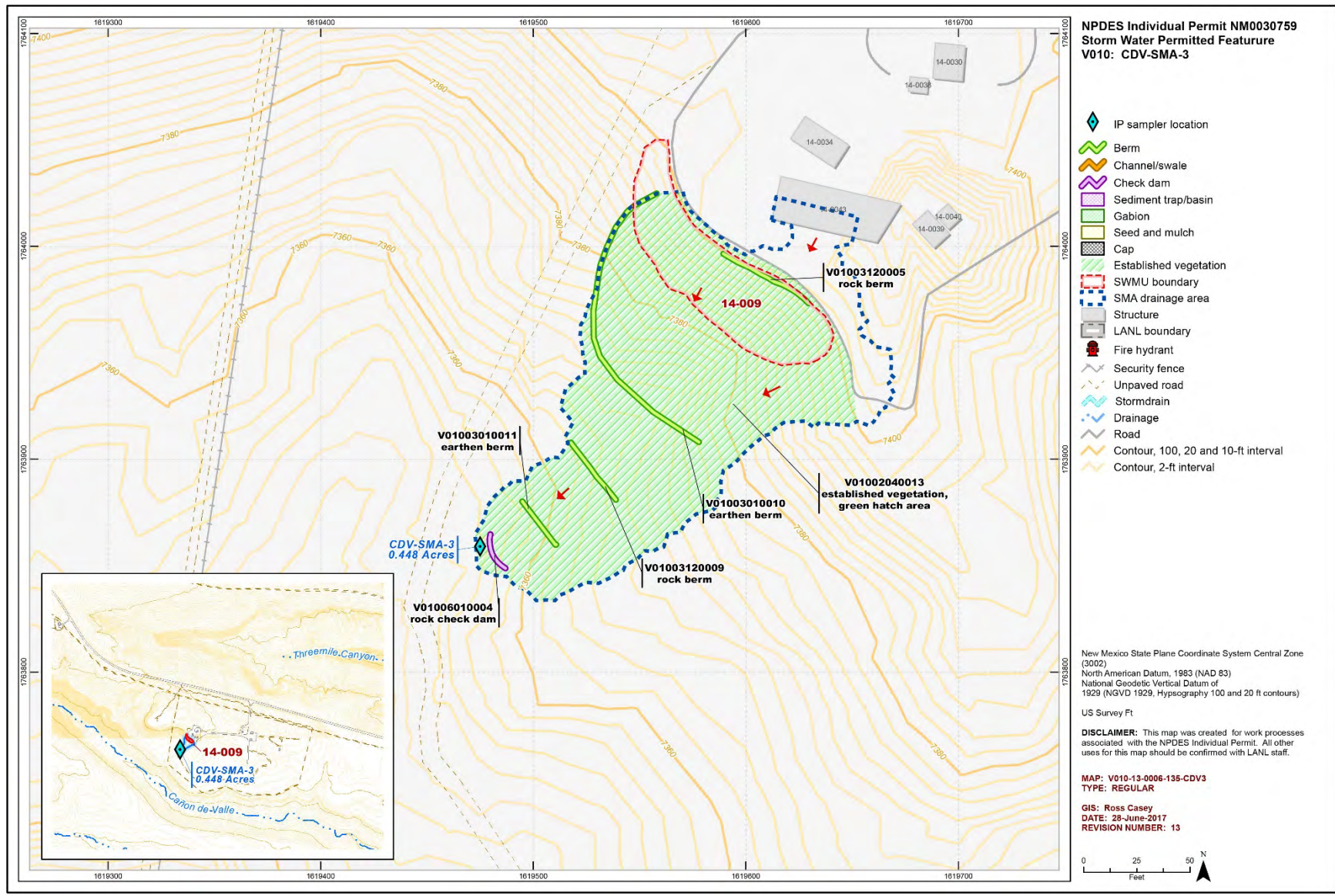
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62916	Rearranged rock in rock berm V01003120005 to maintain structural integrity	6-27-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-63428	Built up rock berm V01003120005 with existing rock at inspection	7-26-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-64160	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly.	8-3-2017	0 day(s)	Maintenance conducted as soon as practicable

### 191.5 Compliance Status

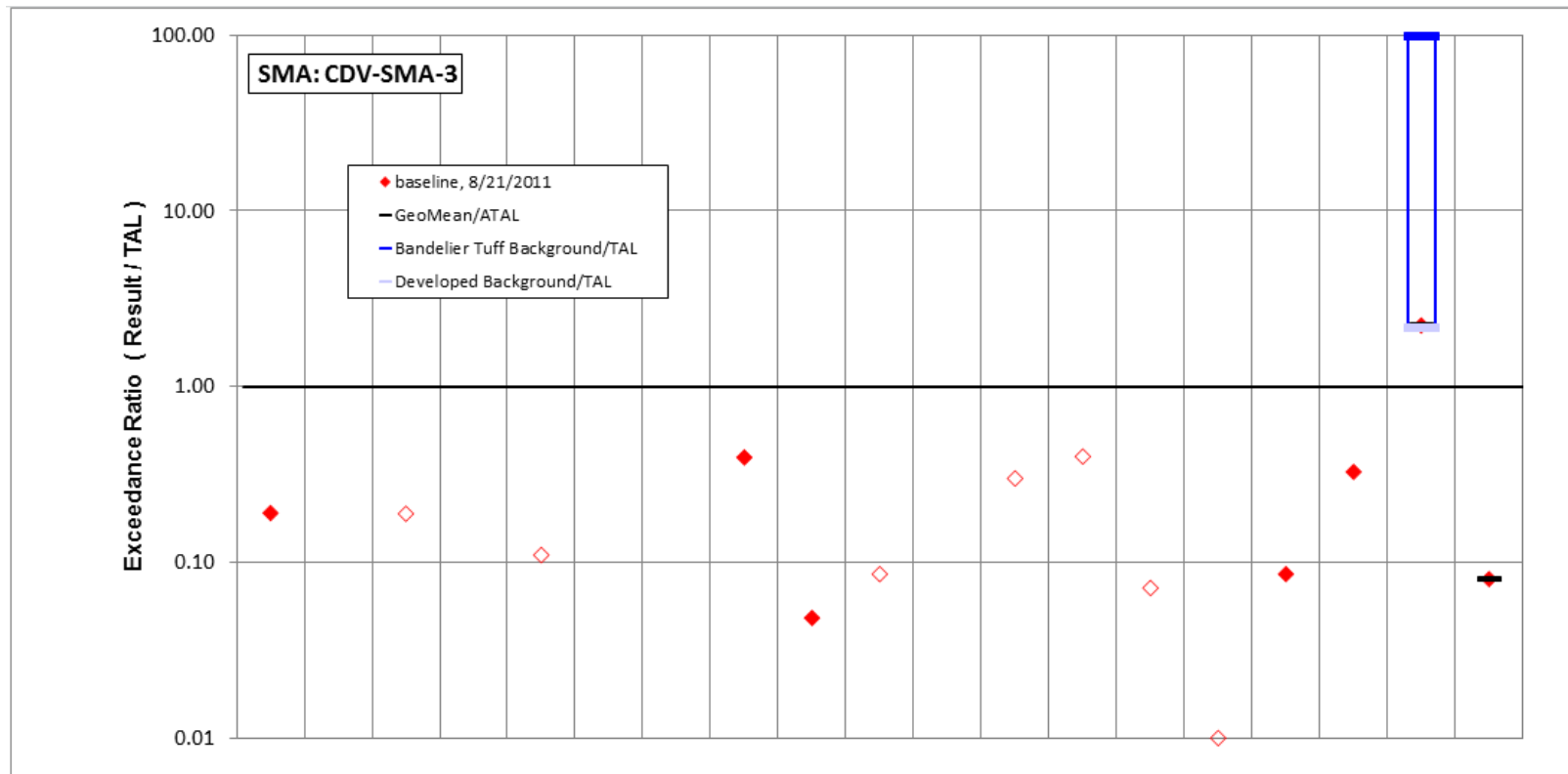
The Site associated with CDV-SMA-3 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 191-4 presents the 2017 compliance status.

**Table 191-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 14-009	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 25, 2012, "Submittal of Certification of Installation of Enhanced Control Measures for Twelve Site Monitoring Areas."



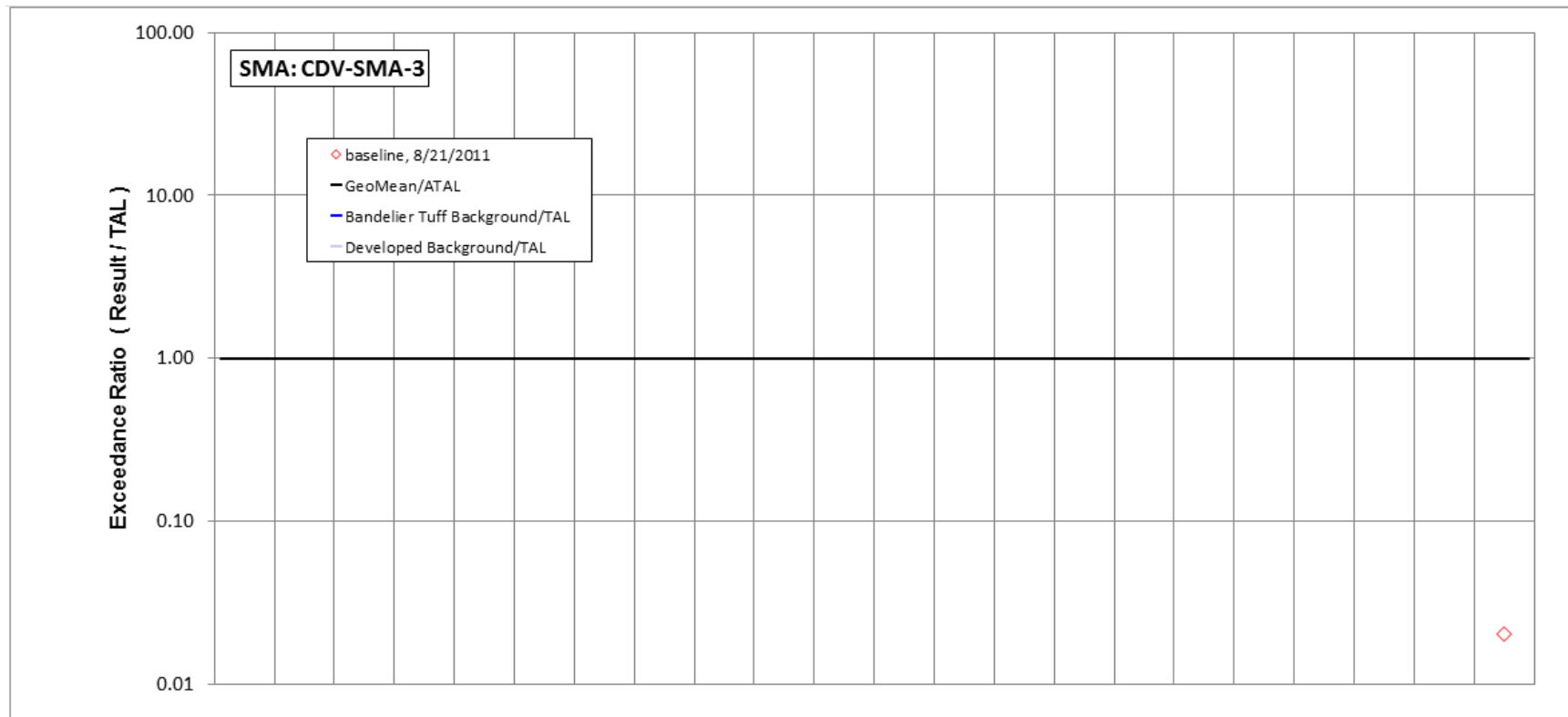
**Figure 191-1 CDV-SMA-3 location map**



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>8/21/2011 result</b>	143	1	1.7	15.3	0.11	2	1.9	1.7	0.82	0.066	1.3	1.5	0.2	0.45	1	3.6	0.0033	33.4	2.41
result / TAL	0.19	0.002	0.19	0.0031	0.11	0.01	0.0019	0.4	0.048	0.086	0.0076	0.3	0.4	0.071	0.01	0.086	0.33	2.2	0.08

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 191-2 Inorganic analytical results summary plot for CDV-SMA-3**



	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	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
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
8/21/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.406	-	-	-	0.406
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-	-	-	0.02

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 191-3 Organic analytical results summary plot for CDV-SMA-3**



## 192.0 CDV-SMA-4: SWMU 14-010

### 192.1 Site Descriptions

One historical industrial activity area is associated with V011, CDV-SMA-4: Site 14-010.

SWMU 14-010 is a former HE sump that was located on the exterior south wall of a former firing chamber [structure 14-2, SWMU 14-002(a)]. The sump received wastewater from a floor drain in firing chamber 14-2 and discharged to an outfall located approximately 24 ft southeast of the sump. In 1973, contaminated portions of structure 14-2 were removed and disposed of at TA-54; the rest of the building was demolished and burned, and the sump and most of the drainline were removed. During the 1997 VCA conducted at the Site, contaminated surface soil and sediment in the drainage area below the former outfall were excavated and removed.

Phase I Consent Order sampling is complete for SWMU 14-010. SWMU 14-010 was recommended for corrective action complete without controls in the supplemental investigation report for Cañon de Valle Aggregate Area TA-14, submitted to NMED in 2016. SWMU 14-010 will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 192-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 192.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 192-1).

**Table 192-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V01102040010	Established Vegetation	-	-	X	-	B
V01103010008	Earthen Berm	-	X	-	X	B
V01104060007	Rip Rap	X	-	X	-	B
V01104060011	Rip Rap	-	-	X	-	B
V01106010009	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 192.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at CDV-SMA-4. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

### 192.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-4 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 192-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62406	6-14-2017
Storm Rain Event	BMP-62917	6-27-2017
Storm Rain Event	BMP-63429	7-26-2017
Storm Rain Event	BMP-64161	8-3-2017
Storm Rain Event	BMP-66235	10-16-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 192-3 Maintenance during 2017**

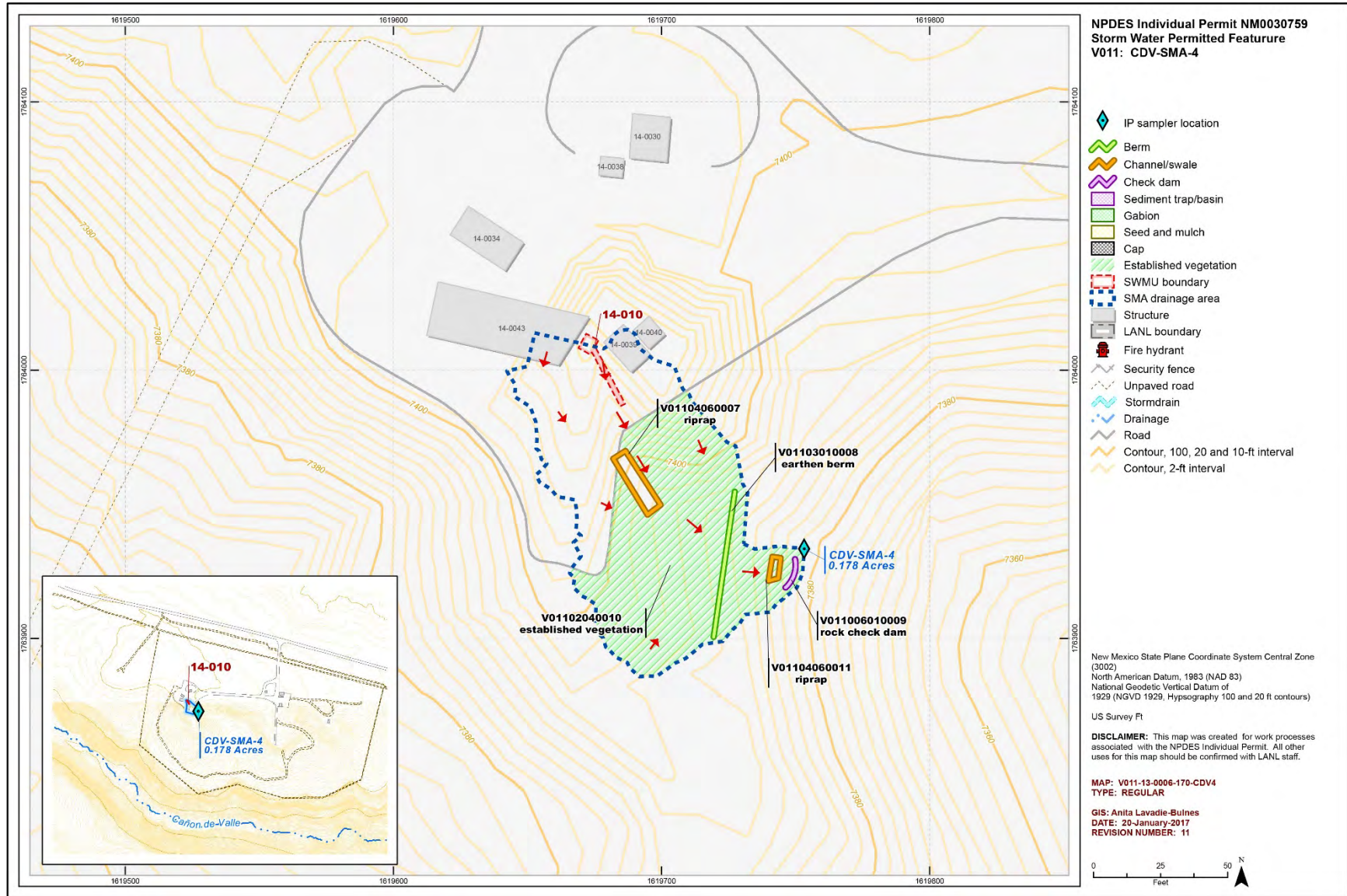
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-64161	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	8-3-2017	0 day(s)	Maintenance conducted as soon as practicable

### 192.5 Compliance Status

The Site associated with CDV-SMA-4 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 192-4 presents the 2017 compliance status.

**Table 192-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 14-010	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since the initiation of the Permit.



**Figure 192-1 CDV-SMA-4 location map**

## **193.0 CDV-SMA-6.01: SWMU 14-006 and AOC 14-001(g)**

### **193.1 Site Descriptions**

Two historical industrial activity areas are associated with V012, CDV-SMA-6.01: Sites 14-006 and 14-001(g).

SWMU 14-006 is a decommissioned HE sump (structure 14-31), associated drainline, and outfall located at TA-14 approximately 45 ft east of control building 14-23. Installed in 1952, the steel-lined sump is constructed of reinforced concrete and measures approximately 4.5 ft wide × 8 ft long × 5 ft deep. The sump received discharges from sink and floor drains in building 14-23 and discharged to an outfall approximately 55 ft southeast of the sump. The sump has been filled with concrete and its outlet is plugged (date not known). Currently, the outfall receives only storm water.

Phase I Consent Order sampling is complete for SWMU 14-006. SWMU 14-006 was recommended for corrective action complete in the supplemental investigation report for Cañon de Valle Aggregate Area TA-14, submitted to NMED in 2016. SWMU 14-006 will be eligible for a COC upon approval of the report by NMED.

AOC 14-001(g) is an active firing pad (structure 14-35) located south of control building 14-23 at TA-14. Installed in 1964, the reinforced concrete pad is 5 ft<sup>2</sup> × 2 ft thick and surrounded on three sides with a blast shield. At the base, the shield is a 6-ft<sup>2</sup> × 2-ft-thick concrete pad overlain by a neoprene shock pad, a 4.5-in.-thick steel plate, and several inches of sand. The shield directs the force of detonations away from nearby control building 14-23. The AOC 14-001(g) firing pad is used to conduct test shot experiments.

Since AOC 14-001(g) is an active firing point, Consent Order samples were collected in sediment catchment areas in the drainage downgradient of the Site to determine if contaminants are migrating from the Site. Consent Order sampling data indicate all detected inorganic and organic chemical concentrations and radionuclide activities are below residential SSLs and confirmed that contaminants are not migrating from the Site. Consent Order investigations will not be conducted at AOC 14-001(g) until firing point activities cease.

The project map (Figure 193-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **193.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 193-1).

Enhanced controls were installed and certified on October 15, 2015, and submitted to EPA on October 16, 2015, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.



**Table 193-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V01202040013	Established Vegetation	-	X	X	-	B
V01203010016	Earthen Berm	-	X	-	X	B
V01203010017	Earthen Berm	X	-	-	X	EC
V01203010018	Earthen Berm	-	X	-	X	EC
V01203020003	Base Course Berm	-	X	-	X	CB
V01206010022	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 193.3 Storm Water Monitoring

SWMU 14-006 and AOC 14-001(g) are monitored within CDV-SMA-6.01. Following the installation of baseline control measures, a baseline storm water sample was collected on July 31, 2014 (Figures 193-2 and 193-3). In Figure 193-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 10 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 140 pCi/L (ATAL is 15 pCi/L), and
- Radium-226 and radium-228 activity of 46.3 pCi/L (ATAL is 30 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

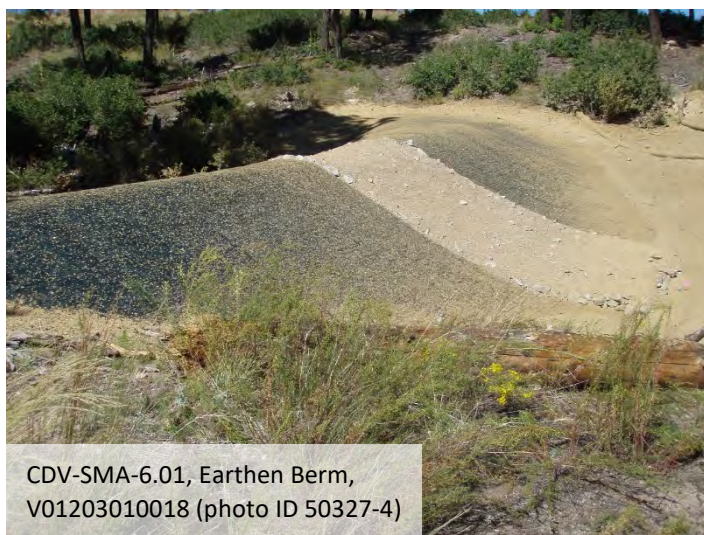
#### *SWMU 14-006:*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above BVs in 4 of 7 shallow (i.e., less than 3 ft bgs) 2011 Consent Order soil and tuff samples at a maximum concentration 5.6 times the soil BV.
- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at the Site. However, radium-226 and radium-228 are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity or radium isotopes but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. No alpha-emitting radionuclides were detected or detected above BVs and/or FVs. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*AOC 14-001(g):*

- Copper is known to be associated with industrial materials historically managed at the Site. Copper was detected above BVs in 3 of 30 shallow 2011 Consent Order soil and tuff samples at a maximum concentration 2 times the soil BV.
- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at the Site. However, radium-226 and radium-228 are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity or radium isotopes but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. No alpha-emitting radionuclides were detected or detected above BVs and/or FVs. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 193-2 and 193-3. 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 193-2 and 193-3.



Monitoring location CDV-SMA-6.01 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2014 is between these two values.
- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2014 gross-alpha result is between these two values.

- Radium-226 and radium-228—Radium-226 and radium-228 UTL for background storm water containing sediment derived from Bandelier Tuff is 52.7 pCi/L, and radium-226 and radium-228 background storm water UTL for storm water run-on from a developed landscape is 8.94 pCi/L. The 2014 radium-226 and radium-228 result is between these two values.

All the analytical results for these samples are reported in the 2014 Annual Report.

### 193.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-6.01 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 193-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62410	6-14-2017
Storm Rain Event	BMP-62921	6-27-2017
Storm Rain Event	BMP-63433	7-25-2017
Storm Rain Event	BMP-64165	8-3-2017
Storm Rain Event	BMP-66239	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-6.01 in 2017.

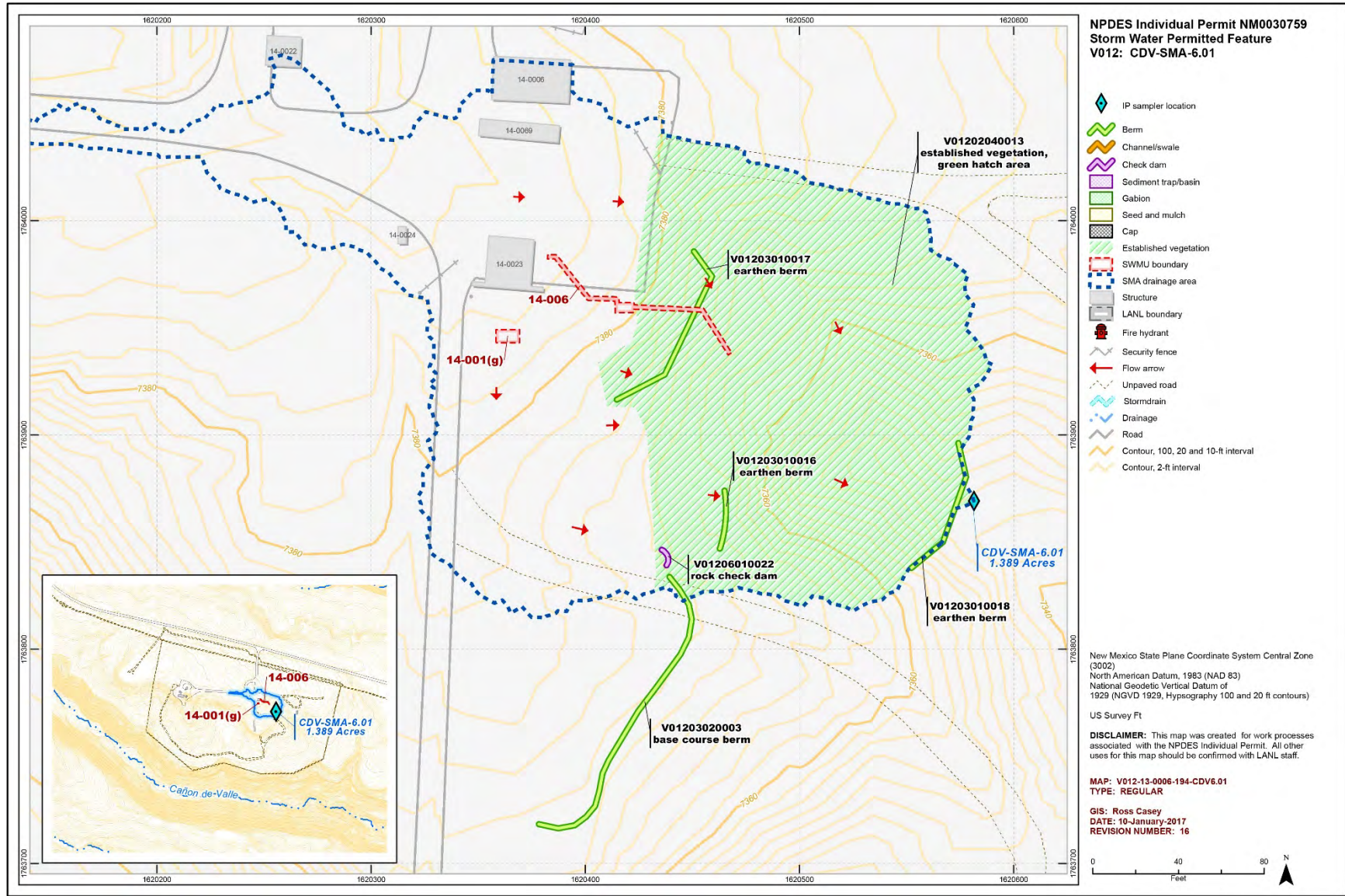
### 193.5 Compliance Status

The Sites associated with CDV-SMA-6.01 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 193-3 presents the 2017 compliance status.

**Table 193-3 Compliance Status during 2017**

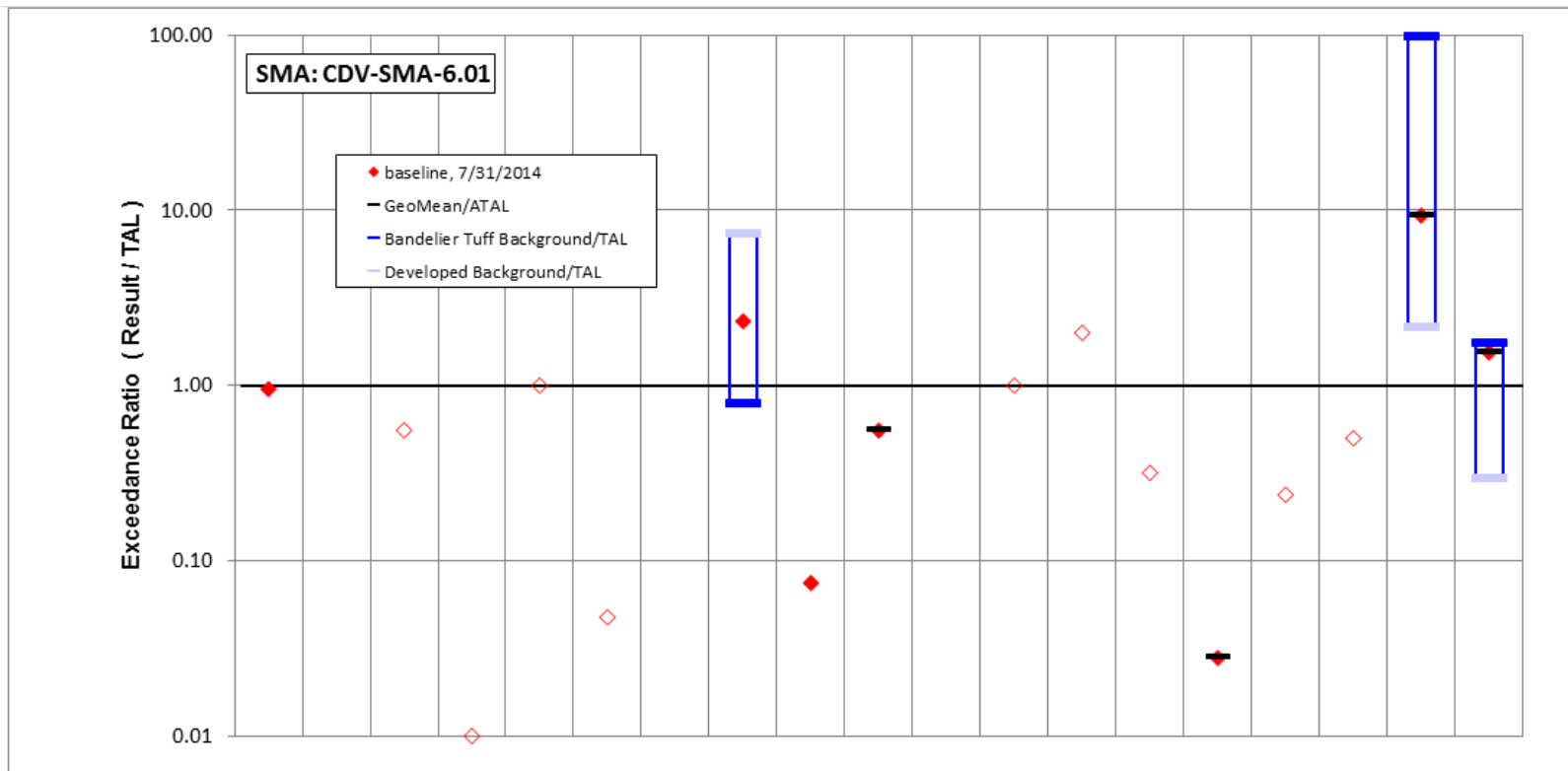
Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 14-001(g)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 16, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas."
SWMU 14-006	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 16, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas."





**Figure 193-1 CDV-SMA-6.01 location map**

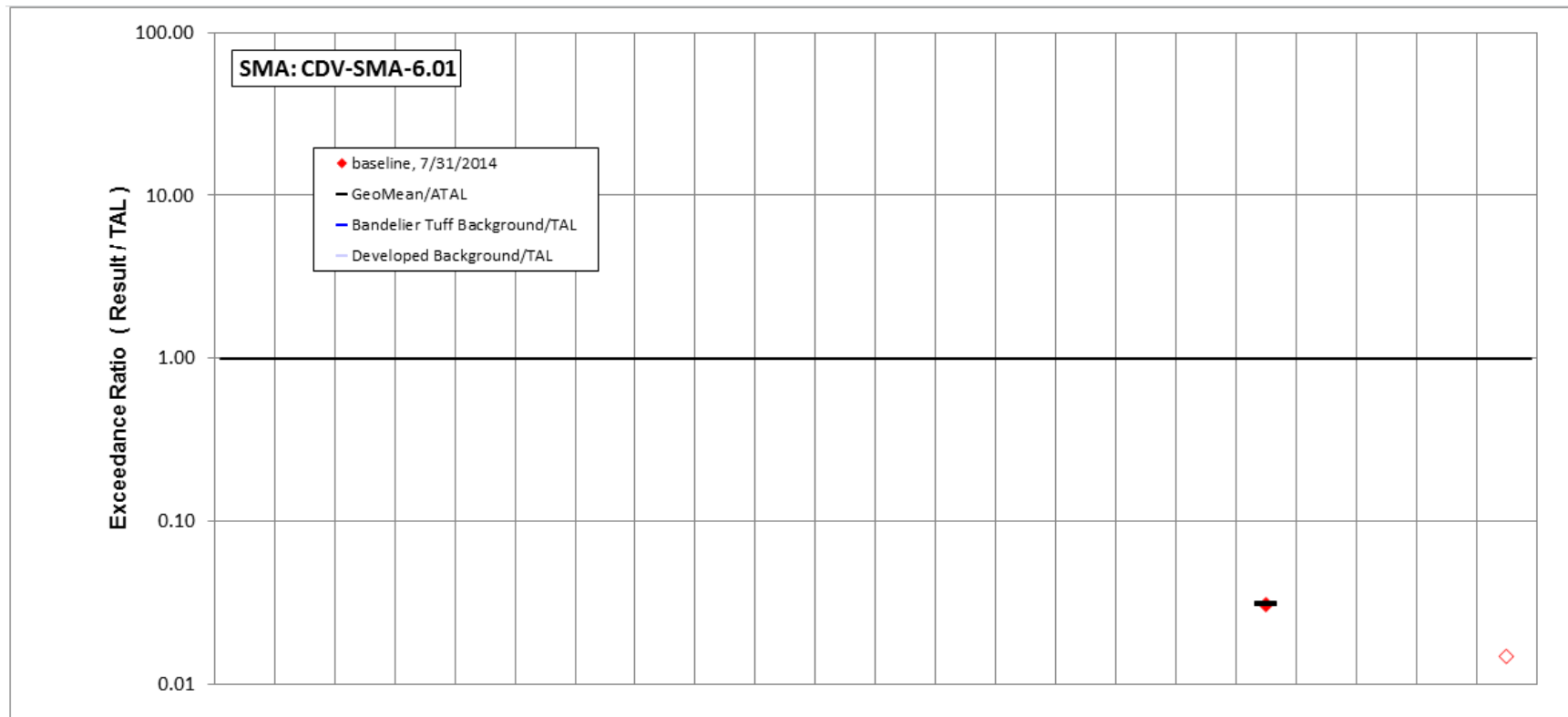




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	Mercury	Nickel	Selenium	<b>Silver</b>	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	<b>Radium-226 and Radium-228</b>
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/31/2014 result</b>	716	3	5	50	1	10	2.19	<b>10</b>	1.27	0.426	1.07	5	<b>1</b>	2	2.79	10	0.005	<b>140</b>	<b>46.3</b>
result / TAL	0.95	0.005	0.56	0.01	1	0.048	0.0022	<b>2.3</b>	0.075	0.55	0.0063	1	<b>2</b>	0.32	0.028	0.24	0.5	<b>9.3</b>	<b>1.5</b>

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 193-2 Inorganic analytical results summary plot for CDV-SMA-6.01



	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	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
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
7/31/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.15	-	-	-	0.296
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.031	-	-	-	0.015

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 193-3 Organic analytical results summary plot for CDV-SMA-6.01

## **194.0 CDV-SMA-6.02: SWMUs 14-002(c), 14-002(d), and 14-002(e)**

### **194.1 Site Descriptions**

Three historical industrial activity areas are associated with V012A, CDV-SMA-6.02: Sites 14-002(c), 14-002(d), and 14-002(e).

SWMU 14-002(c) is a decommissioned firing site (structure 14-5) located in the southeastern portion of TA-14. Structure 14-5 consisted of a control building and firing pad. Constructed in 1944, the wood-framed control building measured 11 ft wide × 18 ft long × 10 ft high and was surrounded on three sides by an earthen berm. A 10-ft<sup>2</sup> × 8-ft-high concrete firing pad faced with a 0.5-in. steel plate was attached to the exterior south wall of the control building. The firing site was used to conduct small-scale explosive tests until the mid-1950s. The control building was converted to a storage site in 1961 and used to store cyanogen gas from 1965 to the 1970s. In 1980, a 5-ft-diameter metal sphere was installed on the firing pad at the south side of building 14-5. The sphere was used to conduct slow-combustion experiments, which continued until 1985, when building operations ceased. The firing pad was removed at an unknown date. The control building was partially destroyed by the Cerro Grande fire in 2000; only the concrete portions of the roof and walls remain.

Before implementation of the 2011 sampling for Sites in the Water/Cañon de Valle watershed, the historical information was thoroughly reviewed. The review determined that SWMU 14-002(c) should be added to CDV-SMA-6.02. Accordingly, the Site description and project map (Figure 194-1) have been updated to include SWMU 14-002(c). SWMU 14-002(c) is located within the current SMA boundary, and no changes to the SMA boundary are required. The sampler location did not change, and samples previously collected are representative of SWMU 14-002(c). An explanation of the error was incorporated in the IP renewal application. The information and evaluation of Site 14-002(c) provided below and in other sections of this SDPPP update are for informational purposes only.

Phase I Consent Order investigation is complete for SWMU 14-002(c). SWMU 14-002(c) was recommended for corrective action complete without controls in the supplemental investigation report for Cañon de Valle Aggregate Area TA-14, submitted to NMED in 2016. SWMU 14-002(c) will be eligible for a COC upon approval of the report by NMED.

SWMU 14-002(d) is an x-unit chamber (structure 14-14) located at TA-14, approximately 7 ft southwest of structure 14-5. Constructed in 1944, the x-unit chamber was one of two voltage distribution systems installed at the SWMU 14-002(c) firing site. The x-unit chamber was constructed of reinforced concrete and measured approximately 3 ft wide × 4 ft long × 3 ft high. The x-unit housed the firing voltage distribution system used for the remote detonation of small-scale explosives tests at structure 14-5. The x-unit was used from 1944 to the mid-1950s when explosives operations ceased. It is not known whether the chamber is still in place. Investigation of SWMU 14-002(d) is deferred per Section XI and Appendix A of the 2016 Consent Order. The 1994 RFI work plan for OU 1085 incorrectly identified SWMU 14-002(d) as a firing pad associated with former control building 14-5 [SWMU 14-002(c)]. Engineering drawings reviewed during planning for Consent Order investigations confirmed the firing pad was actually part of SWMU 14-002(c), and SWMU 14-002(d) is an x-unit chamber (ENG C-365). Potential contaminants associated with industrial materials historically managed at this Site are PCBs. Potential contaminants associated with adjacent SWMU 14-002(c), which is also located within the CDV-SMA-6.02 drainage, are copper, mercury, and uranium.

SWMU 14-002(e) is an x-unit chamber (structure 14-15) located at TA-14, approximately 7 ft southeast of structure 14-5. Constructed in 1944, the x-unit chamber was one of two voltage distribution systems installed at the SWMU 14-002(c) firing site. The x-unit chamber was constructed of reinforced concrete and measured approximately 3 ft wide x 4 ft long x 3 ft high. The x-unit housed the firing voltage distribution system used for the remote detonation of small-scale explosives tests at structure 14-5. The x-unit was used from 1944 to the mid-1950s when explosives operations ceased.



It is not known whether the chamber is still in place. Investigation of SWMU 14-002(e) is deferred per Section XI and Appendix A of the 2016 Consent Order. The 1994 RFI work plan for OU 1085 incorrectly identified SWMU 14-002(e) as a firing pad associated with former control building 14-5 [SWMU 14-002(c)]. Engineering drawings reviewed during planning for Consent Order investigations confirmed the firing pad was actually part of SWMU 14-002(c).

The project map (Figure 194-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 194.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 194-1).

Enhanced controls were installed and certified on July 18, 2012, and submitted to EPA on July 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 194-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V012A01010005	Seed and Wood Mulch	-	-	X	-	EC
V012A03010004	Earthen Berm	-	X	-	X	EC
V012A03010006	Earthen Berm	-	X	-	X	EC
V012A03060008	Straw Wattle	-	X	-	X	B
V012A03140009	Coir Log	-	X	-	X	B
V012A03140010	Coir Log	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.



### 194.3 Storm Water Monitoring

SWMU 14-002(c) is monitored within CDV-SMA-6.02. Following the installation of baseline control measures, baseline confirmation samples were collected on August 13, 2011, and September 1, 2011 (Figures 194-2 and 194-3). In Figure 194-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Inorganic analytical results from these baseline samples yielded the following TAL exceedances:

- Copper concentrations of 28.1 µg/L and 29.3 µg/L (MTAL is 4.3 µg/L),
- Mercury concentrations of 1.6 µg/L and 0.95 µg/L (ATAL is 0.77 µg/L), and
- Gross-alpha activities of 147 pCi/L and 199 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at CDV-SMA-6.02, a corrective action storm water sample was collected on September 13, 2013 (Figures 194-2 and 194-3). Analytical results from this corrective action monitoring sample yielded no TAL exceedances.

These exceedances are typically evaluated by comparing the results from soil samples collected at the Sites during Consent Order investigations with the storm water TAL exceedances to determine whether the exceedance may be related to historical industrial activities. The following discussion is organized by Site and analyte.

#### *SWMU 14-002(c):*

- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was not detected above BVs in any of the five shallow RFI samples collected at this Site.
- Mercury is not known to be associated with industrial materials historically managed at this Site. Mercury was not detected or was not detected above BVs in any of the five shallow RFI samples collected at this Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for total uranium, which contains alpha-emitting radionuclides, and for uranium isotopes, which are alpha-emitting radionuclides.

Site history and Consent Order sampling data indicate the Site is an unlikely a source of the TAL exceedances. The Site is impacted by active firing site operations.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 194-2 and 194-3. 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 194-2 and 194-3.

Monitoring location CDV-SMA-6.02 receives storm water run-on from sediment derived from Bandelier Tuff. Metals including copper are found at low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from locations with sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 are higher than this value.

- Mercury—The mercury UTL from locations with sediment derived from Bandelier Tuff was not calculated because the number of detected values was not sufficient to allow calculation of a UTL value in the baseline metals concentration study. Therefore, a comparison with background mercury UTL could not be made.
- Gross alpha—The gross-alpha background UTL for locations with sediment derived from Bandelier Tuff is 1490 pCi/L. The 2011 gross-alpha results are less than this value.

All the analytical results for these samples are reported in the 2011 and 2013 Annual Reports.

#### 194.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-6.02 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 194-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62411	6-14-2017
Storm Rain Event	BMP-62922	6-27-2017
Storm Rain Event	BMP-63434	7-25-2017
Storm Rain Event	BMP-64166	8-3-2017
Storm Rain Event	BMP-66240	10-16-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 194-3 Maintenance during 2017**

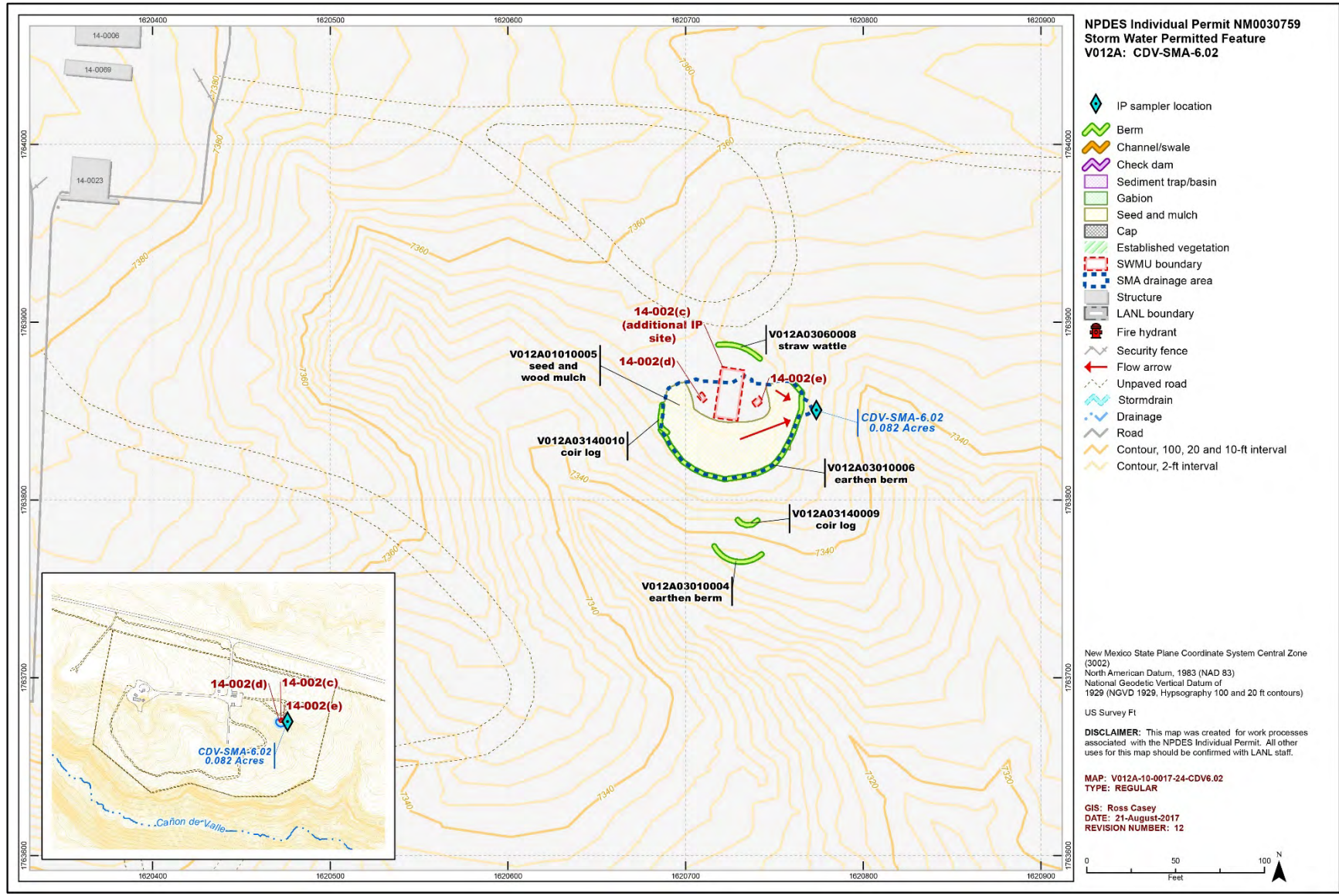
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63772	Installed coir log at western end of earthen berm V012A03010006	8-15-2017	21 day(s)	Maintenance conducted as soon as practicable

#### 194.5 Compliance Status

The Sites associated with CDV-SMA-6.02 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 194-4 presents the 2017 compliance status.

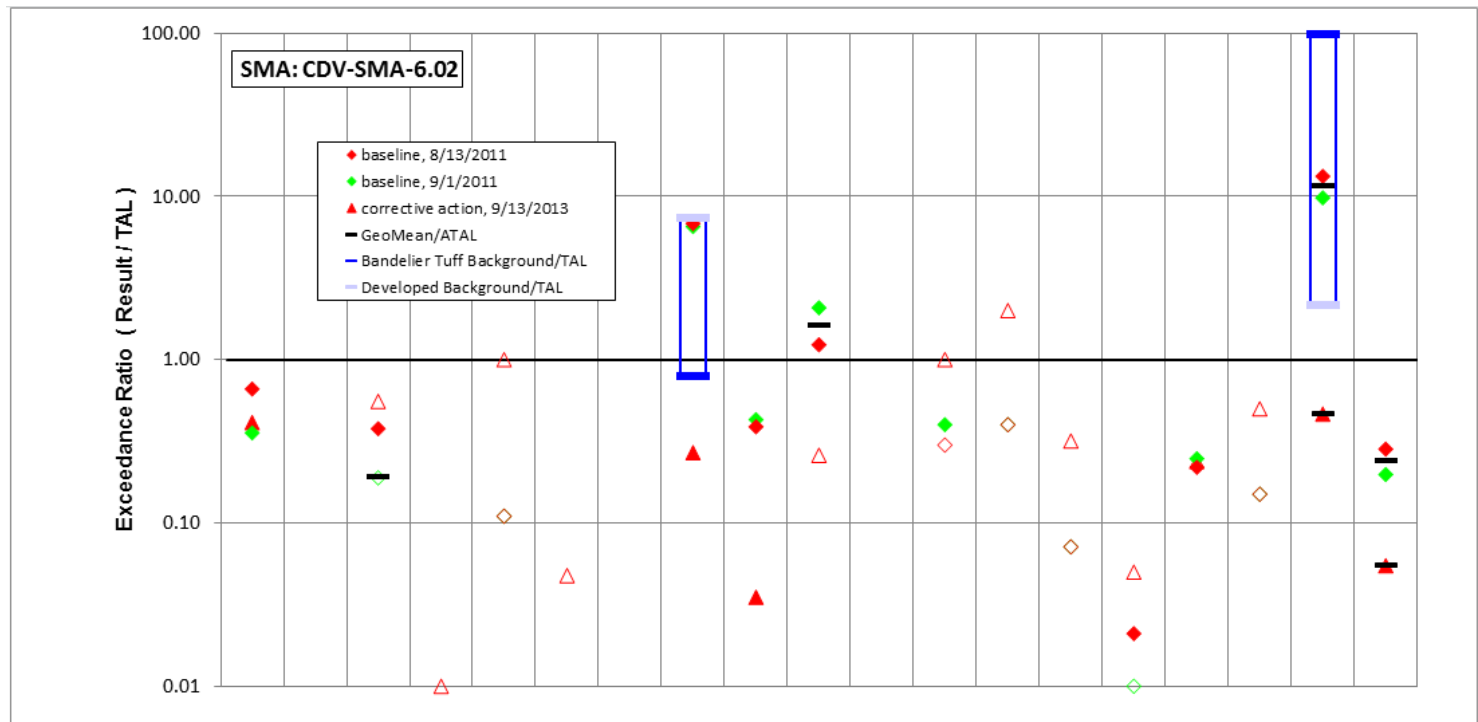
**Table 194-4 Compliance Status during 2017**

<b>Site</b>	<b>Compliance Status on Jan 1, 2017</b>	<b>Compliance Status on Dec 31, 2017</b>	<b>Comments</b>
SWMU 14-002(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 25, 2012, "Submittal of Certification of Installation of Enhanced Control Measures for Twelve Site Monitoring Areas."
SWMU 14-002(d)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 25, 2012, "Submittal of Certification of Installation of Enhanced Control Measures for Twelve Site Monitoring Areas."
SWMU 14-002(e)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 25, 2012, "Submittal of Certification of Installation of Enhanced Control Measures for Twelve Site Monitoring Areas."



**Figure 194-1 CDV-SMA-6.02 location map**

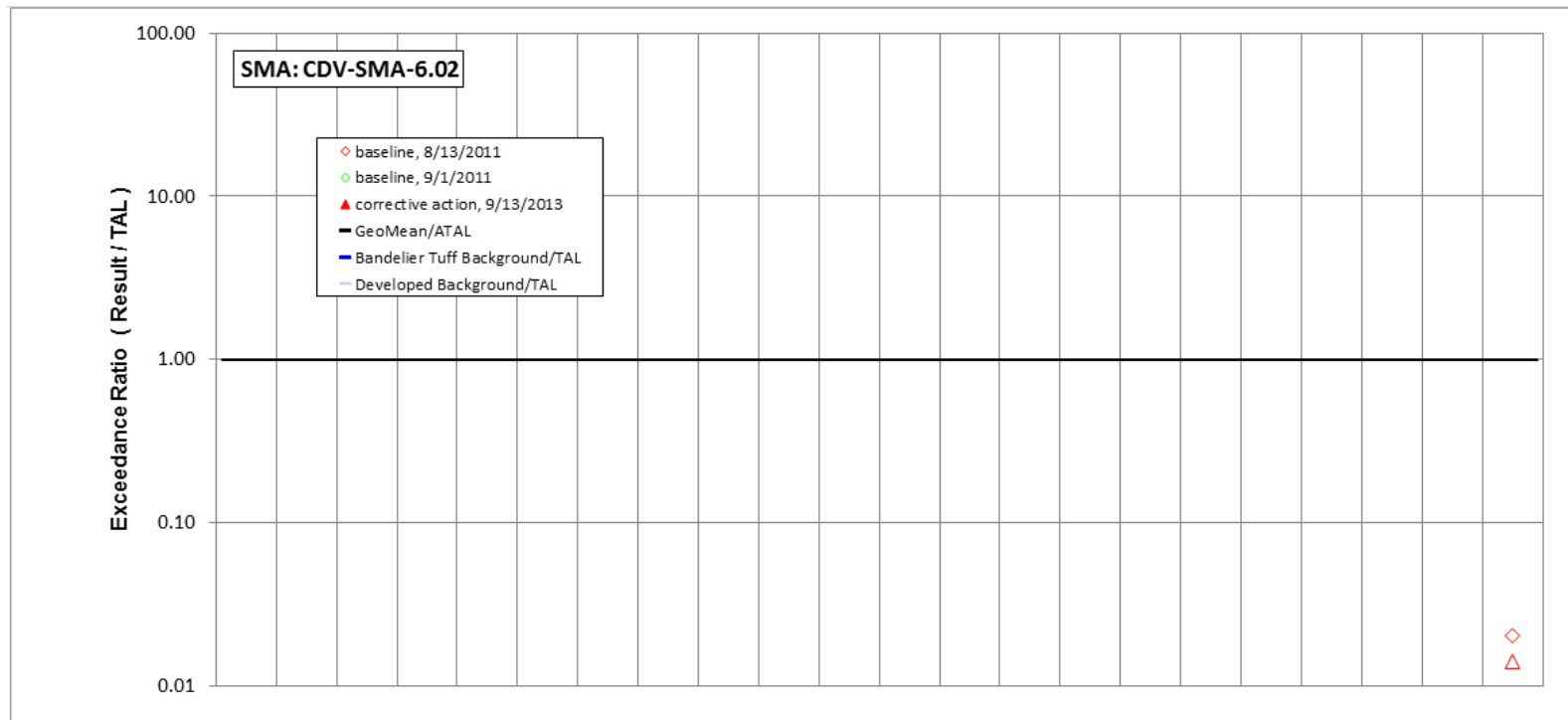




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	<b>Mercury</b>	Nickel	Selenium	<b>Silver</b>	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>9/13/2013 result</b>	309	3	5	50	1	10	1.54	1.16	0.596	0.2	0.621	5	1	2	5	10	0.005	6.97	1.64
result / TAL	0.41	0.005	0.56	0.01	1	0.048	0.0015	0.27	0.035	0.26	0.0037	1	2	0.32	0.05	0.24	0.5	0.46	0.055
<b>9/1/2011 result</b>	267	1	1.7	28.1	0.11	2	3.2	<b>28.1</b>	7.3	1.6	1.3	2	0.2	0.45	1	10.4	0.002	<b>147</b>	5.94
result / TAL	0.36	0.002	0.19	0.0056	0.11	0.01	0.0032	6.5	0.43	2.1	0.0076	0.4	0.4	0.071	0.01	0.25	0.15	<b>9.8</b>	0.2
<b>8/13/2011 result</b>	496	1	3.4	22.4	0.11	2	1.8	<b>29.3</b>	6.6	<b>0.95</b>	1.2	1.5	0.2	0.45	2.1	9.2	0.002	<b>199</b>	8.5
result / TAL	0.66	0.002	0.38	0.0045	0.11	0.01	0.0018	<b>6.8</b>	0.39	<b>1.2</b>	0.0071	0.3	0.4	0.071	0.021	0.22	0.15	<b>13</b>	0.28

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 194-2 Inorganic analytical results summary plot for CDV-SMA-6.02**



	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	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
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
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.368	-	-	-	0.282
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-	-	-	0.014
9/1/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.391	-	-	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-	-	-	-
8/13/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.406	-	-	-	0.406
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-	-	-	0.02

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 194-3 Organic analytical results summary plot for CDV-SMA-6.02

## 195.0 CDV-SMA-7: SWMU 15-008(d)

### 195.1 Site Descriptions

One historical industrial activity area is associated with V013, CDV-SMA-7: Site 15-008(d).

SWMU 15-008(d) is an inactive surface disposal area located south of former storage building 15-22 on the west side of TA-15. The disposal area consists of a small pile of building debris. The source of the building debris and the date it was placed at this location are not known.

Consent Order sampling has not been conducted at SWMU 15-008(d); no historical investigations were conducted before the Consent Order went into effect in 2005. SWMU 16-008(d) will be sampled during the future Cañon de Valle Aggregate Area TA-15 investigation.

The project map (Figure 195-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 195.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 195-1).

Enhanced controls were installed and certified on September 4, 2015, and submitted to EPA on September 10, 2015, as part of corrective action. Photographs of the enhanced controls are available <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 195-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V01302040008	Established Vegetation	-	X	X	-	B
V01303010006	Earthen Berm	X	-	-	X	CB
V01303010007	Earthen Berm	-	X	-	X	CB
V01303140010	Coir Log	-	X	-	X	EC
V01303140011	Coir Log	-	X	-	X	EC
V01303140013	Coir Log	X	-	-	X	EC
V01303140020	Coir Log	-	X	-	X	B
V01304010015	Earthen Channel/Swale	X	-	X	-	EC
V01304040009	Culvert	X	-	X	-	B
V01306010014	Rock Check Dam	X	-	-	X	EC
V01306010016	Rock Check Dam	X	-	-	X	B
V01306010017	Rock Check Dam	X	-	-	X	B
V01306010018	Rock Check Dam	X	-	-	X	B
V01306010019	Rock Check Dam	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 195.3 Storm Water Monitoring

SWMU 15-008(d) is monitored within CDV-SMA-7. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 195-2). In Figure 195-2, cadmium and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 956 µg/L (MTAL is 750 µg/L),
- Selenium concentration of 5.33 µg/L (ATAL is 5 µg/L), and
- Gross-alpha activity of 191 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 15-008(d):*

- Based on the site history, the Site is an unlikely a source of the aluminum, selenium, and gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 195-2. 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 Figure 195-2.

Monitoring location CDV-SMA-7 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2013 is less than this value.
- Selenium—The selenium UTL from undisturbed Bandelier Tuff was not calculated because the number of detected values was not sufficient to permit calculation of the UTL values in the baseline metals background study. Therefore, no comparison to selenium background values in storm water could be made.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2013 Annual Report.



### 195.4 Inspections and Maintenance

RG257 recorded seven storm events at CDV-SMA-7 during the 2017 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 195-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62409	6-13-2017
Storm Rain Event	BMP-62920	6-27-2017
Storm Rain Event	BMP-63432	7-17-2017
Storm Rain Event	BMP-63611	7-25-2017
Storm Rain Event	BMP-64164	8-10-2017
Storm Rain Event	BMP-66238	10-16-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 195-3 Maintenance during 2017**

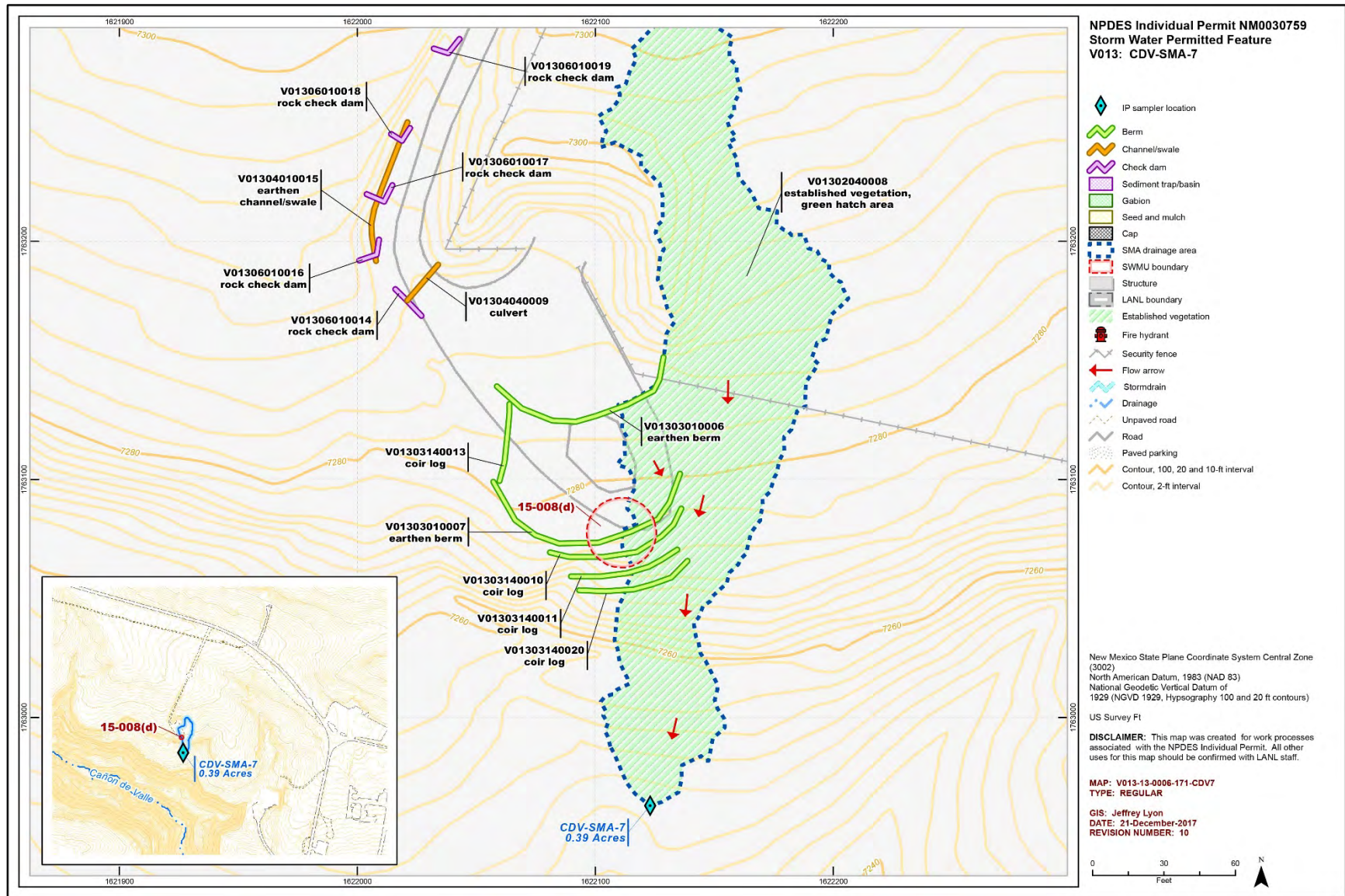
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62409	Rearranged rock to lower spillway and raise southeast end of rock check dam V01306010014 at inspection	6-13-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-62920	Filled in gap between earthen berm V01303010007 and coir log V01303140013 with native rock at inspection	6-27-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-62708	Installed coir log above straw wattle V01303060012 as a replacement	6-29-2017	16 day(s)	Maintenance conducted as soon as practicable
BMP-63771	Installed coir log upgradient of coir log V01303140011 as a replacement	8-15-2017	21 day(s)	Maintenance conducted as soon as practicable
BMP-66238	Cleaned out needle cast from north end of culvert V01304040009 at inspection	10-16-2017	0 day(s)	Maintenance conducted as soon as practicable

### 195.5 Compliance Status

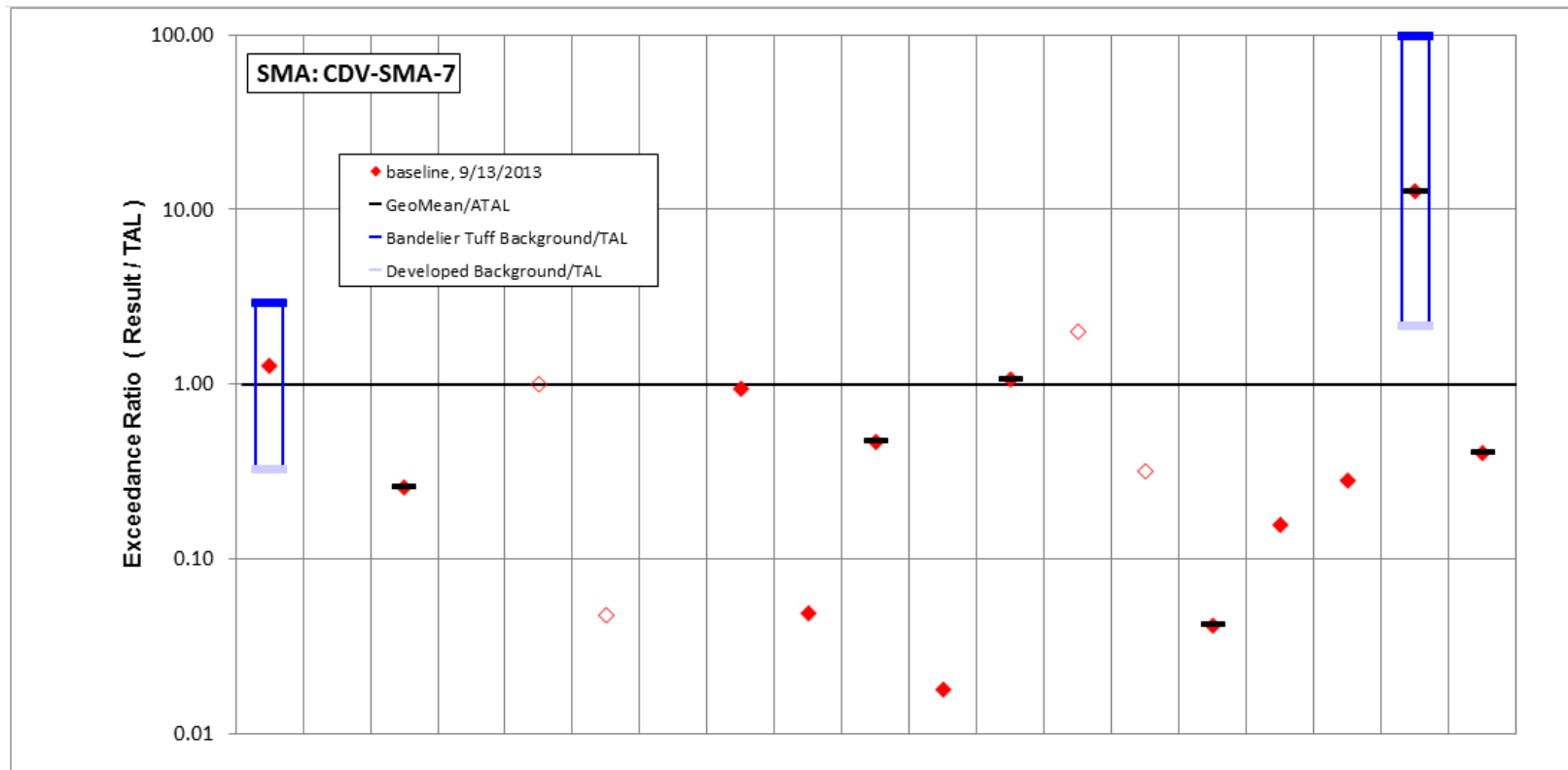
The Site associated with CDV-SMA-7 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 195-4 presents the 2017 compliance status.

**Table 195-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 15-008(d)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas."



**Figure 195-1 CDV-SMA-7 location map**



	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
9/13/2013 result	956	1.23	2.31	30.9	1	10	6.28	4.05	0.831	0.36	3.04	5.33	1	2	4.15	6.58	0.0028	191	12.1
result / TAL	1.3	0.0019	0.26	0.0062	1	0.048	0.0063	0.94	0.049	0.47	0.018	1.1	2	0.32	0.042	0.16	0.28	13	0.4

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 195-2 Inorganic analytical results summary plot for CDV-SMA-7



## 196.0 CDV-SMA-8: SWMU 15-011(c)

### 196.1 Site Descriptions

One historical industrial activity area is associated with V014, CDV-SMA-8: Site 15-011(c).

SWMU 15-011(c) is a purported dry well located west of the former electron gun building (15-194) near the edge of Cañon de Valle. Engineering drawing C-19082 shows the dry well design and location; however, the drawing is not an as-built, and it is likely the dry well was never constructed. The OU 1086 RFI work plan states that no evidence of the dry well was found at the time the work plan was prepared and concludes that effluent from the building was discharged directly to the canyon via the drainage located north and west of the former Hollow buildings. This conclusion is consistent with the CEARP report and the SWMU report.

This effluent consisted of the discharge from two acid-cleaning sinks within former building 15-50. The sinks were removed before 1986. Buildings 15-194 and 15-50 were decommissioned in the mid-1990s, sustained severe damage in the 2000 Cerro Grande fire, and were subsequently demolished in 2004. The 1996 RFI report for Sites within TA-15 describes the SWMU as the drainage located (north and) west of the buildings located at the Hollow; however, the drainage north and west of the former buildings 15-194 and 15-50 is SWMU 15-014(g).

Consent Order investigations have not yet begun; decision-level data are not available for SWMU 15-011(c). SWMU 15-011(c) will be sampled during the future Cañon de Valle Aggregate Area TA-15 investigation.

The project map (Figure 196-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 196.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 196-1).

**Table 196-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V01402040009	Established Vegetation	-	X	X	-	B
V01403010008	Earthen Berm	X	-	-	X	B
V01403010012	Earthen Berm	X	-	-	X	B
V01406010003	Rock Check Dam	X	-	-	X	CB
V01406010010	Rock Check Dam	X	-	-	X	B
V01406010011	Rock Check Dam	X	-	-	X	B
V01406010013	Rock Check Dam	X	-	-	X	B
V01406010014	Rock Check Dam	X	-	-	X	B
V01406010015	Rock Check Dam	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 196.3 Storm Water Monitoring

SWMU 15-011(c) is monitored within CDV-SMA-8. Following the installation of baseline control measures, a baseline storm water sample was collected on July 31, 2014 (Figures 196-2 and 196-3). In Figures 196-2 and 196-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1360 µg/L (MTAL is 750 µg/L) and
- Gross-alpha activity of 53.4 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 15-011(c):*

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Consent Order investigations have not been performed at SWMU 15-011(c); no decision-level data are available for this Site.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 196-2 and 196-3. 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 196-2 and 196-3.

Monitoring location CDV-SMA-8 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2014 is between these values.
- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2014 gross-alpha result is between these values.

All the analytical results for these samples are reported in the 2014 Annual Report.

### 196.4 Inspections and Maintenance

RG262.4 recorded three storm events at CDV-SMA-8 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 196-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62432	6-19-2017
Storm Rain Event	BMP-62943	7-7-2017
Storm Rain Event	BMP-64187	8-3-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 196-3 Maintenance during 2017**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62432	Rearranged sides of rock check dam V01406010015 at inspection to be higher than spillway	6-19-2017	0 day(s)	Maintenance conducted as soon as practicable

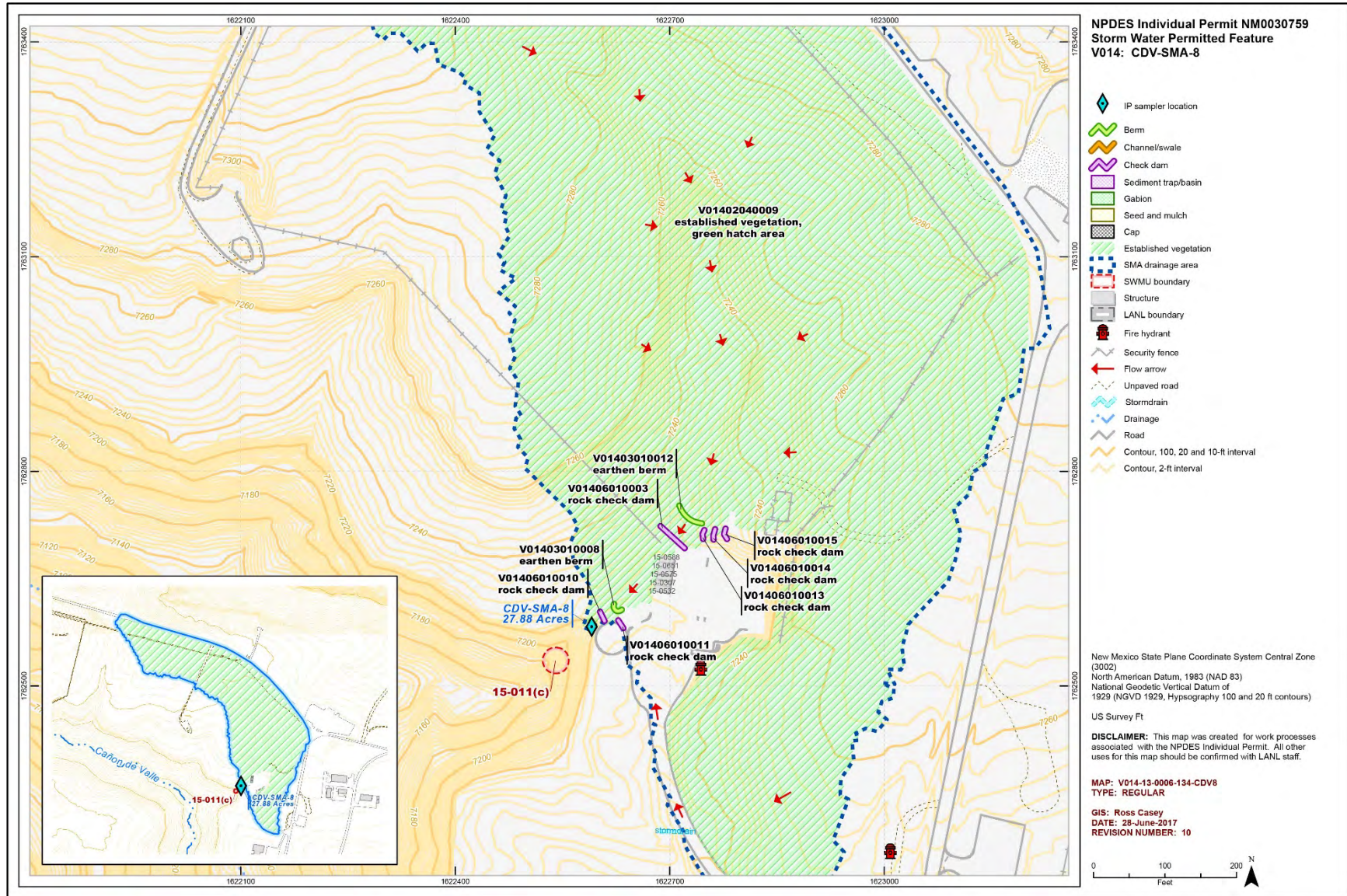
### 196.5 Compliance Status

The Site associated with CDV-SMA-8 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 196-4 presents the 2017 compliance status.

**Table 196-4 Compliance Status during 2017**

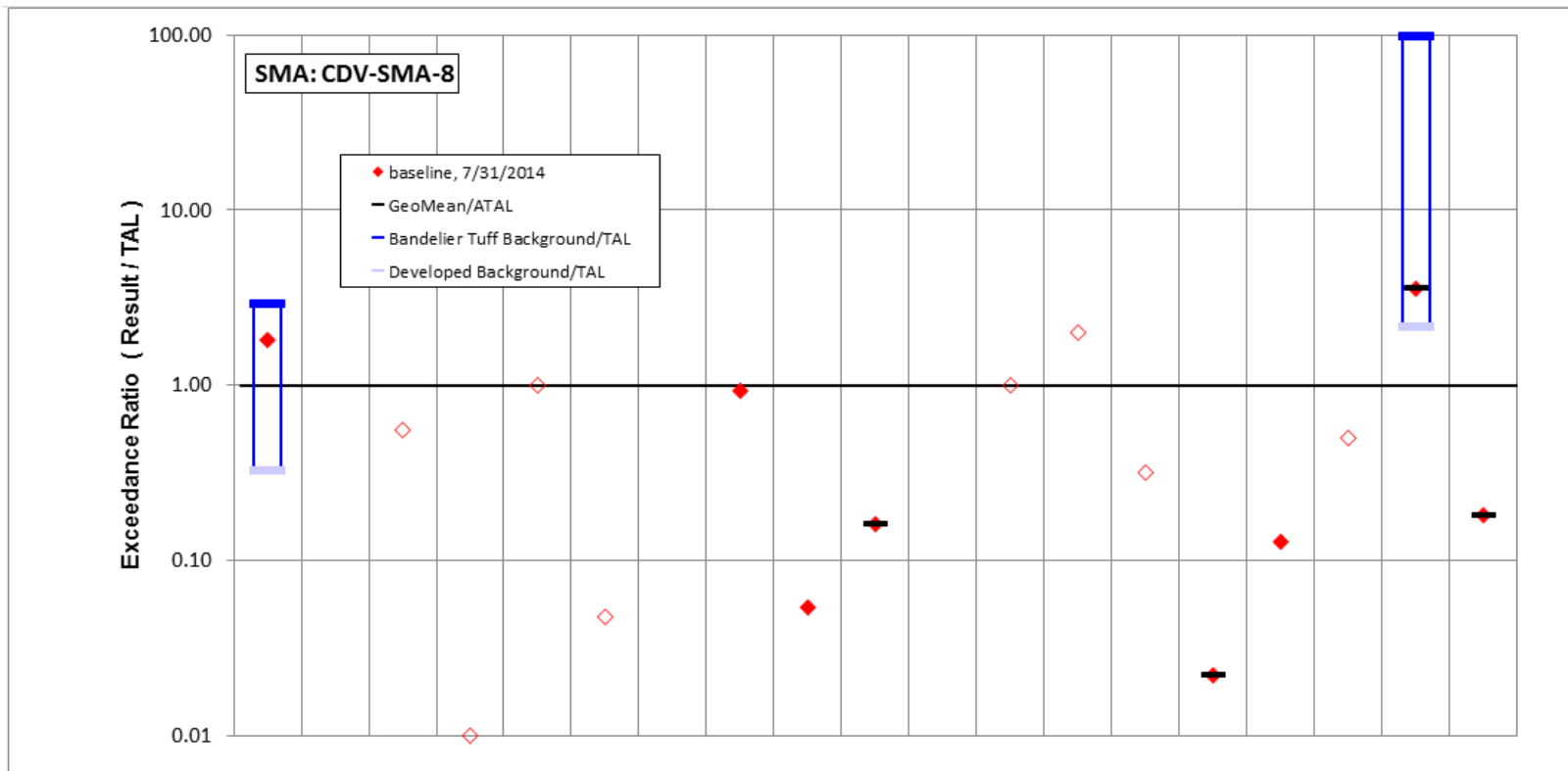
Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 15-011(c)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."





**Figure 196-1 CDV-SMA-8 location map**

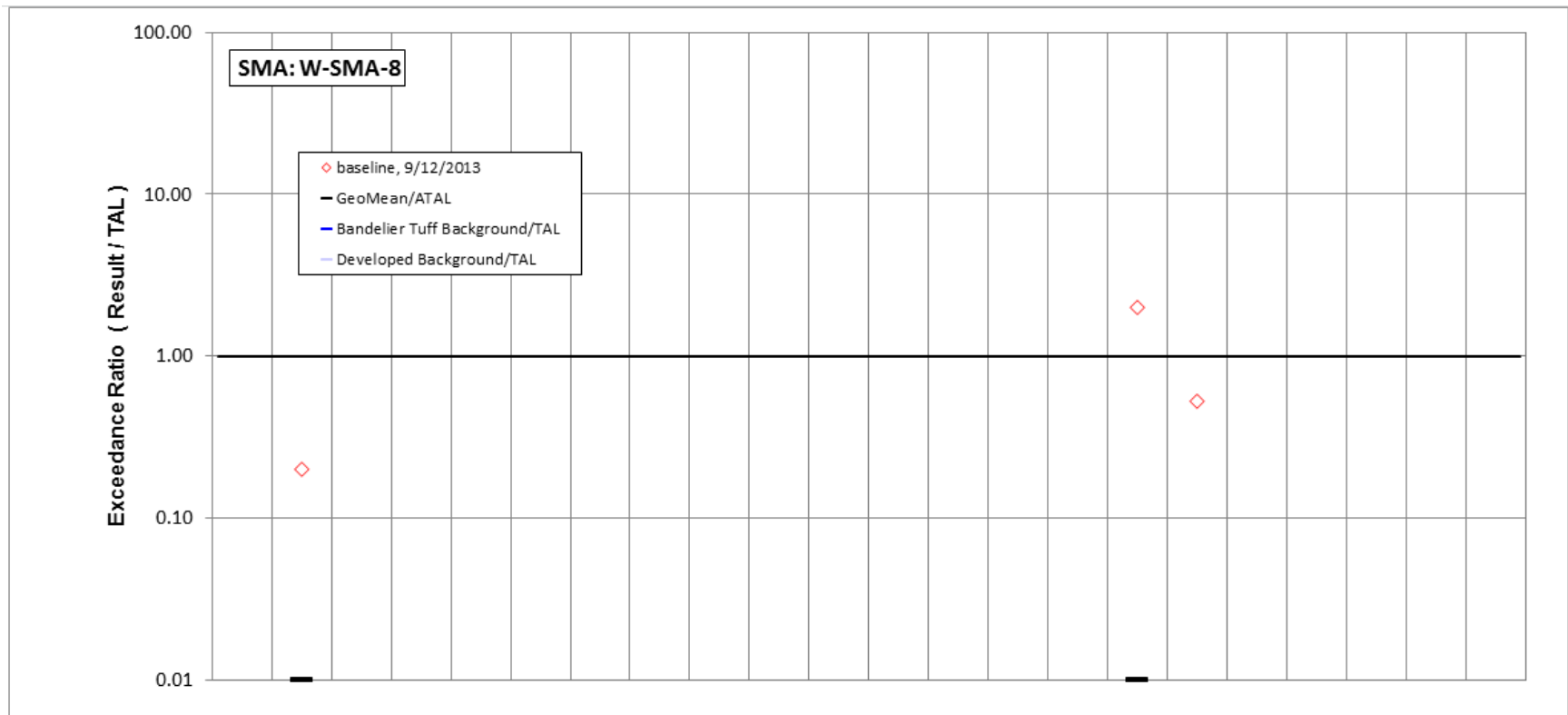




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/31/2014 result</b>	<b>1360</b>	3	5	50	1	10	2.22	4	0.917	0.124	1.42	5	1	2	2.21	5.37	0.005	53.4	5.44
result / TAL	<b>1.8</b>	0.005	0.56	0.01	1	0.048	0.0022	0.93	0.054	0.16	0.0084	1	2	0.32	0.022	0.13	0.5	3.6	0.18

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 196-2 Inorganic analytical results summary plot for CDV-SMA-8



	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	<b>Hexachlorobenzene</b>	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	<b>MLQ</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>MLQ</b>	<b>MTAL</b>	-	-	-	-	-
std value	-	<b>5</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>5</b>	<b>19</b>	-	-	-	-	-
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
<b>9/12/2013 result</b>	-	<b>1</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>10</b>	<b>10</b>	-	-	-	-	-
<b>result / TAL</b>	-	<b>0.2</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>2</b>	<b>0.53</b>	-	-	-	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 196-3 Organic analytical results summary plot for CDV-SMA-8

## 197.0 CDV-SMA-8.5: SWMU 15-014(a)

### 197.1 Site Descriptions

One historical industrial activity area is associated with V015, CDV-SMA-8.5: Site 15-014(a).

SWMU 15-014(a) is an inactive drainline and outfall associated with former building 15-183. The drainline received effluent from former photoprocessing operations in building 15-183 and discharged to a former NPDES-permitted outfall (EPA 06A123), located approximately 130 ft from the edge of Cañon de Valle. The drainline and outfall began receiving effluent in 1961 when building 15-183 was first constructed. The drainline and the outfall discharge point were plugged in 1997 when the drainline was tied into the TA-16 sanitary sewer system. The outfall was removed from the NPDES permit as of January 14, 1998. Building 15-183 is currently used as a general nonnuclear laboratory.

Consent Order investigations have not yet begun; decision-level data are not available for SWMU 15-014(a). SWMU 15-014(a) will be sampled during the future Cañon de Valle Aggregate Area TA-15 investigation.

The project map (Figure 197-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 197.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 197-1).

**Table 197-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V01502040006	Established Vegetation	-	X	X	-	B
V01503010005	Earthen Berm	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 197.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at CDV-SMA-8.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

### 197.4 Inspections and Maintenance

RG262.4 recorded three storm events at CDV-SMA-8.5 during the 2017 season. These rain events triggered three post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 197-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62433	6-13-2017
Storm Rain Event	BMP-62944	6-27-2017
Storm Rain Event	BMP-64188	8-3-2017

No maintenance activities or facility modifications affecting discharge were conducted at CDV-SMA-8.5 in 2017.

### 197.5 Compliance Status

The Site associated with CDV-SMA-8.5 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 197-3 presents the 2017 compliance status.

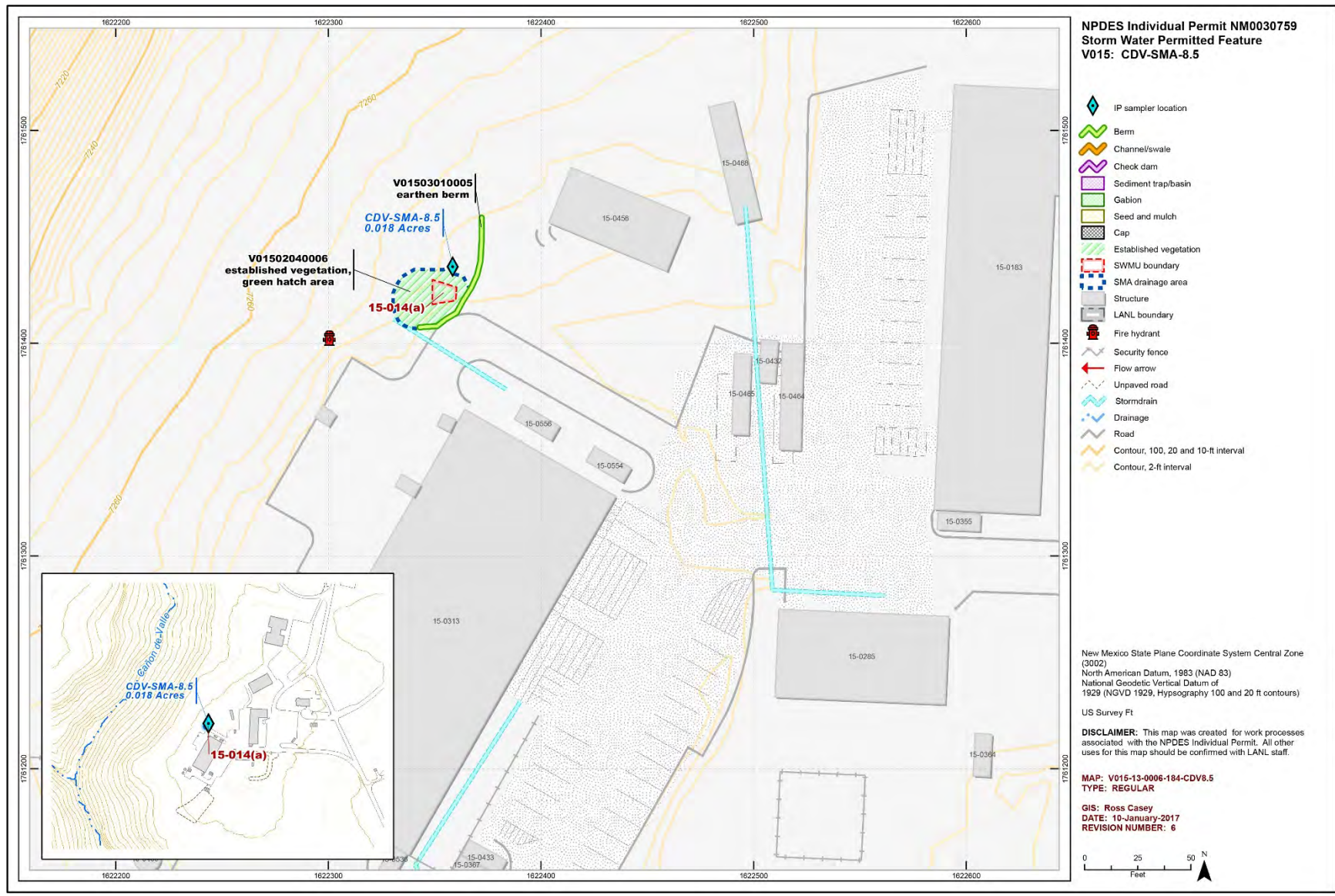
**Table 197-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 15-014(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.



CDV-SMA-8.5, Earthen Berm, V01503010005 (photo ID 8536-1r)





**Figure 197-1 CDV-SMA-8.5 location map**

## 198.0 CDV-SMA-9.05: SWMU 15-007(b)

### 198.1 Site Descriptions

One historical industrial activity area is associated with V016, CDV-SMA-9.05: Site 15-007(b).

SWMU 15-007(b) is a surface disposal area known as MDA Z that is located northwest of Firing Site G [SWMU 15-004(g)] in the south-central portion of TA-15 on the south side of the road leading to building 15-233. A geophysical survey conducted during the 1995 RFI yielded the following: MDA Z is roughly triangular and approximately 225 ft long × 50 ft wide with a surface area of approximately 11,250 ft<sup>2</sup>; the volume of MDA Z measures approximately 2000 yd<sup>3</sup>. Beginning in 1965, MDA Z received construction and shot debris from PHERMEX consisting of used sandbags filled with concrete and steel blast matting. Disposal activities at MDA Z ceased in the 1980s. When the Site was surveyed after the 2000 Cerro Grande fire, only minor burning of groundcover was noted. The presence of DU in surface soils at the Site was noted during the RFI and during a site visit in 2010.

Consent Order investigations have not yet begun; decision-level data are not available for SWMU 15-007(b). SWMU 15-007(b) will be sampled during the future Cañon de Valle Aggregate Area TA-15 investigation.

The project map (Figure 198-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 198.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 198-1).

**Table 198-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
V01602040005	Established Vegetation	-	X	X	-	B
V01603010002	Earthen Berm	-	X	-	X	CB
V01603010003	Earthen Berm	-	X	-	X	CB
V01603010004	Earthen Berm	X	-	-	X	CB
V01603140006	Coir Log	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 198.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at CDV-SMA-9.05. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

### 198.4 Inspections and Maintenance

RG262.4 recorded three storm events at CDV-SMA-9.05 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 198-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61383	4-3-2017
Storm Rain Event	BMP-62434	6-19-2017
Storm Rain Event	BMP-62945	6-28-2017
Storm Rain Event	BMP-64189	8-2-2017
Pre-SIP Field Walkdown	COMP-54077	10-18-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 198-3 Maintenance during 2017**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62434	Monitoring Lead designee picked up floatable waste, garbage, and/or debris and disposed of properly during follow-up site visit.	6-26-2017	7 day(s)	Maintenance conducted as soon as practicable

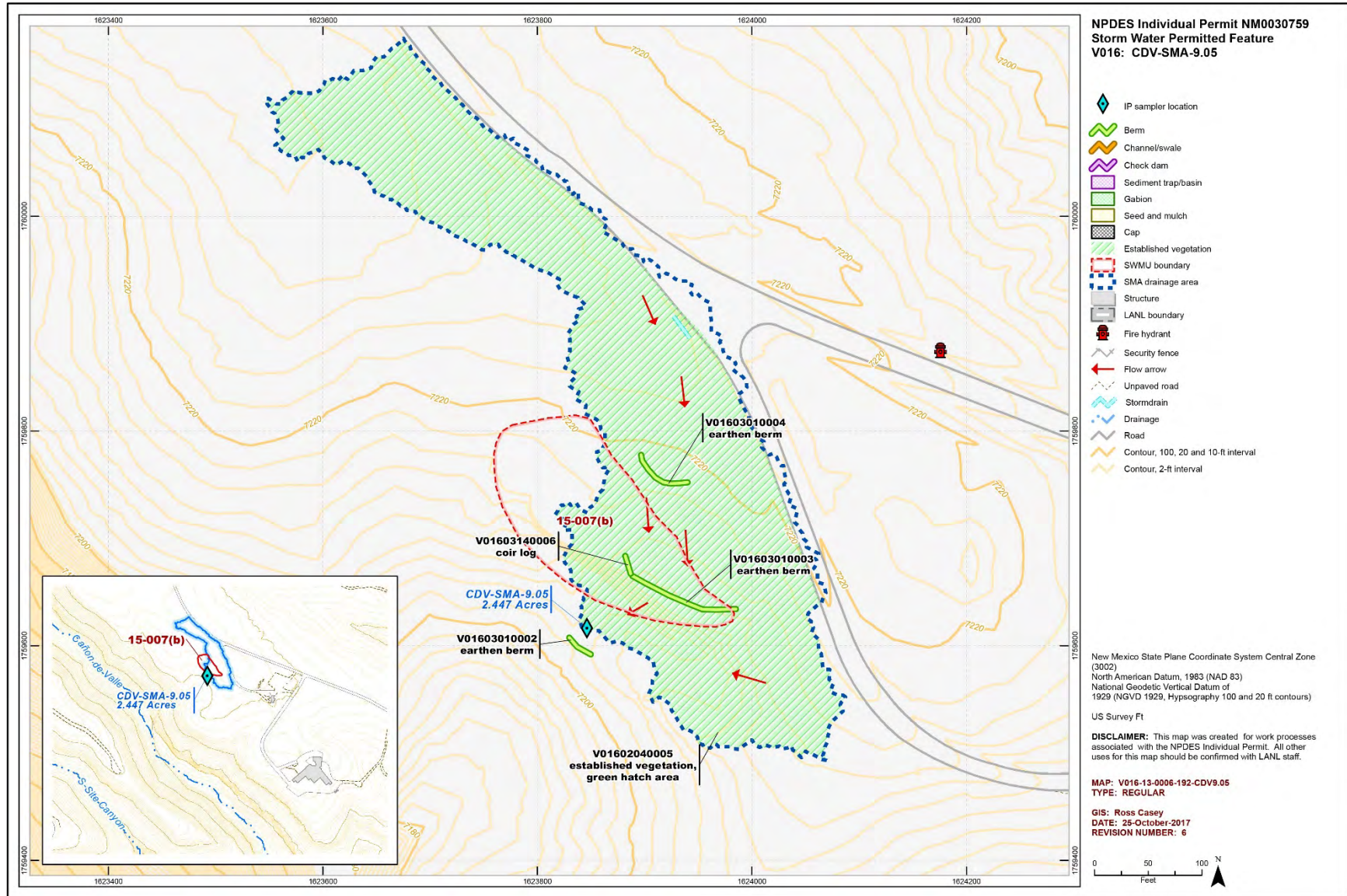
### 198.5 Compliance Status

The Site associated with CDV-SMA-9.05 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 198-4 presents the 2017 compliance status.

**Table 198-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 15-007(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.





**Figure 198-1 CDV-SMA-9.05 location map**



## **199.0 F-SMA-2: AOC 36-004(c)**

### **199.1 Site Descriptions**

One historical industrial activity area is associated with F001, F-SMA-2: Site 36-004(c).

AOC 36-004(c) consists of an active firing site, known as Minie Firing Site, located at TA-36 near the head of Fence Canyon, approximately 800 ft south of the Meenie Firing Site [AOC 36-004(b)]. Facilities associated with the Minie Firing Site include a control bunker (building 36-8), a make-up building (building 36-7), a firing platform, and an x-ray house. Construction of the Minie Firing Site was completed in 1950. The Site has been used extensively to conduct armor-piercing experiments in which penetrator jets are directed at targets at the canyon wall to the west of the Site. Metal plates are placed behind the targets to stop the penetrators. The Minie Firing Site has also been used for OD of scrap HE. In addition, emergency detonation of leaking gas cylinders has also been performed, but on a very infrequent basis.

Consent Order nature and extent sampling was not conducted at AOC 36-004(c) because the Site is an active RCRA-regulated OD unit. However, Consent Order samples were collected in sediment catchment areas in the drainage channel downgradient of the Site to determine if contaminants are migrating from the Site. The migration of potential contaminants from AOC 36-004(c) is limited to the drainage downgradient of the Site for all constituents and does not extend beyond Fence Canyon Reach F-3. Further Consent Order investigations are deferred under Section XI and Appendix A of the 2016 Consent Order until the firing site is no longer active.

The project map (Figure 199-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **199.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 199-1).

Enhanced controls were installed and certified on June 27, 2014, and September 28, 2015, and submitted to EPA on July 11, 2014, and September 29, 2015, respectively, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 199-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
F00102040018	Established Vegetation	-	X	X	-	B
F00103010017	Earthen Berm	-	X	-	X	B
F00103010024	Earthen Berm	X	-	-	X	B
F00103010025	Earthen Berm	X	-	-	X	EC
F00103010026	Earthen Berm	X	-	-	X	EC
F00103010027	Earthen Berm	X	-	-	X	EC
F00103010028	Earthen Berm	-	X	-	X	EC
F00103010029	Earthen Berm	-	X	-	X	EC
F00103010030	Earthen Berm	-	X	-	X	EC
F00103010031	Earthen Berm	X	-	-	X	EC
F00103010035	Earthen Berm	X	-	-	X	B
F00103010036	Earthen Berm	X	-	-	X	EC
F00103010037	Earthen Berm	X	-	-	X	EC
F00103010039	Earthen Berm	-	X	-	X	EC
F00103010040	Earthen Berm	-	X	-	X	EC
F00103010041	Earthen Berm	-	X	-	X	EC
F00103010042	Earthen Berm	-	X	-	X	EC
F00103010043	Earthen Berm	-	X	-	X	EC
F00103010044	Earthen Berm	-	X	-	X	EC
F00103120021	Rock Berm	-	-	-	X	EC
F00103120023	Rock Berm	-	X	-	X	EC
F00104010001	Earthen Channel/Swale	X	-	X	-	CB
F00104010038	Earthen Channel/Swale	X	-	X	-	EC
F00104050033	Water Bar	-	-	X	-	EC
F00104060034	Rip Rap	-	-	X	-	EC
F00105060022	Infiltration Basin	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 199.3 Storm Water Monitoring

AOE 36-004(c) is monitored within F-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on August 15, 2011 (Figures 199-2 and 199-3). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 866 µg/L (MTAL is 750 µg/L),
- Copper concentration of 72.5 µg/L (MTAL is 4.3 µg/L), and
- Gross-alpha activity of 140 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at F-SMA-2, corrective action storm water samples were collected on July 15, 2014, and July 31, 2014 (Figures 199-2 and 199-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 10.8 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activities of 112 pCi/L and 58.9 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*AOC 36-004(c):*

- Copper was likely associated with industrial materials historically managed at this Site. Copper was detected in 5 of 14 samples at maximum concentration 2.9 times the sediment BV.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at AOC 36-004(c). Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which is capable of detecting americium-241 and uranium-235, and for uranium isotopes, all of which are alpha-emitting radionuclides. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 199-2 and 199-3. 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 199-2 and 199-3.

Monitoring location F-SMA-2 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as locations with sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; copper background storm water UTL from locations with sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2011 is greater than both of these values, while the 2014 results are between these two values.
- Gross alpha—The gross-alpha background UTL for locations with 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 landscape is 32.5 pCi/L. The 2011 and 2014 gross-alpha results are between these two values.

All the analytical results for these samples are reported in the 2011 and 2014 Annual Reports.

### 199.4 Inspections and Maintenance

RG267.4 recorded three storm events at F-SMA-2 during the 2017 season. These rain events triggered four post-storm inspection. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 199-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61396	4-5-2017
Storm Rain Event	BMP-64201	8-10-2017
Storm Rain Event	BMP-65412	9-20-2017
Storm Rain Event	BMP-66460	10-18-2017

No maintenance activities or facility modifications affecting discharge were conducted at F-SMA-2 in 2017.

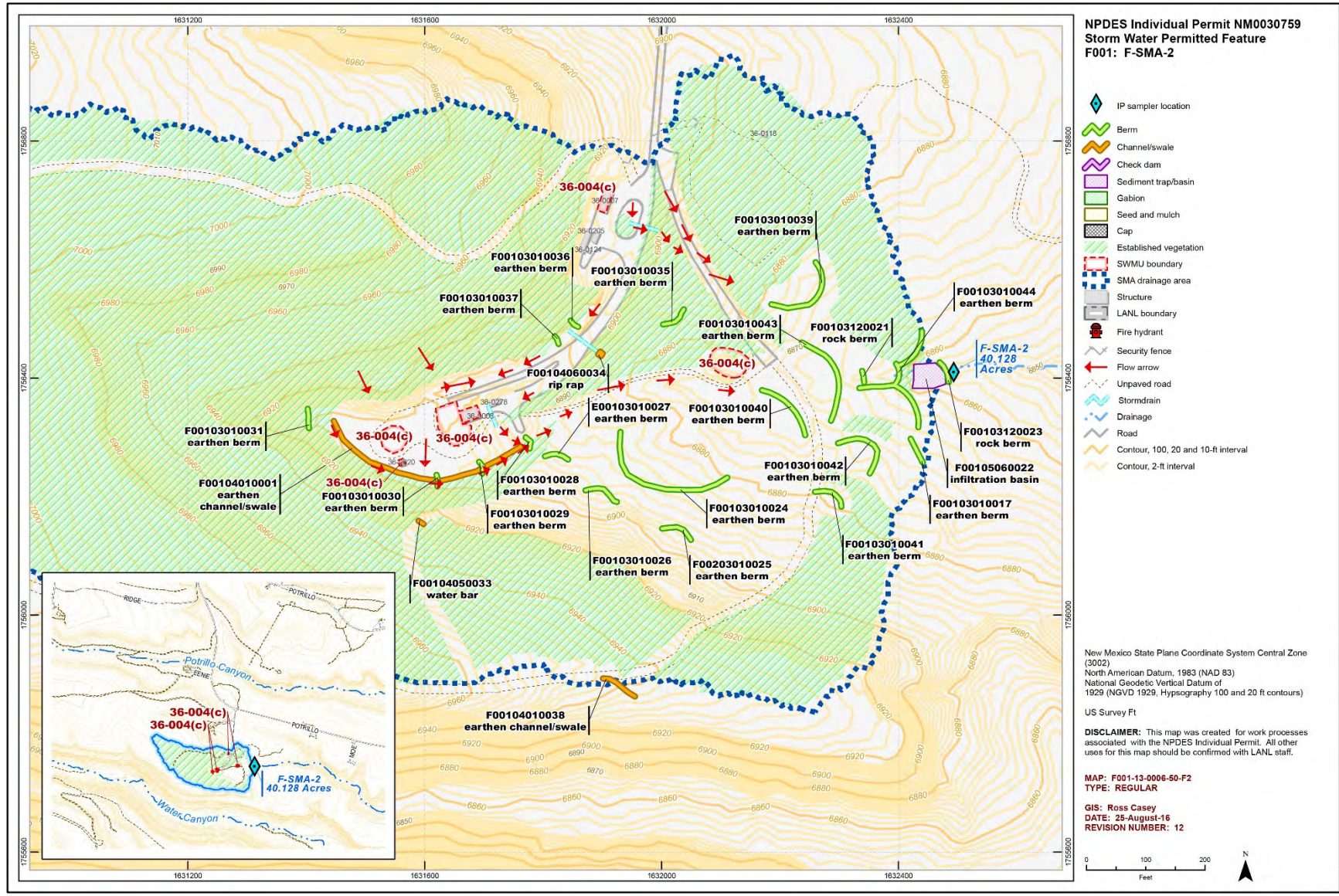
### 199.5 Compliance Status

The Site associated with F-SMA-2 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 199-3 presents the 2017 compliance status.

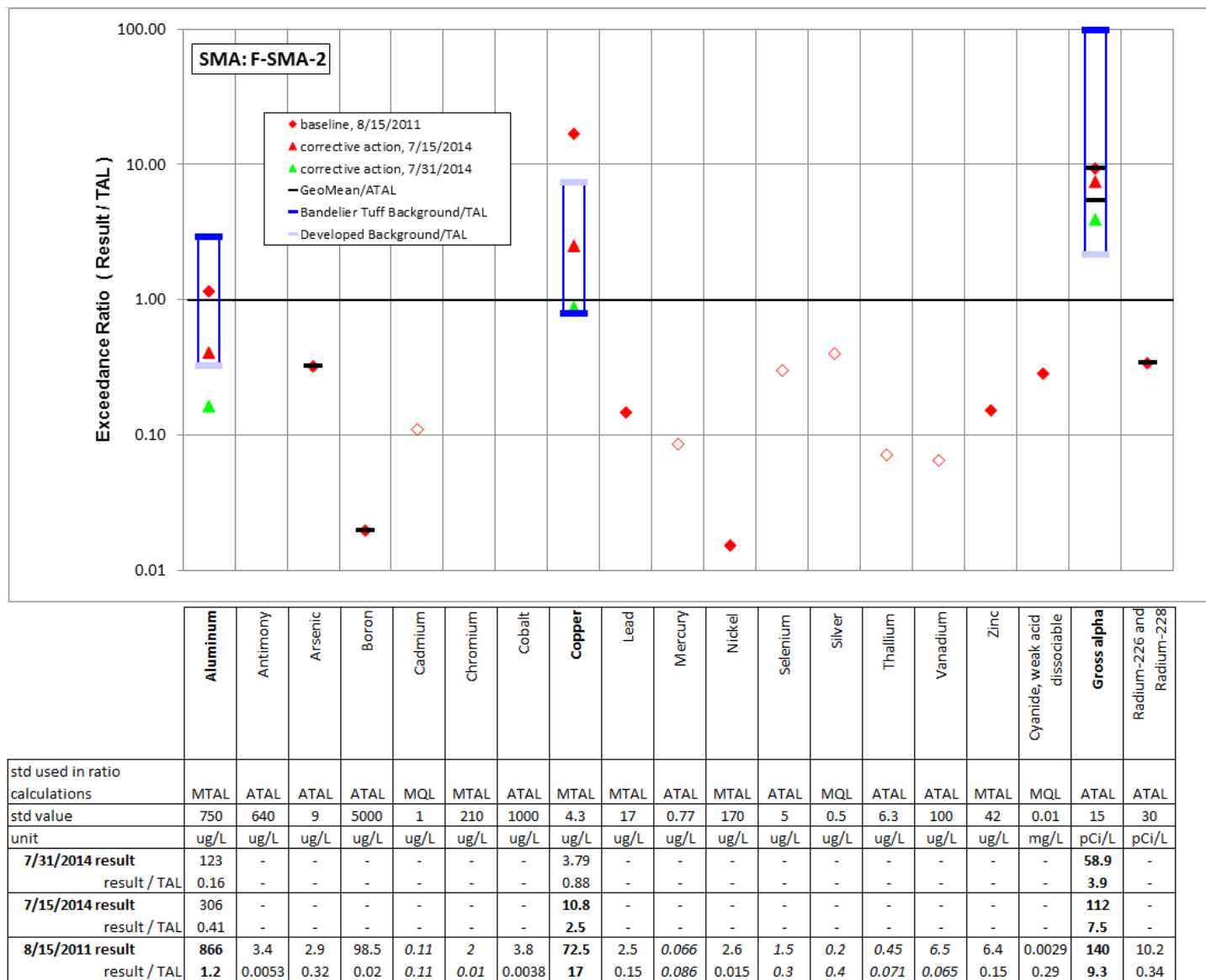
**Table 199-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 36-004(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas."



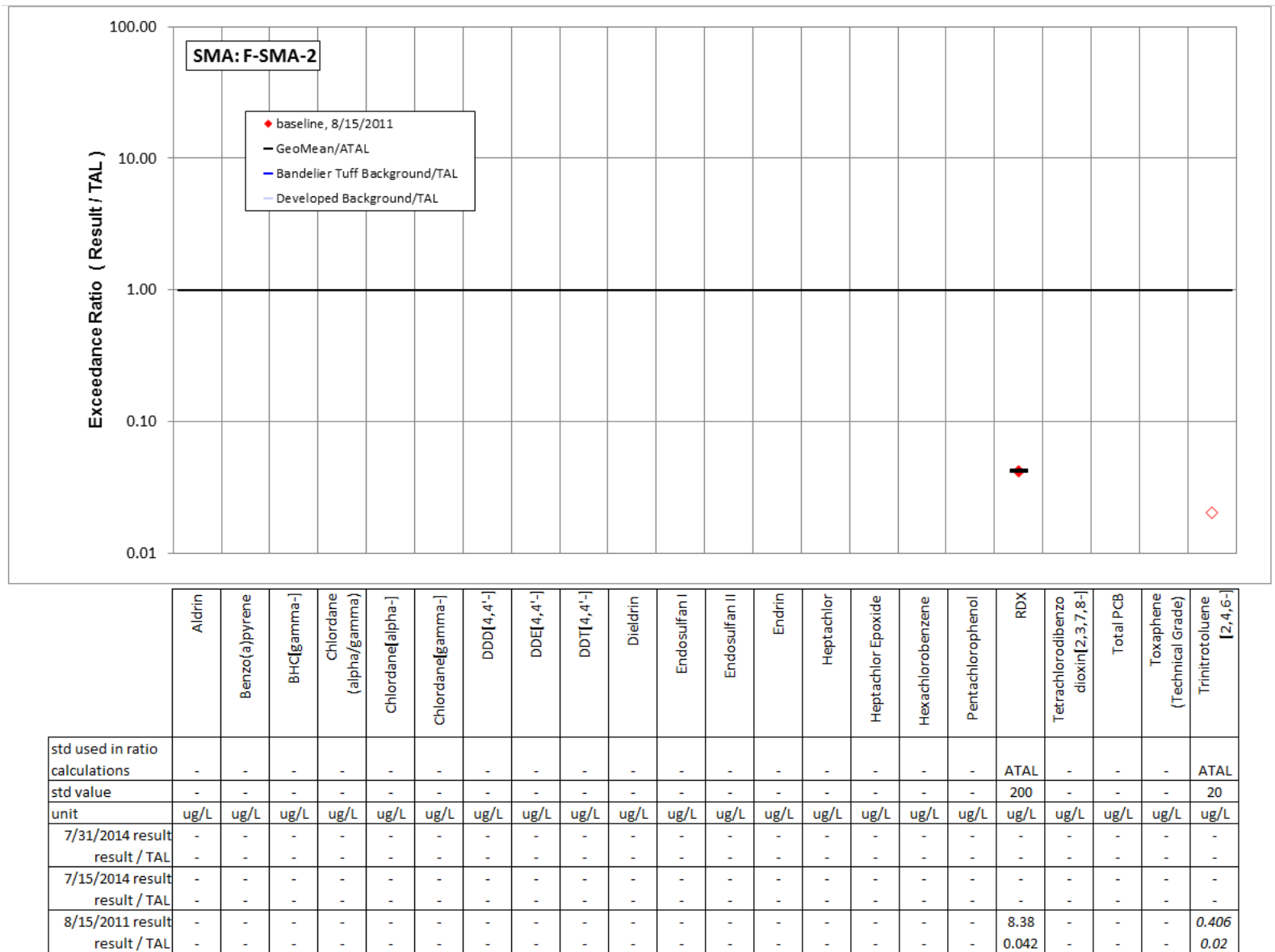


**Figure 199-1 F-SMA-2 location map**



Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 199-2 Inorganic analytical results summary plot for F-SMA-2**



Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 199-3 Organic analytical results summary plot for F-SMA-2**



## **200.0 PT-SMA-0.5: SWMU 15-009(e) and AOC C-15-004**

### **200.1 Site Descriptions**

Two historical industrial activity areas are associated with I001, PT-SMA-0.5: Sites 15-009(e) and C-15-004.

SWMU 15-009(e) is a decommissioned 1500-gal. septic tank (structure 15-72) at E-F Firing Site [SWMU 15-004(f)] at TA-15. The septic tank was constructed in 1947 and received sanitary waste from the E-F Firing Site control building (15-27), located approximately 175 ft northeast of the tank. The drainline goes around structure 15-463, a transportable used for storage. The septic tank is constructed of 4- to 6-in. reinforced concrete and measures 5 ft long × 9 ft deep × 7 ft wide. The septic tank was used until 1981 when E-F Firing Site last operated. Discharges from the septic tank flowed through a VCP to an outfall located approximately 30 ft from the tank at the edge of Potrillo Canyon. During the 1997 VCA conducted at SWMU 15-009(e), the contents of the septic tank were removed, the interior of septic tank was pressure-washed, concrete-chip samples were collected from the tank interior to demonstrate the adequacy of the corrective action, and the tank and drainlines were filled and plugged with expandable concrete and left in place.

Phase I Consent Order sampling is complete for SWMU 15-009(e). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order and VCA confirmation samples were below residential SSLs. SWMU 15-009(e) was recommended for additional field characterization activities in the supplemental investigation report for Potrillo and Fence Canyons Aggregate Area, submitted to NMED in 2015.

AOC C-15-004 is a former transformer station (former structure 15-56) that was located approximately 30 ft southwest of the former E-F Firing Site control room (building 15-27) at TA-15. Two transformers (18-gal. and 30-gal. capacity) were located on a 5-ft-long wooden platform 10 ft above the ground. Each transformer contained mineral oil with PCBs of unknown concentration. The date the transformers were installed is not known, but they were removed from the Site in 1989. No evidence was found of a release on the wooden platform or on the soil beneath the platform.

Phase I Consent Order sampling is complete for AOC C-15-004. All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. AOC C-15-004 was recommended for corrective action complete without controls in the supplemental investigation report for Potrillo and Fence Canyons Aggregate Area, submitted to NMED in September 2015. AOC C-15-004 will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 200-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **200.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 200-1).

Enhanced controls were installed and certified on November 27, 2012, and submitted to EPA on December 13, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.



**Table 200-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
I00102040009	Established Vegetation	-	X	X	-	B
I00103010007	Earthen Berm	-	X	-	X	EC
I00103010008	Earthen Berm	X	-	-	X	EC
I00103060011	Straw Wattle	-	X	-	X	B
I00103060013	Straw Wattle	-	X	-	X	B
I00104030012	Rock Channel/Swale	X	-	X	-	B

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 200.3 Storm Water Monitoring

SWMU 15-009(e) and AOC C-15-004 are monitored within PT-SMA-0.5. Following the installation of baseline control measures, a baseline storm water sample was collected on September 1, 2011 (Figures 200-2 and 200-3). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1380 µg/L (MTAL is 750 µg/L),
- Copper concentration of 6.5 µg/L (MTAL is 4.3 µg/L), and
- Gross-alpha activity of 79.5 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e. less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 15-009(e):*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. Aluminum was not detected above BVs in any of the 13 shallow Consent Order and VCA confirmation samples collected at SWMU 15-009(e).
- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was detected above the BV in 1 of 13 shallow Consent Order and VCA confirmation samples collected at SWMU 15-009(e) at a concentration equivalent to the soil BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 15-009(e); however, they are associated with industrial materials managed at adjacent E-F Firing Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, the Site is an unlikely a source of the TAL exceedances. The SMA receives runoff from industrially developed (E-F Firing Site) areas and undeveloped areas.

*AOC C-15-004:*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. Aluminum was not detected above BVs in any of the four shallow Consent Order samples collected at AOC C-15-004.
- Copper is not known to be associated with industrial materials historically managed at this Site. Copper was detected above the BV in 3 of 4 shallow Consent Order samples collected at AOC C-15-004 at a maximum concentration 3.3 times the soil BV.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at AOC C-15-004; however, they are associated with industrial materials managed at adjacent E-F Firing Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, the Site is an unlikely a source of the TAL exceedances. The SMA receives runoff from industrially developed (E-F Firing Site) areas and undeveloped areas.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 200-2 and 200-3. 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 200-2 and 200-3.

PT-SMA-0.5 is located on Bandelier Tuff and no run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from locations containing sediments derived from Bandelier Tuff were compared with aluminum, copper, and gross-alpha MTAL and ATAL exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper and aluminum are associated with minerals in the Bandelier Tuff as well.

- Aluminum—The aluminum UTL for storm water containing sediments derived from Bandelier Tuff is 2210 µg/L; the result from 2011 is less than this value.
- Copper—The copper UTL for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L; the result from 2011 is greater than this value.
- Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L; the result from 2011 is less than this value.

All the analytical results for these samples are reported in the 2011 Annual Report.

## 200.4 Inspections and Maintenance

RG262.4 recorded three storm events at PT-SMA-0.5 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 200-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61397	4-4-2017
Storm Rain Event	BMP-62435	6-14-2017
Storm Rain Event	BMP-62946	7-5-2017
Storm Rain Event	BMP-64190	8-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at PT-SMA-0.5 in 2017.

## 200.5 Compliance Status

The Sites associated with PT-SMA-0.5 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 200-3 presents the 2017 compliance status.

**Table 200-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 15-009(e)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, December 13, 2012, "Certification of Installation of Enhanced Control Measures for Nine Site Monitoring Areas."
AOC C-15-004	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, December 13, 2012, "Certification of Installation of Enhanced Control Measures for Nine Site Monitoring Areas."



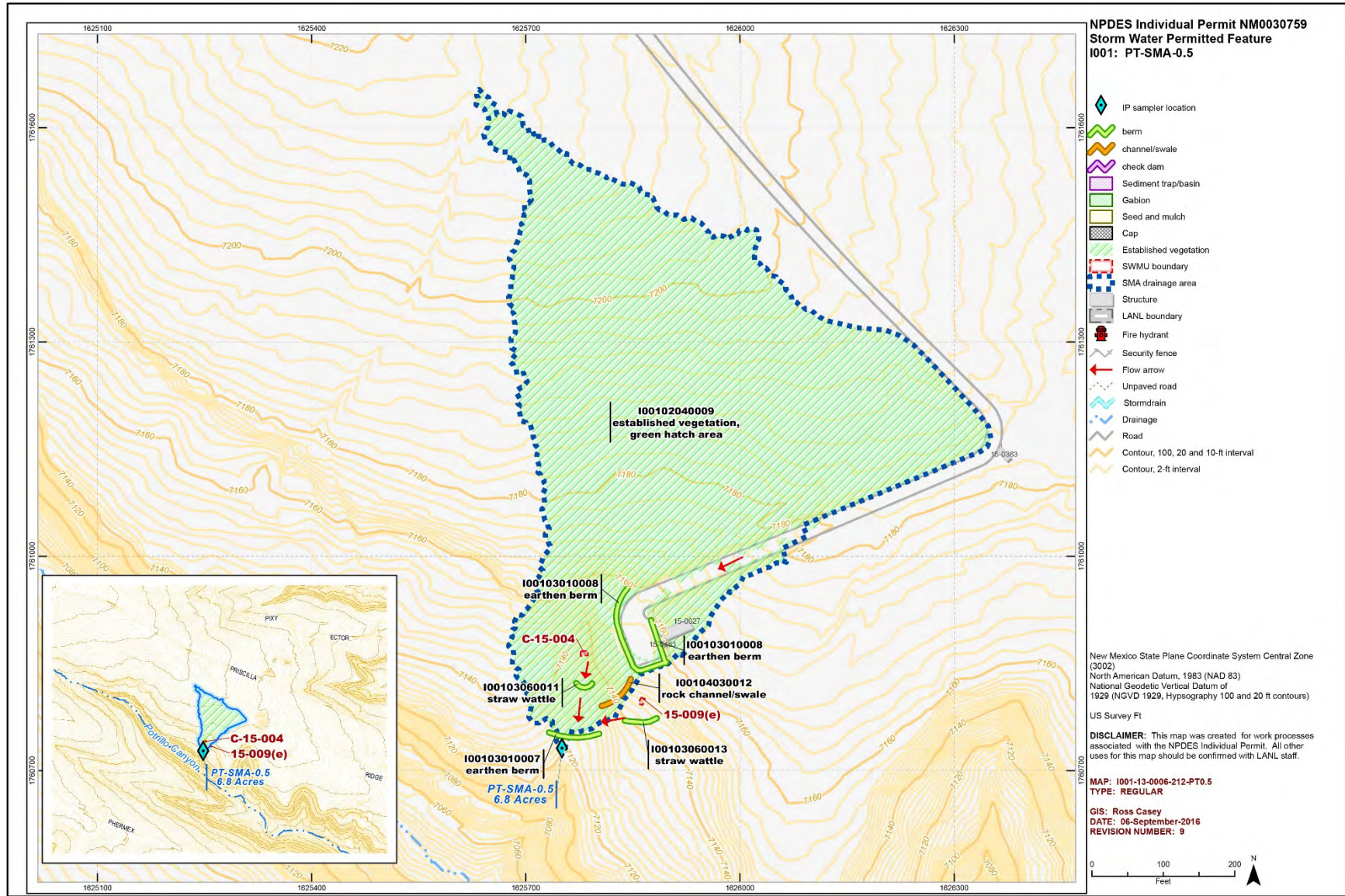
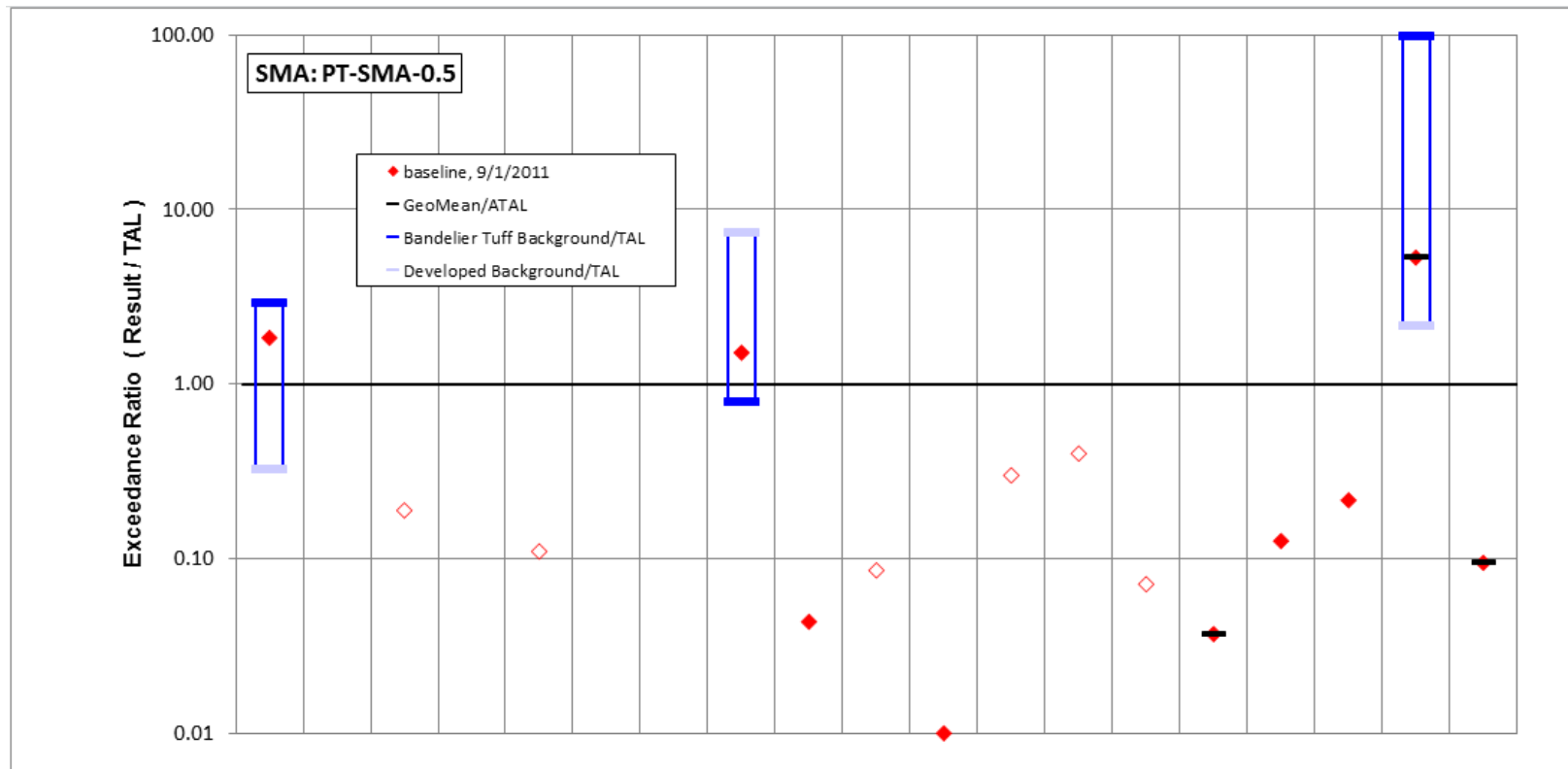


Figure 200-1 PT-SMA-0.5 location map

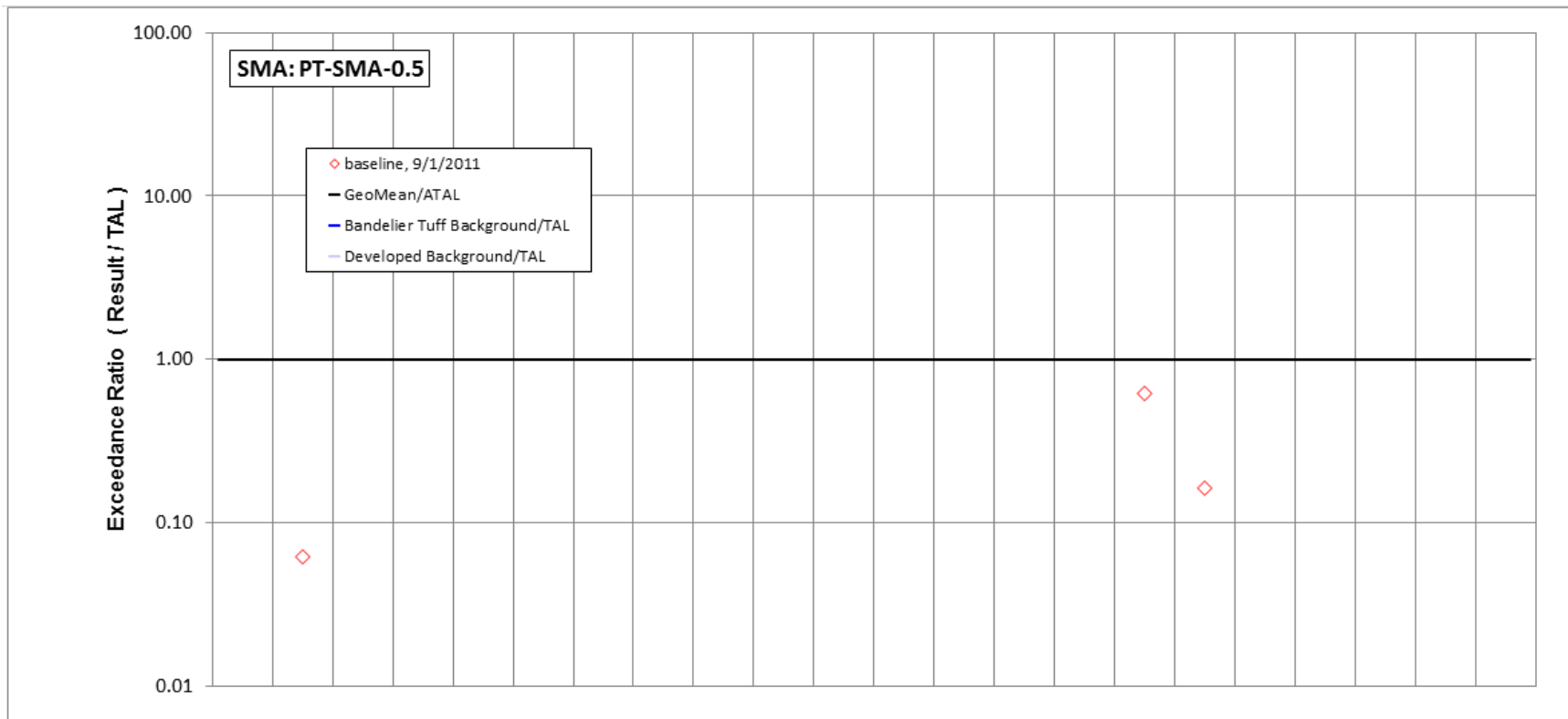




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
9/1/2011 result	<b>1380</b>	<i>1</i>	<i>1.7</i>	<i>30.3</i>	<i>0.11</i>	<i>2</i>	<i>1</i>	<b>6.5</b>	<i>0.74</i>	<i>0.066</i>	<i>1.7</i>	<i>1.5</i>	<i>0.2</i>	<i>0.45</i>	<i>3.7</i>	<i>5.3</i>	<i>0.0022</i>	<b>79.5</b>	<i>2.84</i>
result / TAL	<b>1.8</b>	<i>0.002</i>	<i>0.19</i>	<i>0.0061</i>	<i>0.11</i>	<i>0.01</i>	<i>0.001</i>	<b>1.5</b>	<i>0.044</i>	<i>0.086</i>	<i>0.01</i>	<i>0.3</i>	<i>0.4</i>	<i>0.071</i>	<i>0.037</i>	<i>0.13</i>	<i>0.22</i>	<b>5.3</b>	<i>0.095</i>

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 200-2 Inorganic analytical results summary plot for PT-SMA-0.5



	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	-	<b>MLQ</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>MLQ</b>	<b>MTAL</b>	-	-	<b>ATAL</b>	-	-
std value	-	<b>5</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>5</b>	<b>19</b>	-	-	<b>6E-04</b>	-	-
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
9/1/2011 result	-	<b>0.309</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>3.09</b>	<b>3.09</b>	-	-	<b>1E-09</b>	-	-
result / TAL	-	<b>0.062</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.62</b>	<b>0.16</b>	-	-	<b>2E-06</b>	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 200-3 Organic analytical results summary plot for PT-SMA-0.5

## 201.0 PT-SMA-1: SWMUs 15-004(f) and 15-008(a)

### 201.1 Site Descriptions

Two historical industrial activity areas are associated with I002, PT-SMA-1: Sites 15-004(f) and 15-008(a).

SWMU 15-004(f) is an inactive firing site, E-F Firing Site, that consists of three inactive firing points (D, E, and F) covering a total area of approximately 60 acres at TA-15. E-F Firing Site began operating in 1946 and was last used in 1981. It was operated extensively from 1947 to 1973 and was the largest firing site at the Laboratory. Originally, E-F Firing Site consisted of a single firing point (D) that was built in 1946 and that ceased to operate in 1949. In 1947, the firing area was expanded to include Firing Point E, which was used for large-scale shots containing up to 2500 lb of HE, and Firing Point F, which was used for smaller-scale shots. Firing Points E and F were approximately 650 ft apart and were wired to an underground control bunker (structure 15-27). Tests at the two firing points were conducted on the ground and created depressions in the ground. After test shots, the firing points were either regraded or backfilled with gravel to fill in the depressions. Eventually, nearby soil was mounded on the north and south sides of Firing Point E to protect TA-15 structures from shrapnel. Tests at E-F Firing Site involved HE, uranium (metal and depleted), beryllium, lead, and mercury.

Phase I Consent Order sampling is complete for SWMU 15-004(f). The objective of the investigation was to identify areas and depths of soil requiring corrective action and to determine if contaminants are migrating from the Site. Although several constituents were detected above industrial SSLs/SALs, the Site does not pose a current risk because of the administrative controls that are in place. Per the Potrillo and Fence Canyons Aggregate Area supplemental investigation report submitted to NMED in September 2015, additional samples will be collected during the Phase II investigation to verify the distribution of potential contamination; subsequently, potential corrective actions for the Site will be identified and evaluated. The migration of potential contaminants from SWMU 15-004(f) is limited to the drainage downgradient of the Site for most constituents and does not extend beyond Potrillo Canyon Reach PO-3.

SWMU 15-008(a) is the location of two former small surface disposal areas on the edge of Potrillo Canyon, south and east of E-F Firing Site [SWMU 15-004(f)], at TA-15. The disposal areas were located within approximately 350 ft of each other, with each disposal area having dimensions of approximately 8 ft in diameter × 2 ft high. Both areas were used to dispose of debris from tests conducted at E-F Firing Site, including soil, rock, pebbles, metal fragments, plastic, electrical cable, and electrical accessories. The exact period of operation of the surface disposal areas is not known but probably falls within the period of operation for E-F Firing Site (1946 to 1981). All debris and soil were removed from both surface disposal areas during the 2010 Consent Order investigation.

Phase I Consent Order sampling is complete for SWMU 15-008(a). SWMU 15-008(a) is located within the boundary of E-F Firing Site [SWMU 15-004(f)]. Per the Potrillo and Fence Canyons Aggregate Area supplemental investigation report submitted to NMED in September 2015, this Site will not be eligible for a COC until additional investigation and corrective actions are complete for E-F Firing Site.

The project map (Figure 201-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## 201.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 201-1).

Enhanced controls were installed and certified on August 3, 2012, and October 15, 2015, and submitted to EPA on August 27, 2012, and October 16, 2015, respectively, as part of corrective action. Photographs of the enhanced controls are available at

<http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 201-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
I00201010022	Seed and Wood Mulch	-	-	X	-	CB
I00202040034	Established Vegetation	-	X	X	-	B
I00203010018	Earthen Berm	-	X	-	X	CB
I00203010019	Earthen Berm	-	X	-	X	CB
I00203010020	Earthen Berm	-	X	-	X	CB
I00203010021	Earthen Berm	-	X	-	X	CB
I00203010023	Earthen Berm	-	X	-	X	EC
I00203010024	Earthen Berm	-	X	-	X	EC
I00203010025	Earthen Berm	-	X	-	X	EC
I00203010026	Earthen Berm	-	X	-	X	EC
I00203010027	Earthen Berm	-	X	-	X	EC
I00203010028	Earthen Berm	-	X	-	X	EC
I00203010029	Earthen Berm	-	X	-	X	EC
I00203010030	Earthen Berm	-	X	-	X	EC
I00203010039	Earthen Berm	-	X	-	X	EC
I00203060035	Straw Wattle	-	X	-	X	B
I00203060036	Straw Wattle	-	X	-	X	B
I00203060037	Straw Wattle	-	X	-	X	B
I00203120012	Rock Berm	X	-	-	X	CB
I00203120013	Rock Berm	X	-	-	X	CB
I00203120038	Rock Berm	X	-	-	X	EC
I00203140040	Coir Log	-	X	-	X	EC
I00203140041	Coir Log	-	X	-	X	EC
I00206010031	Rock Check Dam	-	X	-	X	EC
I00206010032	Rock Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.



### 201.3 Storm Water Monitoring

SWMUs 15-004(f) and 15-008(a) are monitored within PT-SMA-1. Following the installation of baseline control measures, a baseline storm water sample was collected on September 1, 2011 (Figures 201-2 and 201-3). In Figures 201-2 and 201-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1380 µg/L (MTAL is 750 µg/L),
- Copper concentration of 6.5 µg/L (MTAL is 4.3 µg/L),
- Zinc concentration of 75.9 µg/L (MTAL is 42 µg/L), and
- Gross-alpha activity of 79.5 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at PT-SMA-1, corrective action storm water samples were collected on July 9, 2014, and July 31, 2014 (Figures 201-2 and 201-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Copper concentrations of 45.5 µg/L and 21.4 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activities of 650 pCi/L and 4400 pCi/L (ATAL is 15 pCi/L).

Following a sampler move to a more representative monitoring location, a corrective action monitoring storm water sample was collected on September 26, 2017 (Figures 201-2 and 201-3). Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 4.8 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activity of 17.6 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 15-004(f):*

- Copper was likely associated with industrial materials historically managed at this Site. Copper was detected above BVs in 38 of 69 shallow Consent Order and RFI samples at a maximum concentration 561 times the soil BV.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Shallow RFI and Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross alpha radioactivity.



PT-SMA-1, Rock Berm, I00203120013  
(photo ID 23587-1)

*SWMU 15-008(a):*

- Copper was likely associated with industrial materials historically managed at this Site. Copper was detected above BVs in 15 of 22 shallow Consent Order samples at a maximum concentration 525 times the soil BV.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTL) using the approved EPA method for calculating BVs. 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 201-2 and 201-3. 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 201-2 and 201-3.

PT-SMA-1 is located on Bandelier Tuff and no run-on occurs from developed facilities (i.e., buildings, pavement, and parking lots); therefore, calculated storm water UTLs from locations containing sediments derived from Bandelier Tuff were compared with copper and gross-alpha MTAL and ATAL exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals. Copper is associated with minerals in the Bandelier Tuff as well.

- Copper—The copper UTL for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L; the results from 2011, 2014, and 2017 are greater than this value.
- Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L; the results from 2011 and 2017 and one result from 2014 are less than this value. The other result from 2014 is greater than this value.

All the analytical results for these samples are reported in the 2011, 2014, and 2017 Annual Reports.

The monitoring station for PT-SMA-1 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.

#### **201.4 Inspections and Maintenance**

RG262.4 recorded three storm events at PT-SMA-1 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 201-2 Control Measure Inspections during 2017**

<b>Inspection Type</b>	<b>Inspection Reference</b>	<b>Inspection Date</b>
Storm Rain Event and Annual Erosion Evaluation	BMP-61398	4-4-2017
Storm Rain Event	BMP-62436	6-14-2017
Storm Rain Event	BMP-62947	7-5-2017
Storm Rain Event	BMP-64191	8-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at PT-SMA-1 in 2017.

### 201.5 Compliance Status

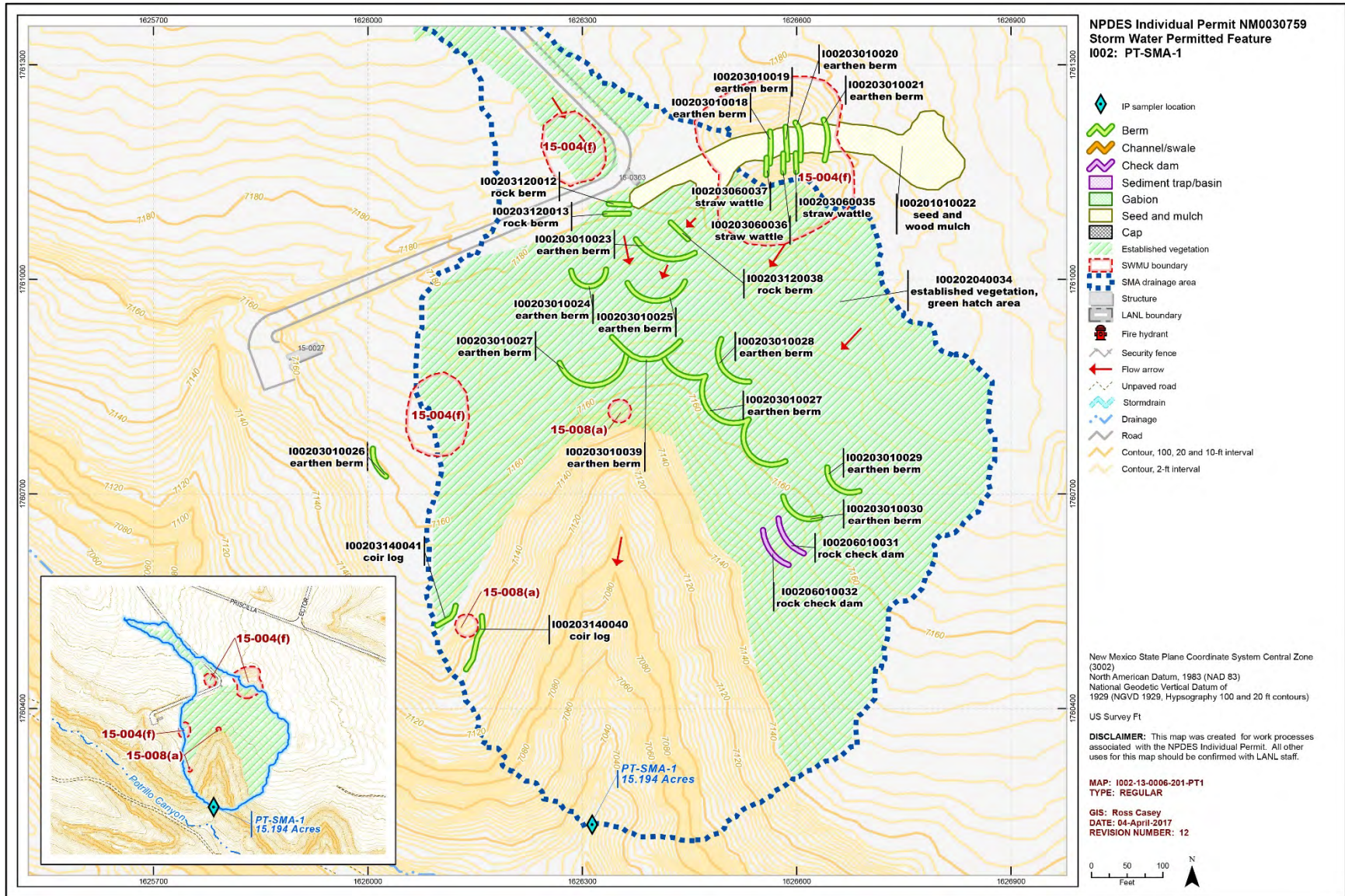
The Sites associated with PT-SMA-1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 201-3 presents the 2017 compliance status.

**Table 201-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 15-004(f)	Enhanced Control Corrective Action Monitoring	Alternative Compliance Request in Process	In 2017, the sampler was moved to a more representative monitoring location. The corrective action recommendation is to submit an alternative compliance request to EPA.  LANL, October 16, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas."
SWMU 15-008(a)	Enhanced Control Corrective Action Monitoring	Alternative Compliance Request in Process	In 2017, the sampler was moved to a more representative monitoring location. The corrective action recommendation is to submit an alternative compliance request to EPA.  LANL, October 16, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas."

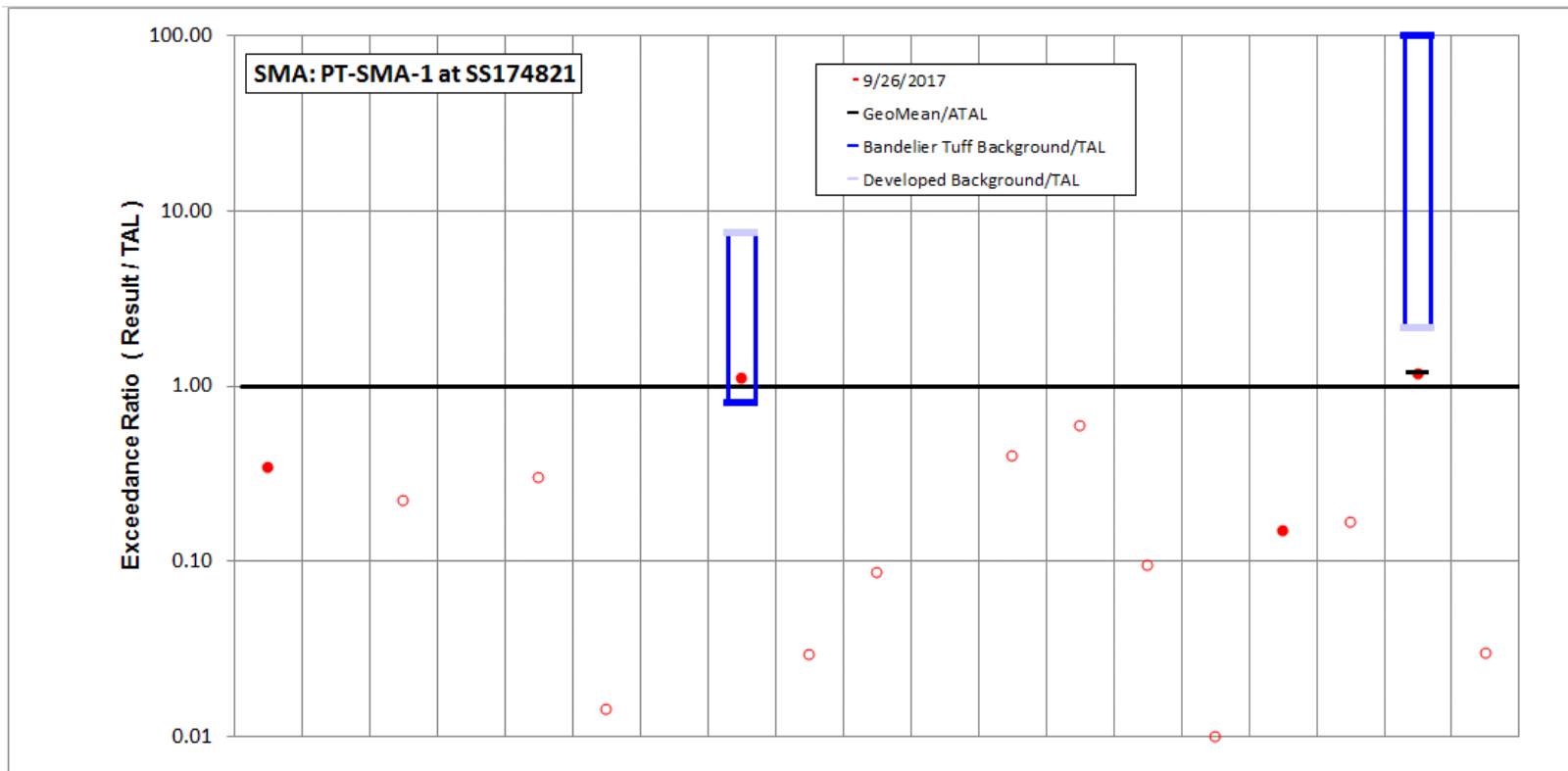
Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.





**Figure 201-1 PT-SMA-1 location map**

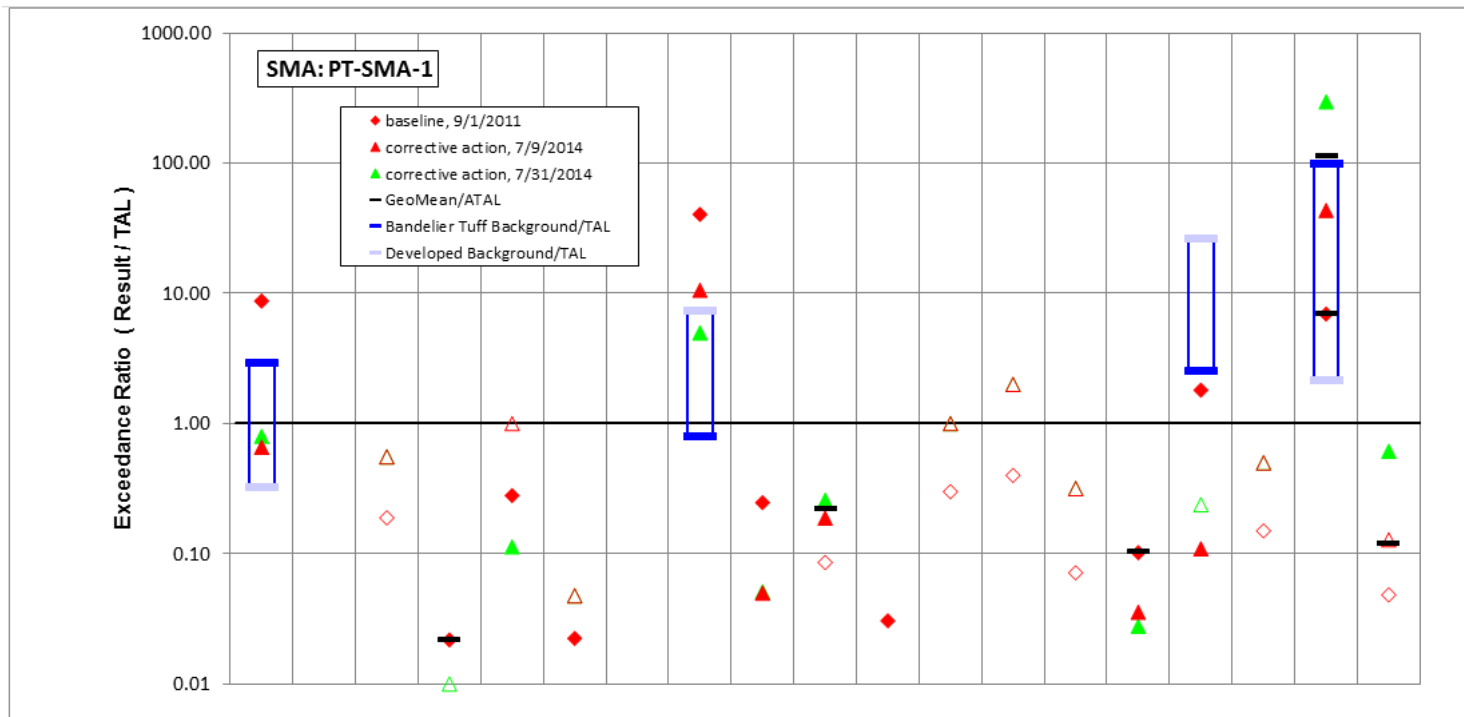




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	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
<b>9/26/2017 result</b>	260	3.31	2	22.1	0.3	3	1.59	<b>4.8</b>	0.5	<i>0.067</i>	0.85	2	0.3	0.6	1	6.26	<i>0.002</i>	<b>17.6</b>	<i>0.894</i>
result / TAL	0.35	0.0052	0.22	0.0044	0.3	<i>0.014</i>	0.0016	<b>1.1</b>	0.029	<i>0.087</i>	0.005	0.4	0.6	<i>0.095</i>	0.01	0.15	0.17	<b>1.2</b>	<i>0.03</i>

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

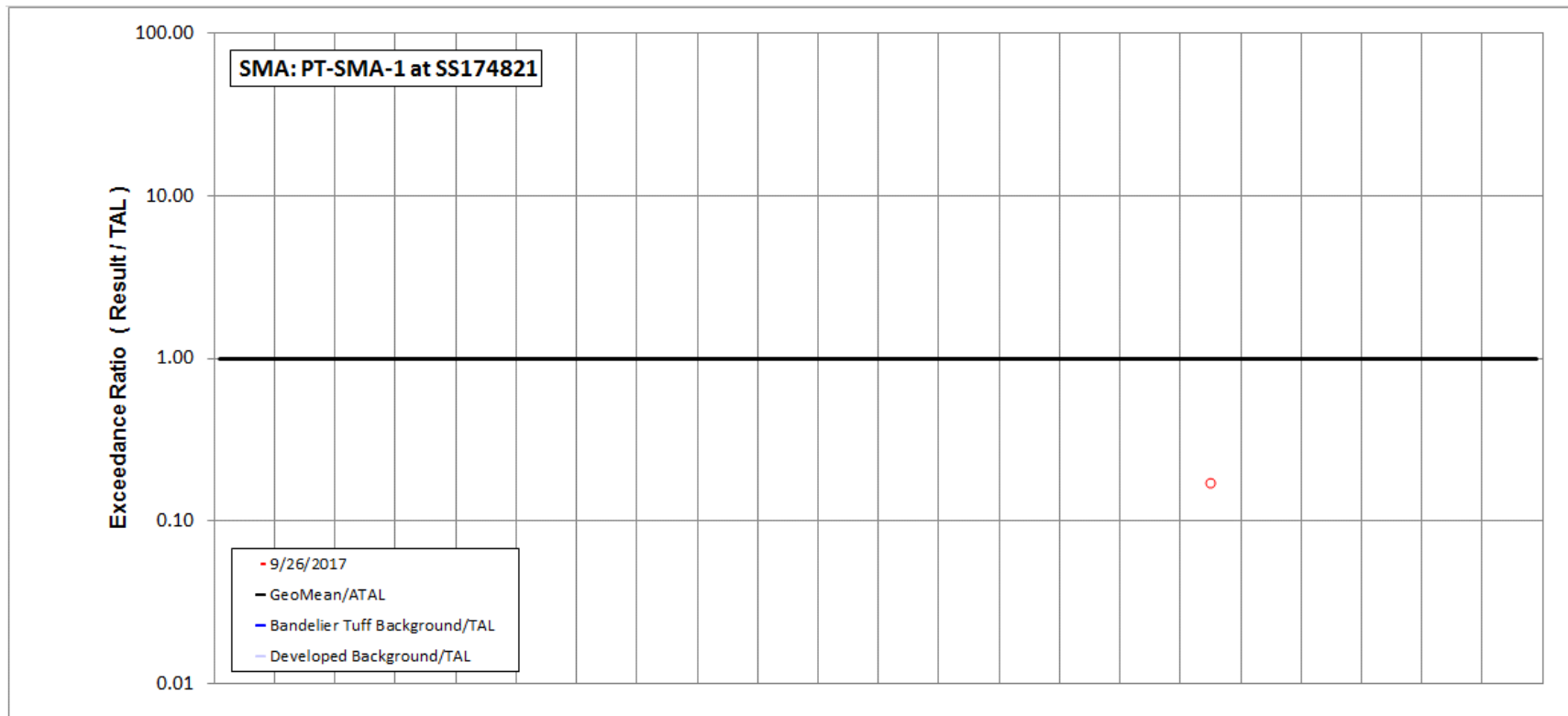
Figure 201-2a Inorganic analytical results summary plot for PT-SMA-1



	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/31/2014 result</b>	599	1.14	5	50	0.113	10	2.15	<b>21.4</b>	0.87	0.199	1.01	5	<b>1</b>	2	2.78	10	<i>0.005</i>	<b>4440</b>	18.4
result / TAL	0.8	<i>0.0018</i>	<i>0.56</i>	<i>0.01</i>	0.11	<i>0.048</i>	<i>0.0022</i>	5	0.051	0.26	0.0059	1	2	<i>0.32</i>	<i>0.028</i>	<i>0.24</i>	0.5	<b>300</b>	0.61
<b>7/9/2014 result</b>	494	3	5	17.1	1	10	1.04	<b>45.5</b>	0.849	0.145	1.1	5	<b>1</b>	2	3.56	4.59	<i>0.005</i>	<b>650</b>	3.85
result / TAL	0.66	<i>0.005</i>	<i>0.56</i>	<i>0.0034</i>	1	<i>0.048</i>	<i>0.001</i>	<b>11</b>	0.05	0.19	0.0065	1	2	<i>0.32</i>	<i>0.036</i>	0.11	0.5	<b>43</b>	0.13
<b>9/1/2011 result</b>	6550	1.2	1.7	109	0.28	4.7	4.9	<b>174</b>	4.2	<i>0.066</i>	5.2	1.5	0.2	0.45	10.2	<b>75.9</b>	<i>0.002</i>	<b>104</b>	1.45
result / TAL	<b>8.7</b>	<i>0.0019</i>	<i>0.19</i>	<i>0.022</i>	0.28	<i>0.022</i>	<i>0.0049</i>	<b>40</b>	0.25	<i>0.086</i>	0.031	0.3	0.4	<i>0.071</i>	0.1	<b>1.8</b>	0.15	<b>6.9</b>	<i>0.048</i>

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

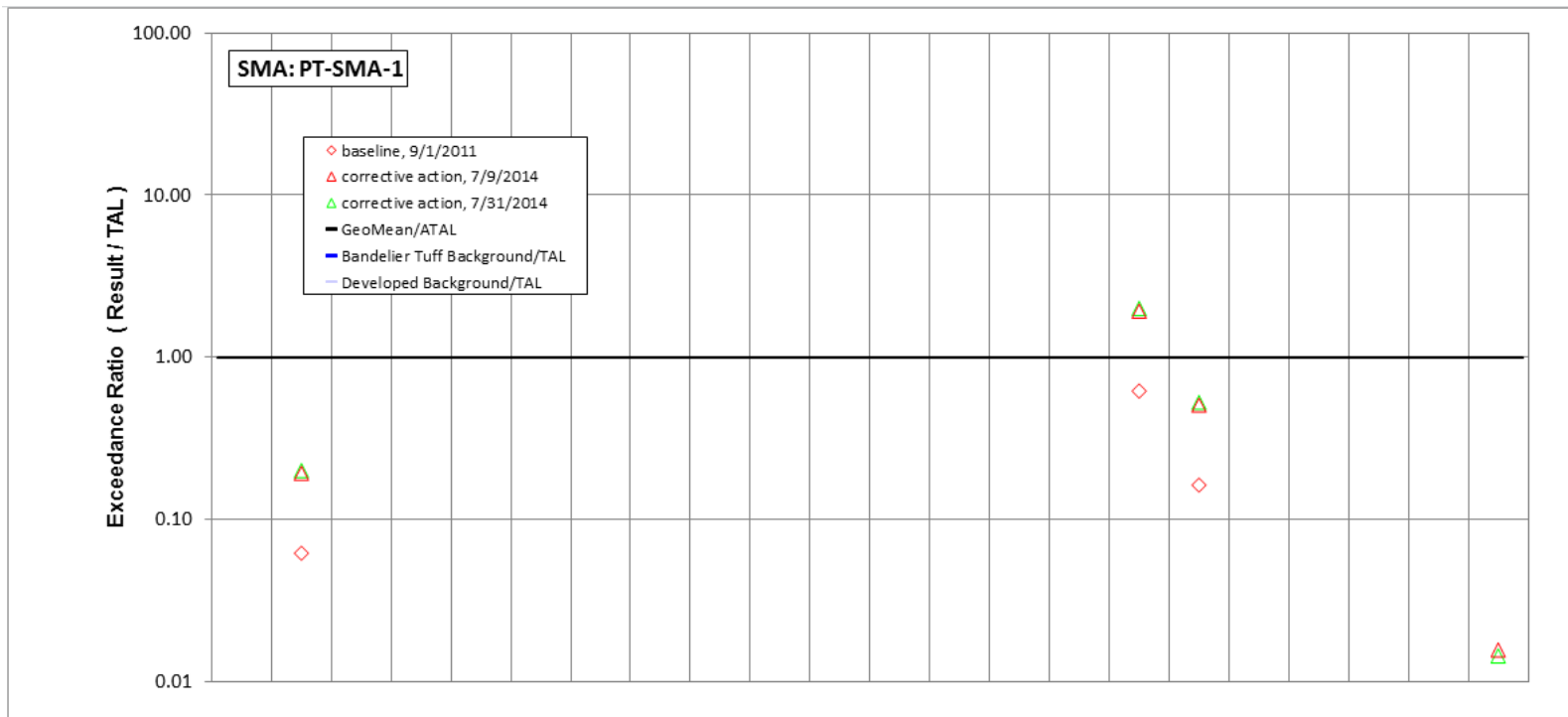
**Figure 201-2b Inorganic analytical results summary plot for PT-SMA-1**



	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	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	MTAL	ATAL	-	-	-	-	ATAL
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	200	-	-	-	-	20
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	ug/L
9/26/2017 result	-	<i>0.033</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	<i>0.007</i>	<i>3.23</i>	<i>0.101</i>	-	-	-	-	<i>0.101</i>
result / TAL	-	<i>0.007</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	<i>0.001</i>	<i>0.17</i>	<i>5E-04</i>	-	-	-	-	<i>0.005</i>

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 201-3a Organic analytical results summary plot for PT-SMA-1



	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	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	ATAL	-	-	-	ATAL
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	200	-	-	-	20
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
7/31/2014 result	-	<b>1</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>10</b>	<i>10</i>	<i>0.287</i>	-	-	-	<i>0.287</i>
result / TAL	-	<b>0.2</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>2</b>	<i>0.53</i>	<i>0.001</i>	-	-	-	<i>0.014</i>
7/9/2014 result	-	<i>0.962</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>9.62</b>	<i>9.62</i>	<i>0.313</i>	-	-	-	<i>0.313</i>
result / TAL	-	<i>0.19</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>1.9</b>	<i>0.51</i>	<i>0.002</i>	-	-	-	<i>0.016</i>
9/1/2011 result	-	<i>0.309</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	<i>3.09</i>	<i>3.09</i>	-	-	-	-	-
result / TAL	-	<i>0.062</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	<i>0.62</i>	<i>0.16</i>	-	-	-	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 201-3b Organic analytical results summary plot for PT-SMA-1**



## 202.0 PT-SMA-1.7: SWMU 15-006(a)

### 202.1 Site Descriptions

One historical industrial activity area is associated with I003, PT-SMA-1.7: Site 15-006(a).

SWMU 15-006(a) is a firing chamber (structure 15-184) and related equipment at TA-15 PHERMEX firing site. Review of the Site descriptions and activities conducted within PT-SMA-1.7 has identified that Site 15-006(a) was incorrectly associated with industrial materials to be monitored at the SMA. Site 15-006(a) is structure 15-184, which housed the equipment associated with the firing site. The firing site, 15-003, is the likely source of material released from the Site and the Site intended for regulation under the Individual Permit. Therefore, the current SMA location monitors runoff from the firing Site instead of runoff from structure 15-184.

The PHERMEX firing site and associated facilities were built in the early 1960s. Past environmental surveys at the PHERMEX firing site include an aerial radiological survey conducted in 1982 that identified elevated levels of uranium-238. A 1991 surface radiation survey identified elevated contact exposure rates believed to be associated with chunks of DU at the PHERMEX firing site.

Investigation of SWMU 15-006(a) is deferred per Section XI and Appendix A of the 2016 Consent Order; therefore, Consent Order nature and extent sampling has not been conducted at the Site.

However, Consent Order samples were collected in sediment catchment areas in the drainage downgradient of the Site to determine if contaminants are migrating from the Site. The migration of potential contaminants from SWMU 15-006(a) is limited to the drainage downgradient of the Site for most constituents and does not extend beyond Potrillo Canyon Reach PO-4.



PT-SMA-1.7, Rock Check Dam, I00306010022 (photo ID 32227-

Detected concentrations of inorganic and organic chemicals and radionuclides in Consent Order drainage samples were all below residential SSLs, except the single detection of arsenic, which was well below industrial SSL. Further Consent Order investigations are deferred until the firing site is no longer active.

The project map (Figure 202-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 202.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 202-1).

Enhanced controls were installed and certified on June 26, 2014, and submitted to EPA on July 11, 2014, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 202-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
I00302040017	Established Vegetation	-	X	X	-	B
I00303010018	Earthen Berm	-	X	-	X	EC
I00305040019	Gravel Infiltration Strip	-	X	-	X	EC
I00306010020	Rock Check Dam	-	X	-	X	EC
I00306010021	Rock Check Dam	-	X	-	X	EC
I00306010022	Rock Check Dam	-	X	-	X	EC
I00306010023	Rock Check Dam	-	X	-	X	EC
I00306010024	Rock Check Dam	-	X	-	X	EC
I00306010025	Rock Check Dam	-	X	-	X	EC
I00306010026	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 202.3 Storm Water Monitoring

SWMU 15-006(a) is monitored within PT-SMA-1.7. Following the installation of baseline control measures, a baseline confirmation sample was collected on September 10, 2012 (Figures 202-2 and 202-3). In Figure 202-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Inorganic analytical results from this baseline sample yielded the following TAL exceedance:

- Gross-alpha activity of 92.6 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 15-006(a):*

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 202-2 and 202-3. 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 202-2 and 202-3.

Monitoring location PT-SMA-1.7 receives storm water run-on from industrially developed locations (PHERMEX firing site) as well as locations with sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha background UTL for locations with 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 landscape is 32.5 pCi/L. The 2012 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2012 Annual Report.

#### 202.4 Inspections and Maintenance

RG262.4 recorded three storm events at PT-SMA-1.7 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 202-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61399	4-3-2017
Storm Rain Event	BMP-62437	6-19-2017
Storm Rain Event	BMP-62948	6-29-2017
Storm Rain Event	BMP-64192	8-2-2017

No maintenance activities or facility modifications affecting discharge were conducted at PT-SMA-1.7 in 2017.

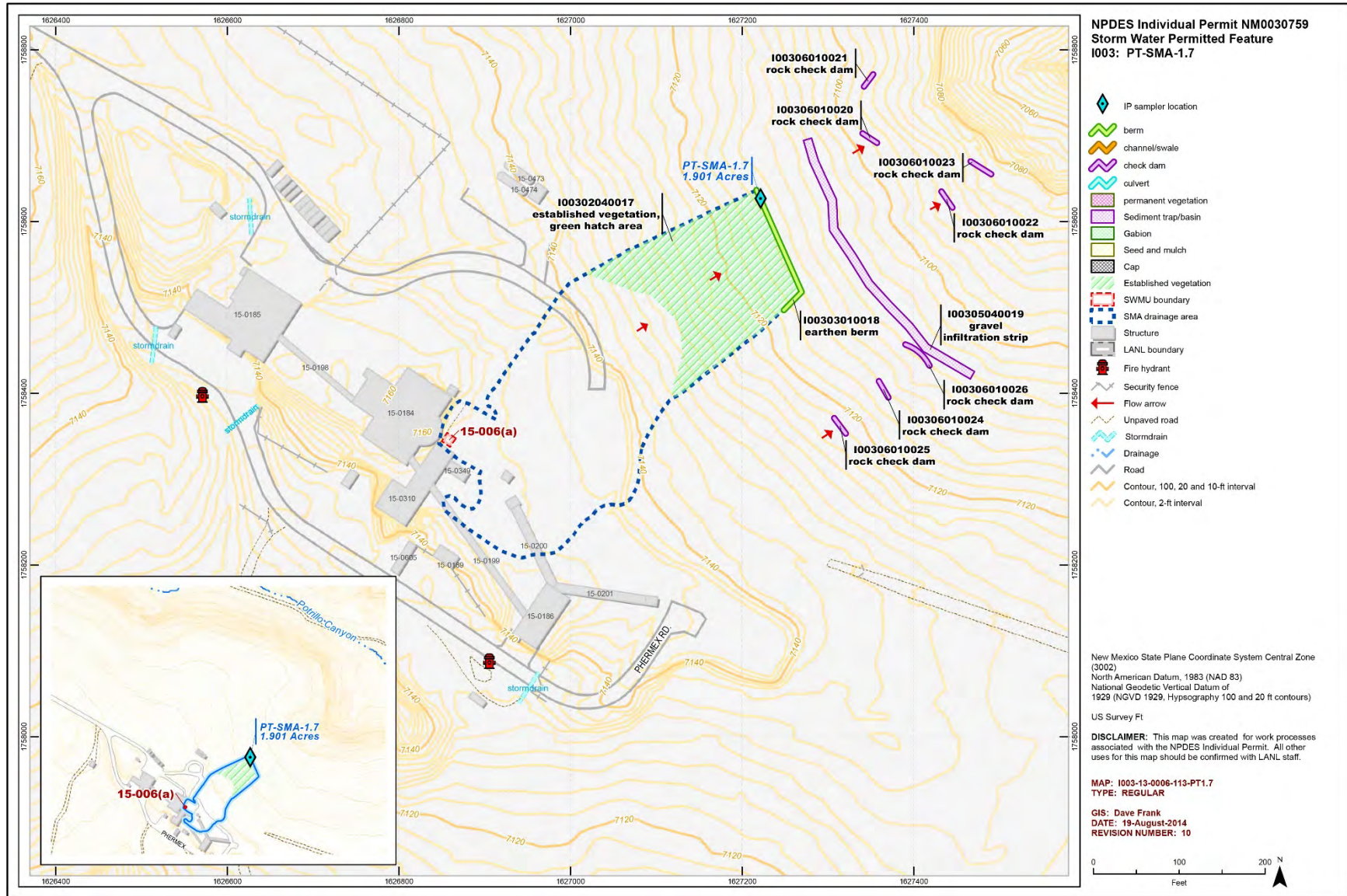
#### 202.5 Compliance Status

The Site associated with PT-SMA-1.7 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 202-3 presents the 2017 compliance status.

**Table 202-3 Compliance Status during 2017**

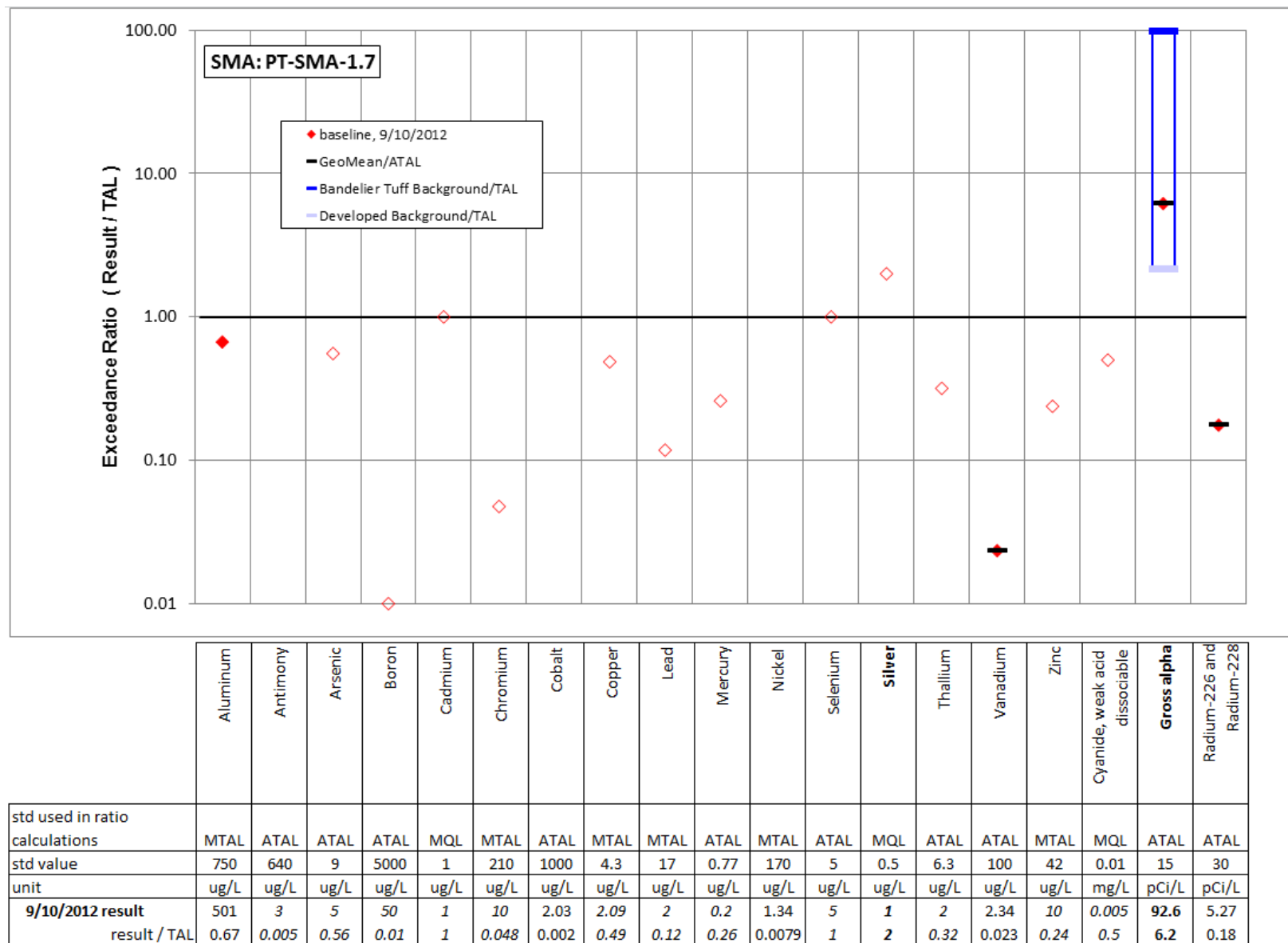
Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 15-006(a)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 11, 2014, "Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (CDV-SMA-2.41, F-SMA-2, LA-SMA-5.51, PT-SMA-1.7, S-SMA-0.25)."





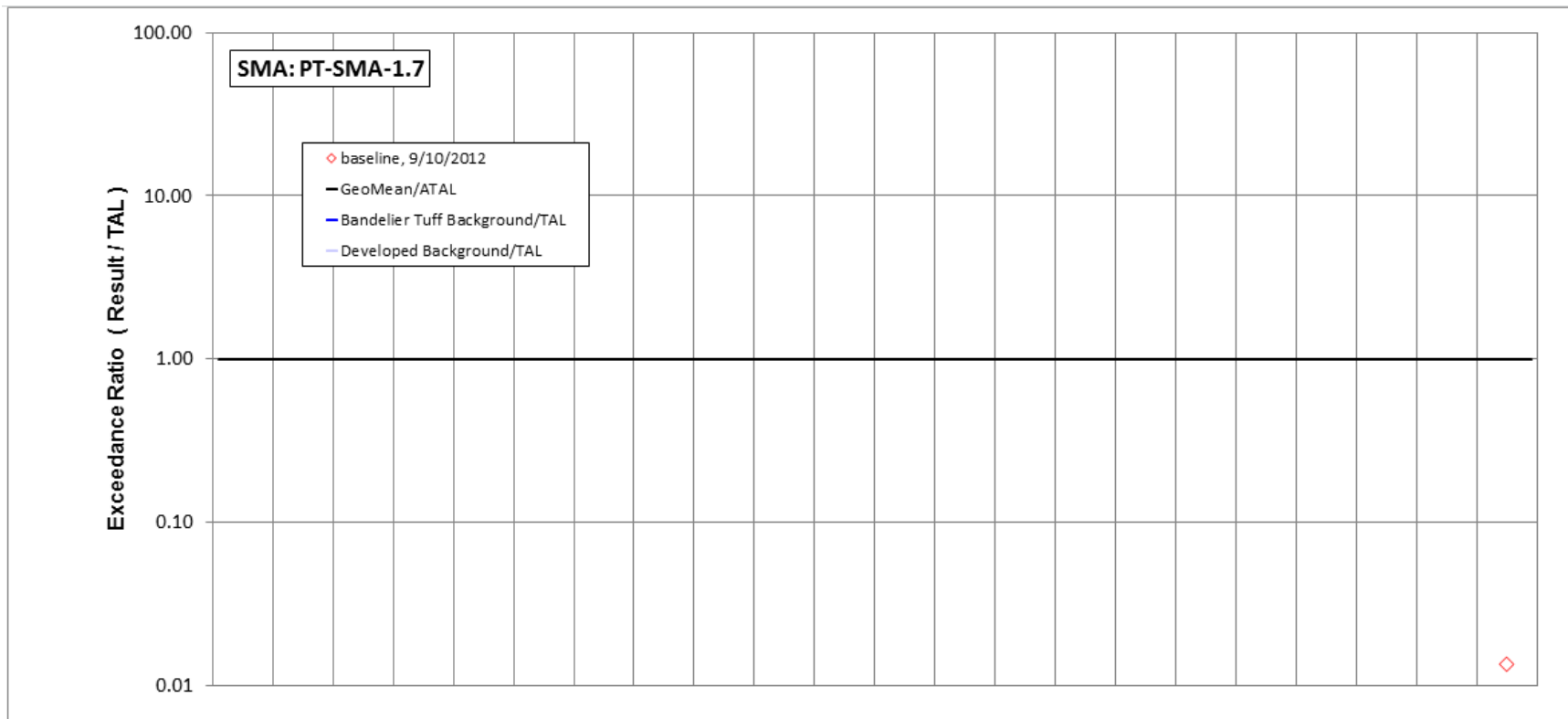
**Figure 202-1 PT-SMA-1.7 location map**





Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 202-2 Inorganic analytical results summary plot for PT-SMA-1.7



	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	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
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
9/10/2012 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	-	-	-	0.27
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	-	-	0.014

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 202-3 Organic analytical results summary plot for PT-SMA-1.7

## **203.0 PT-SMA-2: SWMU 36-003(b) and AOCs 15-008(f) and 36-004(e)**

### **203.1 Site Descriptions**

Three historical industrial activity areas are associated with I004, PT-SMA-2: Sites 36-003(b), 15-008(f), and 36-004(e).

SWMU 36-003(b) is a decommissioned septic system located at the west end of TA-36. The septic system consists of a septic tank (structure 36-61) and its associated drainlines and outfall. The septic tank sits near the edge of Mesita del Potrillo, approximately 100 ft southwest of building 36-55, the control bunker for the I-J Firing Site. The control bunker housed the electronics and instrumentation used in the operation of the I-J Firing Site [SWMU 36-004(e)] and also contained a toilet, sink, and water fountain, all of which were connected to the septic tank via a 4-in.-diameter clay-tile pipe. The septic tank is constructed of reinforced concrete with a capacity of 420 gal. The tank has a buried overflow pipe that previously discharged near the north rim of Potrillo Canyon. The overflow pipe was capped in 1989 to stop its discharge into the canyon. After the overflow pipe was capped, the septic tank continued to be used until the early 1990s when the tank was taken out of service. During that time, the tank's contents were periodically removed and taken to a sanitary WWTP for treatment and disposal. The contents of the SWMU 36-003(b) septic tank were sampled in 1981, and the analytical data confirmed HE was not present. The 1996 VCA implemented at SWMU 36-003(b) included removing the septic tank contents, pressure-washing the tank, and filling the tank with expanding cement. The contents of the tank were disposed of as LLW at TA-54, Area G, and at the TA-50 RLWTF; no confirmation samples were collected.

Phase I Consent Order sampling is complete for SWMU 36-003(b). All detected constituent concentrations were below residential SSLs and SALs. Nature and extent was reevaluated under the supplemental investigation report for Potrillo and Fence Canyons Aggregate Area, submitted to NMED in 2015. The Site was recommended for additional field characterization activities to define the extent of contamination for one or more chemicals/radionuclides.

AOC 15-008(f) consists of several sand mounds located next to I-J Firing Site [AOC 36-004(e)] at TA-15. I-J Firing Site is located on a mesa overlooking Potrillo Canyon and was originally located in TA-15 when it was constructed in 1948 but is now part of TA-36.

Investigation of AOC 15-008(f) is deferred per Section XI and Appendix A of the 2016 Consent Order; therefore, Consent Order nature and extent sampling has not been conducted at the Site. However, Consent Order samples were collected in sediment catchment areas in the drainages downgradient of I-J Firing Site [AOC 36-004(e)], which includes AOC 15-008(f), to determine if contaminants are migrating from the Site. The migration of potential contaminants from AOCs 15-008(f) and 36-004(e) is limited to the drainage downgradient of the Site for most constituents and does not extend beyond Potrillo Canyon Reach PO-4. Detected contaminant concentrations in Consent Order drainage samples were below residential SSLs and SALs, except for uranium-238, which was detected above the residential SAL but below the industrial SAL in two samples from one location in the drainage downgradient of AOCs 15-008(f) and 36-004(e). Further Consent Order investigations are deferred until the firing site is no longer active.

AOC 36-004(e) is I-J Firing Site located at the west end of TA-36 on Mesita del Potrillo along the north rim of Potrillo Canyon. I-J Firing Site consists of two firing points (I and J) and the control building (36-55). The Site was constructed in 1948 and was located in TA-15 until 1981 when the boundary of TA-36 was expanded to encompass the portion of TA-15 that contained the I-J Firing Site. Shots at I-J Firing Site used up to 500 lb of HE and involved a variety of solid and liquid explosives and inorganic

chemicals. According to former employees, significant amounts of DU were used at I-J Firing Site in addition to small quantities of mercury and cadmium. Some shots were fired into iron, copper, or lead targets. Other metals used in shots included aluminum, antimony, various steels, lithium-magnesium alloys, and lithium hydride. In addition, hydrocarbons, argon, benzene, small amounts of mercury, cadmium, and beryllium were used in shots. All shots involving radioactive materials at I-J Firing Site were conducted in fully enclosed containment vessels. These vessels were removed from the I-J Firing Site for use at TA-15, although one was later returned to the I-J Firing Site. The returned vessel was identified in the 1990 SWMU report as AOC C-36-001 and was subsequently removed from the Site in 1994. Other activities conducted at I-J Firing Site included tests in which DU projectiles were fired into an embankment. This projectile test area was designated as AOC C-36-006(e).

Investigation of AOC 36-004(e) is deferred per Section XI and Appendix A of the 2016 Consent Order; therefore, Consent Order nature and extent sampling has not been conducted at the Site. However, Consent Order samples were collected in sediment catchment areas in the drainages downgradient of the Site to determine if contaminants are migrating from the Site. The migration of potential contaminants from AOC 36-004(e) is limited to the drainage downgradient of the Site for most constituents and does not extend beyond Potrillo Canyon Reach PO-4. Detected constituent concentrations in Consent Order drainage samples were below residential SSLs and SALs, except for uranium-238, which was detected above the residential SAL but below the industrial SAL in two samples from one location in the drainage downgradient of the Site. Further Consent Order investigations are deferred until the firing site is no longer active.

The project map (Figure 203-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **203.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 203-1).

Enhanced controls were installed and certified on September 28, 2015, and submitted to EPA on September 29, 2015, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.



**Table 203-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
I00402040011	Established Vegetation	-	X	X	-	B
I00403010021	Earthen Berm	-	X	-	X	EC
I00403010022	Earthen Berm	X	-	-	X	EC
I00403010024	Earthen Berm	-	X	-	X	EC
I00403060012	Straw Wattle	X	-	-	X	EC
I00403060013	Straw Wattle	-	X	-	X	EC
I00403120010	Rock Berm	-	X	-	X	CB
I00403120023	Rock Berm	-	X	-	X	EC
I00404060020	Rip Rap	X	-	X	-	EC
I00406010014	Rock Check Dam	-	X	-	X	EC
I00406010015	Rock Check Dam	-	X	-	X	EC
I00406010016	Rock Check Dam	-	X	-	X	EC
I00406010017	Rock Check Dam	-	X	-	X	EC
I00406010018	Rock Check Dam	-	X	-	X	EC
I00406010019	Rock Check Dam	-	X	-	X	EC
I00406010025	Rock Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 203.3 Storm Water Monitoring

SWMU 36-003(b) and AOCs 15-008(f) and 36-004(e) are monitored within PT-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on July 7, 2014 (Figures 203-2 and 203-3). In Figures 203-2 and 203-3, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Copper concentration of 10.3 µg/L (MTAL is 4.3 µg/L) and
- Gross-alpha activity of 290 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 36-003(b):*

- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was detected at a concentration equivalent to the BV in 1 of the 3 shallow (i.e., less than 3 ft bgs) 2011 Consent Order soil samples.

- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at the Site.

*AOC 15-008(f):*

- Copper is likely associated with industrial materials historically managed at the Site. Copper was detected above BVs in 4 of 20 shallow 2011 Consent Order samples at a maximum concentration 1.3 times the soil BV.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. Uranium-234, uranium-235/236, and uranium-238 were each detected above soil, sediment, and tuff BVs in 7, 6, and 11 of 20 shallow Consent Order samples at maximum detected activities 24, 27, and 62 times the soil BVs, respectively. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

*AOC 36-004(e):*

- Copper is known to have been associated with industrial materials historically managed at the Site. Copper was detected above BVs in 4 of 20 shallow 2011 Consent Order samples at a maximum concentration 1.3 times the soil BV.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. Uranium-234, uranium-235/236, and uranium-238 were each detected above soil, sediment, and tuff BVs in 7, 6, and 11 of 20 shallow Consent Order samples at maximum detected activities 24, 27, and 62 times the soil BVs, respectively. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 203-2 and 203-3. 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 203-2 and 203-3.

Monitoring location PT-SMA-2 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2014 is between these two values.

- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2014 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2014 Annual Report.

### 203.4 Inspections and Maintenance

RG262.4 recorded three storm events at PT-SMA-2 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 203-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61400	4-4-2017
Storm Rain Event	BMP-62438	6-14-2017
Storm Rain Event	BMP-62949	7-5-2017
Storm Rain Event	BMP-64193	8-9-2017

No maintenance activities or facility modifications affecting discharge were conducted at PT-SMA-2 in 2017.

### 203.5 Compliance Status

The Sites associated with PT-SMA-2 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 203-3 presents the 2017 compliance status.

**Table 203-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 15-008(f)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas."
SWMU 36-003(b)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas."
AOC 36-004(e)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas."



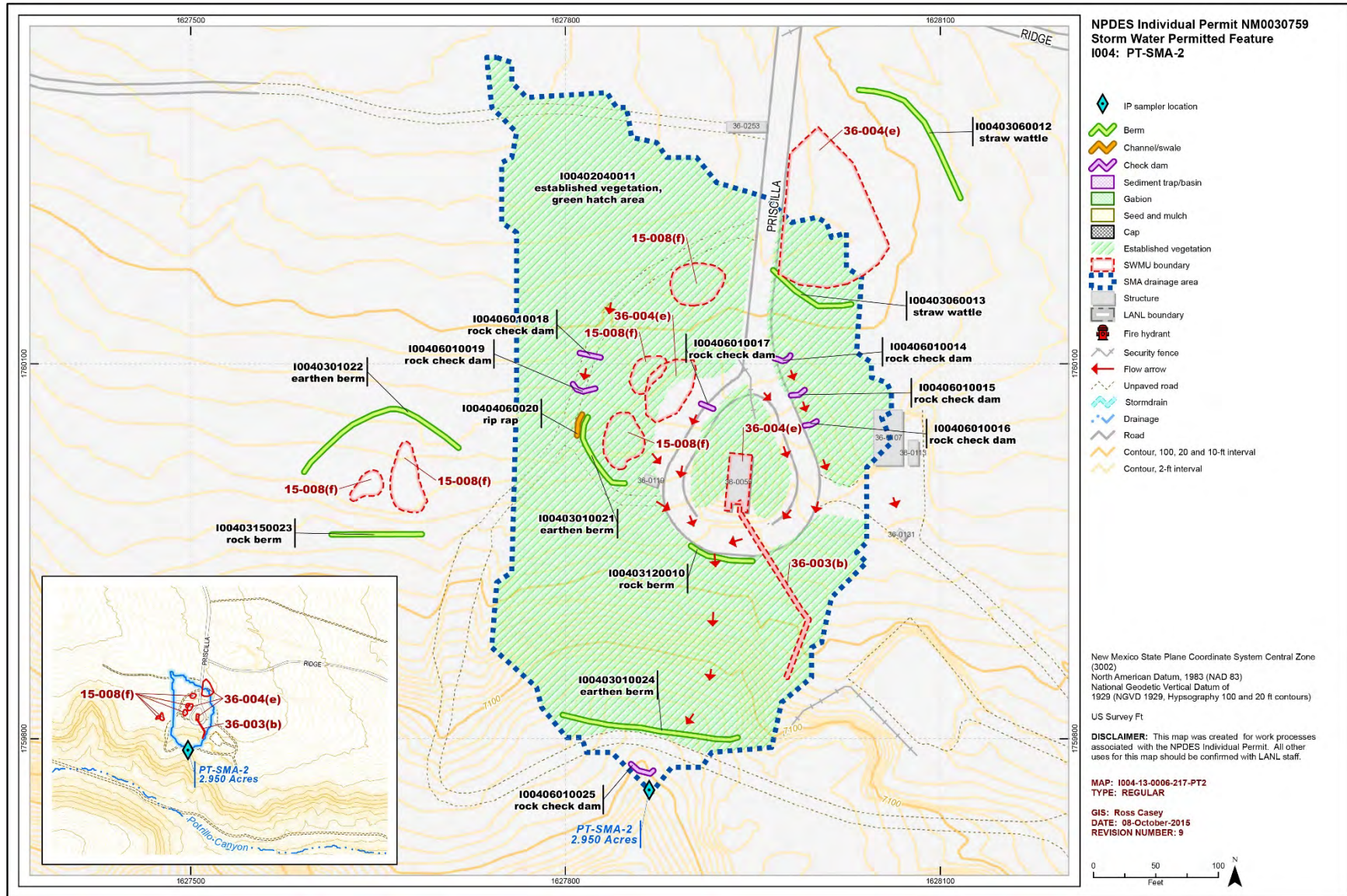
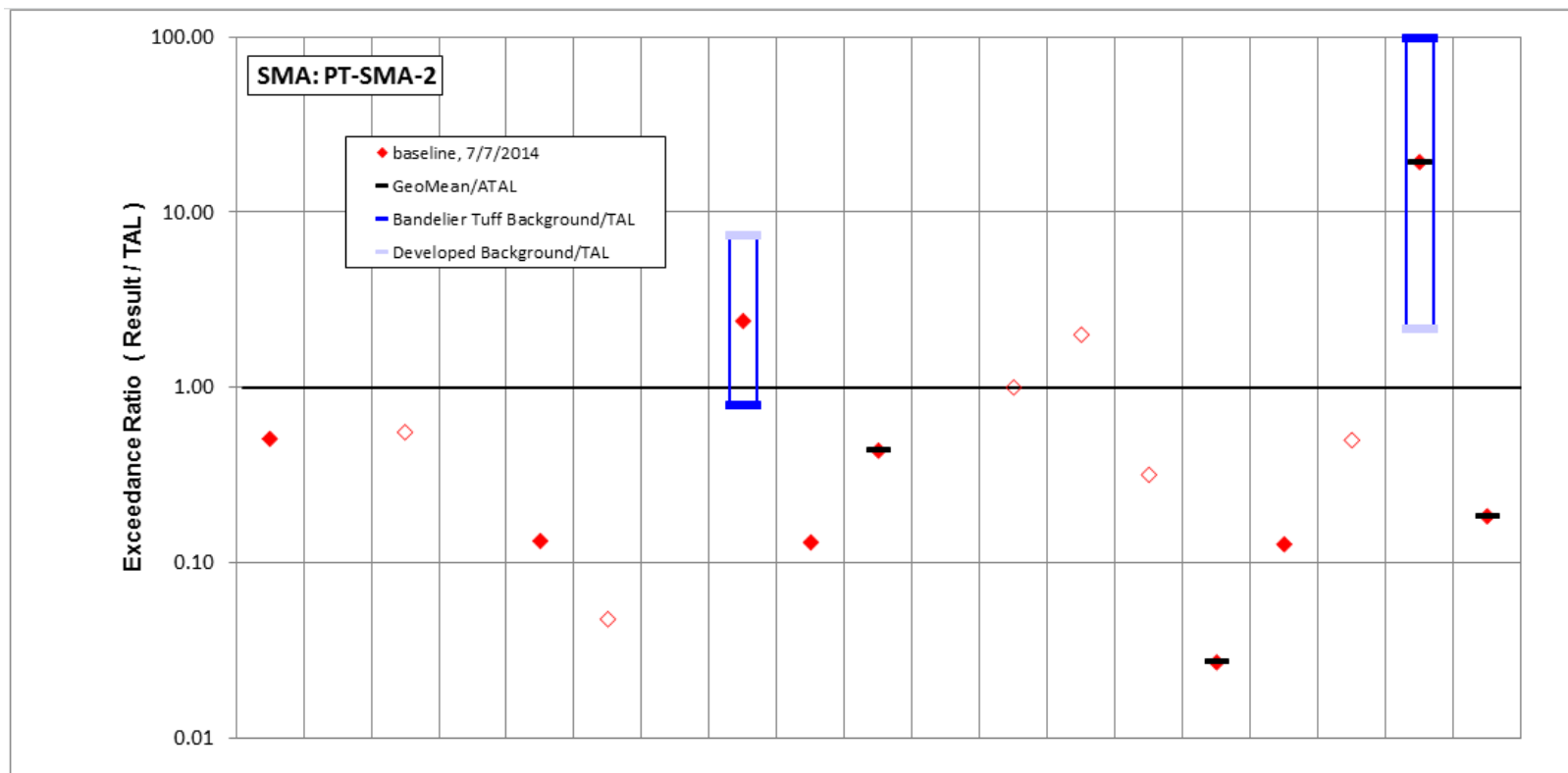


Figure 203-1 PT-SMA-2 location map

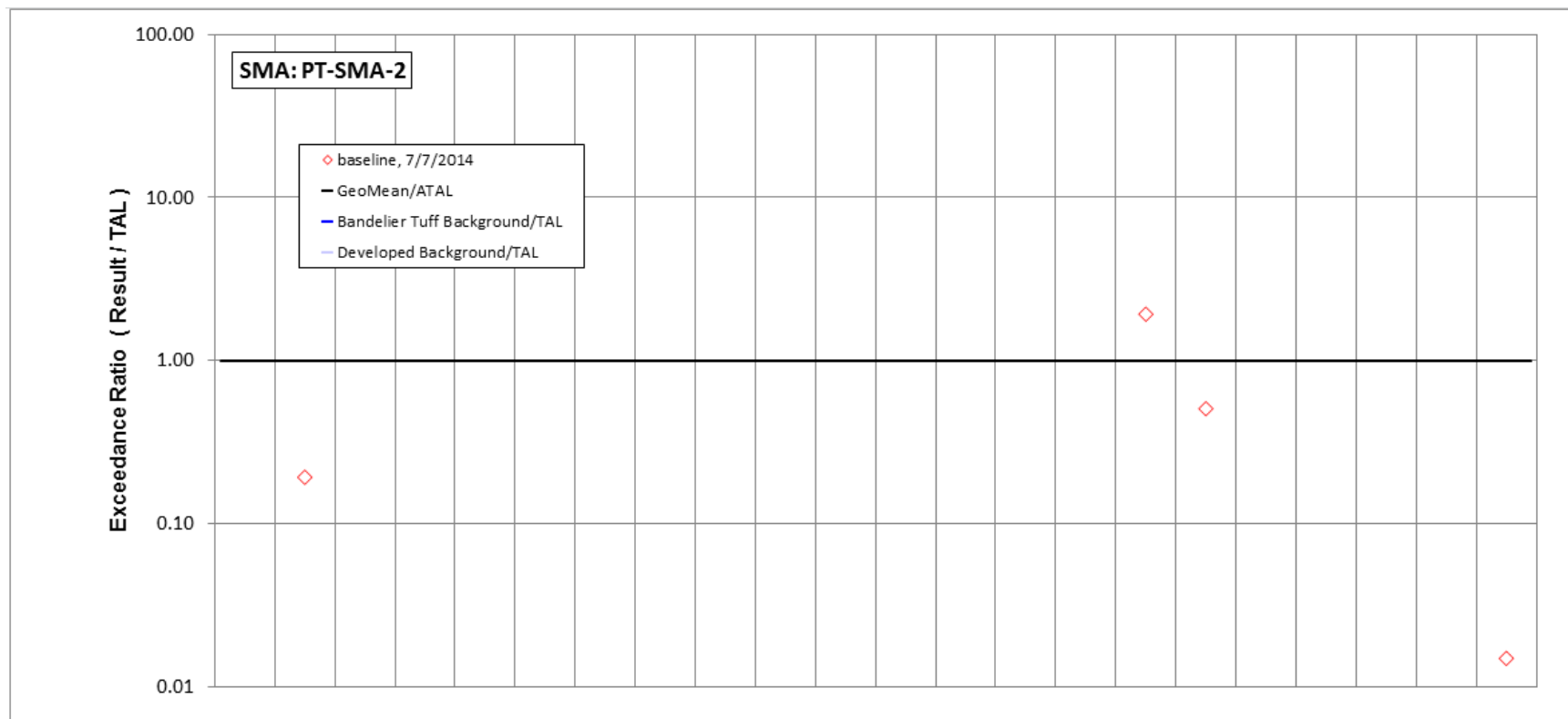




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	Mercury	Nickel	Selenium	<b>Silver</b>	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/7/2014 result</b>	382	4.05	5	22.2	0.133	10	5	<b>10.3</b>	2.22	0.336	1.64	5	<b>1</b>	2	2.7	5.35	0.005	<b>290</b>	5.52
result / TAL	0.51	0.0063	0.56	0.0044	0.13	0.048	0.005	<b>2.4</b>	0.13	0.44	0.0096	1	<b>2</b>	0.32	0.027	0.13	0.5	<b>19</b>	0.18

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 203-2 Inorganic analytical results summary plot for PT-SMA-2**



	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	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	ATAL	-	-	-	-	ATAL
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	200	-	-	-	-	20
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	ug/L
7/7/2014 result	-	0.962	-	-	-	-	-	-	-	-	-	-	-	-	-	9.62	9.62	0.298	-	-	-	-	0.298
result / TAL	-	0.19	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	0.51	0.002	-	-	-	-	0.015

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 203-3 Organic analytical results summary plot for PT-SMA-2

## 204.0 PT-SMA-2.01: AOCs C-36-001 and C-36-006(e)

### 204.1 Site Descriptions

Two historical industrial activity areas are associated with I004A, PT-SMA-2.01: Sites C-36-001 and C-36-006(e).

AOC C-36-001 is a former containment vessel that provided secondary containment for explosives tests at TA-36. The containment vessel was manufactured in 1970 and located at the PHERMEX test facility at TA-15. The containment vessel was later relocated to the I-J Firing Site and placed south of building 36-55, where it remained until 1983 when it was removed. The containment vessel consisted of a 19.5-ton, 12-ft-diameter steel sphere. An explosive device was placed and detonated in a primary containment vessel which, in turn, was placed inside the AOC C-36-001 containment vessel. The explosion gases were vented through a filtration system that captured particulates and did not allow release of the test material. No specific location(s) exists for this Site; the location is identified only as the general area south of building 36-55. In 1994, a VCA was implemented at AOC C-36-001 that involved decontamination and disposal of the vessel. The vessel was taken from TA-36 to building 15-233 for initial decontamination and was subsequently taken to the facility at TA-50 for further decontamination. It was then returned to TA-15 pending acceptance for disposal at TA-54, Area G. In October 1994, the containment vessel was disposed of at MDA G at TA-54. No confirmation samples were collected during the VCA.

The previous locations of the former containment vessel used at PHERMEX and the I-J Firing Site are not known and would have been impacted by historical and current firing site operations. Therefore, characterization of any releases from AOC C-36-001 will be accomplished by future investigations at the PHERMEX and I-J Firing Site. Investigation of both PHERMEX and I-J Firing Site is deferred per Section XI and Appendix A of the 2016 Consent Order.

AOC C-36-006(e) is a former projectile test area located within the southern portion of the I-J Firing Site [AOC 36-004(e)] along the north rim of Potrillo Canyon. AOC C-36-006(e) was formerly used for testing DU projectiles as part of I-J Firing Site activities. Projectiles were fired from a 120-mm gun into a nearby embankment. Although some projectiles were recovered after an experiment was completed, much of the projectile material remains on-site. Originally, the I-J Firing Site was located within the boundary of TA-15. In 1981, the boundary of TA-36 was expanded to include portions of TA-15. As part of this expansion, the area where I-J Firing Site was located was transferred to TA-36. Although the 1990 SWMU report addresses the I-J Firing Site as AOC 36-004(e), it addresses the nearby projectile test area (which was also part of the 1981 transfer to TA-36) as AOC 15-006(e). AOC 15-006(e) was renamed AOC C-36-006(e) in the OU 1086 work plan because the projectile test area was within the boundaries of TA-36 when the work plan was written.

Previous investigations conducted at I-J Firing Site, which encompasses AOC C-36-006(e), consisted of a surface radiological survey conducted in 1991 that identified areas of elevated radioactivity at the time of the survey. Numerous pieces of DU and oxidized DU were present around the Site. Based on the presence of visible pieces of DU, an interim action plan was prepared in 1997 that called for removing visible pieces of DU from the firing site and surrounding area and installing storm water controls. However, the plan was never implemented.

AOC C-36-006(e) is encompassed by the I-J Firing Site, which is deferred for investigation per Section XI and Appendix A of the 2016 Consent Order. However, Consent Order samples were collected in sediment catchment areas in the drainages downgradient of the Site to determine if contaminants are migrating from the Site, which includes the I-J Firing Site. Concentrations of detected inorganic

chemicals and organic chemicals and radionuclide activities decreased in the drainages downgradient of the Site and were not detected or not detected above BVs in samples collected from the bottom of the drainage below the Site. All detected concentrations and activities are below residential SSLs and SALs.

The project map (Figure 204-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 204.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 204-1).

Enhanced controls were installed and certified on August 3, 2012, and submitted to EPA on August 27, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 204-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
I004A02040005	Established Vegetation	-	X	X	-	B
I004A03010004	Earthen Berm	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 204.3 Storm Water Monitoring

AOCs C-36-001 and C-36-006(e) are monitored within PT-SMA-2.01. Following the installation of baseline control measures, a baseline confirmation sample was collected on August 18, 2011 (Figures 204-2 and 204-3). Inorganic analytical results from this baseline sample yielded the following TAL exceedance:

- Gross-alpha activity of 295 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### AOC C-36-001:

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Consent Order sampling has not been conducted; the location of the former containment vessel is not known.

#### AOC C-36-006(e):

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Consent Order sampling has not been conducted; the location of the former containment vessel is not known.



TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 204-2 and 204-3. 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 204-2 and 204-3.

The SMA receives runoff from industrially developed (I-J Firing Site) areas and undeveloped areas. The concentration of gross-alpha radioactivity detected in the SMA sample was above the BV for runoff from developed areas and below the BV for runoff from undeveloped areas. These results are consistent with the land use within the SMA drainage area.

All the analytical results for these samples are reported in the 2011 Annual Report.

#### 204.4 Inspections and Maintenance

RG262.4 recorded three storm events at PT-SMA-2.01 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 204-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61401	4-4-2017
Storm Rain Event	BMP-62439	6-14-2017
Storm Rain Event	BMP-62950	7-5-2017
Storm Rain Event	BMP-64194	8-9-2017

No maintenance activities or facility modifications affecting discharge were conducted at PT-SMA-2.01 in 2017.

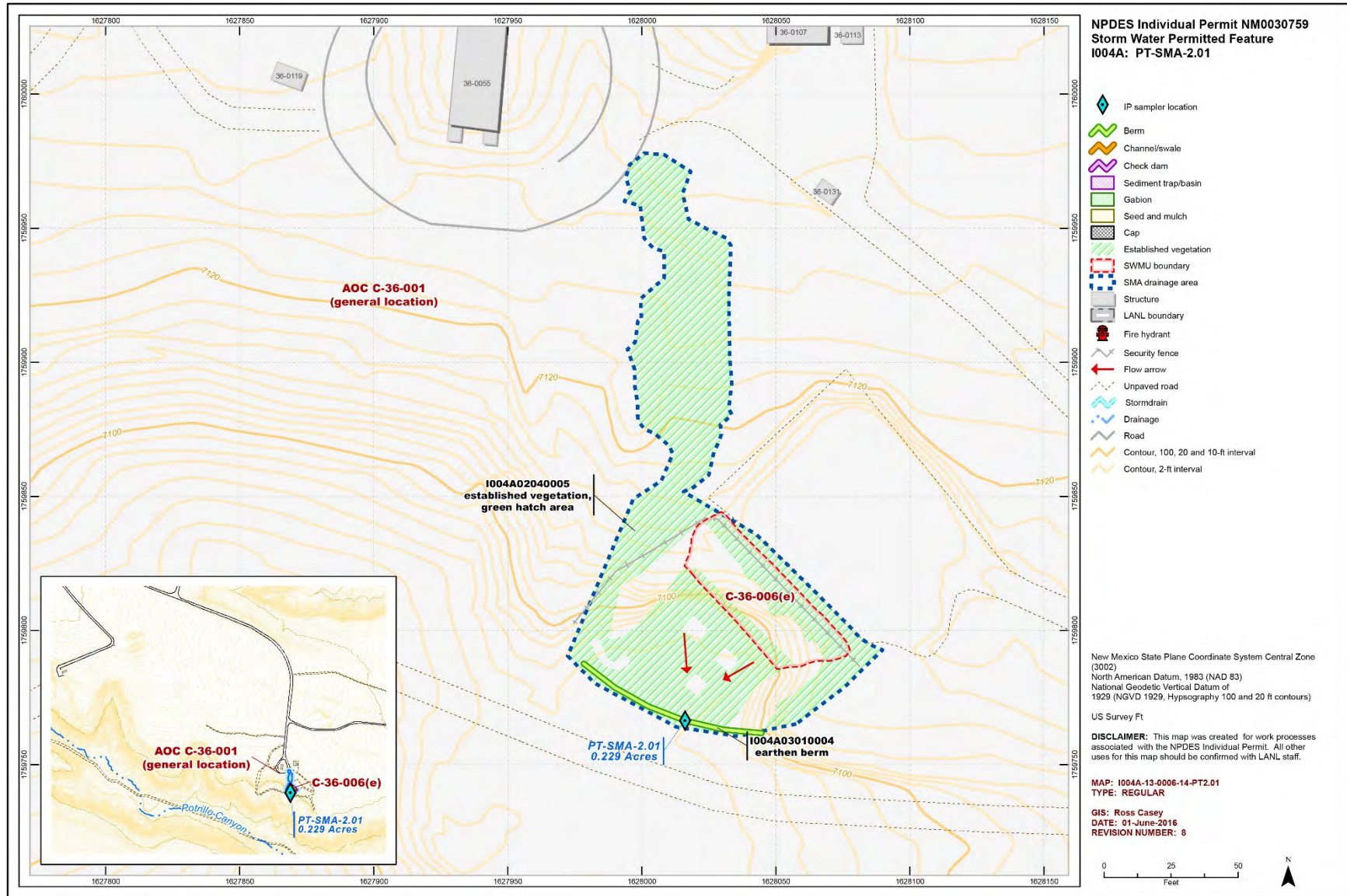
#### 204.5 Compliance Status

The Sites associated with PT-SMA-2.01 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 204-3 presents the 2017 compliance status.

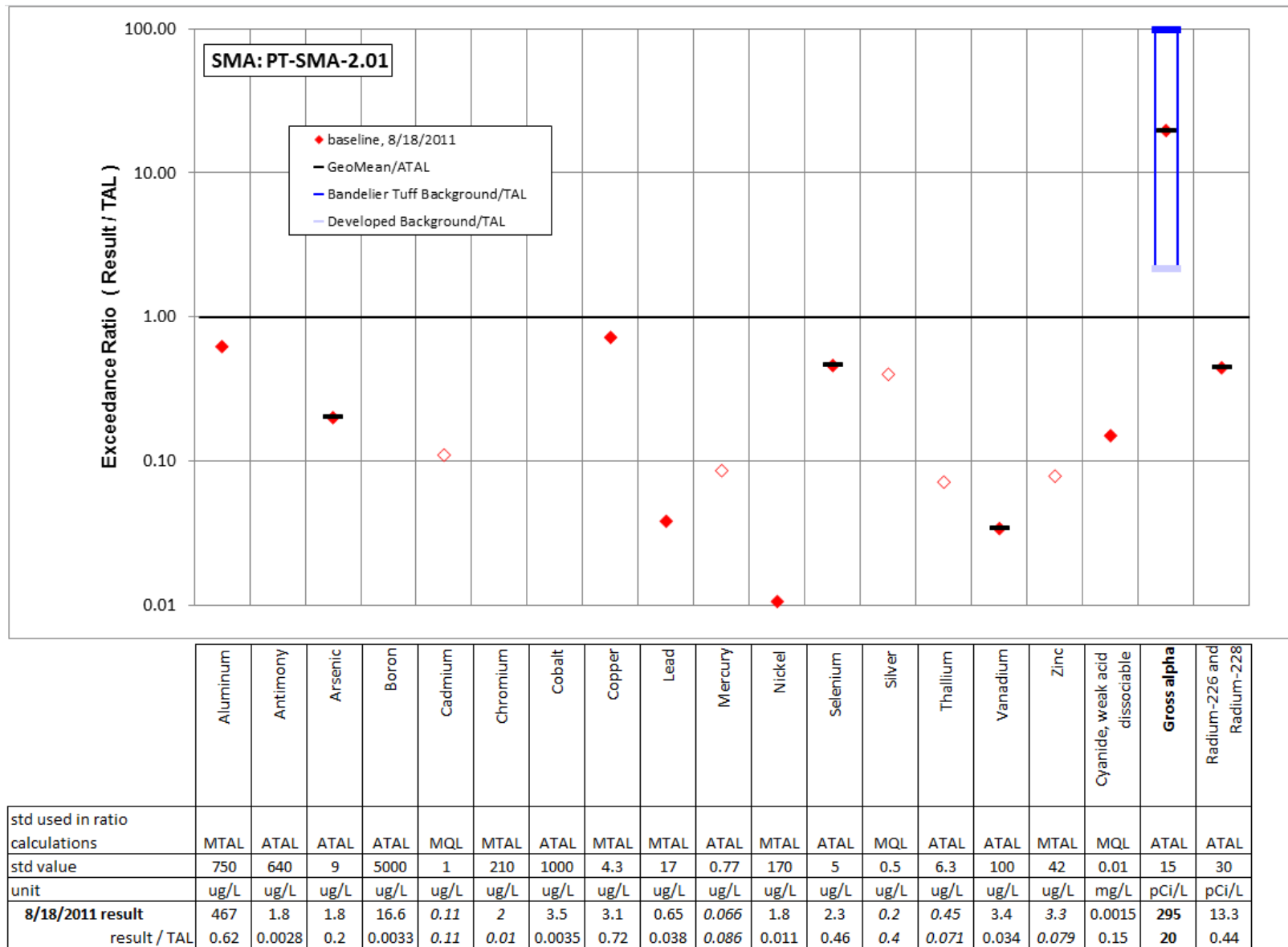
**Table 204-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC C-36-001	Enhanced Control Corrective Action Monitoring	Corrective Action Complete	LANL, August 28, 2017, “NPDES Permit No. NM0030759 - Completion of Corrective Action for Site C-36-001 in PT-SMA-2.01.”
AOC C-36-006(e)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, August 27, 2012, “Certification of Enhanced Control Measures for Eight Site Monitoring Areas.”

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.

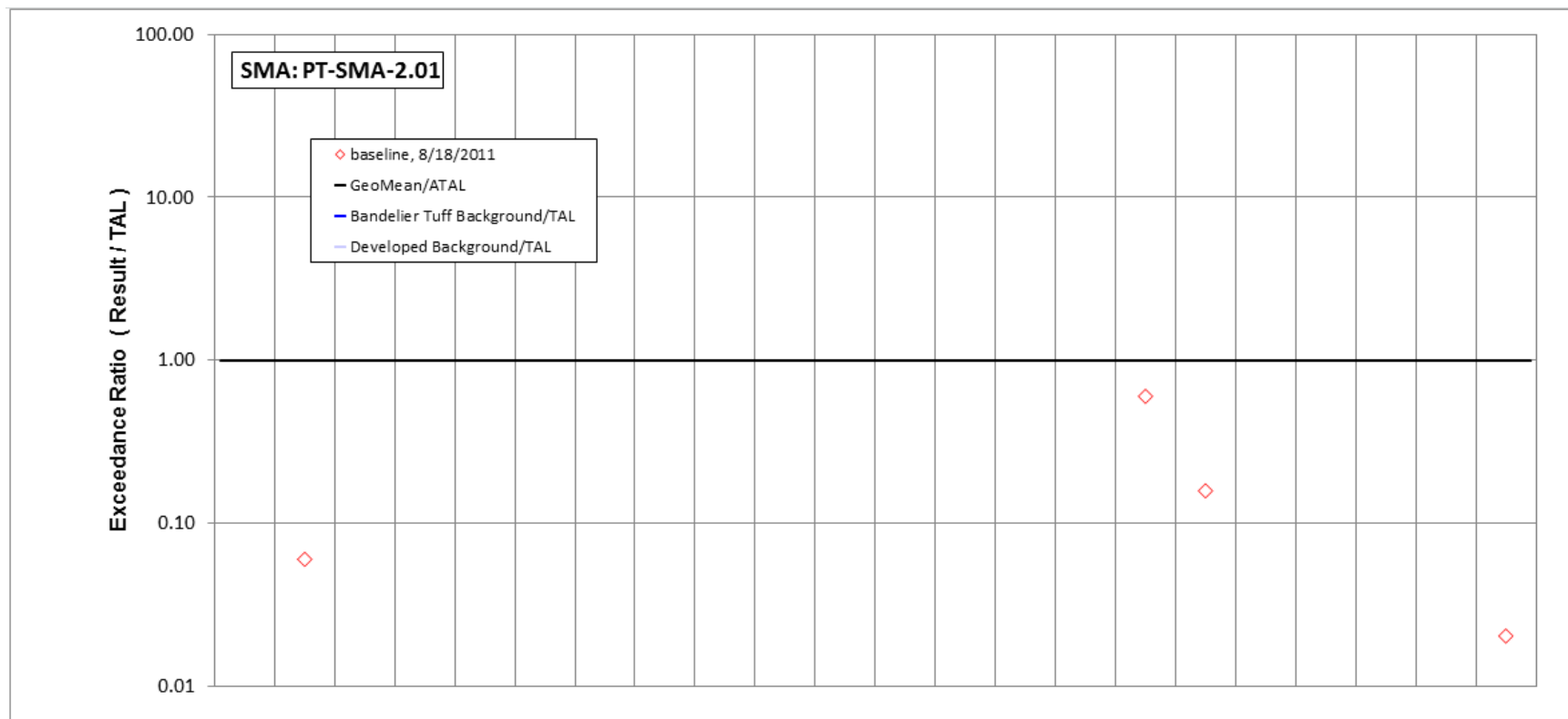


**Figure 204-1 PT-SMA-2.01 location map**



Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 204-2 Inorganic analytical results summary plot for PT-SMA-2.01**



	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	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	ATAL	-	-	-	-	ATAL
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	200	-	-	-	-	20
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	ug/L
8/18/2011 result	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	0.406	-	-	-	-	0.406
result / TAL	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.16	0.002	-	-	-	-	0.02

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 204-3 Organic analytical results summary plot for PT-SMA-2.01



## **205.0 PT-SMA-3: SWMU 36-006 and AOC 36-004(a)**

### **205.1 Site Descriptions**

Two historical industrial activity areas are associated with I005, PT-SMA-3: Sites 36-006 and 36-004(a).

SWMU 36-006 consists of a former surface disposal area that was located on the southern slope of Potrillo Canyon, approximately 600 ft north of the Eenie Firing Site [AOC 36-004(a)] at TA-36.

SWMU 36-006 was used from 1955 to 1970 to dispose of cables, metal, concrete, and other similar debris from the TA-36 firing sites. The debris covered an area approximately 75 ft wide that extended approximately 100 ft down the south canyon slope. The remainder of the debris was scattered laterally 300 ft along the south canyon slope. This debris was dumped into the canyon from trucks on the canyon rim. Although the TA-36 firing sites were still active at that time, SWMU 36-006 was not used as a surface disposal area after 1996. Firing site personnel removed most of the debris between 1999 and 2006. All remaining debris was removed from the SWMU 36-006 surface disposal area during the 2010 Consent Order investigation.

Phase I Consent Order sampling is complete for SWMU 36-006. SWMU 36-006 was recommended for corrective action complete with controls in the supplemental investigation report for Potrillo and Fence Canyons Aggregate Area, submitted to NMED in September 2015. SWMU 36-006 will be eligible for a COC upon approval of the report by NMED.

AOC 36-004(a) is the active Eenie Firing Site located at TA-36 on Mesita del Potrillo on the rim of Potrillo Canyon. AOC 36-004(a) consists of the impact area, a control bunker (building 36-0003), and a make-up building (36-4) that contains a storage area. Construction of the Eenie Firing Site began in 1949 and was completed in 1951. Materials used in experimental shots include lead oxide, mercury, copper, nickel, brass, DU, and nitroglycerine. Other activities conducted at the Site include shoulder-mounted projectiles fired into targets in the southern portion of the firing site.

Investigation of AOC 36-004(a) is deferred per Section XI and Appendix A of the 2016 Consent Order; therefore, Consent Order nature and extent sampling has not been conducted at the Site. However, Consent Order samples were collected in sediment catchment areas in the drainage downgradient of the Site to determine if contaminants are migrating from the Site. The migration of potential contaminants from AOC 36-004(a) is limited to the drainage below AOC 36-004(a) for most constituents and does not extend beyond Potrillo Canyon Reach PO-4. All detected constituents in samples collected in the drainage downgradient of AOC 36-004(a) were below residential SSLs and SALs. Further Consent Order investigations are deferred until the firing site is no longer active.

The project map (Figure 205-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **205.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 205-1).

Enhanced controls were installed and certified on August 10, 2015, and submitted to EPA on August 17, 2015, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 205-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
I00502040009	Established Vegetation	-	X	X	-	B
I00503010030	Earthen Berm	X	-	X	-	EC
I00503060017	Straw Wattle	X	-	-	X	B
I00503060018	Straw Wattle	X	-	-	X	B
I00503120015	Rock Berm	X	-	-	X	B
I00503140039	Coir Log	X	-	-	X	B
I00504030016	Rock Channel/Swale	X	-	X	-	B
I00504040005	Culvert	-	X	X	-	CB
I00504060038	Rip Rap	-	X	-	X	EC
I00505020037	Sediment Basin	-	X	-	X	EC
I00506010021	Rock Check Dam	X	-	-	X	B
I00506010022	Rock Check Dam	X	-	-	X	B
I00506010023	Rock Check Dam	X	-	-	X	B
I00506010024	Rock Check Dam	X	-	-	X	B
I00506010026	Rock Check Dam	X	-	-	X	B
I00506010027	Rock Check Dam	X	-	-	X	B
I00506010031	Rock Check Dam	X	-	-	X	EC
I00506010032	Rock Check Dam	X	-	-	X	EC
I00506010033	Rock Check Dam	X	-	-	X	EC
I00506010034	Rock Check Dam	X	-	-	X	EC
I00506010035	Rock Check Dam	X	-	-	X	EC
I00506010036	Rock Check Dam	X	-	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 205.3 Storm Water Monitoring

SWMU 36-006 and AOC 36-004(a) are monitored within PT-SMA-3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 15, 2014 (Figures 205-2 and 205-3). In Figure 205-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Gross-alpha activity of 548 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

**SWMU 36-006:**

- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity or radium isotopes but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. Uranium-238 was detected above the soil BV in 3 of 28 shallow (i.e., less than 3 ft bgs) 2011 Consent Order samples at a highest detected activity of 2.3 times the soil BV. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

**AOC 36-004(a):**

- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at the Site. No samples have been collected at this Site.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 205-2 and 205-3. 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 205-2 and 205-3.

Monitoring location PT-SMA-3 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2014 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2014 Annual Report.

**205.4 Inspections and Maintenance**

RG267.4 recorded three storm events at PT-SMA-3 during the 2017 season. These rain events triggered four post-storm inspection. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 205-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61374	4-6-2017
Storm Rain Event	BMP-64202	8-10-2017
Storm Rain Event	BMP-65421	9-20-2017
Storm Rain Event	BMP-66327	10-18-2017

No maintenance activities or facility modifications affecting discharge were conducted at PT-SMA-3 in 2017.

**205.5 Compliance Status**

The Sites associated with PT-SMA-3 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 205-3 presents the 2017 compliance status.

**Table 205-3 Compliance Status during 2017**

<b>Site</b>	<b>Compliance Status on Jan 1, 2017</b>	<b>Compliance Status on Dec 31, 2017</b>	<b>Comments</b>
AOC 36-004(a)	Enhanced Control Corrective Action Initiated	Enhanced Control Corrective Action Monitoring	LANL, August 17, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Eight Site Monitoring Areas."
SWMU 36-006	Enhanced Control Corrective Action Initiated	Enhanced Control Corrective Action Monitoring	LANL, August 17, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Eight Site Monitoring Areas."



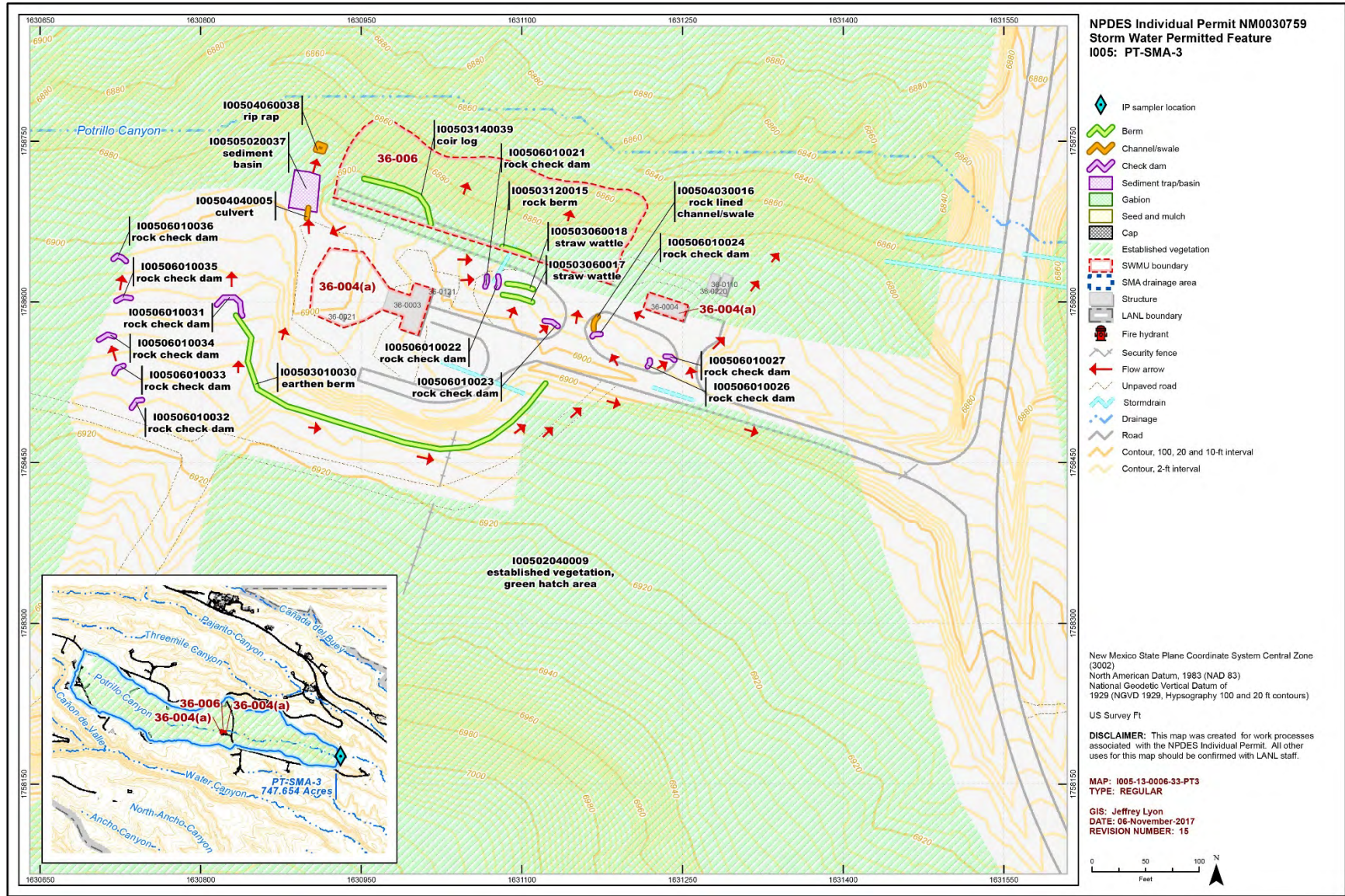
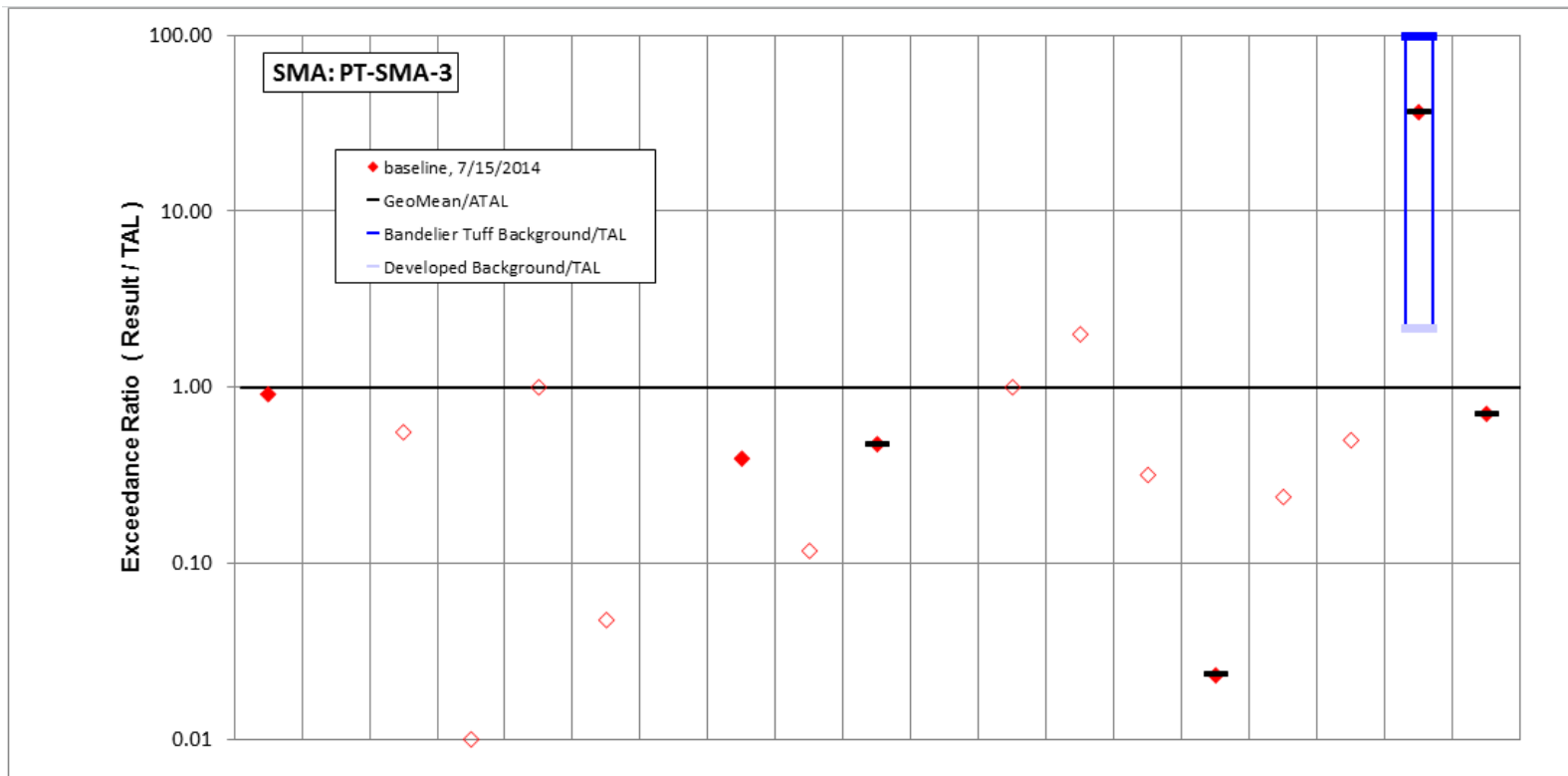


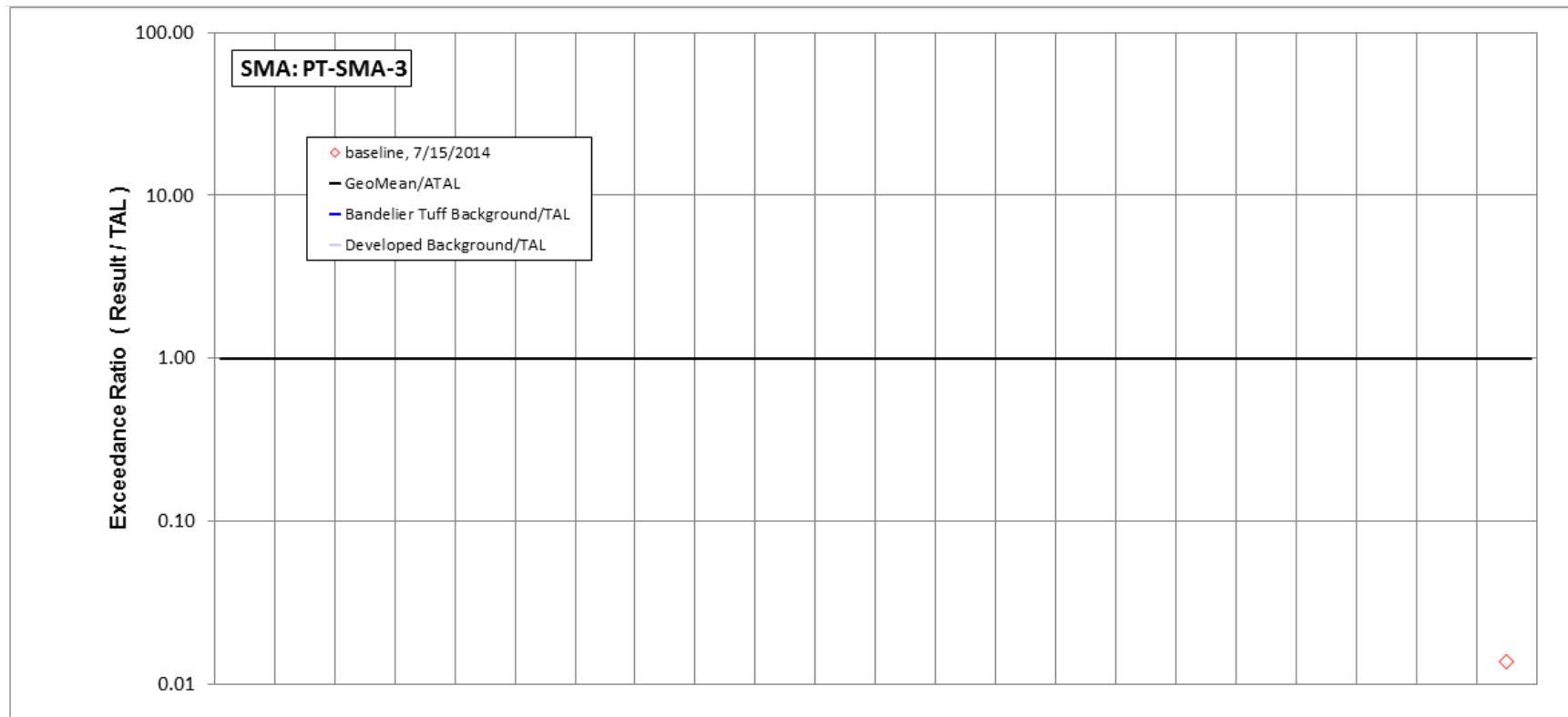
Figure 205-1 PT-SMA-3 location map



	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/15/2014 result</b>	685	3	5	50	1	10	2.46	1.69	2	0.366	1.19	5	1	2	2.31	10	0.005	<b>548</b>	21.2
result / TAL	0.91	0.005	0.56	0.01	1	0.048	0.0025	0.39	0.12	0.48	0.007	1	2	0.32	0.023	0.24	0.5	37	0.71

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 205-2 Inorganic analytical results summary plot for PT-SMA-3**



	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	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
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
7/15/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.275	-	-	-	0.275
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	-	-	0.014

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 205-3 Organic analytical results summary plot for PT-SMA-3



## 206.0 PT-SMA-4.2: SWMU 36-004(d)

### 206.1 Site Descriptions

One historical industrial activity area is associated with I007, PT-SMA-4.2: Site 36-004(d).

SWMU 36-004(d) consists of the active Lower Slobbovia Firing Site and the inactive Skunk Works Firing Site, located in Potrillo Canyon, and three former burn pits located on the mesa top above Potrillo Canyon at TA-36. The Lower Slobbovia Firing Site consists of two active firing points and a control building (36-12). One of the firing points (structure 36-13) was constructed in 1950 and is located on top of an approximately 200-ft-diameter sand and dirt pad. The control building (36-12) was constructed into the side of the pad. The second firing point consisted of a wooden tower (structure 36-120) constructed in 1986 at the northwest end of a 1000-ft-long sled track for conducting drop tests. Shots fired at the Lower Slobbovia Firing Site primarily involved HE. Less than 2% of the shots involved significant amounts of metal (e.g., DU, lead, copper, aluminum, and steel). The largest shot fired at Lower Slobbovia used 5000 to 6000 lb of HE. In addition, underground tests, buried to approximately 100 ft, were conducted at this Site.

The Skunk Works Firing Site, located approximately 0.5 mi northwest of the Lower Slobbovia Firing Site, was used to conduct small-explosives experiments during the 1950s. These experiments involved gas (acetylene and oxygen), liquid (tetranitromethane), and solid explosives. Beryllium and radioactive materials were not used at the Site. Structures at the Skunk Works Firing Site included a 5- × 5.5- × 5-ft belowgrade structure that previously served as a battery storage room and two buildings (36-44 and 36-45) that were moved to the Site from TA-15. All the structures have been removed. The Skunk Works firing pad was located next to building 36-45. A shallow depression, located approximately 100 ft farther up the canyon, was also used as a firing pad. The burn pits were used for burning and disposal of test debris before MDA AA (SWMU 36-001) was established in the mid-1960s. These pits are located on Mesita del Potrillo approximately 4000 ft west of the Lower Slobbovia control building (36-12). The largest pit is a bermed enclosure located north of Potrillo Road and is approximately 40 ft in diameter. Two smaller areas are located south of Potrillo Road. Debris was transported by truck from TA-36 firing sites to the pits, placed in the pits, and burned. The debris consisted of wood, nails, other metal fragments, plastics, and sand contaminated with barium, uranium, and HE.

Investigation of SWMU 36-004(d) is deferred per Section XI and Appendix A of the 2016 Consent Order; therefore, Consent Order nature and extent sampling has not been conducted at the Site. However, Consent Order samples were collected in sediment catchment areas in the drainages downgradient of all portions of the Site to determine if contaminants are migrating from the Site. The migration of potential contaminants from SWMU 36-004(d) is limited to the drainages below SWMU 36-004(d) for most constituents and does not extend beyond Potrillo Canyon Reach PO-4 or Fence Canyon Reach F-3. All detected constituents in samples collected in drainages downgradient of SWMU 36-004(d) were below residential SSLs and SALs. Further Consent Order investigations are deferred until the firing site is no longer active.

The project map (Figure 206-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.



## 206.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 206-1).

Enhanced controls were installed and certified on October 28, 2015, and submitted to EPA on October 30, 2015, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 206-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
I00701010037	Seed and Wood Mulch	-	X	X	-	B
I00701010053	Seed and Wood Mulch	-	X	X	-	B
I00701010054	Seed and Wood Mulch	-	X	X	-	B
I00701010058	Seed and Wood Mulch	-	X	X	-	B
I00701020038	Seed and Gravel Mulch	-	X	X	-	B
I00701060021	Erosion Control Blanket	-	-	X	-	EC
I00702040008	Established Vegetation	X	X	X	-	B
I00703010014	Earthen Berm	-	X	-	X	EC
I00703010022	Earthen Berm	-	-	X	-	EC
I00703010024	Earthen Berm	-	X	-	X	EC
I00703010025	Earthen Berm	-	X	-	X	EC
I00703010026	Earthen Berm	-	X	-	X	EC
I00703010027	Earthen Berm	-	X	-	X	EC
I00703010028	Earthen Berm	-	X	-	X	EC
I00703010029	Earthen Berm	-	X	-	X	EC
I00703010035	Earthen Berm	-	X	-	X	B
I00703010044	Earthen Berm	-	X	-	X	B
I00703120007	Rock Berm	-	X	-	X	B
I00703120009	Rock Berm	-	X	-	X	B
I00703140015	Coir Log	-	X	-	X	EC
I00703140016	Coir Log	-	X	-	X	EC
I00703140017	Coir Log	-	X	-	X	EC
I00703140018	Coir Log	-	X	-	X	EC
I00703140019	Coir Log	-	X	-	X	EC
I00703140020	Coir Log	-	X	-	X	EC
I00704040005	Culvert	X	-	X	-	CB
I00704050023	Water Bar	-	X	-	X	EC
I00704060002	Rip Rap	-	X	X	-	CB
I00704060034	Rip Rap	-	X	-	X	EC
I00704060036	Rip Rap	-	X	X	-	B

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
I00704060040	Rip Rap	-	X	X	-	B
I00704060041	Rip Rap	-	X	X	-	B
I00704060043	Rip Rap	-	X	X	-	B
I00704060045	Rip Rap	-	X	X	-	B
I00704060046	Rip Rap	-	X	X	-	B
I00704060048	Rip Rap	-	X	X	-	B
I00704060055	Rip Rap	-	X	X	-	B
I00704060057	Rip Rap	-	X	X	-	B
I00704080049	TRM-Lined Swale	-	X	X	-	B
I00704080050	TRM-Lined Swale	-	X	X	-	B
I00704080051	TRM-Lined Swale	-	X	X	-	B
I00706010010	Rock Check Dam	X	-	-	X	EC
I00706010011	Rock Check Dam	X	-	-	X	EC
I00706010012	Rock Check Dam	-	X	-	X	EC
I00706010013	Rock Check Dam	-	X	-	X	EC
I00706010031	Rock Check Dam	-	X	-	X	EC
I00706010032	Rock Check Dam	-	X	-	X	EC
I00706010033	Rock Check Dam	-	X	-	X	EC
I00706010039	Rock Check Dam	-	X	-	X	B
I00706010042	Rock Check Dam	-	X	-	X	B
I00706010047	Rock Check Dam	-	X	-	X	B
I00707010052	Gabion	-	X	X	-	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 206.3 Storm Water Monitoring

SWMU 36-004(d) is monitored within PT-SMA-4.2. Following the installation of baseline control measures, a baseline storm water sample was collected on July 2, 2014 (Figures 206-2 and 206-3). In Figure 206-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Gross-alpha activity of 393 pCi/L (ATAL is 15 pCi/L) and
- Radium-226 and radium-228 activity of 95.9 pCi/L (ATAL is 30 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

SWMU 36-004(d):

- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at the Site. However, radium-226 and radium-228 are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity or radium isotopes but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. Uranium-238 was detected above the soil BV in 1 of 24 shallow (i.e., less than 3 ft bgs) 2011 Consent Order and 1996 RFI soil and sediment samples at a detected activity 1.2 times the soil BV. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the CWA and are excluded from the definition of adjusted gross-alpha radioactivity.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 206-2 and 206-3. 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 206-2 and 206-3.

Monitoring location PT-SMA-4.2 receives storm water run-on from landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2014 gross-alpha result is less than this value.
- Radium-226 and radium-228—Radium-226 and radium-228 UTL for background storm water containing sediment derived from Bandelier Tuff is 52.7 pCi/L. The 2014 radium-226 and radium-228 result is greater than this value.

All the analytical results for these samples are reported in the 2014 Annual Report.

#### 206.4 Inspections and Maintenance

RG267.4 recorded three storm events at PT-SMA-4.2 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 206-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61375	4-5-2017
Storm Rain Event	BMP-64203	8-11-2017
Storm Rain Event	BMP-65422	9-20-2017
Storm Rain Event	BMP-66265	10-19-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 206-3 Maintenance during 2017**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-64203	North end of rock check dam I00706010032 extended to the west	8-11-2017	0 day(s)	Maintenance conducted as soon as practicable
BMP-65422	Additional rock added to ends of rock check dams I00706010010 and I00706010013 by Monitoring Lead designee at follow-up site visit	9-26-2017	6 day(s)	Maintenance conducted as soon as practicable

### 206.5 Compliance Status

The Site associated with PT-SMA-4.2 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 206-4 presents the 2017 compliance status.

**Table 206-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 36-004(d)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 30, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Nine (9) Site Monitoring Areas."



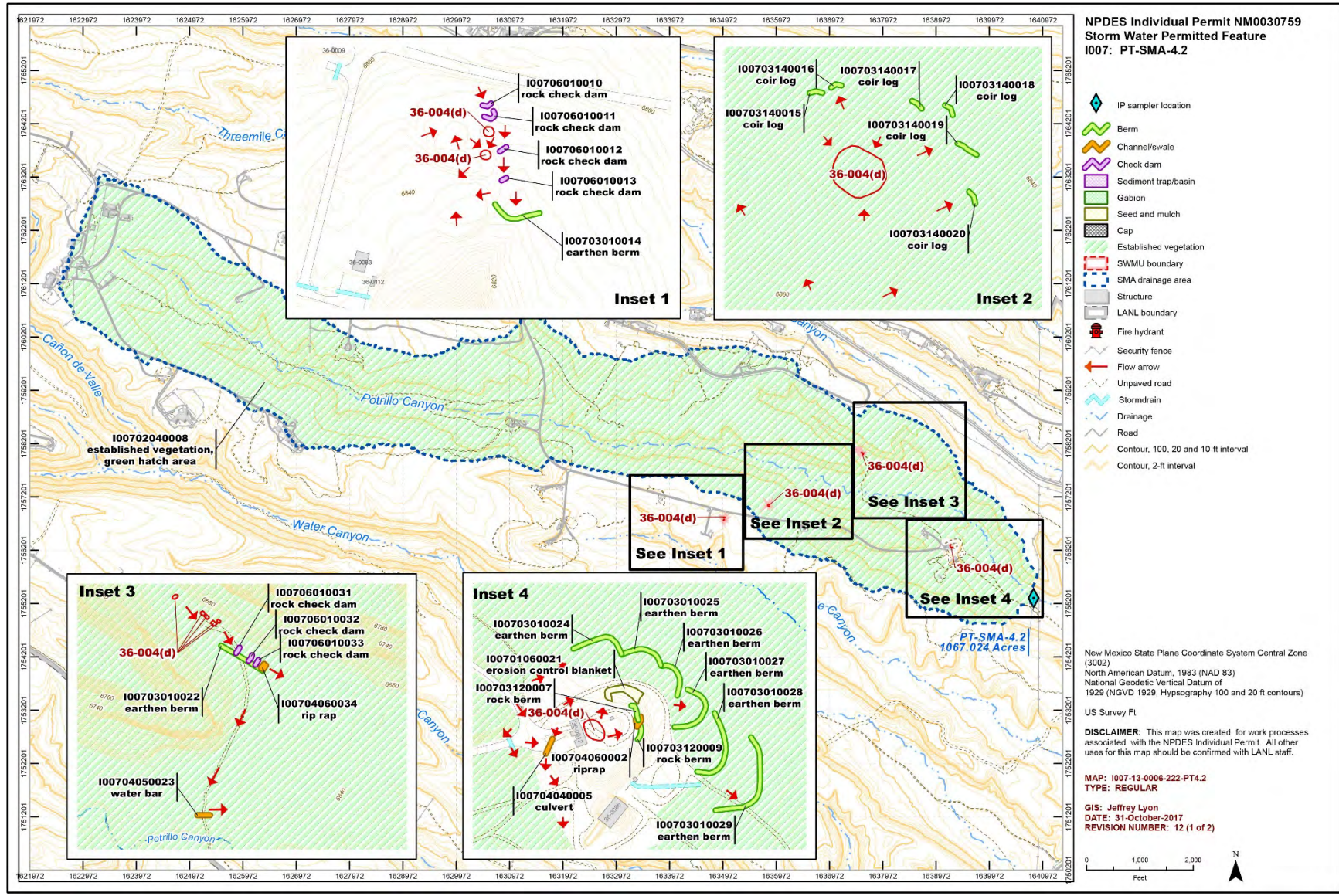
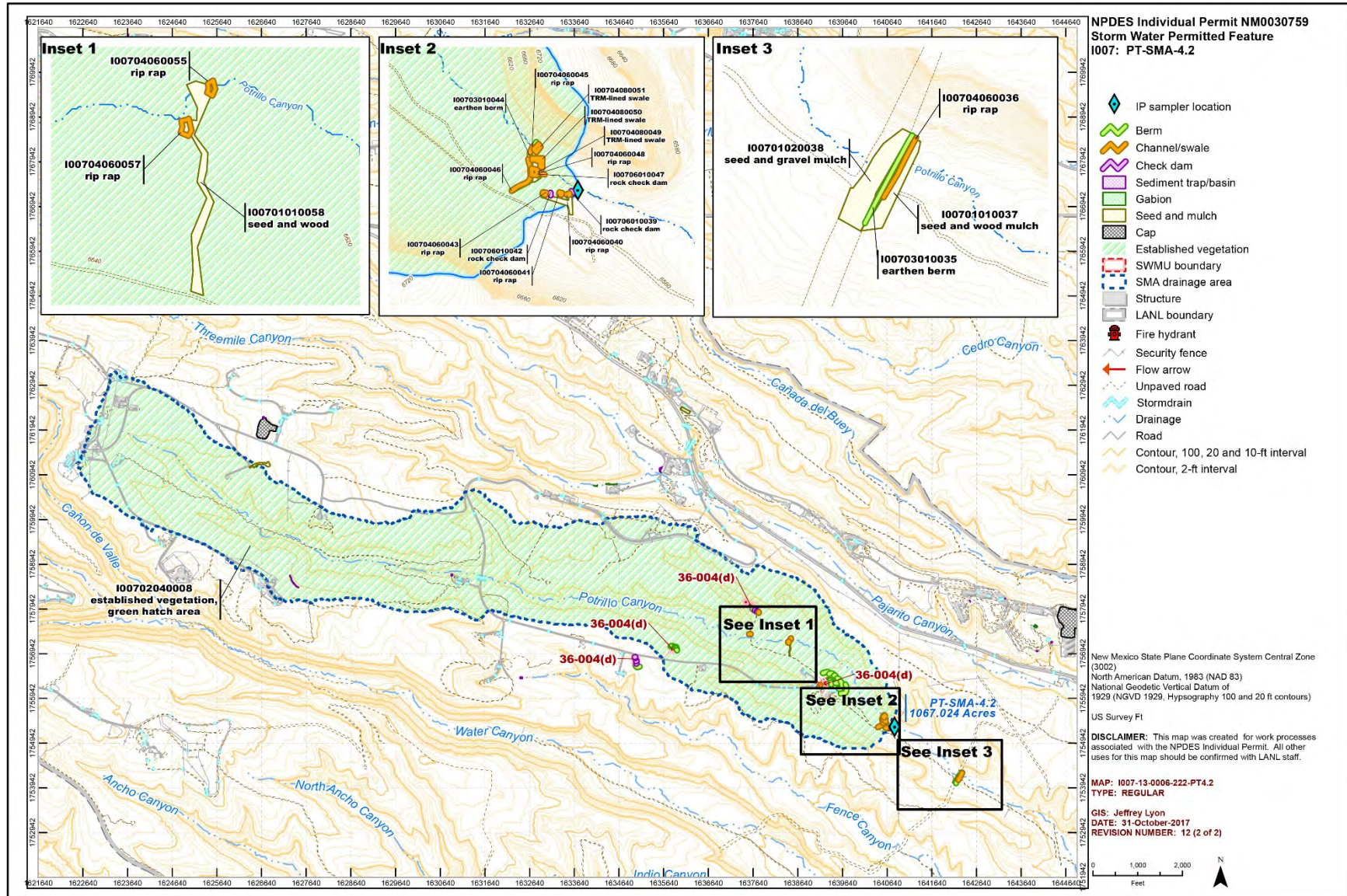
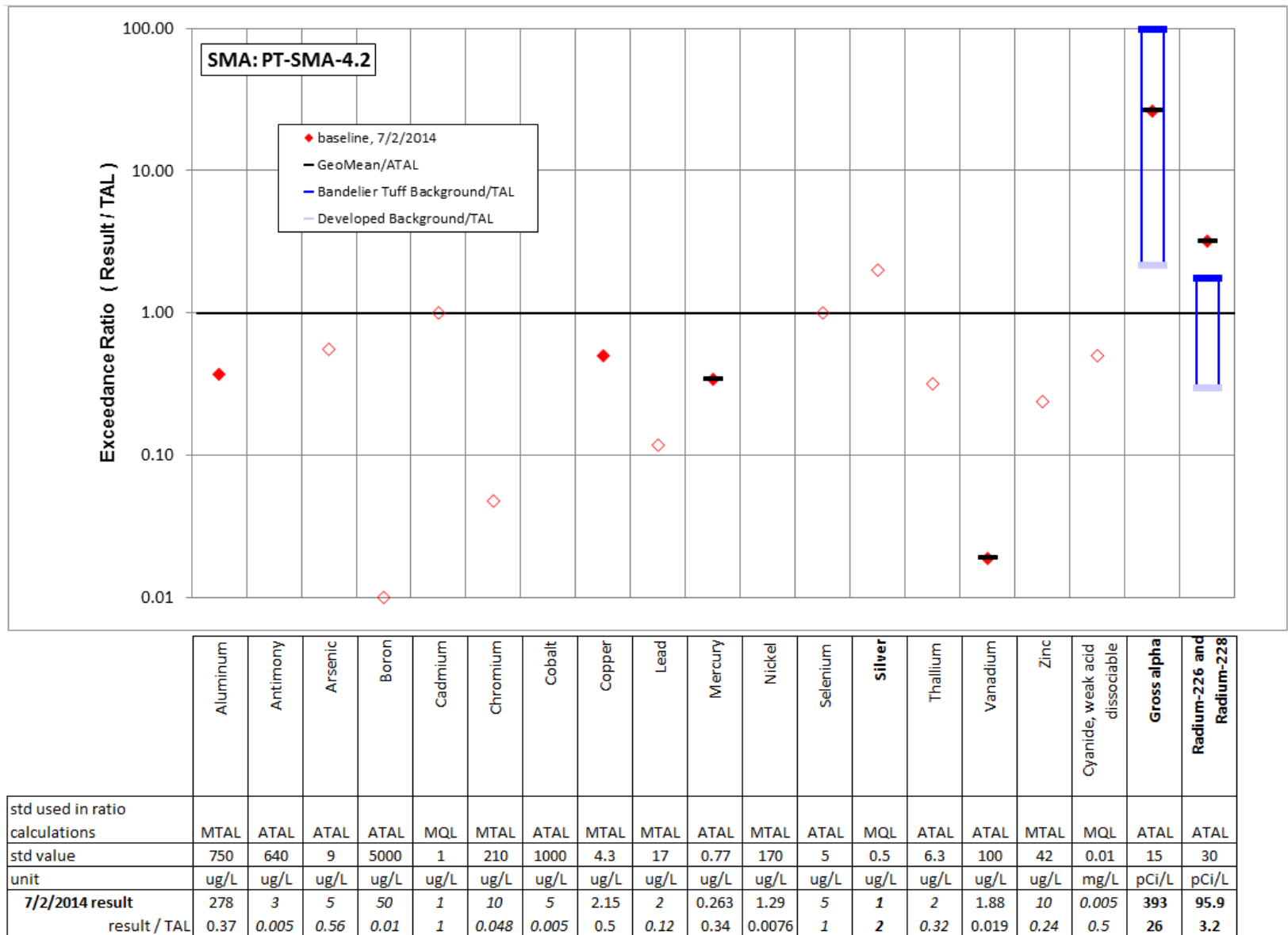


Figure 206-1 PT-SMA-4.2 location map



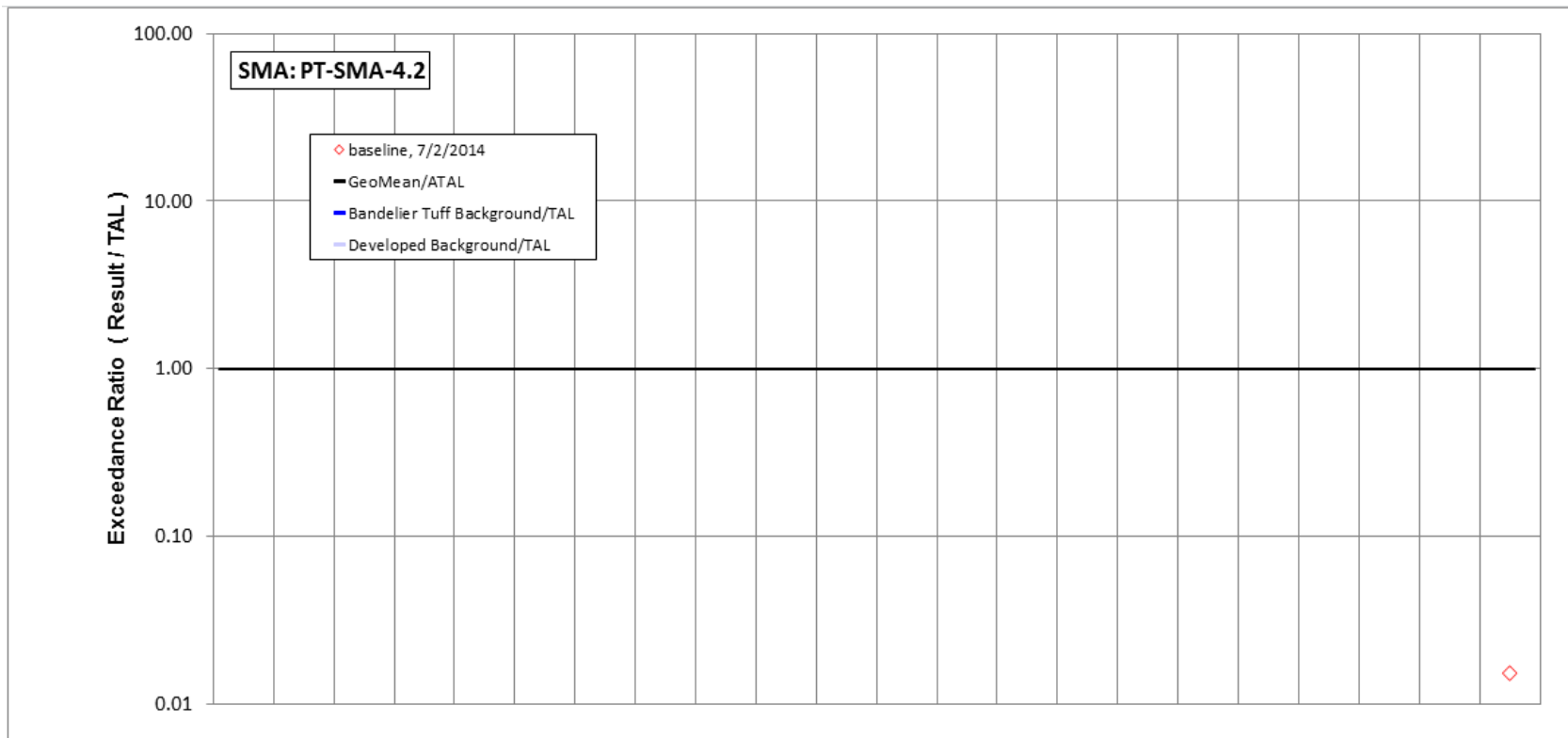


**Figure 206-1 PT-SMA-4.2 location map (continued)**



Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 206-2 Inorganic analytical results summary plot for PT-SMA-4.2**



	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	-	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	-	20
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	ug/L
7/2/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.305	-	-	-	-	0.305
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-	-	-	-	0.015

Bold font indicates result > TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 206-3 Organic analytical results summary plot for PT-SMA-4.2



## **207.0 W-SMA-1: SWMUs 16-017(j)-99, 16-026(v), and 16-026(c2)**

### **207.1 Site Descriptions**

Three historical industrial activity areas are associated with W001, W-SMA-1: Sites 16-017(j)-99, 16-026(v), and 16-026(c2).

SWMU 16-017(j)-99 is a former HE magazine (structure 16-63) at TA-16. The magazine was a 24- × 26- × 9-ft wood-framed structure surrounded by an earthen berm on three sides and the top. The magazine was built in 1945 to store HE and was removed in 1998. This SWMU was originally designated as part of SWMU 16-017, a group of 24 structures in central TA-16. In 1999, SWMU 16-017 was separated into 24 SWMUs, each consisting of a single structure.

Consent Order sampling has not yet been conducted at SWMU 16-017(j)-99; the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. No investigations were conducted at the Site before the Consent Order went into effect in 2005.

SWMU 16-026(v) is a former NPDES-permitted outfall (05A072) that served decommissioned analytical chemistry laboratory building 16-460 at TA-16. The outfall is located approximately 60 ft southeast of the building and received effluent from a sump [SWMU 16-003(c)], building floor drains, steam-cup drains, sink drains, and a drinking fountain. The outfall was plugged in 1992. It was removed from the NPDES permit effective September 19, 1997.

Consent Order sampling has not yet been conducted at SWMU 16-026(v); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. However, decision-level data are available from the 1995 RFI.

SWMU 16-026(c2) consists of the two outfalls that served chemical storage building 16-462 at TA-16. The outfalls are located approximately 30 ft southeast of the building. Floor troughs within 16-462 drain to 6-in.-diameter VCP drainlines that exit the south and southeast side of the building. Effluent flowed from the drainlines southeast to a drainage ditch. Building 16-462 was built in 1952 to store chemicals for use in the analytical chemistry laboratory (building 16-460). All drains at building 16-462 were plugged in 1991. There are no records of chemical spills in building 16-462.

Consent Order sampling has not yet been conducted at SWMU 16-026(c2); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. No investigations were conducted at the Site before the Consent Order went into effect in 2005.

The project map (Figure 207-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **207.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 207-1).

Enhanced controls were installed and certified on May 2, 2013, and submitted to EPA on June 4, 2013, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 207-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00102040019	Established Vegetation	-	X	X	-	B
W00103010014	Earthen Berm	X	-	-	X	EC
W00103010015	Earthen Berm	X	-	-	X	EC
W00104060011	Rip Rap	X	-	X	-	CB
W00104060017	Rip Rap	-	X	X	-	EC
W00105030016	Sand Filter	-	X	-	X	EC
W00106010008	Rock Check Dam	-	X	-	X	CB
W00106010012	Rock Check Dam	X	-	-	X	EC
W00106010013	Rock Check Dam	X	-	-	X	EC
W00108020018	Rock Cap	-	-	X	-	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 207.3 Storm Water Monitoring

SWMUs 16-017(j)-99, 16-026(c2), and 16-026(v) are monitored within W-SMA-1. Following the installation of baseline control measures, two baseline storm water samples were collected on August 3, 2011, and September 9, 2011 (Figure 207-2). In Figure 207-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from these samples yielded the following TAL exceedances:

- Aluminum concentrations of 918 µg/L and 1410 µg/L (MTAL is 750 µg/L) and
- Gross-alpha activity of 50.7 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at W-SMA-1, a corrective action storm water sample was collected on September 12, 2013 (Figure 207-2). Analytical results from this corrective action monitoring sample yielded the following TAL exceedances:

- Aluminum concentration of 1010 µg/L (MTAL is 750 µg/L) and
- Gross-alpha activity of 314 pCi/L (ATAL is 15 pCi/L).

A second corrective action storm water sample was collected on July 19, 2014 (Figure 207-2). Analytical results from this corrective action monitoring sample yielded the following TAL exceedances:

- Aluminum concentration of 858 µg/L (MTAL is 750 µg/L) and
- Copper concentration of 4.45 µg/L (MTAL is 4.3 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 16-017(j)-99:*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.
- Copper is not known to be associated with industrial materials historically managed at the Site. Consent Order investigations have not been performed at SWMU 16-017(j)-99; no decision-level data are available for this Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.

*SWMU 16-026(c2):*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.
- Copper is not known to be associated with industrial materials historically managed at the Site. Consent Order investigations have not been performed at SWMU 16-026(c2); no decision-level data are available for this Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.

*SWMU 16-026(v):*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. Aluminum was detected in 1 of 9 shallow RFI samples at a concentration equivalent to the tuff BV.
- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected in 7 of 9 shallow RFI samples at a maximum concentration 36.8 times the sediment BV. There are no other outfalls within the SMA and no documented source of copper.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Shallow RFI samples were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because they are not potential contaminants at this Site.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 207-2. 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 Figure 207-2.

Monitoring location W-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as locations with sediment derived from Bandelier Tuff. Metals including aluminum and copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL for storm water containing sediments derived from Bandelier Tuff is 2210 µg/L, and the aluminum background storm water UTL for storm water run-on from a developed landscape is 245 µg/L. The two results from 2011 and the result from 2013 are between these values.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2014 is between these two values.
- Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The result from 2013 is between these two values and the geometric mean of both gross-alpha results from 2011 is below both of these values.

All the analytical results for these samples are reported in the 2011, 2013, and 2014 Annual Reports.

#### 207.4 Inspections and Maintenance

RG253 recorded six storm events at W-SMA-1 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 207-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Verification Inspection for Additional Controls	BMP-61546	4-21-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62909	7-5-2017
Storm Rain Event	BMP-63420	7-19-2017
Storm Rain Event	BMP-64153	8-7-2017
Storm Rain Event	BMP-65111	8-29-2017
Storm Rain Event	BMP-65946	10-12-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-1 in 2017.

#### 207.5 Compliance Status

The Sites associated with W-SMA-1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. SWMU 16-017(j)-99 is corrective action complete with a certificate of no exposure. The IP was under administrative continuance at the end of 2017.

Table 207-3 presents the 2017 compliance status.



**Table 207-3 Compliance Status during 2017**

<b>Site</b>	<b>Compliance Status on Jan 1, 2017</b>	<b>Compliance Status on Dec 31, 2017</b>	<b>Comments</b>
SWMU 16-017(j)-99	Corrective Action Complete	Corrective Action Complete	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - Submittal of Completion of Corrective Action Certification of No Exposure at LA-SMA-1 (Site 00-017); M-SMA-4 (Site 48-005); 2M-SMA-2.2 [Site 03-003(k)]; S-SMA-0.25 [Site 03-013(a)]; and W-SMA-1 [Site 16-017(j)-99]."
SWMU 16-026(c2)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-026(v)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."

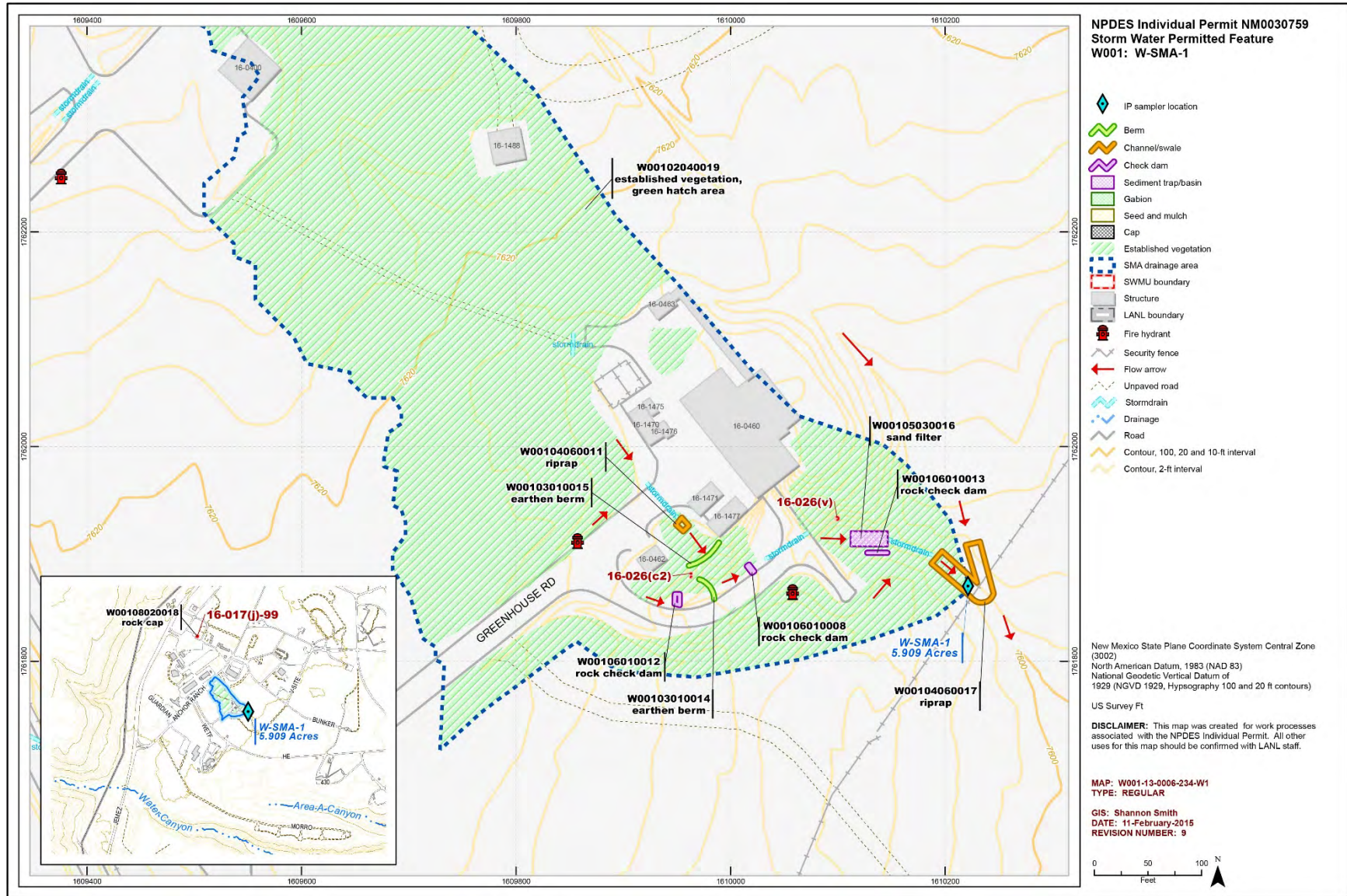
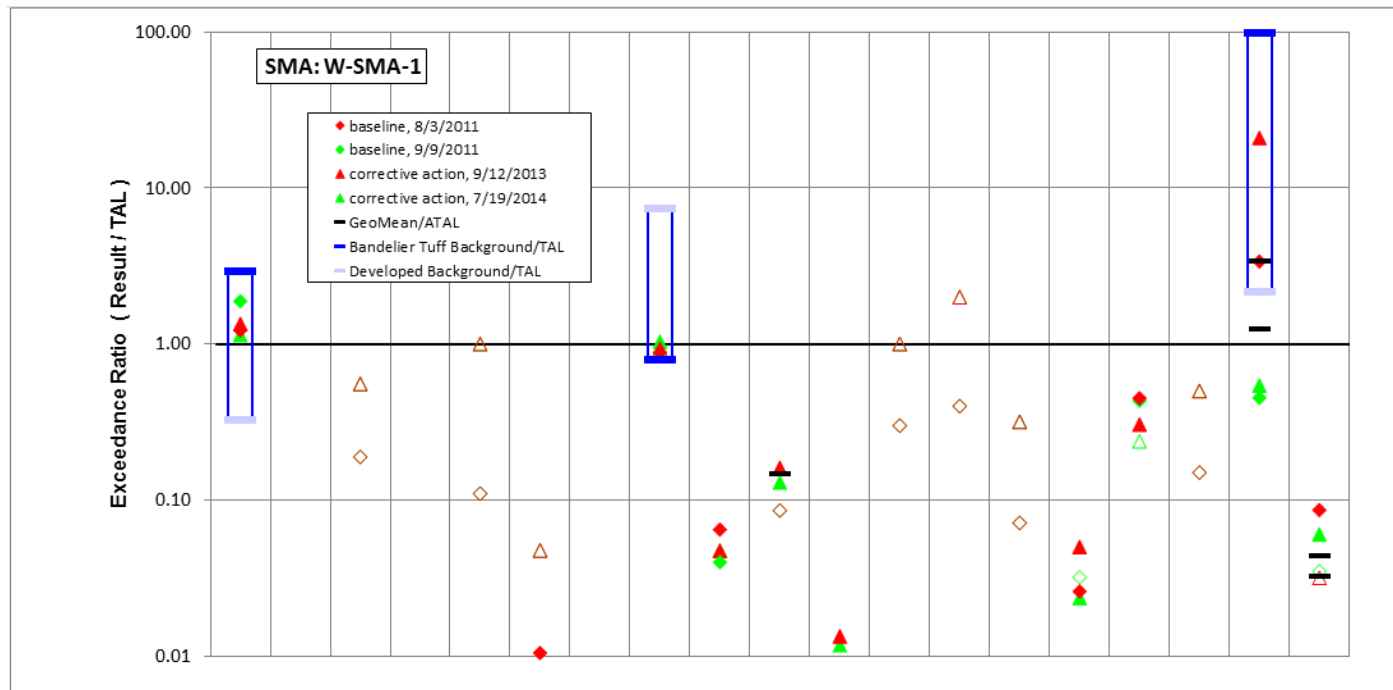


Figure 207-1 W-SMA-1 location map



	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/19/2014 result</b>	<b>858</b>	3	5	17.5	1	10	1.22	<b>4.45</b>	0.805	0.1	2	5	<b>1</b>	2	2.36	10	0.005	8.13	1.81
result / TAL	<b>1.1</b>	0.005	0.56	0.0035	1	0.048	0.0012	<b>1</b>	0.047	0.13	0.012	1	<b>2</b>	0.32	0.024	0.24	0.5	0.54	0.06
<b>9/12/2013 result</b>	<b>1010</b>	3	5	18.8	1	10	1.45	4.01	0.806	0.124	2.28	5	<b>1</b>	2	5.01	12.8	0.005	<b>314</b>	0.953
result / TAL	<b>1.3</b>	0.005	0.56	0.0038	1	0.048	0.0014	0.93	0.047	0.16	0.013	1	<b>2</b>	0.32	0.05	0.3	0.5	<b>21</b>	0.032
<b>9/9/2011 result</b>	<b>1410</b>	1	1.7	15	0.11	2	3.7	3.6	0.68	0.066	1.6	1.5	0.2	0.45	3.2	18.2	0.002	6.78	1.05
result / TAL	<b>1.9</b>	0.002	0.19	0.003	0.11	0.01	0.0037	0.84	0.04	0.086	0.0094	0.3	0.4	0.071	0.032	0.43	0.15	0.45	0.035
<b>8/3/2011 result</b>	<b>918</b>	1	1.7	15	0.11	2.2	2.4	3.8	1.1	0.066	1.6	1.5	0.2	0.45	2.6	18.9	0.002	<b>50.7</b>	2.59
result / TAL	<b>1.2</b>	0.002	0.19	0.003	0.11	0.01	0.0024	0.88	0.065	0.086	0.0094	0.3	0.4	0.071	0.026	0.45	0.15	<b>3.4</b>	0.086

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 207-2 Inorganic analytical results summary plot for W-SMA-1**



## 208.0 W-SMA-1.5: SWMUs 16-026(b2) and 16-028(d)

### 208.1 Site Descriptions

Two historical industrial activity areas are associated with W002, W-SMA-1.5: Sites 16-026(b2) and 16-028(d).

SWMU 16-026(b2) is an outfall that served decommissioned small-machine (millwright) shop located in room 138 of building 16-202 at TA-16. The outfall is located approximately 135 ft southeast of building 16-202 and daylighted in the drainage ditch along Anchor Ranch Road. The outfall received overflow from an oil/water separator, which consisted of a 3- × 3- × 3-ft cement pit located below floor level. The separator was installed in 1952, when building 16-202 was built, and remains in place. By 1977, room 138 was no longer used as shop and the separator ceased to be used. The building has been used for administrative offices since 1995.

Consent Order sampling has not yet been conducted at SWMU 16-026(b2); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. No investigations were conducted at the Site before the Consent Order went into effect in 2005.



W-SMA-1.5, Rock Check Dam, W00206010009 (photo ID 26655-2)

SWMU 16-028(d) is a former NPDES-permitted outfall (04A083) located at TA-16, approximately 80 ft southeast of building 16-202. The outfall formerly served a decommissioned machine shop in building 16-202 and connected to the building through an 8-in.-diameter VCP. The outfall received noncontact cooling water and wash water from two floor drains, effluent from two non-HE sumps, discharge from two sink drains, and rainwater from 16 roof drains. In 1995,

building 16-202 was converted to office space, and the drainlines within the building were modified so the outfall receives only storm water from the building's roof drains. The outfall was removed from the NPDES permit effective September 19, 1997.

Consent Order sampling has not yet been conducted at SWMU 16-028(d); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. No investigations were conducted at the Site before the Consent Order went into effect in 2005.

The project map (Figure 208-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 208.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 208-1).

Enhanced controls were installed and certified on September 25, 2012, and September 4, 2015, and submitted to EPA on October 25, 2012, and September 10, 2015, respectively, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.



**Table 208-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00202040017	Established Vegetation	-	X	X	-	B
W00203010015	Earthen Berm	-	X	-	X	EC
W00203010020	Earthen Berm	-	X	-	X	EC
W00203160022	Wood Chip Wattle	X	-	-	X	B
W00204060007	Rip Rap	-	X	X	-	CB
W00204070002	Vegetated Swale	-	X	X	-	CB
W00204070003	Vegetated Swale	-	X	X	-	CB
W00205020013	Sediment Basin	-	X	-	X	EC
W00205020021	Sediment Basin	-	X	-	X	EC
W00206010008	Rock Check Dam	X	-	-	X	CB
W00206010009	Rock Check Dam	X	-	-	X	CB
W00206010010	Rock Check Dam	-	X	-	X	CB
W00206010016	Rock Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 208.3 Storm Water Monitoring

SWMUs 16-026(b2) and 16-028(d) are monitored within W-SMA-1.5. Following the installation of baseline control measures, two baseline storm water samples were collected on August 3, 2011, and September 1, 2011 (Figure 208-2). Analytical results from these samples yielded the following TAL exceedances:

- Copper concentration of 9.7 µg/L (MTAL is 4.3 µg/L),
- Zinc concentration of 49.3 µg/L (MTAL is 42 µg/L), and
- Gross-alpha activity of 22 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at W-SMA-1.5, a corrective action storm water sample was collected on July 19, 2014 (Figure 208-2). Analytical results from this corrective action monitoring sample yielded the following TAL exceedance:

- Copper concentration of 6.9 µg/L (MTAL is 4.3 µg/L).

A corrective action storm water sample was collected on September 28, 2017 (Figure 208-2). Analytical results from this sample yielded no TAL exceedances.

No further sampling is required for W-SMA-1.5 for the duration of the IP.

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 16-026(b2):*

- Copper may have been associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.
- Zinc may have been associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.

*SWMU 16-028(d):*

- Copper may have been associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.
- Zinc may have been associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 208-2. 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 Figure 208-2.

Monitoring location W-SMA-1.5 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as locations with sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles.

- Copper—The copper UTL for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L, and the copper background storm water UTL for storm water run-on from a developed landscape is 32.3 µg/L. One result from 2011 and the 2014 result are between these values, and the second 2011 result is below both values.

All the analytical results for these samples are reported in the 2011, 2014, and 2017 Annual Reports.

#### **208.4 Inspections and Maintenance**

RG253 recorded six storm events at W-SMA-1.5 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following page.

**Table 208-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62910	7-5-2017
Storm Rain Event	BMP-63421	7-19-2017
Storm Rain Event	BMP-64154	8-7-2017
Storm Rain Event	BMP-65112	8-29-2017
Storm Rain Event	BMP-65947	10-12-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-1.5 in 2017.

### 208.5 Compliance Status

The Sites associated with W-SMA-1.5 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 208-3 presents the 2017 compliance status.

**Table 208-3 Compliance Status during 2017**

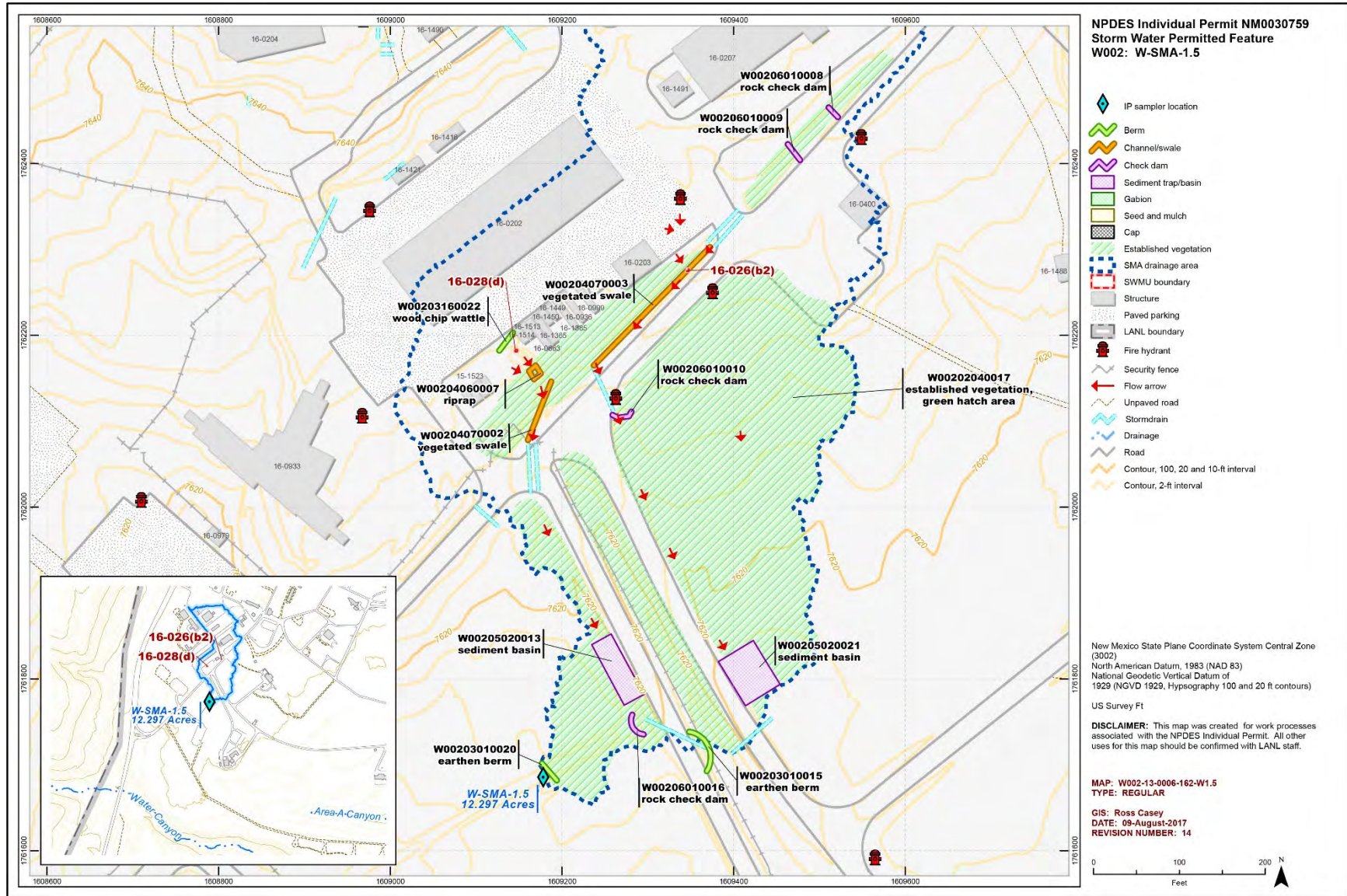
Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-026(b2)	Enhanced Control Corrective Action Monitoring	Corrective Action Complete	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."
SWMU 16-028(d)	Enhanced Control Corrective Action Monitoring	Corrective Action Complete	LANL, September 10, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Six Site Monitoring Areas (2M-SMA-3; CDB-SMA-1; CDV-SMA-1.7; PJ-SMA-1.05; STRM-SMA-1.5; and W-SMA-1.5)."

Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.

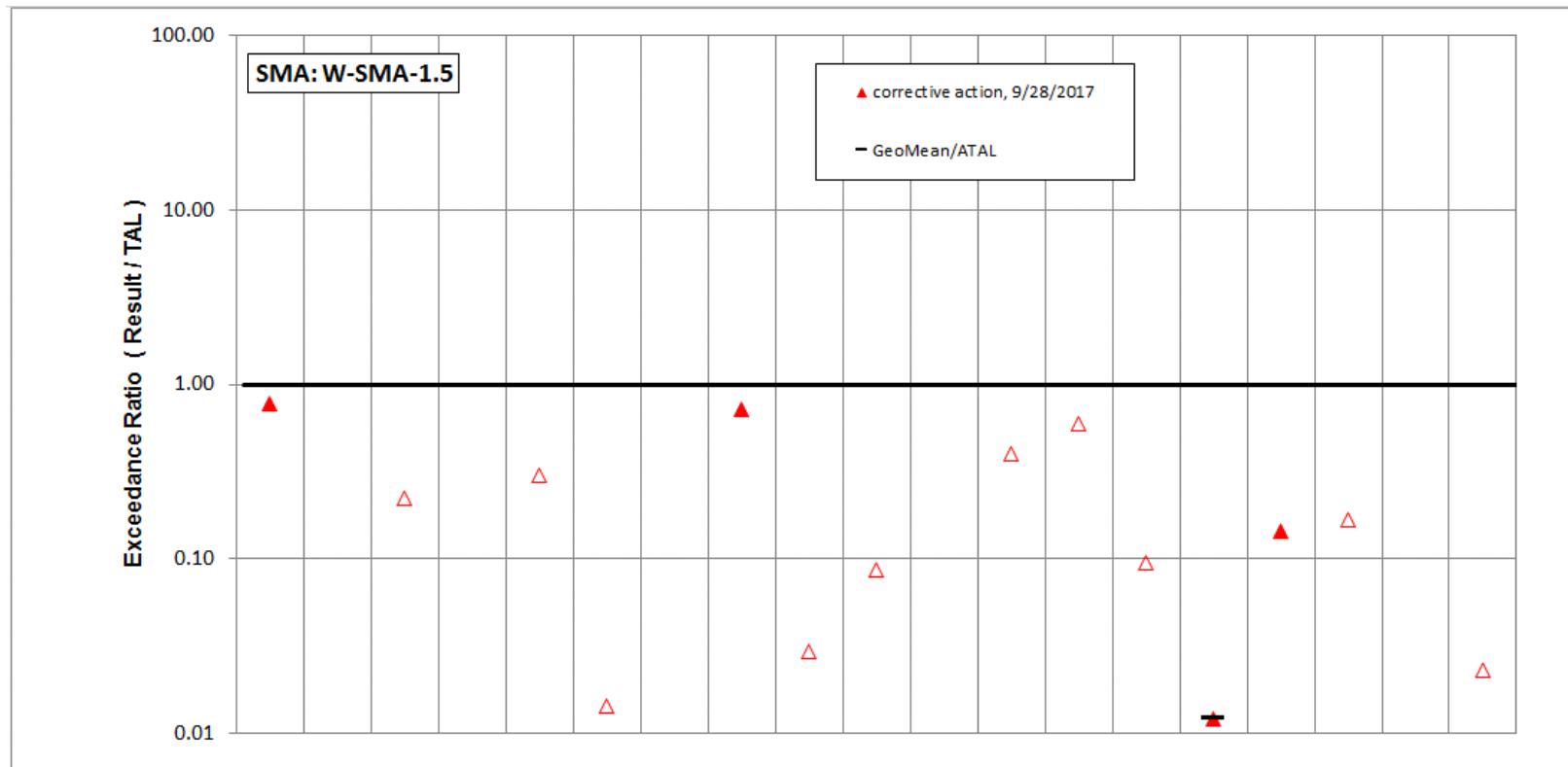


W-SMA-1.5, Earthen Berm, W00203010020 (photo ID 48334-12)





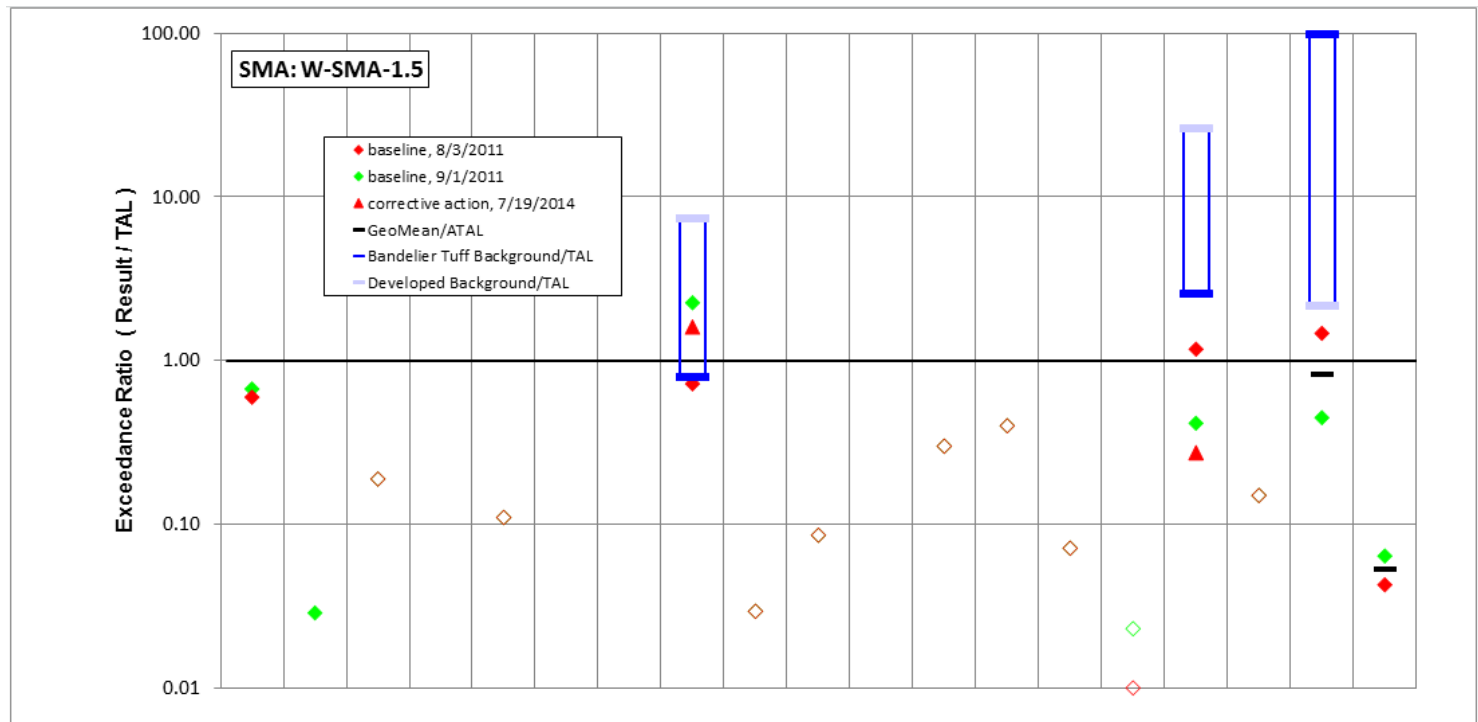
**Figure 208-1 W-SMA-1.5 location map**



	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
9/28/2017 result	584	<i>1</i>	<i>2</i>	<i>15</i>	<i>0.3</i>	<i>3</i>	<i>1</i>	3.06	<i>0.5</i>	<i>0.067</i>	0.699	<i>2</i>	<i>0.3</i>	<i>0.6</i>	1.22	6.07	<i>0.002</i>	-	<i>0.688</i>
result / TAL	0.78	<i>0.002</i>	<i>0.22</i>	<i>0.003</i>	<i>0.3</i>	<i>0.014</i>	<i>0.001</i>	0.71	<i>0.029</i>	<i>0.087</i>	0.0041	<i>0.4</i>	<i>0.6</i>	<i>0.095</i>	0.012	0.14	<i>0.17</i>	-	<i>0.023</i>

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 208-2a Inorganic analytical results summary plot for W-SMA-1.5



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	<b>Zinc</b>	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>7/19/2014 result</b>	-	-	-	-	-	-	-	<b>6.9</b>	-	-	-	-	-	-	-	11.5	-	-	-
result / TAL	-	-	-	-	-	-	-	<b>1.6</b>	-	-	-	-	-	-	-	0.27	-	-	-
<b>9/1/2011 result</b>	503	18.4	1.7	15	0.11	2	3.2	<b>9.7</b>	0.5	0.066	0.83	1.5	0.2	0.45	2.3	17.4	0.002	6.72	1.92
result / TAL	0.67	0.029	0.19	0.003	0.11	0.01	0.0032	<b>2.3</b>	0.029	0.086	0.0049	0.3	0.4	0.071	0.023	0.41	0.15	0.45	0.064
<b>8/3/2011 result</b>	448	3.4	1.7	15	0.11	2	1.8	3.1	0.5	0.066	0.91	1.5	0.2	0.45	1	<b>49.3</b>	0.002	22	1.28
result / TAL	0.6	0.0053	0.19	0.003	0.11	0.01	0.0018	0.72	0.029	0.086	0.0054	0.3	0.4	0.071	0.01	<b>1.2</b>	0.15	<b>1.5</b>	0.043

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 208-2b Inorganic analytical results summary plot for W-SMA-1.5**

## 209.0 W-SMA-2.05: SWMU 16-028(e)

### 209.1 Site Descriptions

One historical industrial activity area is associated with W003, W-SMA-2.05: Site 16-028(e).

SWMU 16-028(e) is a formerly NPDES-permitted outfall (04A091) that served materials testing laboratory building 16-450 at TA-16. The outfall was located southeast of building 16-450 and received discharges through a drainline from an HE sump [SWMU 16-029(g)]. The outfall discharged outside the security fence at the edge of Water Canyon. The sump was removed in 1997, and the drainline to the outfall was plugged but left in place. The outfall was removed from the NPDES permit effective September 19, 1997.

Consent Order sampling has not yet been conducted at SWMU 16-028(e); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. However, decision-level data are available from the 1995 RFI.

The project map (Figure 209-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 209.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 209-1).

Enhanced controls were installed and certified on September 25, 2012, and submitted to EPA on October 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 209-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00302040010	Established Vegetation	-	X	X	-	B
W00303010007	Earthen Berm	-	X	-	X	EC
W00303010008	Earthen Berm	-	X	-	X	EC
W00306010009	Rock Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 209.3 Storm Water Monitoring

SWMU 16-028(e) is monitored within W-SMA-2.05. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 209-2). Analytical results from this sample yielded the following TAL exceedance:

- Aluminum concentration of 1240 µg/L (MTAL is 750 µg/L).



Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 16-028(e):*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. Aluminum was detected above the tuff BV in 1 of 10 shallow RFI samples at a concentration 1.4 times the tuff BV.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 209-2. 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 Figure 209-2.

Monitoring location W-SMA-2.05 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as locations with sediment derived from Bandelier Tuff. Metals including aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Aluminum—The aluminum UTL for storm water containing sediments derived from Bandelier Tuff is 2210 µg/L and the aluminum background storm water UTL for storm water run-on from a developed landscape is 245 µg/L. The 2011 result is between these values.

All the analytical results for these samples are reported in the 2011 Annual Report.

#### 209.4 Inspections and Maintenance

RG253 recorded six storm events at W-SMA-2.05 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 209-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62911	7-5-2017
Storm Rain Event	BMP-63422	7-19-2017
Storm Rain Event	BMP-64155	8-3-2017
Storm Rain Event	BMP-65113	8-29-2017
Storm Rain Event	BMP-65948	10-10-2017

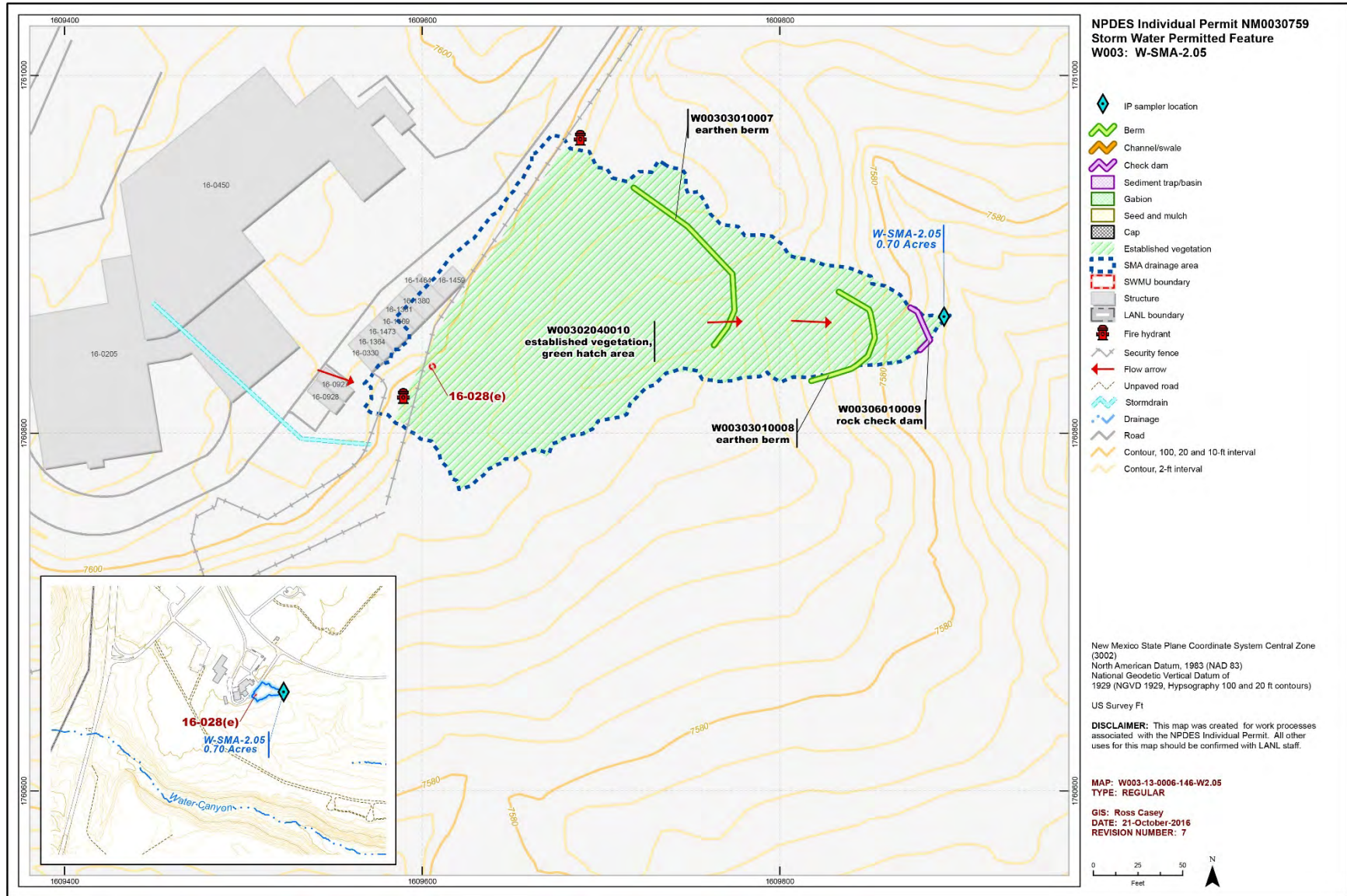
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-2.05 in 2017.

**209.5 Compliance Status**

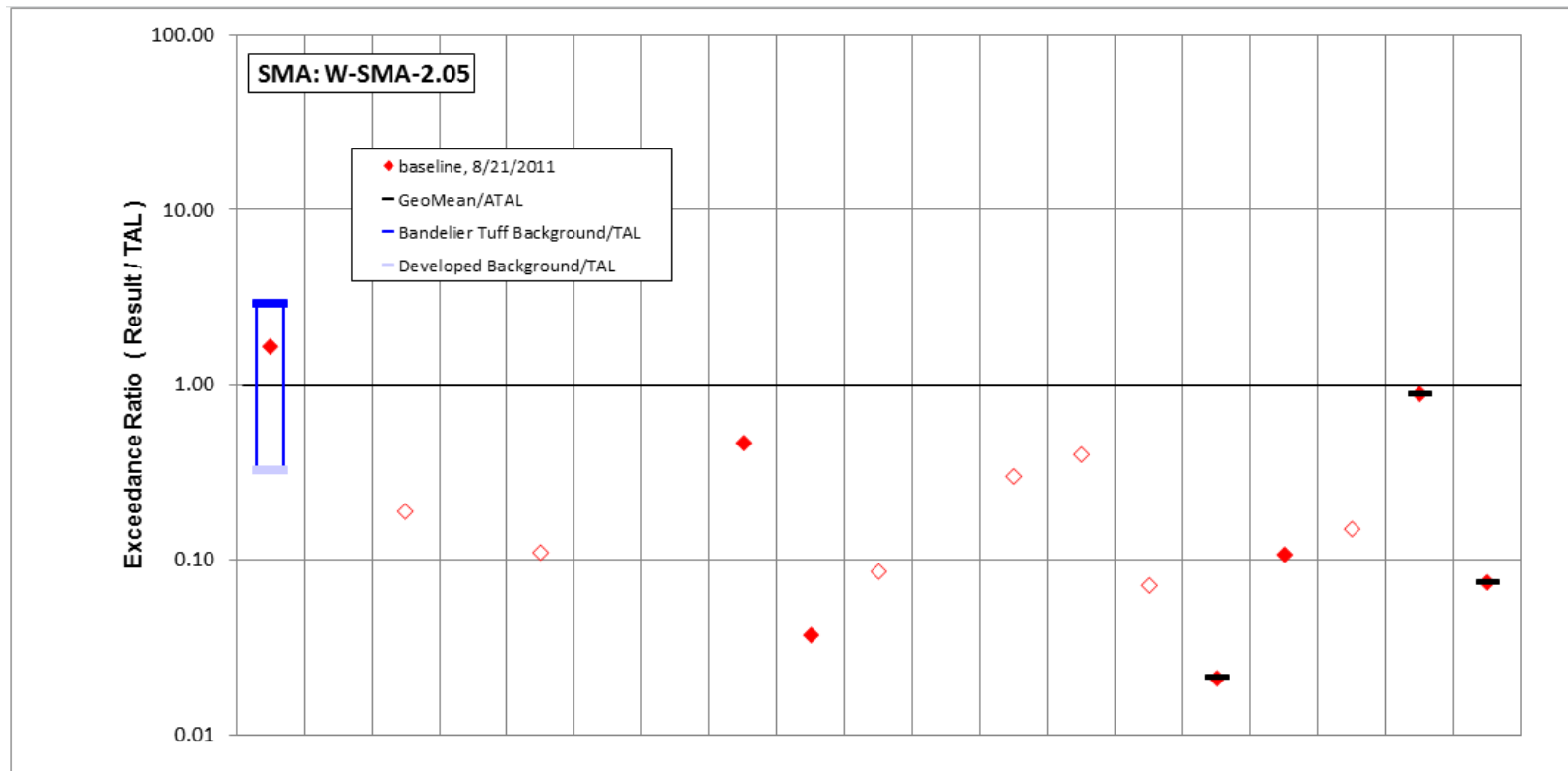
The Site associated with W-SMA-2.05 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 209-3 presents the 2017 compliance status.

**Table 209-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-028(e)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 25, 2012, "Submittal of Certification of Installation of Enhanced Control Measures for Nine Site Monitoring Areas."



**Figure 209-1 W-SMA-2.05 location map**



	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>8/21/2011 result</b>	<b>1240</b>	<i>1</i>	<i>1.7</i>	<i>17.4</i>	<i>0.11</i>	<i>2</i>	<i>4.2</i>	<i>2</i>	<i>0.63</i>	<i>0.066</i>	<i>1.4</i>	<i>1.5</i>	<i>0.2</i>	<i>0.45</i>	<i>2.1</i>	<i>4.5</i>	<i>0.002</i>	<i>13.3</i>	<i>2.23</i>
result / TAL	<b>1.7</b>	<i>0.002</i>	<i>0.19</i>	<i>0.0035</i>	<i>0.11</i>	<i>0.01</i>	<i>0.004</i>	<i>0.47</i>	<i>0.037</i>	<i>0.086</i>	<i>0.008</i>	<i>0.3</i>	<i>0.4</i>	<i>0.071</i>	<i>0.021</i>	<i>0.11</i>	<i>0.15</i>	<i>0.89</i>	<i>0.074</i>

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 209-2 Inorganic analytical results summary plot for W-SMA-2.05



## 210.0 W-SMA-3.5: SWMU 16-026(y)

### 210.1 Site Descriptions

One historical industrial activity area is associated with W004, W-SMA-3.5: Site 16-026(y).

SWMU 16-026(y) is a former outfall that served building 16-411. The outfall drainline consists of a 4-in.-diameter VCP that exits the west side of building 16-411, then turns south to terminate at a discharge point on the hill slope of Water Canyon. The discharge point is located south of a double security fence at the edge of Water Canyon. Building 16-411 was constructed in 1951 and used to assemble finished HE components. The outfall received discharges from an equipment room floor drain, a sink, roof drains, a water fountain, and an eyewash station. In the 1990s, the roof drains were rerouted to a separate outfall, and all other drains were either plugged or rerouted to a holding tank.

Consent Order investigations have not yet begun at SWMU 16-026(y); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. Decision-level data are not available for the Site.

The project map (Figure 210-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 210.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 210-1).

**Table 210-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00402040008	Established Vegetation	-	X	X	-	B
W00403060009	Straw Wattle	X	-	-	X	B
W00403060012	Straw Wattle	X	-	-	X	B
W00403060013	Straw Wattle	X	-	-	X	B
W00403060014	Straw Wattle	X	-	-	X	B
W00404060003	Rip Rap	-	X	X	-	CB
W00406010007	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 210.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at W-SMA-3.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

### 210.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-3.5 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 210-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62420	6-13-2017
Storm Rain Event	BMP-62931	7-5-2017
Storm Rain Event	BMP-63443	7-19-2017
Storm Rain Event	BMP-64175	8-3-2017
Storm Rain Event	BMP-66406	10-16-2017

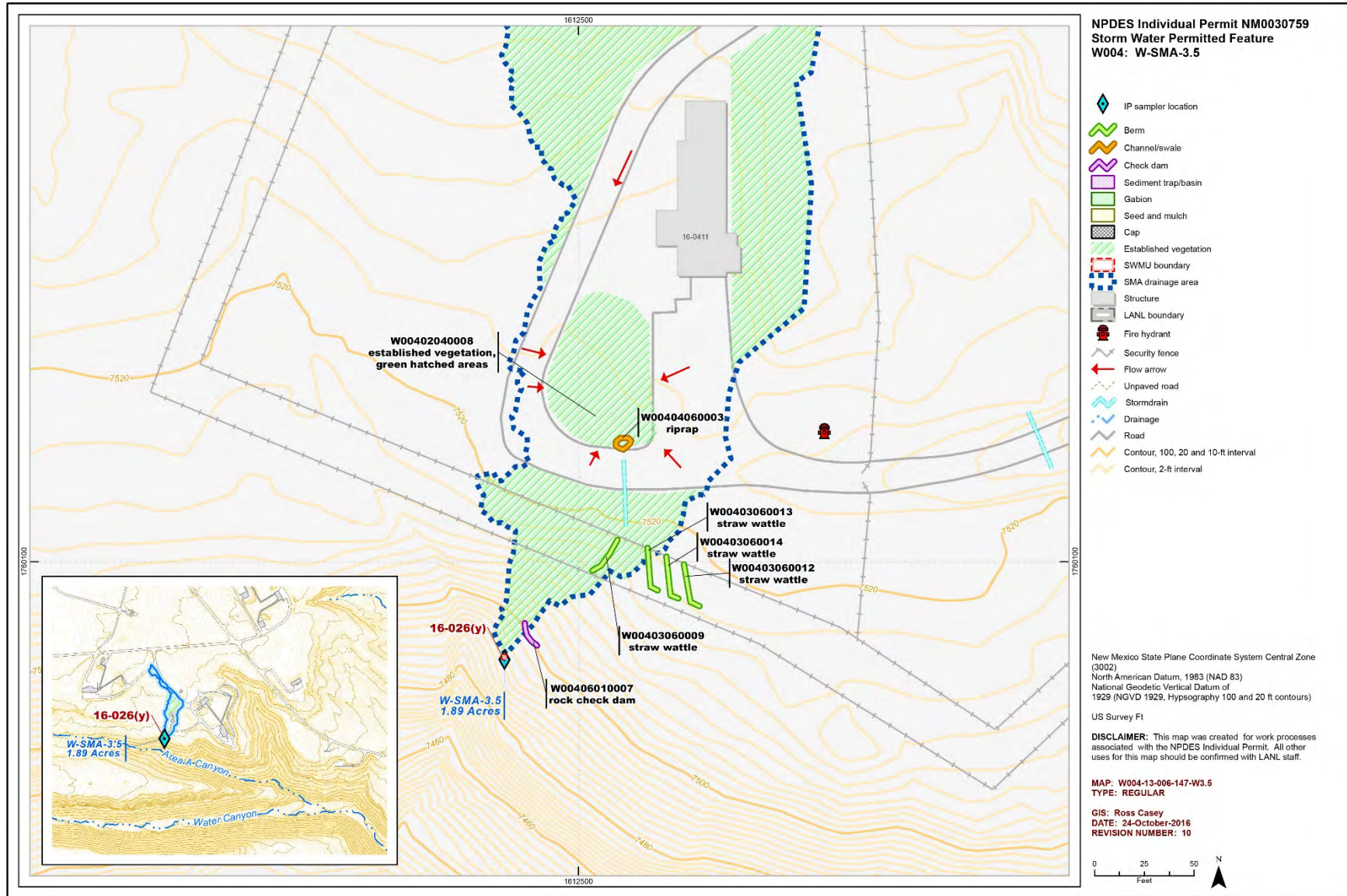
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-3.5 in 2017.

### 210.5 Compliance Status

The Site associated with W-SMA-3.5 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 210-3 presents the 2017 compliance status.

**Table 210-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-026(y)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.



**Figure 210-1 W-SMA-3.5 location map**

## 211.0 W-SMA-4.1: SWMU 16-003(a)

### 211.1 Site Descriptions

One historical industrial activity area is associated with W005, W-SMA-4.1: Site 16-003(a).

SWMU 16-003(a) is an HE sump and an inactive former NPDES-permitted outfall (05A053) that served assembly building 16-410. The concrete subsurface sump is located on the exterior southeast wall of the building and measured 12 ft long × 4 ft wide × 5 ft high. The sump served floor, roof, and equipment drains and removed suspended HE solids from process water before it was discharged to the outfall, located approximately 320 ft southeast of the building. The sump was installed in the early 1950s and modified in 1966 to improve its effectiveness and to reduce HE handling. The outfall was plugged in 1992 and removed from the NPDES permit effective January 14, 1998. The sump remains active and is pumped out on a regular basis.

Consent Order investigations have not yet begun at SWMU 16-003(a); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. Decision-level data are available from an RFI performed in 1995.

The project map (Figure 211-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 211.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 211-1).

**Table 211-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00502040006	Established Vegetation	-	X	X	-	B
W00503060008	Straw Wattle	X	-	-	X	B
W00503060009	Straw Wattle	-	X	-	X	B
W00503140010	Coir Log	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 211.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at W-SMA-4.1. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.



### 211.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-4.1 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 211-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Verification Inspection for Additional Controls	BMP-61547	4-21-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62421	6-13-2017
Storm Rain Event	BMP-62932	7-5-2017
Storm Rain Event	BMP-63444	7-21-2017
Storm Rain Event	BMP-64176	8-3-2017
Storm Rain Event	BMP-66407	10-16-2017

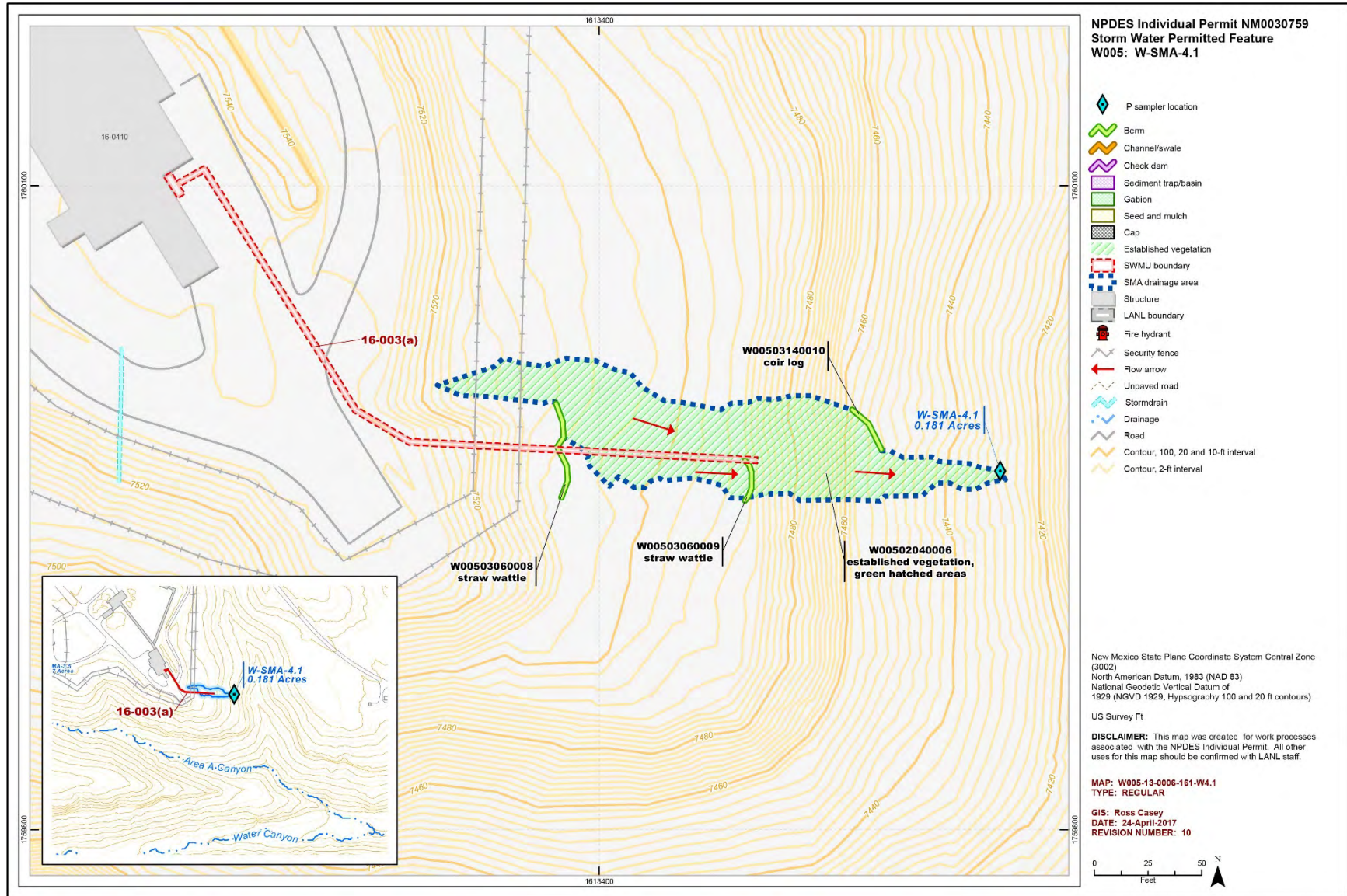
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-4.1 in 2017.

### 211.5 Compliance Status

The Site associated with W-SMA-4.1 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 211-3 presents the 2017 compliance status.

**Table 211-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-003(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.



**Figure 211-1 W-SMA-4.1 location map**

## 212.0 W-SMA-5: SWMUs 16-001(e), 16-003(f), 16-026(b), 16-026(c), 16-026(d), and 16-026(e)

### 212.1 Site Descriptions

Six historical industrial activity areas are associated with W006, W-SMA-5: Sites 16-001(e), 16-003(f), 16-026(b), 16-026(c), 16-026(d), and 16-026(e).

SWMU 16-001(e) is an inactive dry well located at TA-16 approximately 170 ft east of HE-processing building 16-306. Constructed in the 1980s, the dry well never functioned properly because it drained to impermeable tuff. Eventually, the dry well was filled with soil and capped with concrete.

Consent Order Phase I investigation sampling is complete. SWMU 16-001(e) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 16-001(e) will be eligible for a COC upon approval of the report by NMED.

SWMU 16-003(f) consists of two HE sumps at TA-16 that served building 16-304. The sumps discharged to an outfall. Building 16-304 was a plastics and plastic-component development and production facility. Polycarbonate components were fabricated using injection-molding machines. Other components were made using hydraulic presses. Large high-temperature ovens were used to dry-mold powders and to cure thermoset plastics. Solvents also were used at building 16-304. By 1993, solvents were containerized and sent off-site for disposal, and HE operations in the building had ceased.

Consent Order Phase I investigation sampling is complete. SWMU 16-003(f) was recommended for additional field characterization activities in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015.

SWMU 16-026(b) is an inactive outfall located to the east of a resthouse (building 16-307). The outfall formerly received discharge from two HE sumps [SWMU 16-029(a)] located near the exterior southeast wall of the resthouse. The outfall discharged to Water Canyon. The sumps were plugged in 1990 and 1991. The resthouse was used to store molds and materials for plastics development and also previously housed a solvent disassembly tank used to remove HE from test devices.

Consent Order Phase I investigation sampling is complete. SWMU 16-026(b) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 16-026(b) will be eligible for a COC upon approval of the report by NMED.

SWMU 16-026(c) is an inactive outfall located at TA-16 to the south of a resthouse (building 16-305). The outfall previously received discharge from two HE sumps [SWMU 16-029(b)] located near the exterior southwest wall of the resthouse. The outfall discharged to Water Canyon. One soil sample was taken from the outfall at structure 16-305 in 1970. Analytical results showed no TNT, RDX, or HMX, although some unknown HE decomposition products may have been present at low levels. The sumps were plugged in



W-SMA-5, Rock Check Dam, W00606010003 (photo ID 8531-07r)



1990 and 1991. The resthouse was used to store chemicals and solvents for plastics development and production and was also used for filament winding of developmental weapons components.

Consent Order Phase I investigation sampling is complete. SWMU 16-026(c) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 16-026(c) will be eligible for a COC upon approval of the report by NMED.

SWMU 16-026(d) is an inactive outfall located to the southeast of a resthouse (building 16-303). The outfall formerly received discharge from two HE sumps [SWMU 16-029(c)] located on the exterior southwest wall of the resthouse. Potential contaminants were HE, inorganic chemicals, and organic chemicals. The outfall discharged to Martin Spring Canyon. Two samples were taken at the SWMU 16-026(d) outfall in 1970. Samples showed elevated levels of HMX and/or RDX and TNT. The sumps were plugged in 1990 and 1991.

Consent Order Phase I investigation sampling is complete. SWMU 16-026(d) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 16-026(d) will be eligible for a COC upon approval of the report by NMED.

SWMU 16-026(e) is an inactive outfall located to the south of building 16-301. The outfall formerly received discharge from two HE sumps [SWMU 16-029(d)] located on the exterior west side of building 16-301. The outfall discharged to Martin Spring Canyon. Building 16-301 originally housed mock HE-processing operations and stored raw materials that were used to prepare mock HE. Building 16-301 was later used as an environmental testing laboratory for research in the effects of temperature, pressure, and humidity on weapons and components. The sumps were plugged in 1990 and 1991.

Consent Order Phase I investigation sampling is complete. SWMU 16-026(e) was recommended for additional field characterization activities in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015.

The project map (Figure 212-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## **212.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 212-1).



**Table 212-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00602040029	Established Vegetation	-	X	X	-	B
W00604040011	Culvert	X	-	X	-	CB
W00604050033	Water Bar	X	-	X	-	B
W00604060006	Rip Rap	X	-	X	-	CB
W00606010003	Rock Check Dam	-	X	-	X	CB
W00606010012	Rock Check Dam	-	X	-	X	CB
W00606010013	Rock Check Dam	-	X	-	X	CB
W00606010014	Rock Check Dam	-	X	-	X	CB
W00606010015	Rock Check Dam	-	X	-	X	CB
W00606010017	Rock Check Dam	-	X	-	X	CB
W00606010021	Rock Check Dam	-	X	-	X	B
W00606010022	Rock Check Dam	-	X	-	X	B
W00606010023	Rock Check Dam	-	X	-	X	B
W00606010024	Rock Check Dam	-	X	-	X	B
W00606010025	Rock Check Dam	X	-	-	X	B
W00606010026	Rock Check Dam	X	-	-	X	B
W00606010027	Rock Check Dam	X	-	-	X	B
W00606010028	Rock Check Dam	-	X	-	X	B
W00606010031	Rock Check Dam	X	-	-	X	B
W00606010032	Rock Check Dam	X	-	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 212.3 Storm Water Monitoring

SWMUs 16-001(e), 16-003(f), 16-026(b), 16-026(c), 16-026(d), and 16-026(e) are monitored within W-SMA-5. Following the installation of baseline control measures, a baseline storm water sample was collected on July 3, 2012 (Figures 212-2 and 212-3). In Figures 212-2 and 212-3, cadmium, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Copper concentration of 6.28 µg/L (MTAL is 4.3 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 16-001(e):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the soil BV in shallow (i.e., less than 3 ft bgs) Consent Order samples. Copper was detected above BV in 2 of 4 shallow samples with a maximum concentration 1.9 times the soil BV.

*SWMU 16-003(f):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BV in 1 shallow Consent Order soil sample collected at the Site.

*SWMU 16-026(b):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in 8 shallow Consent Order and RFI soil, sediment, and tuff samples.

*SWMU 16-026(c):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above soil, sediment, and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above BVs in 5 of 13 shallow samples with a maximum concentration 3.8 times sediment BV.

*SWMU 16-026(d):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above soil and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above the BVs in 3 of 16 shallow soil and tuff samples with a maximum concentration 4.5 times soil BV.

*SWMU 16-026(e):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected only slightly above soil and tuff BVs in shallow Consent Order and RFI samples. Copper was detected above the BVs in 3 of 19 shallow soil and tuff samples with a maximum concentration above BV 1.7 times the tuff BV.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 212-2 and 212-3. 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 212-2 and 212-3.

Monitoring location W-SMA-5 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as locations with sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Copper—The copper UTL for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L, and the copper background storm water UTL for storm water run-on from a developed landscape is 32.3 µg/L. The result from 2012 is between these values.

All the analytical results for these samples are reported in the 2012 Annual Report.

### 212.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-5 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 212-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62422	6-14-2017
Storm Rain Event	BMP-62933	7-5-2017
Storm Rain Event	BMP-63445	7-24-2017
Storm Rain Event	BMP-64177	8-8-2017
Storm Rain Event	BMP-66408	10-17-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 212-3 Maintenance during 2017**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62422	Picked up floatable waste, garbage, and/or debris during inspection and disposed of properly	6-14-2017	0 day(s)	Maintenance conducted as soon as practicable

### 212.5 Compliance Status

The Sites associated with W-SMA-5 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 212-4 presents the 2017 compliance status.

**Table 212-4 Compliance Status during 2017**

<b>Site</b>	<b>Compliance Status on Jan 1, 2017</b>	<b>Compliance Status on Dec 31, 2017</b>	<b>Comments</b>
SWMU 16-001(e)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-003(f)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-026(b)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-026(c)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-026(d)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-026(e)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."



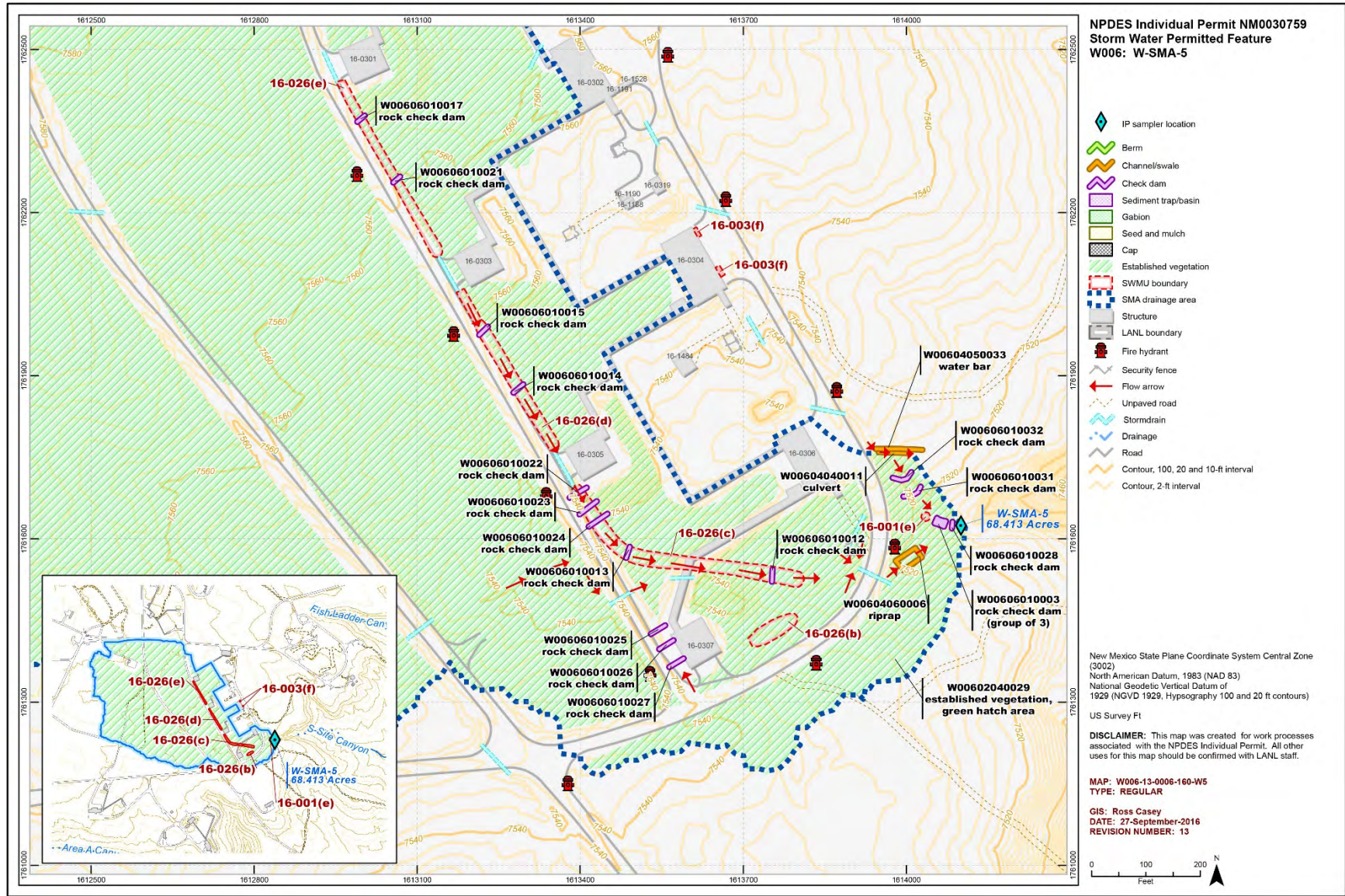
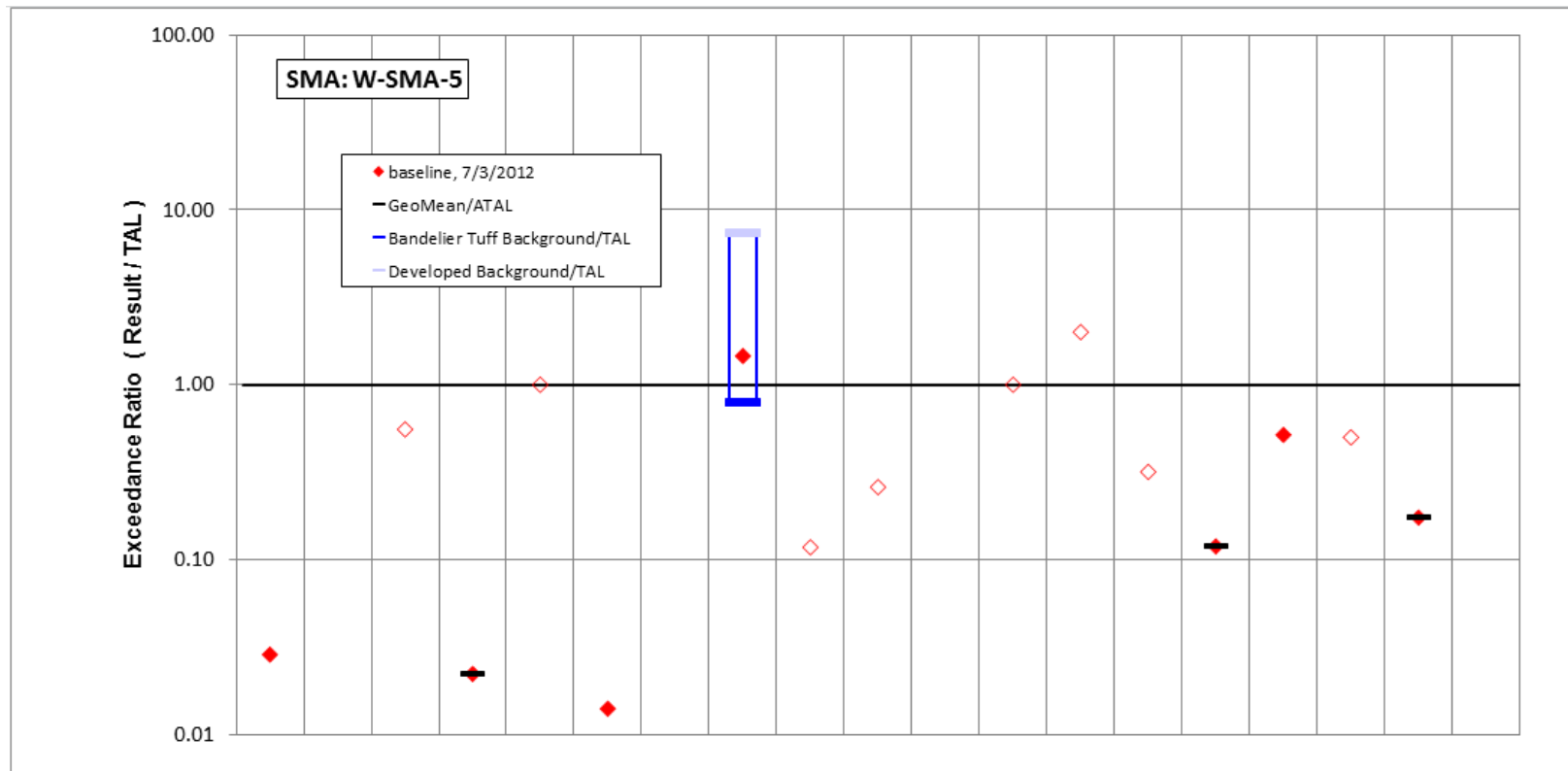


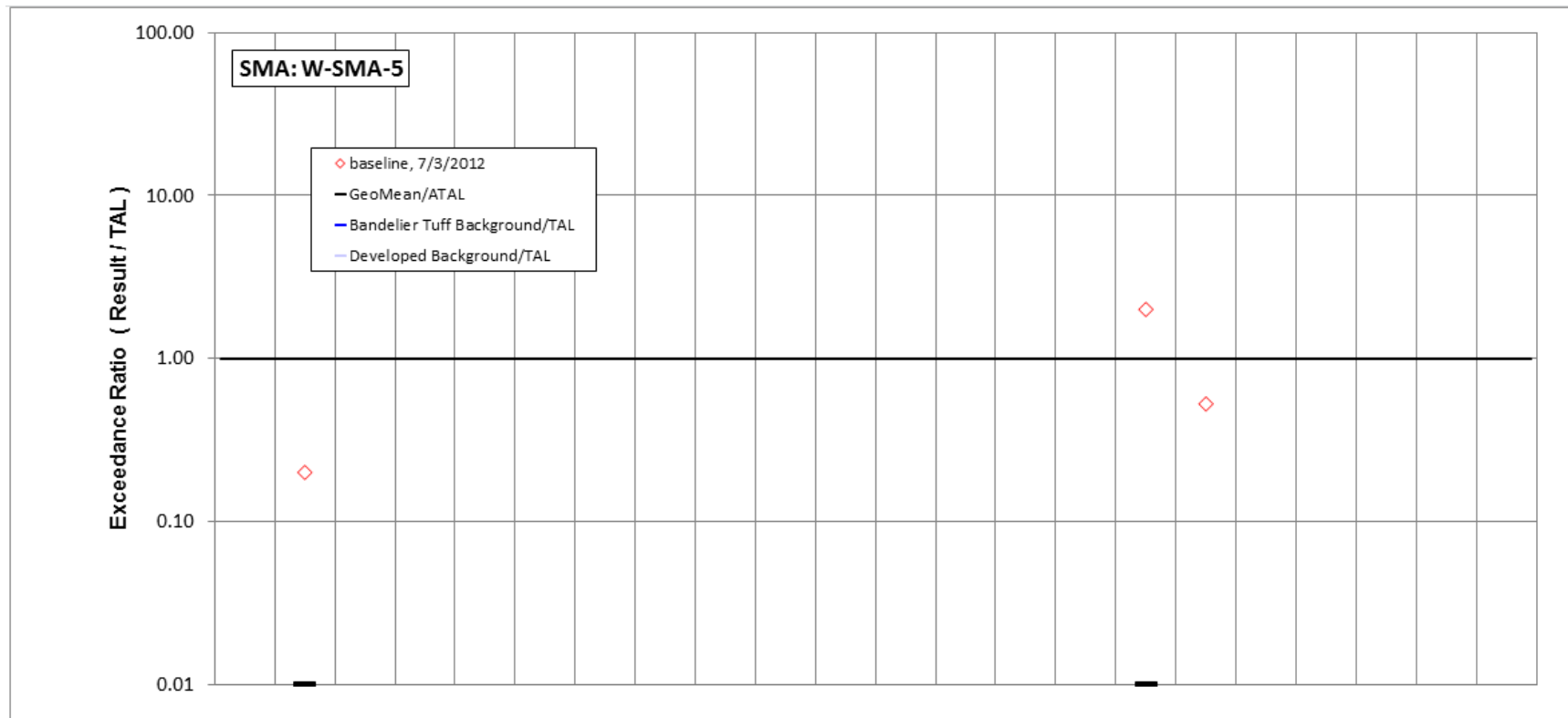
Figure 212-1 W-SMA-5 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	Mercury	Nickel	Selenium	<b>Silver</b>	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
7/3/2012 result	21.5	3	5	111	1	2.95	5	<b>6.28</b>	2	0.2	0.533	5	<b>1</b>	2	11.9	21.7	0.005	2.61	0.224
result / TAL	0.029	0.005	0.56	0.022	1	0.014	0.005	<b>1.5</b>	0.12	0.26	0.0031	1	<b>2</b>	0.32	0.12	0.52	0.5	0.17	0.008

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 212-2 Inorganic analytical results summary plot for W-SMA-5



	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	<b>Hexachlorobenzene</b>	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]	
std used in ratio calculations	-	MQL	-	-	-	-	-	-	-	-	-	-	-	-	-	MQL	MTAL	-	-	-	-	-	-
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	-	-	-	-	-	-
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	ug/L
<b>7/3/2012 result</b>	-	<b>1</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>10</b>	<b>10</b>	-	-	-	-	-	-
<b>result / TAL</b>	-	<b>0.2</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>2</b>	<b>0.53</b>	-	-	-	-	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 212-3 Organic analytical results summary plot for W-SMA-5



## 213.0 W-SMA-6: SWMU 11-001(c)

### 213.1 Site Descriptions

One historical industrial activity area is associated with W007, W-SMA-6: Site 11-001(c).

SWMU 11-001(c) is a former firing pit located at TA-16, northwest of former building 16-370 near the edge of Water Canyon. According to the 1990 SWMU report, the firing pit was similar in construction to Firing Pit 11-14, which was a 37-ft semicircular wall that was 12.5 ft high and 4.5 ft thick. The SWMU 11-001(c) firing pit was first used in 1944. The date when the firing pit ceased to be used is not documented; however, it would have been before construction of building 16-370 in the 1953. An RFI and a VCA were conducted in 1995 and 1996, respectively. However, during preparation of the Upper Water Canyon Aggregate Area investigation work plan, it was determined from engineering drawing R-126 that samples from the RFI and VCA were collected from the wrong location. The firing pit was actually located northwest of the area that was sampled.

Consent Order sampling has not yet been conducted at SWMU 11-001(c); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. Decision-level data are not available from the 1995 RFI or 1996 VCA.

The project map (Figure 213-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 213.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 213-1).

**Table 213-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00701010007	Seed and Wood Mulch	-	-	X	-	B
W00702040004	Established Vegetation	-	X	X	-	B
W00703060005	Straw Wattle	-	X	-	X	B
W00703060006	Straw Wattle	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 213.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at W-SMA-6. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

The monitoring station for W-SMA-6 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.



### 213.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-6 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 213-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62423	6-13-2017
Storm Rain Event	BMP-62934	7-3-2017
Storm Rain Event	BMP-63446	7-19-2017
Storm Rain Event	BMP-64178	8-8-2017
Storm Rain Event	BMP-66409	10-16-2017

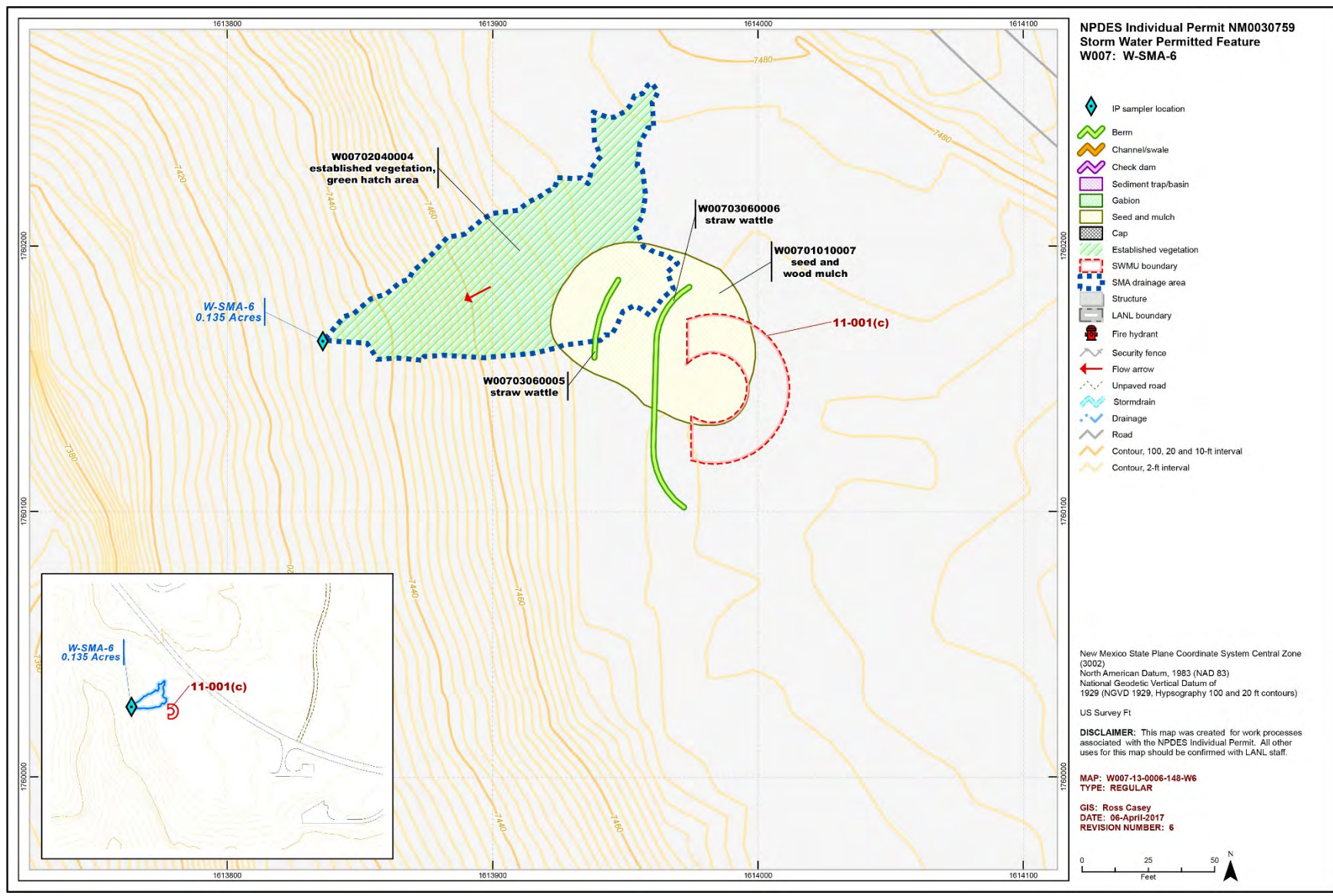
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-6 in 2017.

### 213.5 Compliance Status

The Site associated with W-SMA-6 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 213-3 presents the 2017 compliance status.

**Table 213-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 11-001(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.



**Figure 213-1 W-SMA-6 location map**

## **214.0 W-SMA-7: SWMUs 16-029(e) and 16-026(h2)**

### **214.1 Site Descriptions**

Two historical industrial activity areas are associated with W008, W-SMA-7: Sites 16-029(e) and 16-026(h2).

SWMU 16-029(e) consists of an HE sump and formerly NPDES-permitted outfall (05A159) that served HE equipment assembly building 16-360. The sump is a 12- × 4- × 5-ft subsurface reinforced concrete structure located on the exterior southeast side of the building. The sump received wash water from historical cleaning activities and discharged southeast to the outfall through a 6-in.-diameter drainline. The sump outlet was plugged in the early 1990s; the outfall was removed from the NPDES permit effective August 16, 1995.

Consent Order sampling has not yet been conducted at SWMU 16-029(e); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation.

SWMU 16-026(h2) consists of four outfalls at TA-16 that served HE equipment assembly building 16-360. The western outfall received discharge from a steam pit drain. The southern outfall received condensate from three floor drains. The remaining two outfalls are located to the east of the building and discharge storm water from roof drains. In the 1990s, the steam pit drain and floor drains were rerouted to the sanitary sewer system.

Consent Order sampling has not yet been conducted at SWMU 16-026(h2); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. No previous investigations have been conducted at the Site.

The project map (Figure 214-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **214.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 214-1).

Enhanced controls were installed and certified on September 28, 2015, and submitted to EPA on September 29, 2015, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 214-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00801030048	Hydromulch	-	-	X	-	EC
W00802040014	Established Vegetation	-	X	X	-	B
W00803010049	Earthen Berm	-	X	-	X	EC
W00803060010	Straw Wattle	X	-	-	X	CB
W00803060017	Straw Wattle	-	X	-	X	B
W00803060018	Straw Wattle	-	X	-	X	B
W00803060019	Straw Wattle	-	X	-	X	B
W00803060024	Straw Wattle	-	X	-	X	B
W00803060025	Straw Wattle	-	X	-	X	B
W00803140035	Coir Log	-	X	-	X	EC
W00803140036	Coir Log	-	X	-	X	EC
W00803140037	Coir Log	X	-	-	X	EC
W00803140038	Coir Log	X	-	-	X	EC
W00803140041	Coir Log	X	-	-	X	EC
W00803140042	Coir Log	X	-	-	X	EC
W00803140043	Coir Log	X	-	-	X	EC
W00803140044	Coir Log	X	-	-	X	EC
W00803140045	Coir Log	X	-	-	X	EC
W00803140046	Coir Log	X	-	-	X	EC
W00803140047	Coir Log	X	-	-	X	EC
W00806010001	Rock Check Dam	-	X	-	X	CB
W00806010003	Rock Check Dam	-	X	-	X	CB
W00806010004	Rock Check Dam	-	X	-	X	CB
W00806010015	Rock Check Dam	-	X	-	X	B
W00806010016	Rock Check Dam	-	X	-	X	B
W00806010026	Rock Check Dam	X	-	-	X	EC
W00806010027	Rock Check Dam	X	-	-	X	EC
W00806010028	Rock Check Dam	X	-	-	X	EC
W00806010029	Rock Check Dam	-	X	-	X	EC
W00806010030	Rock Check Dam	X	-	-	X	EC
W00806010031	Rock Check Dam	X	-	-	X	EC
W00806010032	Rock Check Dam	X	-	-	X	EC
W00806010033	Rock Check Dam	X	-	-	X	EC
W00806010034	Rock Check Dam	X	-	-	X	EC
W00808040023	Metal Cap	X	-	-	-	B

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.



### 214.3 Storm Water Monitoring

SWMUs 16-029(e) and 16-029(h2) are monitored within W-SMA-7. Following the installation of baseline control measures, a baseline storm water sample was collected on July 8, 2014 (Figure 214-2). In Figure 214-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Gross-alpha activity of 427 pCi/L (ATAL is 15 pCi/L) and
- Radium-226 and radium-228 activity of 42 pCi/L (ATAL is 30 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 16-029(e):*

- Alpha-emitting radionuclides including radium-226 and radium-228 are not known to be associated with industrial materials historically managed at the Site.

*SWMU 16-029(h2):*

- Alpha-emitting radionuclides including radium-226 and radium-228 are not known to be associated with industrial materials historically managed at the Site.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 214-2. 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 Figure 214-2.

Monitoring location W-SMA-7 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—Gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The 2014 gross-alpha result is between these two values.
- Radium-226 and radium-228—Radium-226 and radium-228 UTL for background storm water containing sediment derived from Bandelier Tuff is 52.7 pCi/L, and radium-226 and radium-228 background storm water UTL for storm water run-on from a developed landscape is 8.94 pCi/L. The 2014 radium-226 and radium-228 result is between these two values.

All the analytical results for these samples are reported in the 2014 Annual Report.

### 214.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-7 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 214-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62424	6-13-2017
Storm Rain Event	BMP-62935	7-3-2017
Storm Rain Event	BMP-63447	7-24-2017
Storm Rain Event	BMP-64179	8-9-2017
Storm Rain Event	BMP-66410	10-11-2017

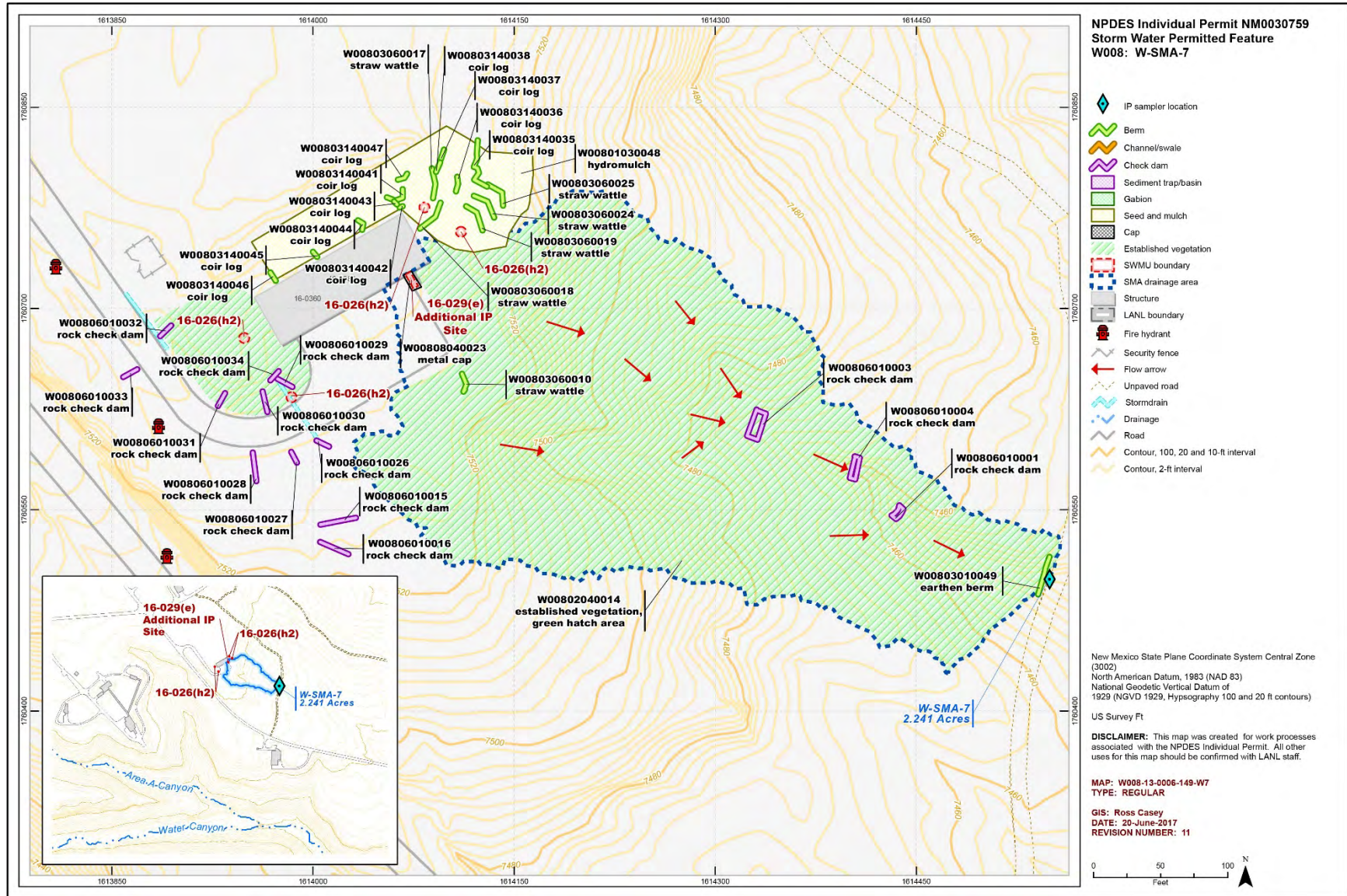
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-7 in 2017.

### 214.5 Compliance Status

The Site associated with W-SMA-7 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 214-3 presents the 2017 compliance status.

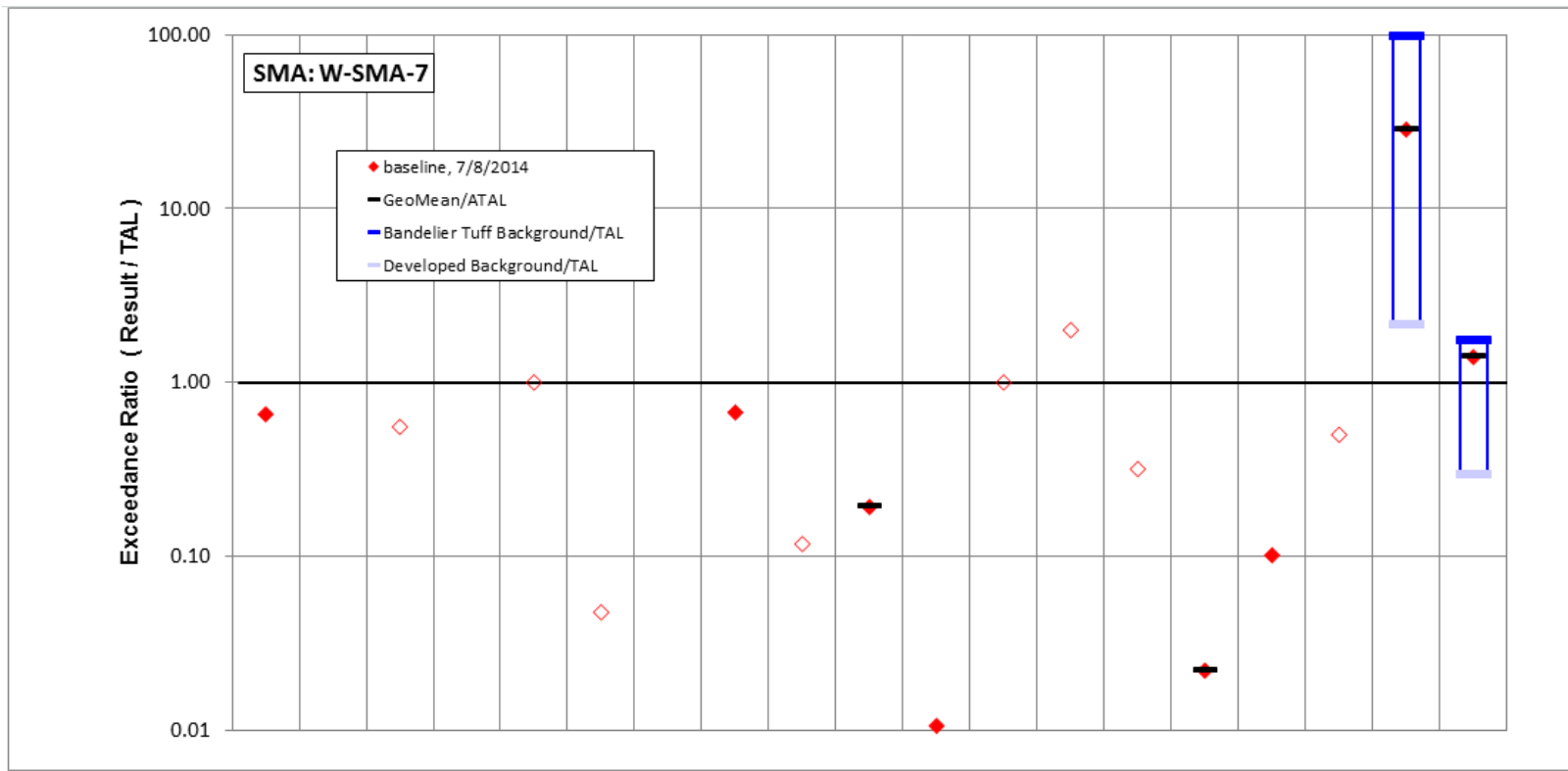
**Table 214-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-029(e)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas."
SWMU 16-026(h2)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 29, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Four Site Monitoring Areas."



**Figure 214-1 W-SMA-7 location map**





	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
7/8/2014 result	492	3	5	17.2	1	10	5	2.89	2	0.148	1.8	5	1	2	2.2	4.26	0.005	427	42
result / TAL	0.66	0.005	0.56	0.0034	1	0.048	0.005	0.67	0.12	0.19	0.011	1	2	0.32	0.022	0.1	0.5	28	1.4

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 214-2 Inorganic analytical results summary plot for W-SMA-7



## 215.0 W-SMA-7.8: SWMU 16-031(a)

### 215.1 Site Descriptions

One historical industrial activity area is associated with W009, W-SMA-7.8: Site 16-031(a).

SWMU 16-031(a) is an outfall that served a former cooling tower (building 16-372) at TA-16. The outfall discharged approximately 150 ft south of the cooling tower at the edge of Water Canyon. The outfall drainline was a 6-in.-diameter VCP that originated from a drain inside the southeast corner of the cooling tower. The cooling tower served building 16-370, a barium nitrate–grinding facility and metal-forming shop. The cooling tower was built in 1953 and burned down during the Cerro Grande fire in 2000. The concrete foundation remains in place.

Consent Order investigations have not yet begun at SWMU 16-031(a); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. Decision-level data are not available for the Site.

The project map (Figure 215-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 215.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 215-1).

**Table 215-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W00902040009	Established Vegetation	-	X	X	-	B
W00903010004	Earthen Berm	X	-	-	X	CB
W00903100010	Gravel Bags	-	X	-	X	B
W00906010001	Rock Check Dam	X	-	-	X	CB
W00906010005	Rock Check Dam	X	-	-	X	CB
W00906010006	Rock Check Dam	X	-	-	X	CB
W00906010007	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 215.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at W-SMA-7.8. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

### 215.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-7.8 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 215-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Verification Inspection for Additional Controls	BMP-61548	4-21-2017
Storm Rain Event and Annual Erosion Evaluation	BMP-62425	6-13-2017
Storm Rain Event	BMP-62936	7-3-2017
Storm Rain Event	BMP-63448	7-24-2017
Storm Rain Event	BMP-64180	8-7-2017
Storm Rain Event	BMP-66411	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-7.8 in 2017.

### 215.5 Compliance Status

The Site associated with W-SMA-7.8 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 215-3 presents the 2017 compliance status.

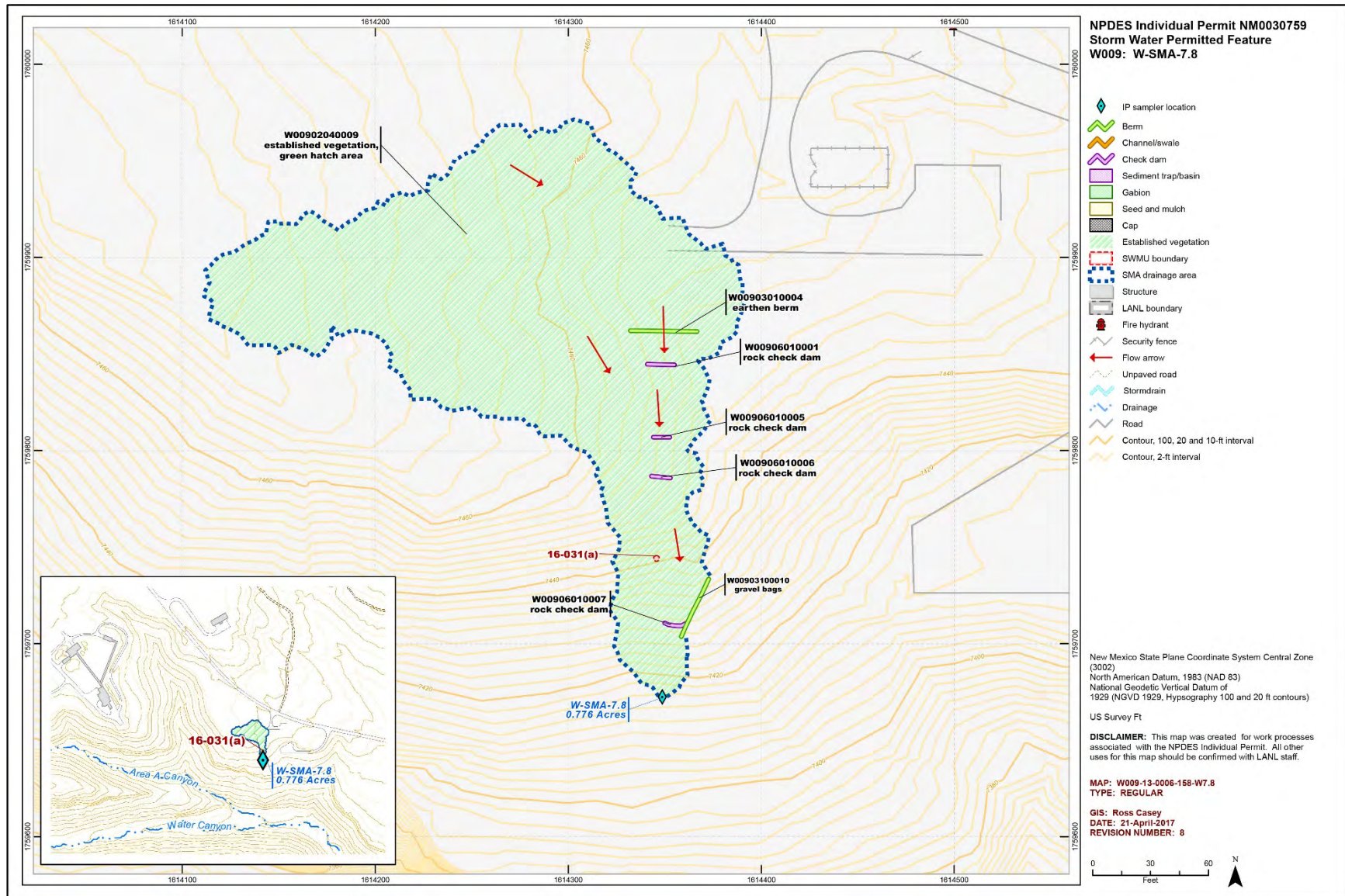
**Table 215-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-031(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.



W-SMA-7.8, Rock Check Dam, W00906010005 (photo ID 7801-4r)





**Figure 215-1 W-SMA-7.8 location map**

## 216.0 W-SMA-7.9: SWMU 16-006(c)

### 216.1 Site Descriptions

One historical industrial activity area is associated with W010, W-SMA-7.9: Site 16-006(c).

SWMU 16-006(c) is an inactive septic system located just west of former building 16-370. The septic system served building 16-370 and consisted of a 1200-gal. concrete septic tank (structure 16-371) and outfall drainline. The 1990 SWMU report states the septic tank discharged to a drain field. However, engineering drawings verify that a drain field was never constructed. The tank was constructed in 1953 and served floor drains and bathrooms on the third floor of building 16-370. Associated drainlines connect to a manhole (structure 16-813), which drained to the septic tank. The outlet line drained to an outfall approximately 260 ft south of the septic tank. The outfall discharged at the edge of Water Canyon. After the drainline was plugged in 1992, the tank was pumped regularly during the time building 16-370 remained operational until 2000. Building 16-370 underwent partial D&D in 2004; only a portion of the wall and the concrete slab remain.

Consent Order investigations have not yet begun at SWMU 16-006(c); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. Decision-level data are available from an RFI performed in 1995 and 1996.

The project map (Figure 216-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 216.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 216-1).

**Table 216-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01002040004	Established Vegetation	-	X	X	-	B
W01006010003	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 216.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at W-SMA-7.9. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.



### 216.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-7.9 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 216-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62415	6-13-2017
Storm Rain Event	BMP-62926	7-3-2017
Storm Rain Event	BMP-63438	7-24-2017
Storm Rain Event	BMP-64170	8-7-2017
Storm Rain Event	BMP-66401	10-16-2017

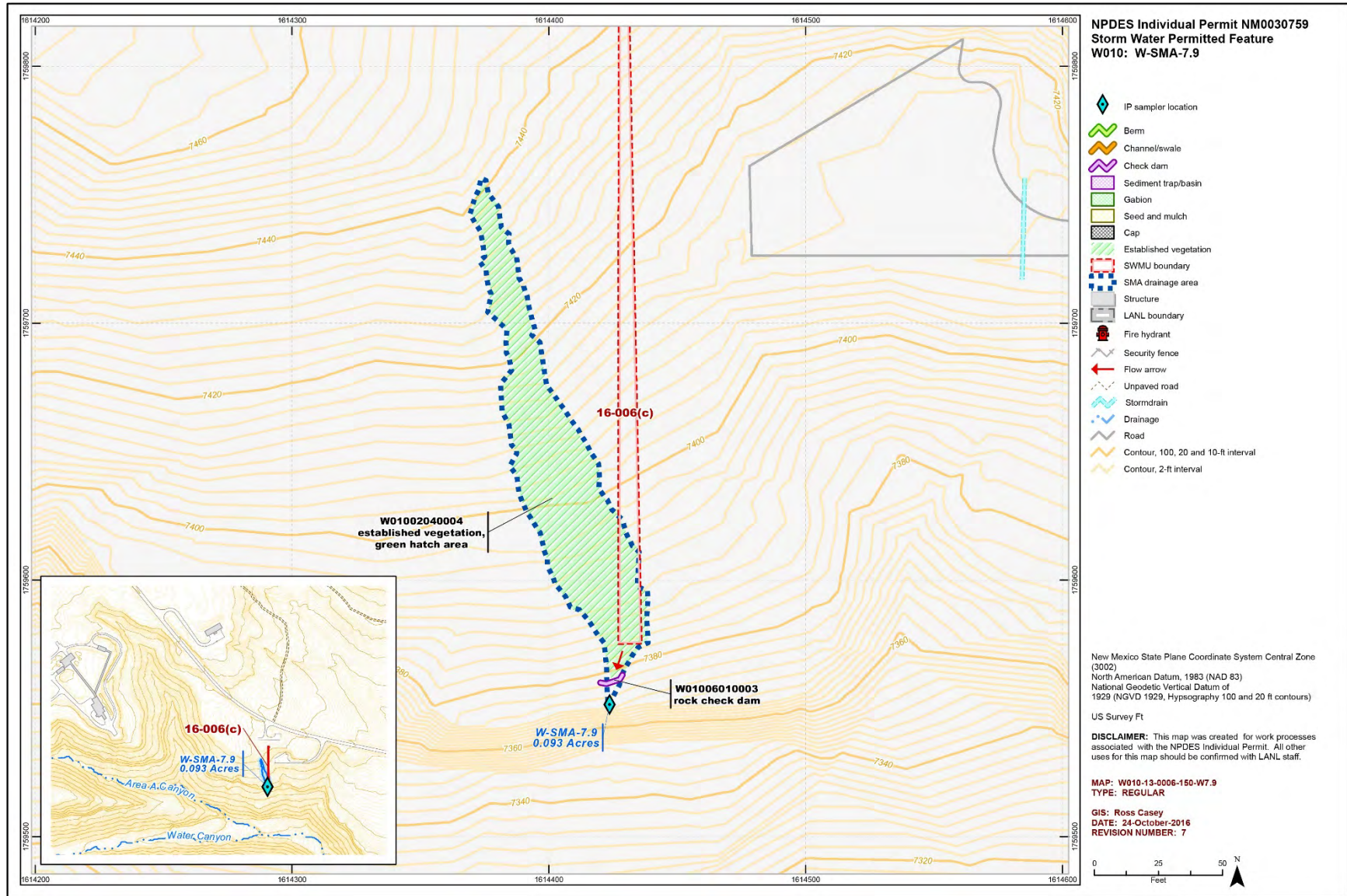
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-7.9 in 2017.

### 216.5 Compliance Status

The Site associated with W-SMA-7.9 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 216-3 presents the 2017 compliance status.

**Table 216-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-006(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.



**Figure 216-1 W-SMA-7.9 location map**

## **217.0 W-SMA-8: SWMUs 16-016(g) and 16-028(b)**

### **217.1 Site Descriptions**

Two historical industrial activity areas are associated with W011, W-SMA-8: Sites 16-016(g) and 16-028(b).

SWMU 16-016(g) is a surface disposal area associated with former building 16-370. Debris includes cans and pipes that were distributed over a 20-ft-diameter area and located in a drainage ditch approximately 60 ft south of the building. Building 16-370 was constructed in 1953 as a barium nitrate-grinding facility and later converted to a metal-forming shop for steel and aluminum. Building 16-370 was demolished in March 2005. HE was never used in the building. The surface disposal area lies in the drainage ditch shared by both SWMUs 16-026(a) and 16-028(b). Field observations indicated the debris was construction debris and not operational waste.

Consent Order sampling has not yet been conducted at SWMU 16-016(g); the Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. No previous investigations have been conducted at the Site.

SWMU 16-028(b) is a formerly NPDES-permitted outfall (04A092) that served former building 16-370. The outfall is located approximately 50 ft south of building 16-370. The outfall drainline consists of a 6-in. VCP that exits building 16-370 from its west side and daylights in Water Canyon. The outfall formerly received effluent from 29 floor drains, an eyewash station, a drinking fountain, and a sink. Building 16-370 was built in 1953 as a barium nitrate-grinding facility. In the late 1950s, it was converted to a metal-forming shop for steel and aluminum. Building 16-370 was demolished in March 2005. All drains that discharged to the outfall were plugged in the 1990s. The outfall was removed from the NPDES permit effective January 14, 1998. In July 2000, as part of the post-Cerro Grande fire recovery, debris removal, mulching, and permanent seeding were conducted at this Site as BMPs. Straw wattles were also installed to stabilize the Site and to prevent storm water run-on and runoff.

Consent Order sampling has not yet been conducted at SWMU 16-028(b). The Site will be sampled during the future Upper Water Canyon Aggregate Area investigation. However, decision-level data are available from the 1998 investigation.

The project map (Figure 217-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **217.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 217-1).

Enhanced controls were installed and certified on August 10, 2015, and submitted to EPA on August 17, 2015, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 217-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01102040009	Established Vegetation	-	X	X	-	B
W01103010012	Earthen Berm	X	-	-	X	EC
W01103010013	Earthen Berm	X	-	-	X	EC
W01103010014	Earthen Berm	X	-	-	X	EC
W01103010015	Earthen Berm	X	-	-	X	EC
W01103040010	Asphalt Berm	X	-	X	-	EC
W01106010006	Rock Check Dam	X	-	-	X	CB
W01106010011	Rock Check Dam	X	-	-	X	B
W01106010016	Rock Check Dam	-	X	-	X	EC

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 217.3 Storm Water Monitoring

SWMUs 16-016(g) and 16-028(b) are monitored within W-SMA-8. Following the installation of baseline control measures, a baseline storm water sample was collected on September 12, 2013 (Figures 217-2 and 217-3). In Figures 217-2 and 217-3, selenium, silver, and hexachlorobenzene are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 823 µg/L (MTAL is 750 µg/L) and
- Copper concentration of 28.1 µg/L (MTAL is 4.3 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 16-016(g):*

- Aluminum may have been associated with industrial materials historically managed at this Site. No soil data are available to evaluate whether the Site is a potential source of the TAL exceedances.
- Copper may have been associated with industrial materials historically managed at this Site. No soil data are available to evaluate whether the Site is a potential source of the TAL exceedances.

#### *SWMU 16-028(b):*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. Aluminum was not detected above the soil BV in the single shallow sample collected during the 1998 investigation.



- Copper may have been associated with industrial materials historically managed at this Site. Copper was detected at a concentration 32 times the soil BV in the single shallow sample collected during the 1998 investigation.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 217-2 and 217-3. 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 217-2 and 217-3.

Monitoring location W-SMA-8 receives storm water run-on from the SWMU 16-016(g) surface disposal area and from landscapes containing sediment derived from Bandelier Tuff.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2013 is between these two values.
- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is between these two values.

All the analytical results for these samples are reported in the 2013 Annual Report.

#### 217.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-8 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 217-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62416	6-13-2017
Storm Rain Event	BMP-62927	7-3-2017
Storm Rain Event	BMP-63439	7-24-2017
Storm Rain Event	BMP-64171	8-7-2017
Storm Rain Event	BMP-66402	10-16-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-8 in 2017.

#### 217.5 Compliance Status

The Sites associated with W-SMA-8 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 217-3 presents the 2017 compliance status.

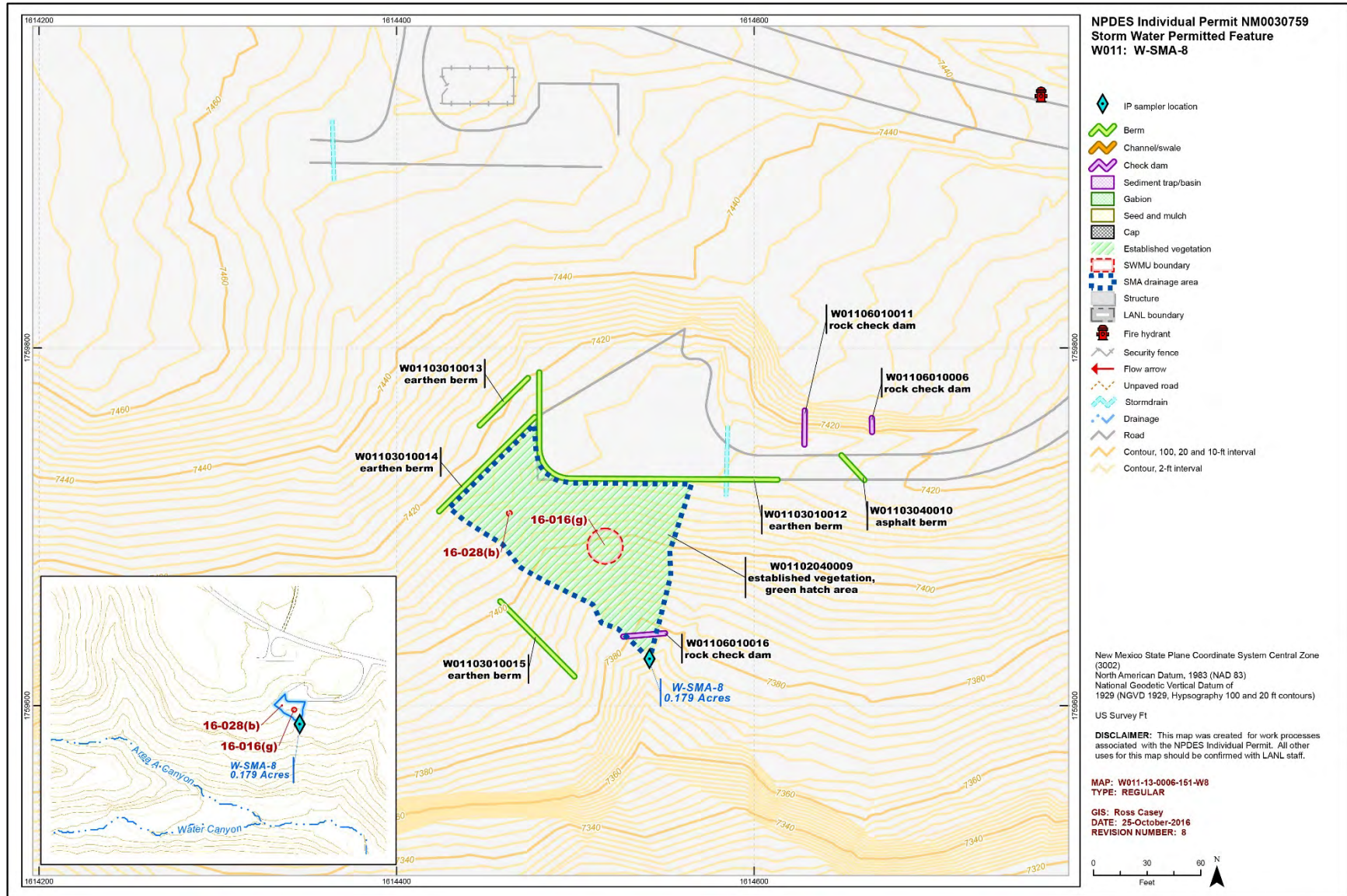
**Table 217-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-016(g)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, August 17, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Eight Site Monitoring Areas."
SWMU 16-028(b)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, August 17, 2015, "NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Eight Site Monitoring Areas."

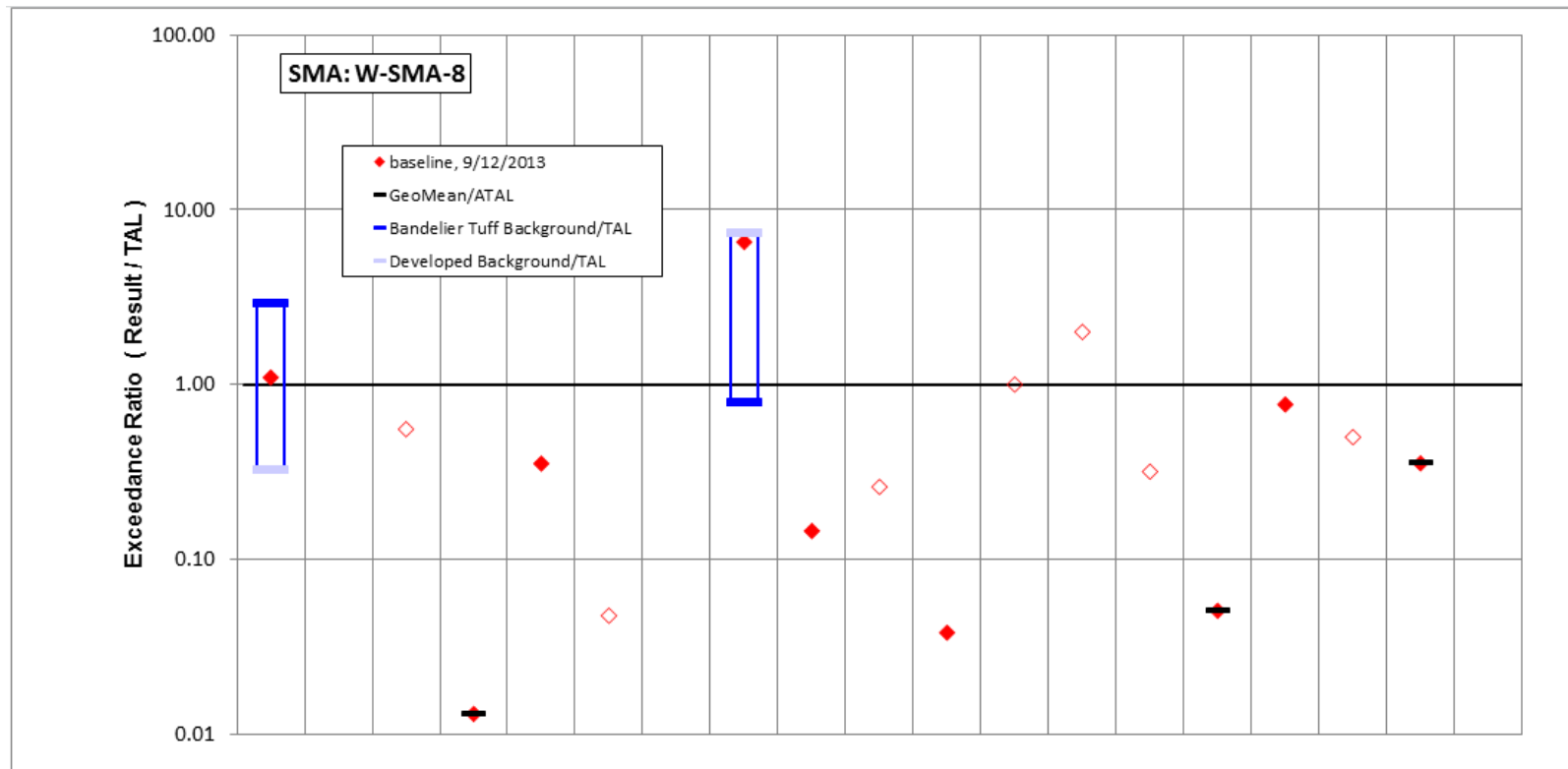


W-SMA-8, Rock Check Dam, W01106010006 (photo ID 7806-1r)





**Figure 217-1 W-SMA-8 location map**

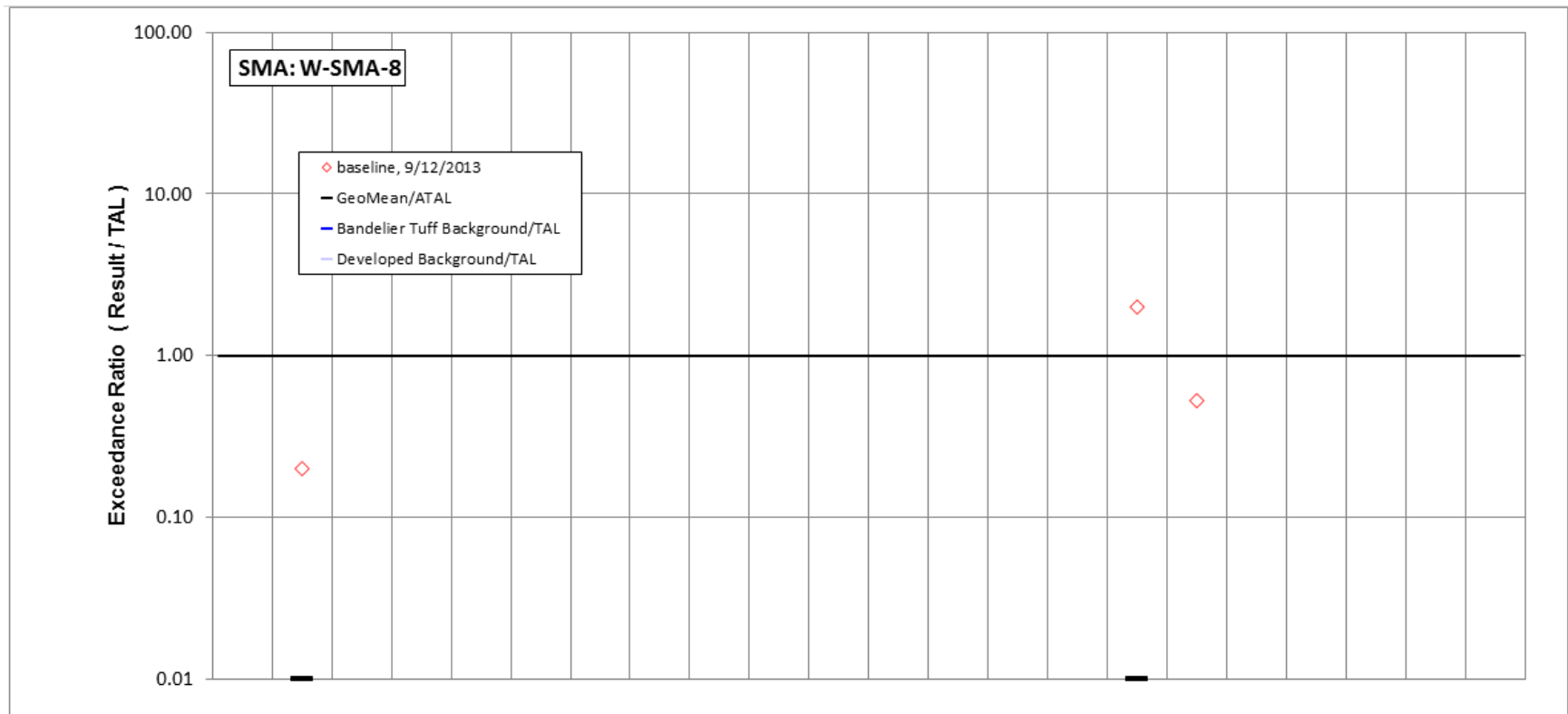


	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
9/12/2013 result	823	3	5	65.2	0.353	10	1.19	28.1	2.47	0.2	6.47	5	1	2	5.08	32.3	0.005	5.31	1E-09
result / TAL	1.1	0.005	0.56	0.013	0.35	0.048	0.0012	6.5	0.15	0.26	0.038	1	2	0.32	0.051	0.77	0.5	0.35	3E-11

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 217-2 Inorganic analytical results summary plot for W-SMA-8





	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	<b>Hexachlorobenzene</b>	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	<b>MQL</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>MQL</b>	<b>MTAL</b>	-	-	-	-	-
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	-	-	-	-	-
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
<b>9/12/2013 result</b>	-	<b>1</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>10</b>	<b>10</b>	-	-	-	-	-
<b>result / TAL</b>	-	<b>0.2</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>2</b>	<b>0.53</b>	-	-	-	-	-

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 217-3 Organic analytical results summary plot for W-SMA-8**

## **218.0 W-SMA-8.7: SWMUs 13-001, 13-002, 16-004(a), 16-026(j2), 16-029(h), and 16-035**

### **218.1 Site Descriptions**

Six historical industrial activity areas are associated with W012, W-SMA-8.7: Sites 13-001, 13-002, 16-004(a), 16-026(j2), 16-029(h), and 16-035.

SWMU 13-001 is an inactive firing site located east of former building 16-340. The firing site is associated with firing activities conducted at P-Site (former TA-13). The area contains shrapnel and debris, including firing cables, lead balls, and chunks of steel and copper.

Phase I Consent Order sampling is complete for SWMU 13-001. The Site meets residential risk levels. SWMU 13-001 was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 13-001 will be eligible for a COC upon approval of the report by NMED.

SWMU 13-002 is a surface disposal area located east of former building 16-340. The disposal area contains debris and shrapnel associated with firing activities conducted at P-Site (former TA-13). A portion of the TA-16 WWTP [Consolidated Unit 16-004(a)-99] is located on top of the southern tip of the surface disposal area.

Phase I Consent Order sampling is complete for SWMU 13-002. SWMU 13-002 meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 13-002 will be eligible for a COC upon approval of the report by NMED.

SWMU 16-004(a) is the inactive Imhoff tank (structure 16-530) that was used for sewage treatment at the TA-16 sanitary WWTP. The structure is approximately 20 × 35 ft with a total area of 700 ft<sup>2</sup> and a depth of 22 ft. The tank was taken out of service in 1992. Located southeast of the former TA-16-340 Complex and north of the communitor (a cutting device for sewage solids), the Imhoff tank received effluent that flowed over a weir into a dosing siphon. Any sludge that may have collected in the tank was digested before it was discharged to drying beds [SWMUs 16-004(d) and 16-004(f)]. The tank had an emergency overflow pipe that discharged onto a slope northeast of the tank.

SWMU 16-004(a) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 16-004(a) will be eligible for a COC upon approval of the report by NMED.

SWMU 16-026(j2) consists of the former outfall from a former HE sump [SWMU 16-029(f)] associated with a former resthouse (structure 16-345) located on the 340 Line at TA-16. The resthouse and sump were constructed in 1952 and served as a HE storage facility for former building 16-340. The sump was located on the southeast exterior wall and received discharge generated during cleaning activities. The outfall received effluent from the sump and discharged southeast of the sump location. The resthouse, sump, and associated drainlines were removed in 2005.

SWMU 16-026(j2) was investigated under the Consent Order and recommended for corrective action complete in the Phase II investigation report for the TA-16-340 complex. NMED approved the investigation report but required the Laboratory to conduct additional surface water and groundwater sampling for the TA-16-340 Complex as well as to maintain the BMPs.

SWMU 16-029(h) consists of an inactive outfall and two inactive/former drainlines (one known and one suspected) from the HE sump [AOC 16-003(p)], located on the south side of former building 16-478. The known drainline exits the southeast corner of the sump and extends 80 ft east of the sump to the rim of

Cañon de Valle. This drainline discharged directly into Cañon de Valle before the drainline was plugged in 1987. A second drainline is alleged to be present. The second drainline is reportedly a French drain that extends south of the sump. Former building 16-478 was used as a bunker, utility room, control room, and high-speed machining room for tests on experimental HE. When the building was removed in 2005, the sump was left in place. During the investigation activities conducted in 2009 and 2010, no evidence of the French drain was found.

Phase I Consent Order sampling is complete for SWMU 16-029(h). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs, except for two detections of arsenic in two subsurface tuff samples. SWMU 16-029(h) was recommended for additional field characterization activities in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015.

SWMU 16-035 is an area of potential soil contamination located approximately 200 ft east of former building 16-340. The soil contamination is associated with a former control bunker (former structure 13-2 renumbered to 16-476). The control bunker was one of several buildings constructed at TA-13 in 1944 to support the Manhattan Project. Former TA-13 was built in 1944 to support the HE project of the Manhattan Project and has been used since then for a variety of Laboratory activities. It was principally designed as a site for counter-x-ray diagnostics of HE lens configurations. Activities that supported the diagnostics included operating counter-x-ray equipment, HE assembly, and research in the magnetic method program. The control bunker was removed during D&D activities in 2005.

Phase I Consent Order sampling is complete for SWMU 16-035. SWMU 16-035 meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 16-035 will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 218-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## 218.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 218-1).

**Table 218-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01202040011	Established Vegetation	-	X	X	-	B
W01203060010	Straw Wattle	-	X	-	X	CB
W01206010006	Rock Check Dam	-	X	-	X	CB
W01206010007	Rock Check Dam	-	X	-	X	CB
W01206010008	Rock Check Dam	X	-	-	X	CB

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 218.3 Storm Water Monitoring

SWMUs 13-001, 13-002, 16-004(a), 16-026(j2), 16-029(h), and 16-035 are monitored within W-SMA-8.7. Following the installation of baseline control measures, a baseline storm water sample was collected on September 12, 2013 (Figures 218-2 and 218-3). In Figure 218-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Aluminum concentration of 1920 µg/L (MTAL is 750 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 13-001:*

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above the soil BV in 28 shallow soil samples collected during 2009–2010 Consent Order investigations.

#### *SWMU 13-002:*

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above the soil BV in 8 shallow soil samples collected during 2009–2010 Consent Order investigations.

#### *SWMU 16-004(a):*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. Samples collected during the 2010 Consent Order investigation were all deep (i.e., greater than 22 ft bgs) samples collected beneath the bottom of the Imhoff tank. No shallow sample data are available for this Site.

#### *SWMU 16-026(j2):*

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was detected above sediment and tuff BVs in 2 of 14 shallow soil, sediment, and tuff samples collected during 2005 and 2008 Consent Order investigations. Aluminum was detected at a maximum concentration 2 times the sediment BV.

#### *SWMU 16-029(h):*

- Aluminum is not known to have been associated with industrial materials historically managed at this Site. Aluminum was not detected above the soil BV in 17 shallow soil samples collected during 2009–2010 Consent Order investigations.

#### *SWMU 16-035:*

- Aluminum is not known to be associated with industrial materials historically managed at this Site. Aluminum was not detected above BVs in 29 shallow (i.e., less than 3 ft bgs) soil and tuff samples collected during the 2010 Consent Order investigation.



TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 218-2 and 218-3. 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 218-2 and 218-3.

Monitoring location W-SMA-8.7 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including aluminum are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2013 is between these two values.

All the analytical results for these samples are reported in the 2013 Annual Report.

#### 218.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-8.7 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 218-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62417	6-13-2017
Storm Rain Event	BMP-62928	7-3-2017
Storm Rain Event	BMP-63440	7-19-2017
Storm Rain Event	BMP-64172	8-7-2017
Storm Rain Event	BMP-66403	10-17-2017

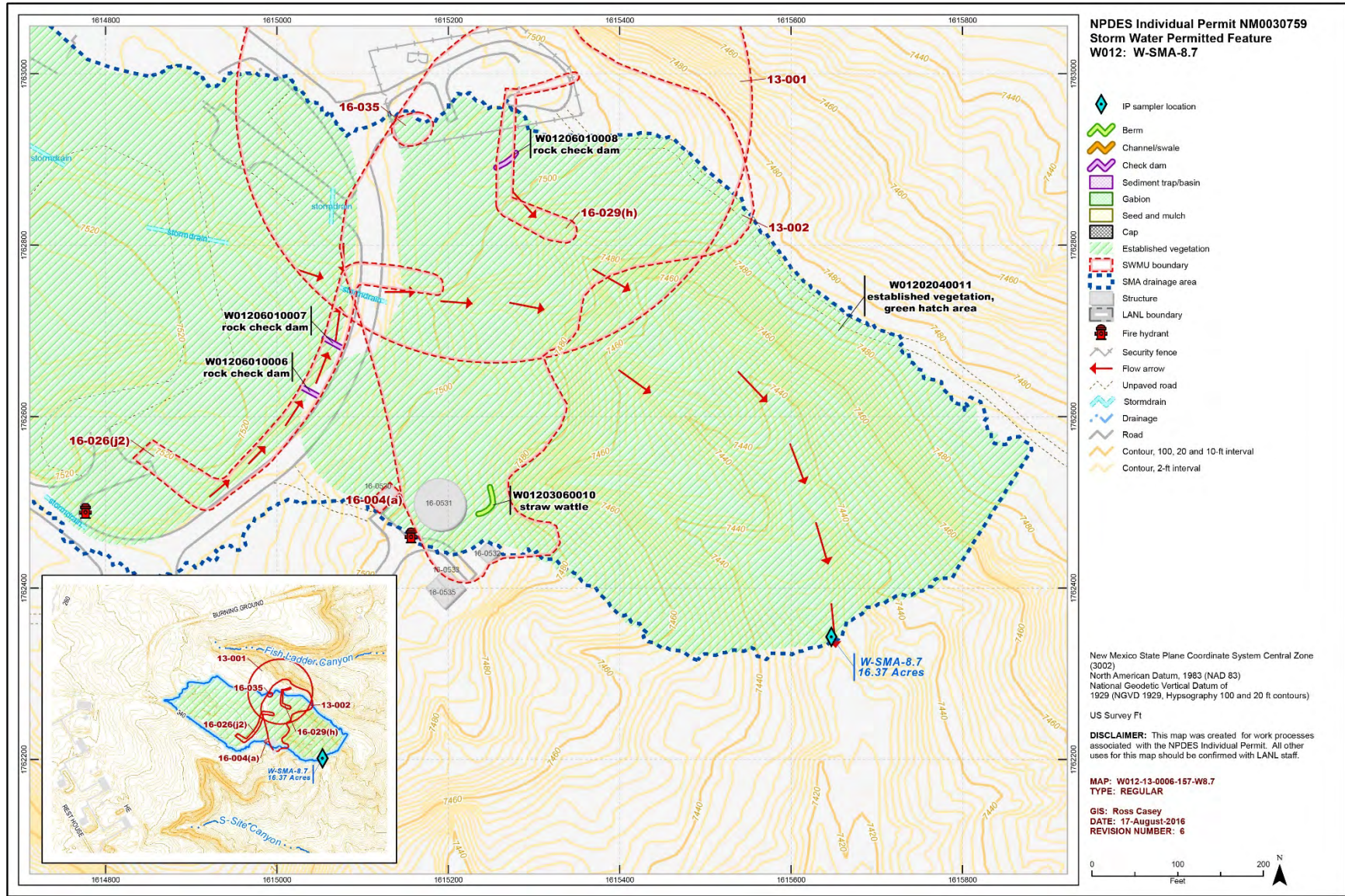
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-8.7 in 2017.

#### 218.5 Compliance Status

The Sites associated with W-SMA-8.7 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 218-3 presents the 2017 compliance status.

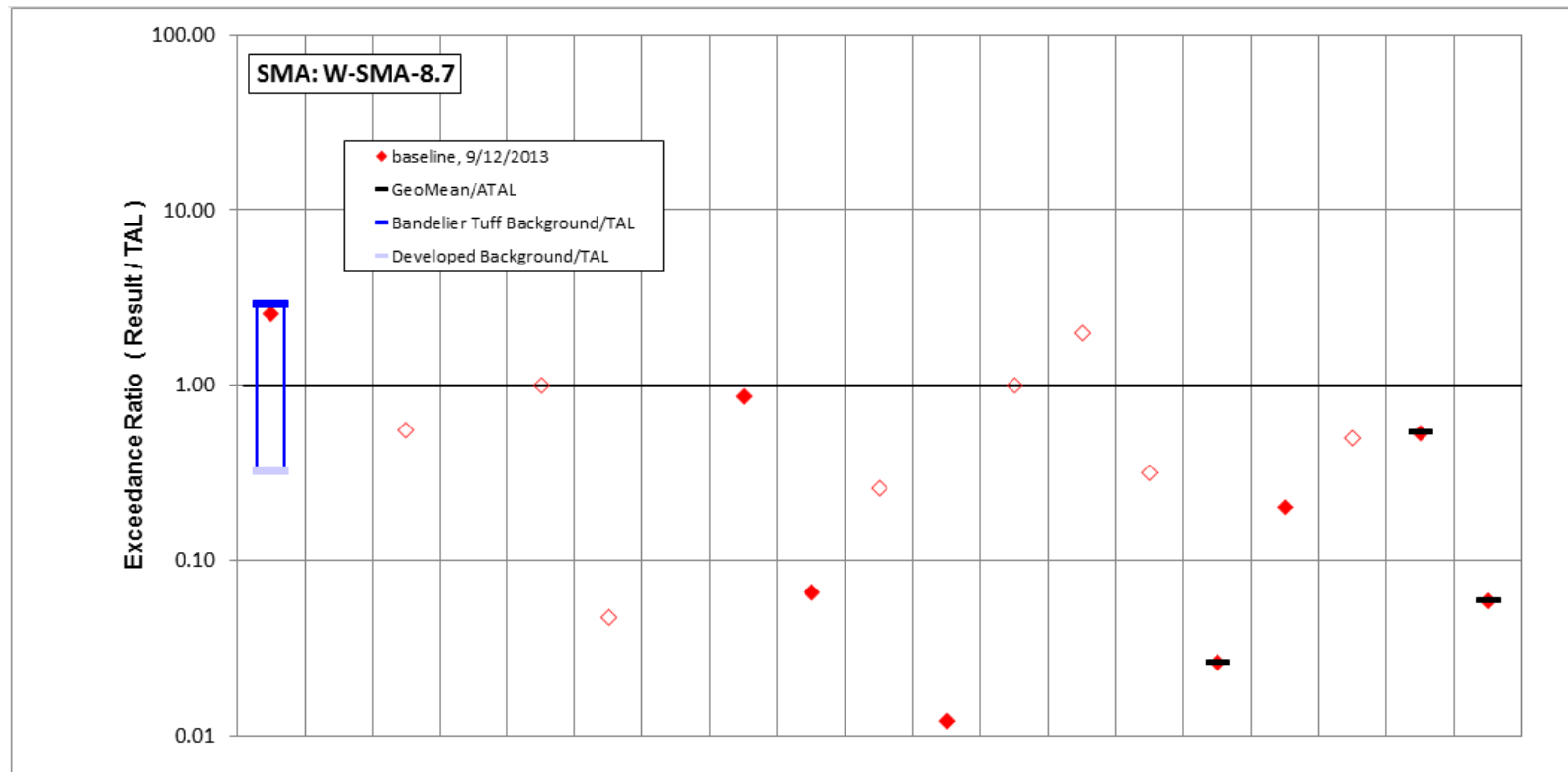
**Table 218-3 Compliance Status during 2017**

<b>Site</b>	<b>Compliance Status on Jan 1, 2017</b>	<b>Compliance Status on Dec 31, 2017</b>	<b>Comments</b>
SWMU 13-001	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 13-002	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-004(a)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-026(j2)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU16-029(h)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 16-035	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."



**Figure 218-1 W-SMA-8.7 location map**



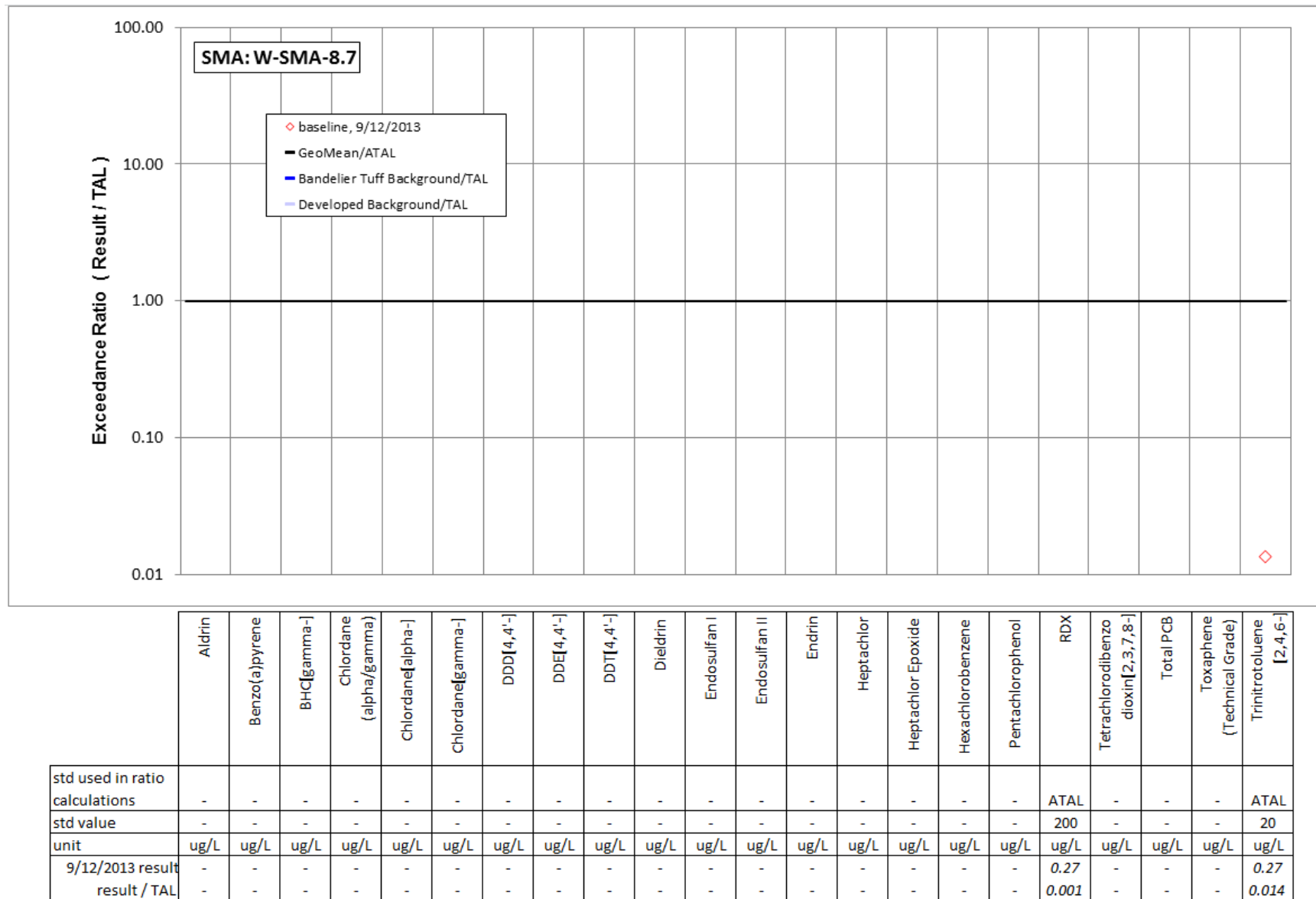


	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
9/12/2013 result	<b>1920</b>	<i>3</i>	<i>5</i>	<i>16.1</i>	<i>1</i>	<i>10</i>	<i>1.32</i>	<i>3.72</i>	<i>1.12</i>	<i>0.2</i>	<i>2.06</i>	<i>5</i>	<i>1</i>	<i>2</i>	<i>2.62</i>	<i>8.47</i>	<i>0.005</i>	<i>8</i>	<i>1.77</i>
result / TAL	<b>2.6</b>	<i>0.005</i>	<i>0.56</i>	<i>0.0032</i>	<i>1</i>	<i>0.048</i>	<i>0.0013</i>	<i>0.87</i>	<i>0.066</i>	<i>0.26</i>	<i>0.012</i>	<i>1</i>	<i>2</i>	<i>0.32</i>	<i>0.026</i>	<i>0.2</i>	<i>0.5</i>	<i>0.53</i>	<i>0.059</i>

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 218-2 Inorganic analytical results summary plot for W-SMA-8.7





Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 218-3 Organic analytical results summary plot for W-SMA-8.7

## 219.0 W-SMA-8.71: SWMU 16-004(c)

### 219.1 Site Descriptions

One historical industrial activity area is associated with W012A, W-SMA-8.71: Site 16-004(c).

SWMU 16-004(c) is the inactive clarifier or final tank (structure 16-532) used for sewage treatment at the former TA-16 sanitary WWTP. The structure is approximately 20 × 20 ft with a total area of 400 ft<sup>2</sup>. The clarifier was located southeast of the trickling filter. The clarifier received discharge from the trickling filter; water flowed through an outlet in the clarifier and discharged to formerly NPDES-permitted outfall EPA-SSS03S and eventually into a tributary of Water Canyon. At full capacity, structure 16-532 could manage 117,600 gal./d. The formerly NPDES-permitted outfall (EPA-SSS03S) for the WWTP was monitored for inorganic chemicals, organic chemicals, and pesticides. Effluent was monitored bimonthly for radionuclides and standard parameters for wastewater systems (e.g., biological oxygen demand, chemical oxygen demand, and total dissolved solids). The former TA-16 sanitary WWTP was constructed in 1953 and was decommissioned in 1992; some of the concrete foundations remain in place.

Phase I Consent Order sampling is complete for SWMU 16-004(c). SWMU 16-004(c) was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015, because it has no complete exposure pathway. SWMU 16-004(c) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 219-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 219.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 219-1).

Enhanced controls were installed and certified on November 27, 2012, and September 4, 2015, and submitted to EPA on December 13, 2012, and September 10, 2015, respectively, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 219-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W012A02040006	Established Vegetation	-	X	X	-	B
W012A03010005	Earthen Berm	X	-	-	X	EC
W012A03010007	Earthen Berm	-	X	-	X	EC
W012A03060008	Straw Wattle	-	X	-	X	B
W012A03060009	Straw Wattle	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 219.3 Storm Water Monitoring

SWMU 16-004(c) is monitored within W-SMA-8.71. Following the installation of baseline control measures, a baseline confirmation sample was collected on August 21, 2011 (Figure 219-2). In Figure 219-2, selenium and silver are reported as nondetectable results equal or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Inorganic analytical results from this baseline sample yielded the following TAL exceedance:

- Gross-alpha activity of 15.8 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at W-SMA-8.71, a corrective action storm water sample was collected on September 13, 2013 (Figure 219-2). Analytical results from this corrective action monitoring sample yielded the following TAL exceedances:

- Copper concentration of 19.8 µg/L (MTAL is 4.3 µg/L),
- Mercury concentration of 1.51 µg/L (ATAL is 0.77 µg/L), and
- Zinc concentration of 55.4 µg/L (MTAL is 42 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 16-004(c):*

- Copper is not known to be associated with industrial materials historically managed at this Site. No shallow Consent Order samples were collected from this Site; potential contamination is expected in the subsurface (i.e., greater than 20 ft bgs). However, copper was not detected above BVs in any of the subsurface Consent Order samples collected at SWMU 16-004(c).
- Mercury is not known to be associated with industrial materials historically managed at this Site. No shallow Consent Order samples were collected from this Site; potential contamination is expected in the subsurface (i.e., greater than 20 ft bgs). However, mercury was not detected above BVs in any of the subsurface Consent Order samples collected at SWMU 16-004(c).
- Zinc is not known to be associated with industrial materials historically managed at this Site. No shallow Consent Order samples were collected from this Site; potential contamination is expected in the subsurface (i.e., greater than 20 ft bgs). However, zinc was not detected above BVs in any of the subsurface Consent Order samples collected at SWMU 16-004(c).



W-SMA-8.71, Earthen Berm, W012A03010005 (photo ID 46536-2)

Based on the Site history (no surface contamination) and Consent Order sampling data (no detects of TAL exceedance constituents), the Site is an unlikely source of the TAL exceedances.

The TAL exceedance was also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled

“Bandelier Tuff Background” in Figure 219-2. 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 Figure 219-2.

Monitoring location W-SMA-8.71 receives storm water run-on from locations with sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is greater than this value.
- Mercury—The mercury UTL from undisturbed Bandelier Tuff was not calculated because the number of detected values was not sufficient to calculate the UTL values in the baseline metals background study. Therefore, no comparison to the mercury background value in storm water could be made.
- Zinc—The zinc UTL from background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. The zinc result from 2013 is less than this value.

All the analytical results for these samples are reported in the 2011 and 2013 Annual Reports.

#### 219.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-8.71 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 219-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62426	6-13-2017
Storm Rain Event	BMP-62937	7-3-2017
Storm Rain Event	BMP-63449	7-19-2017
Storm Rain Event	BMP-64181	8-7-2017
Storm Rain Event	BMP-66412	10-17-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-8.71 in 2017.

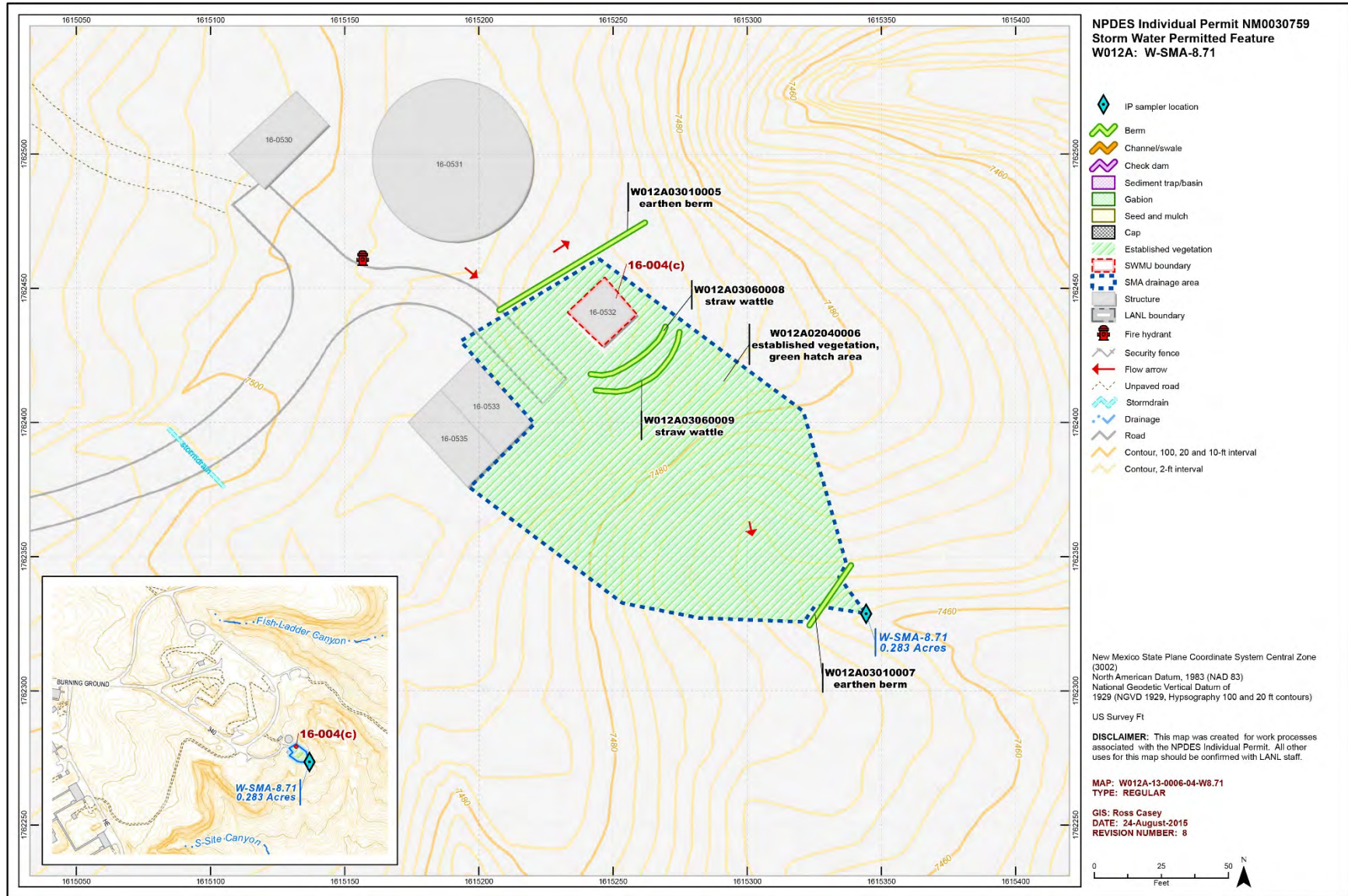
#### 219.5 Compliance Status

The Site associated with W-SMA-8.71 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 219-3 presents the 2017 compliance status.

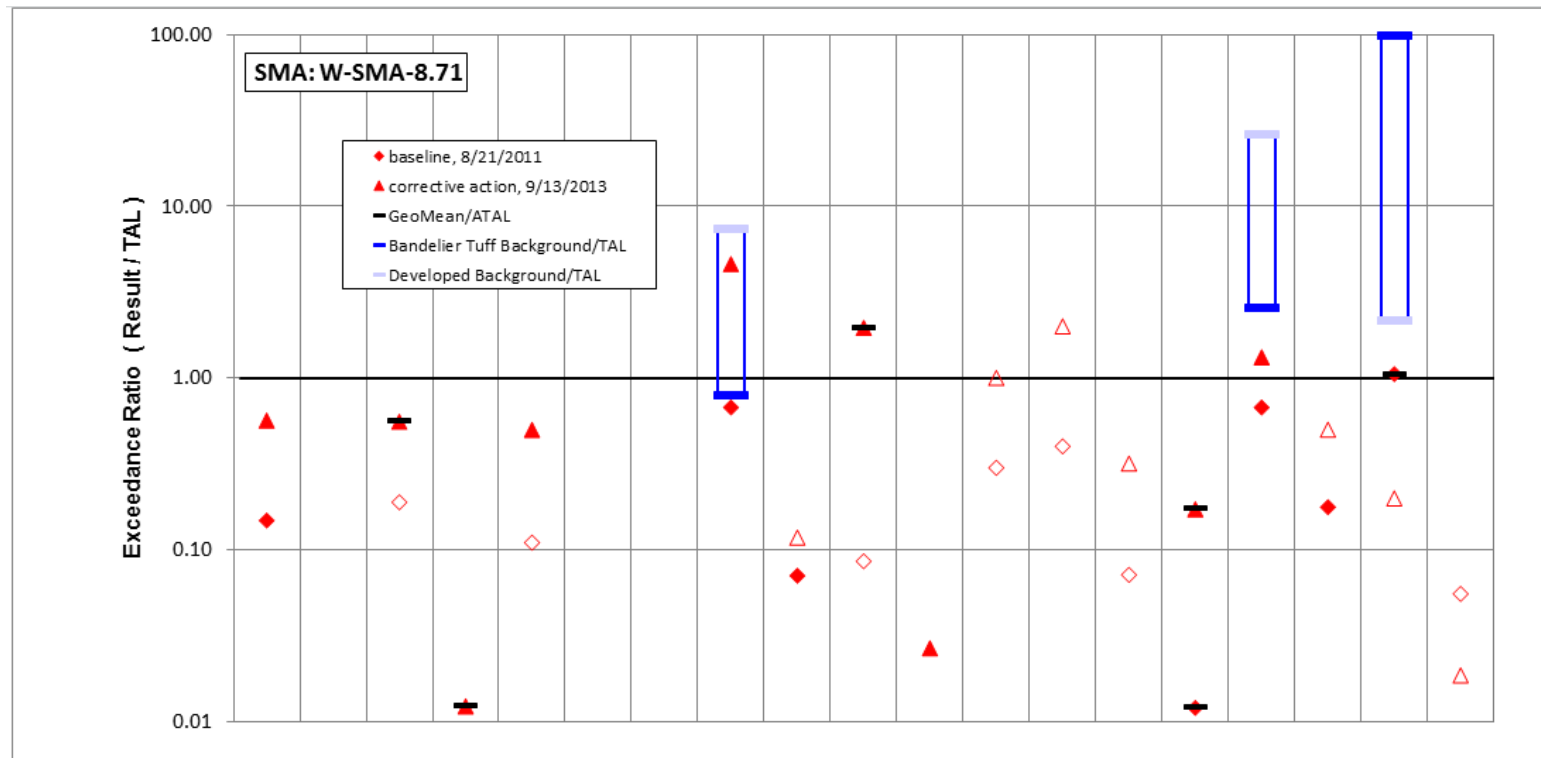
**Table 219-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 16-004(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, September 10, 2015, “NPDES Permit No. NM0030759 - Submittal of Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas.”





**Figure 219-1 W-SMA-8.71 location map**



	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>9/13/2013 result</b>	424	1.34	5.01	61.3	0.499	2	1.06	<b>19.8</b>	2	<b>1.51</b>	4.54	5	<b>1</b>	2	17.2	<b>55.4</b>	<i>0.005</i>	2.99	0.557
result / TAL	0.57	0.0021	0.56	0.012	0.5	0.0095	0.0011	<b>4.6</b>	0.12	<b>2</b>	0.027	1	<b>2</b>	0.32	0.17	<b>1.3</b>	0.5	0.2	0.019
<b>8/21/2011 result</b>	111	1	1.7	15.5	0.11	2	2	2.9	1.2	<i>0.066</i>	0.92	1.5	0.2	0.45	1.2	28.3	0.0018	<b>15.8</b>	1.66
result / TAL	0.15	<i>0.002</i>	<i>0.19</i>	<i>0.0031</i>	<i>0.11</i>	<i>0.01</i>	0.002	0.67	0.071	<i>0.086</i>	0.0054	0.3	0.4	0.071	0.012	0.67	0.18	<b>1.1</b>	0.055

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 219-2 Inorganic analytical results summary plot for W-SMA-8.71**

## 220.0 W-SMA-9.05: AOC 16-030(g)

### 220.1 Site Descriptions

One historical industrial activity area is associated with W013, W-SMA-9.05: Site 16-030(g).

AOC 16-030(g) is a former NPDES-permitted outfall (05A052) located south of building 16-380 at TA-16. The outfall received effluent from a sump [SWMU 16-003(m)], two roof drains, a steam-heating system, and a drop inlet from a parking lot and discharged to Water Canyon. The outfall was removed from the NPDES permit in 1993. The sump and the steam-heating system discharge lines have been plugged, and the outfall currently receives only roof drain and parking lot runoff.

Consent Order investigations have not yet begun at AOC 16-030(g). The Site will be sampled during the future Upper Water Canyon Aggregate Area investigation.

The project map (Figure 220-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 220.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 220-1).

**Table 220-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01302040013	Established Vegetation	-	X	X	-	B
W01303010010	Earthen Berm	-	X	-	X	B
W01303010011	Earthen Berm	-	X	-	X	B
W01304010004	Earthen Channel/Swale	X	-	X	-	CB
W01306010001	Rock Check Dam	-	X	-	X	CB
W01306010012	Rock Check Dam	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 220.3 Storm Water Monitoring

AOC 16-030(g) is monitored within W-SMA-9.05. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 220-2 and 220-3). In Figure 220-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded no TAL exceedances. Baseline confirmation is complete for W-SMA-9.05 and the associated AOC 16-030(g) because all applicable sampling results are below the applicable MTAL or ATAL. No further sampling is required for W-SMA-9.05 for the remaining period of the IP.

#### 220.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-9.05 during the 2017 season. These rain events triggered five post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 220-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62414	6-13-2017
Storm Rain Event	BMP-62925	7-3-2017
Storm Rain Event	BMP-63437	7-19-2017
Storm Rain Event	BMP-64169	8-7-2017
Storm Rain Event	BMP-66399	10-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-9.05 in 2017.

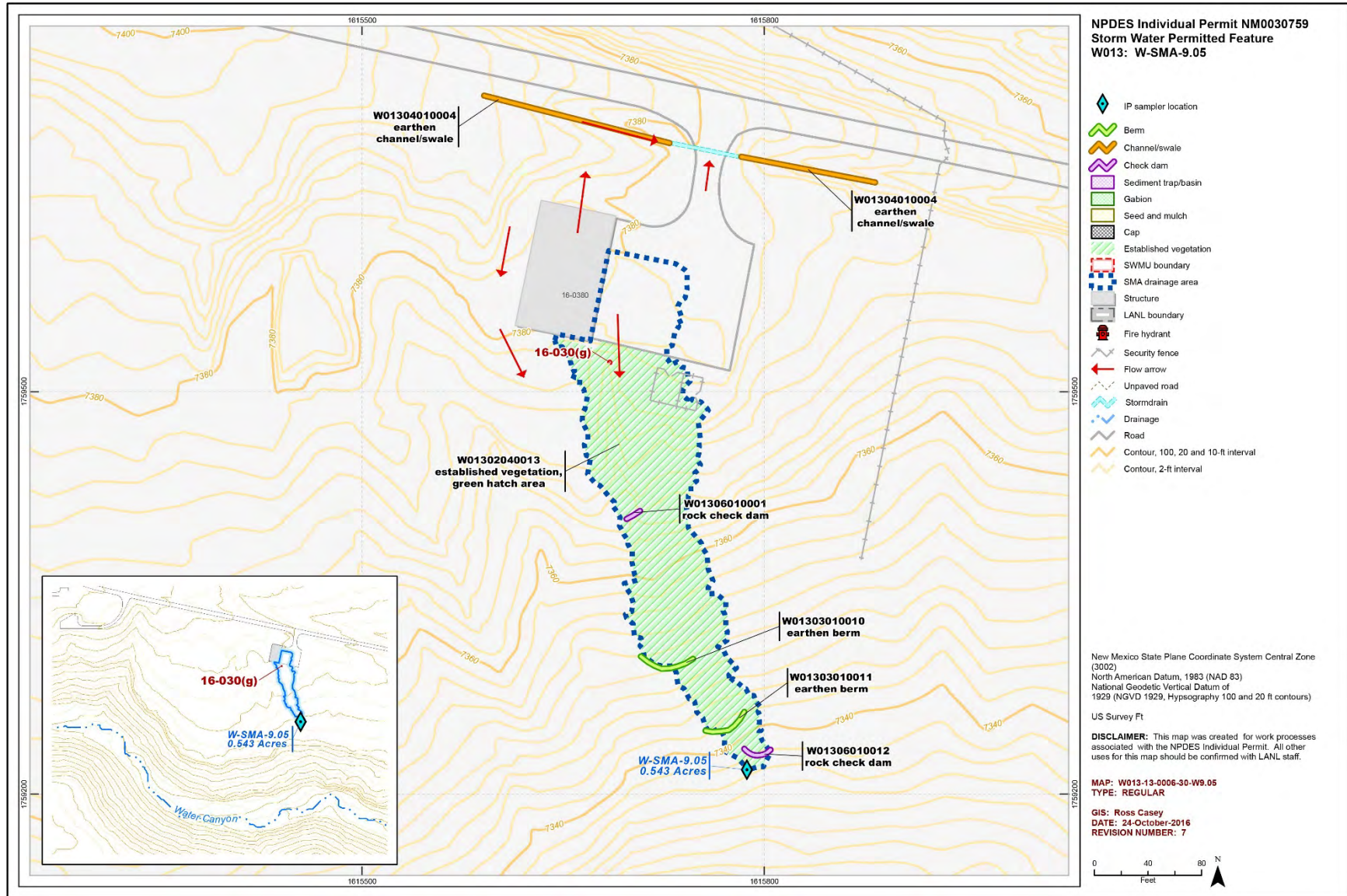
#### 220.5 Compliance Status

The Site associated with W-SMA-9.05 is a Moderate Priority Site. The IP was under administrative continuance at the end of 2017. Table 220-3 presents the 2017 compliance status.

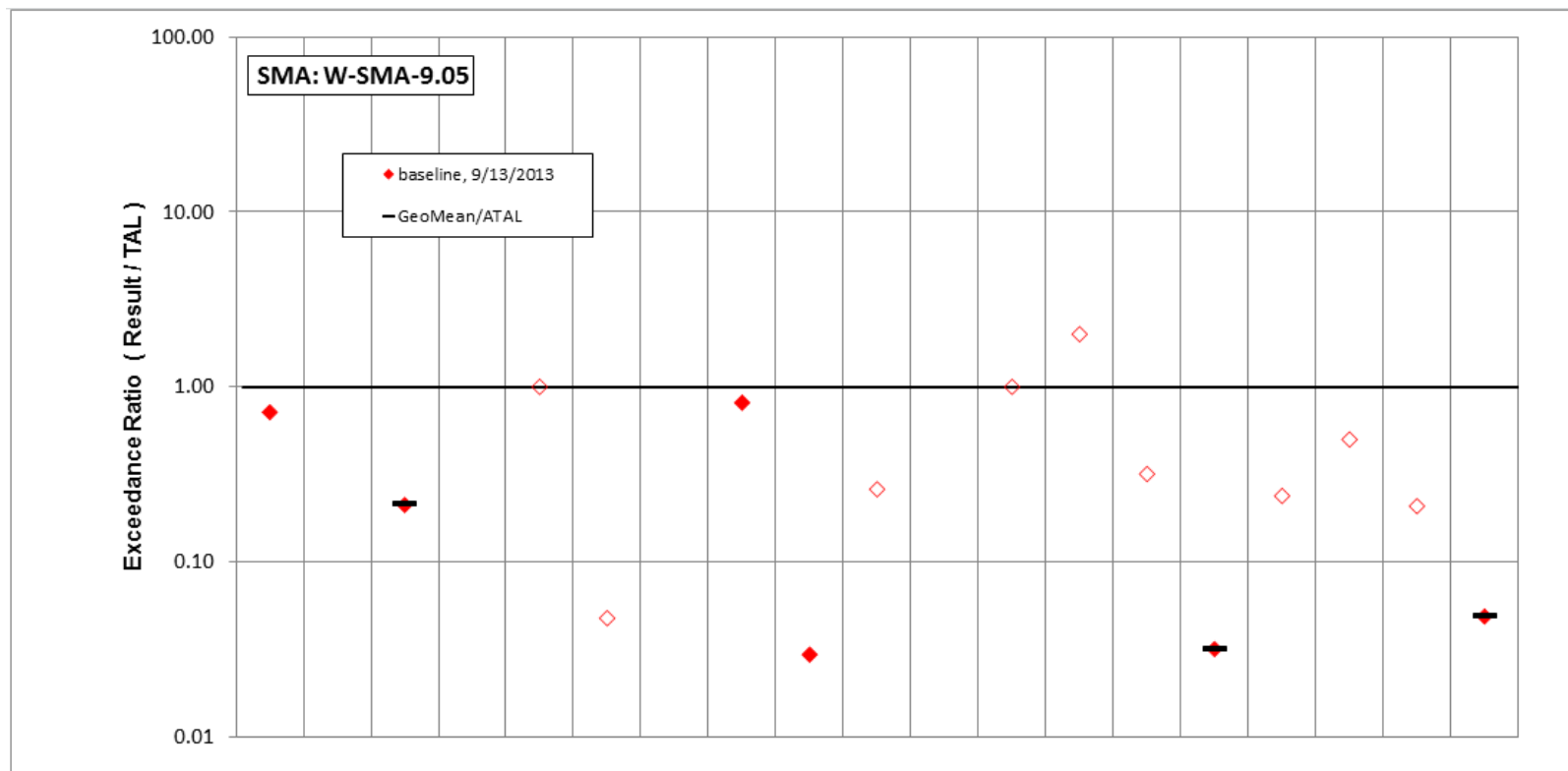
**Table 220-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 16-030(g)	Baseline Confirmation Complete	Baseline Confirmation Complete	Completed 10-21-2013. No additional sampling is necessary for this Site





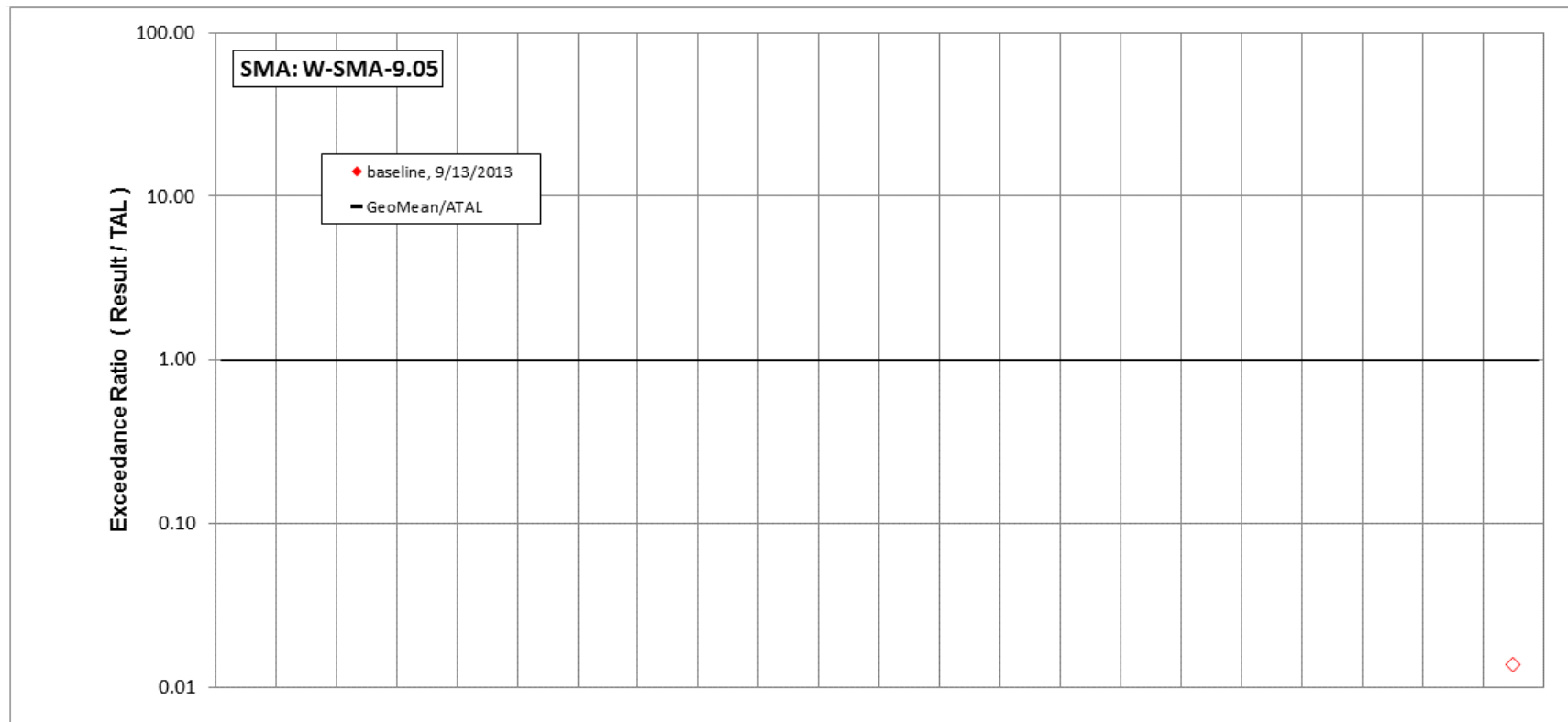
**Figure 220-1 W-SMA-9.05 location map**



	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
9/13/2013 result	537	3	1.9	26.8	1	10	5	3.49	0.501	0.2	1.66	5	1	2	3.17	10	0.005	3.12	1.46
result / TAL	0.72	0.005	0.21	0.0054	1	0.048	0.005	0.81	0.029	0.26	0.0098	1	2	0.32	0.032	0.24	0.5	0.21	0.049

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 220-2 Inorganic analytical results summary plot for W-SMA-9.05



	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	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
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
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.847	-	-	-	0.275
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	-	-	-	0.014

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 220-3 Organic analytical results summary plot for W-SMA-9.05

## 221.0 W-SMA-9.5: AOC 11-012(c)

### 221.1 Site Descriptions

One historical industrial activity area is associated with W014, W-SMA-9.5: Site 11-012(c).

AOC 11-012(c) is an area of potential surface-soil contamination associated with the footprint of former storage magazine 11-9 and is located approximately 500 ft west of building 11-4 at TA-11. Constructed of wood, the 16-ft-square × 9-ft-high magazine 11-9 was built in 1945 and was destroyed by intentional burning in 1960.

Investigation of AOC 11-012(c) is deferred per Section XI and Appendix A of the 2016 Consent Order; therefore, Consent Order sampling has not been conducted at the Site. No investigations were conducted before the Consent Order went into effect in March 2005.

The project map (Figure 221-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 221.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 221-1).

**Table 221-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01402040008	Established Vegetation	-	X	X	-	B
W01403010006	Earthen Berm	X	-	-	X	B
W01403010007	Earthen Berm	X	-	-	X	B
W01403060002	Straw Wattle	-	X	-	X	CB
W01403060009	Straw Wattle	-	X	-	X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 221.3 Storm Water Monitoring

AOC 11-012(c) is monitored within W-SMA-9.5. Following the installation of baseline control measures and a sampler move to a more representative location, a baseline storm water sample was collected on June 25, 2017 (Figure 221-2). Analytical results from the June sample yielded the following TAL exceedances:

- Mercury concentration of 1.1 µg/L (ATAL is 0.77 µg/L) and
- Gross-alpha activity of 81 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent. There are no soil data available for this Site.



AOC 11-012(c):

- Mercury is not known to be associated with industrial materials historically managed at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site.

Based on the Site history and Consent Order sampling data, the Site is an unlikely source of the TAL exceedances.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 221-2. 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 Figure 221-2.

The SMA receives runoff from undeveloped areas.

- Mercury—There are no UTLs for mercury.
- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2017 gross-alpha result is less than this value.

All the analytical results for this sample are reported in the 2017 Annual Report.

The monitoring station for W-SMA-9.5 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.

#### 221.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-9.5 during the 2017 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 221-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62418	6-15-2017
Storm Rain Event	BMP-62929	7-5-2017
Storm Rain Event	BMP-63441	7-18-2017
Storm Rain Event	BMP-63620	7-26-2017
Storm Rain Event	BMP-64173	8-8-2017
TAL Exceedance Inspection	COMP-64433	8-10-2017
Storm Rain Event	BMP-66404	10-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-9.5 in 2017.

### 221.5 Compliance Status

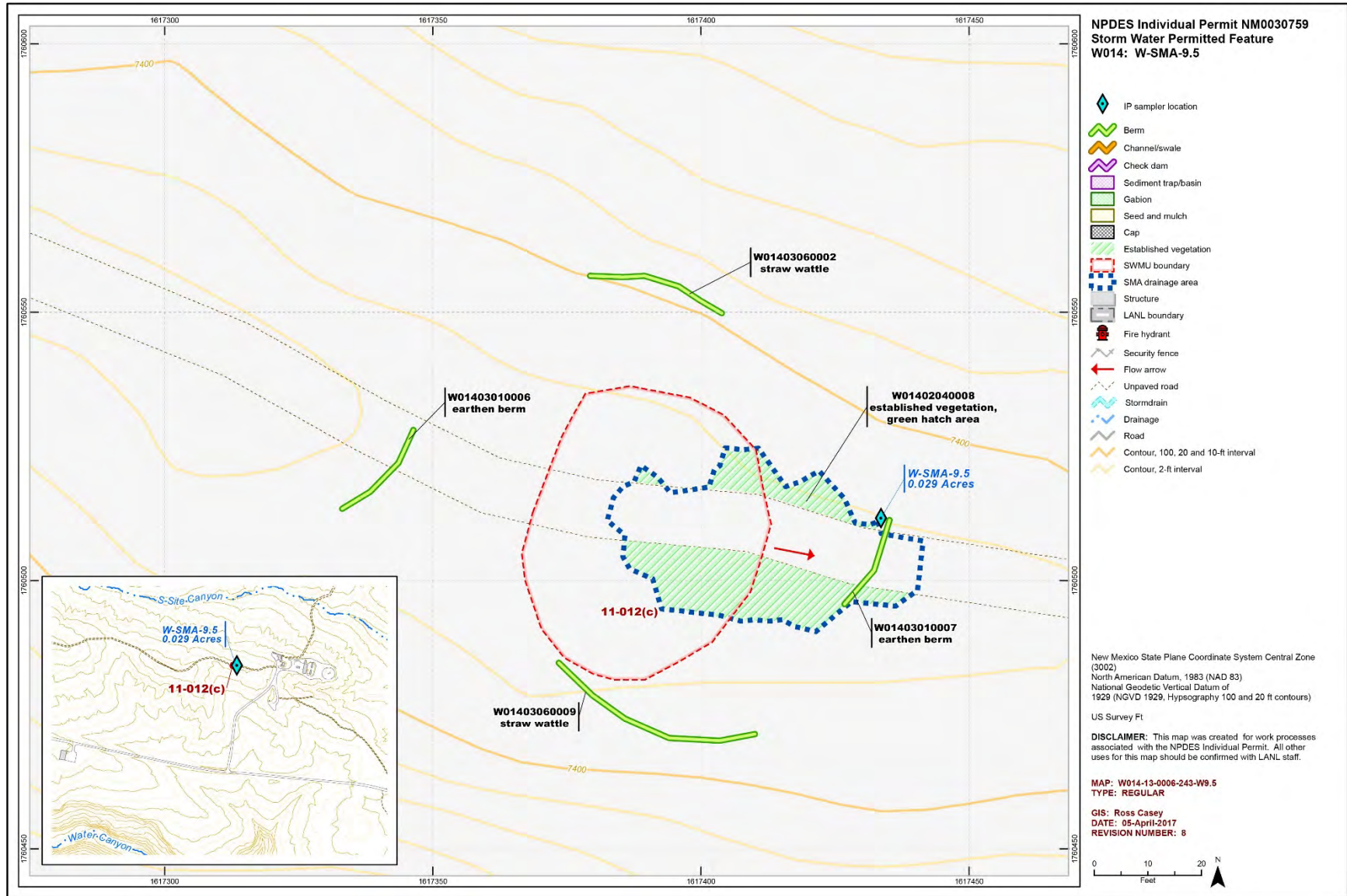
The Site associated with W-SMA-9.5 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 221-3 presents the 2017 compliance status.

**Table 221-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 11-012(c)	Baseline Monitoring Extended	Alternatives Analysis in Process	Preparing an analysis of alternatives to complete corrective action

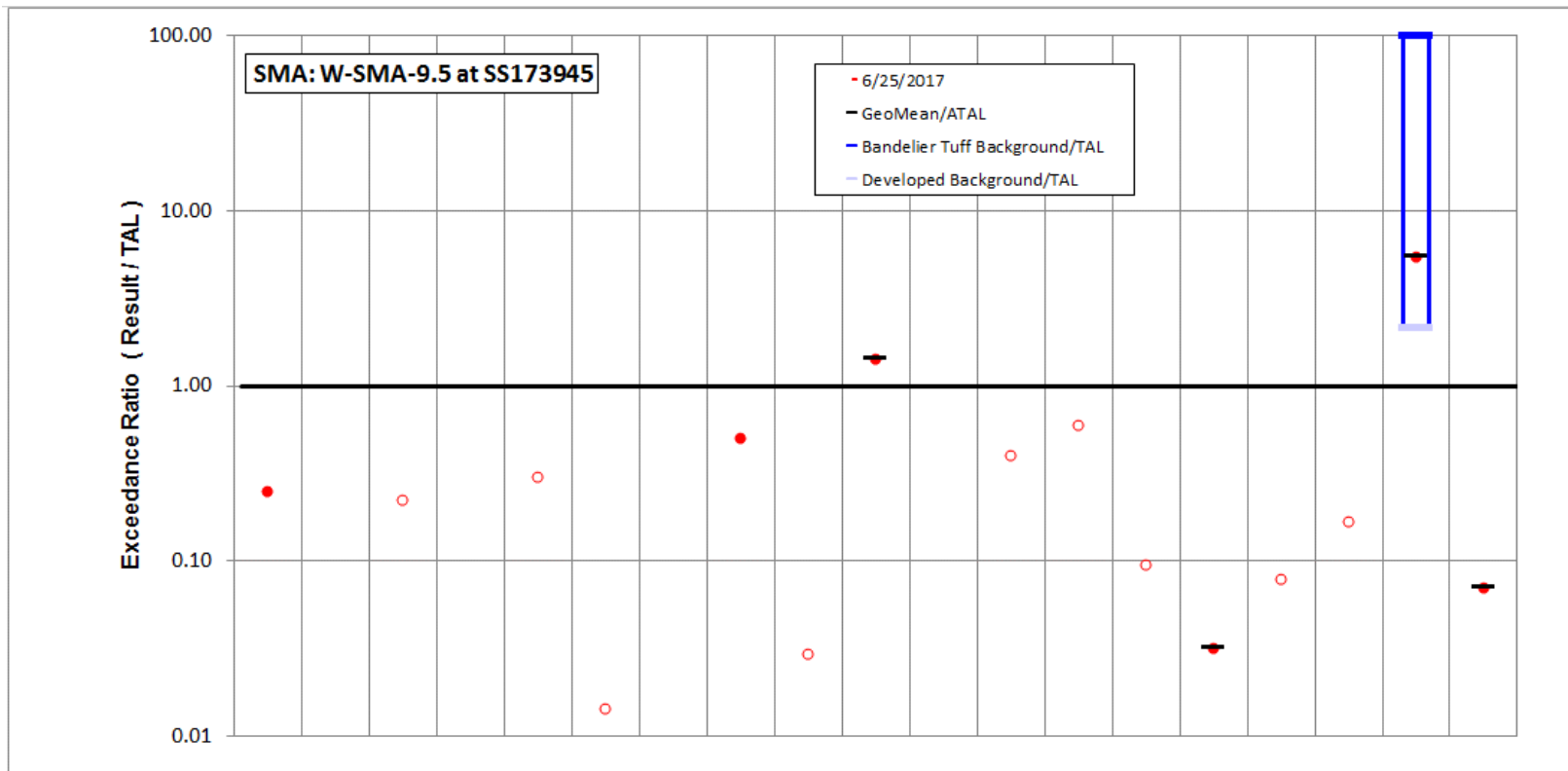
Further details regarding compliance status and planned activities can be found in Attachment 6 for Sites in this SMA.





**Figure 221-1 W-SMA-9.5 location map**





	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	<b>Mercury</b>	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	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
<b>6/25/2017 result</b>	186	1	2	15.9	0.3	3	1.64	2.17	0.5	<b>1.1</b>	0.861	2	0.3	0.6	3.16	3.3	0.002	<b>81</b>	2.1
result / TAL	0.25	0.002	0.22	0.0032	0.3	0.014	0.0016	0.5	0.029	<b>1.4</b>	0.0051	0.4	0.6	0.095	0.032	0.079	0.17	<b>5.4</b>	0.07

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 221-2 Inorganic analytical results summary plot for W-SMA-9.5



## 222.0 W-SMA-9.7: SWMUs 11-011(a) and 11-011(b)

### 222.1 Site Descriptions

Two historical industrial activity areas are associated with W015, W-SMA-9.7: Sites 11-011(a) and 11-011(b).

SWMU 11-011(a) is an inactive NPDES-permitted outfall (EPA-03A130) located at TA-11 north of the K-Site complex and approximately 6 ft northeast of the Electrodynamics Vibration Test Facility (building 11-30), which housed water-cooled electronic equipment. Potential contaminants are organic chemicals. The outfall consisted of a 2-in. pipe that discharged northward to a tributary of Water Canyon. The outfall received untreated cooling tower blowdown from building 11-30. This outfall was removed from the NPDES permit during the 2013 permit renewal.

Consent Order Phase I investigation sampling is complete at this Site. Additional characterization sampling at SWMU 11-011(a) was recommended for additional field activities in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015.

SWMU 11-011(b) is an outfall located at TA-11 north of the Electrodynamics Vibration Test Facility (building 11-30). The inactive outfall consists of a 3-in. pipe that extends about 10 in. beyond the side of a hill. The outfall received discharges from floor drains in building 11-30 from the early 1960s to 1990.

A report prepared by Santa Fe Engineering stated the only potential discharges from floor drains would be deionized water and residual HE potentially released from containers processed on shakers in the building.

Consent Order Phase I investigation sampling is complete at this Site. SWMU 11-011(b) meets residential risk and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015.

SWMU 11-011(b) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 222-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 222.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 222-1).

**Table 222-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01502040008	Established Vegetation	-	X	X	-	B
W01503060018	Straw Wattle	-	X	-	X	B
W01503060019	Straw Wattle	X	-	-	X	B
W01503100017	Gravel Bags	X	-	-	X	B
W01503140020	Coir Log	X	-	-	X	B
W01506030004	Juniper Bales	X	-	-	X	CB
W01506030005	Juniper Bales	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 222.3 Storm Water Monitoring

SWMUs 11-011(a) and 11-011(b) are monitored within W-SMA-9.7. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 222-2). In Figure 222-2, cadmium, selenium, and silver are reported as nondetectable results equal to or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from this sample yielded the following TAL exceedance:

- Copper concentration of 9.74 µg/L (MTAL is 4.3 µg/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 11-011(a):*

- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was detected above BV in 4 of 10 shallow (i.e., less than 3 ft bgs) 2010 Consent Order soil samples at a maximum concentration 6.6 times the soil BV.

#### *SWMU 11-011(b):*

- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was detected above BVs in 2 of 11 shallow 2010 Consent Order soil samples at a maximum concentration 5.1 times the soil BV.

TAL exceedances were also evaluated against the appropriate storm water BVs, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 222-2. 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 Figure 222-2.

Monitoring location W-SMA-9.7 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscapes containing sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2013 is between these two values.

All the analytical results for these samples are reported in the 2013 Annual Report.

### 222.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-9.7 during the 2017 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

**Table 222-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62427	6-15-2017
Storm Rain Event	BMP-62938	7-5-2017
Storm Rain Event	BMP-63450	7-18-2017
Storm Rain Event	BMP-63629	7-26-2017
Storm Rain Event	BMP-64182	8-8-2017
Storm Rain Event	BMP-66413	10-11-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 222-3 Maintenance during 2017**

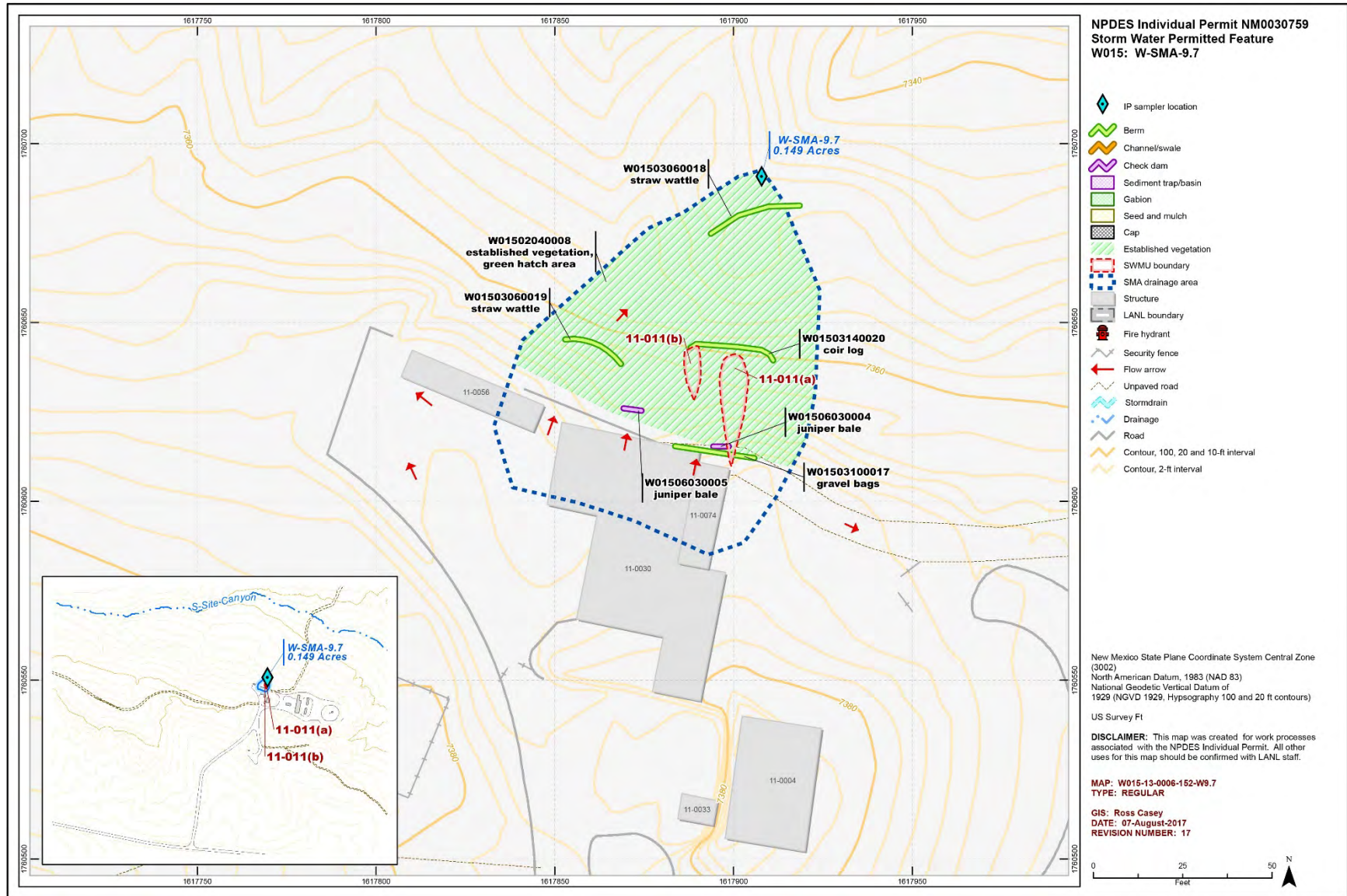
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62733	Installed coir log north of straw wattle W01503060011 as a replacement	7-13-2017	28 day(s)	Maintenance conducted as soon as practicable

### 222.5 Compliance Status

The Sites associated with W-SMA-9.7 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 222-4 presents the 2017 compliance status.

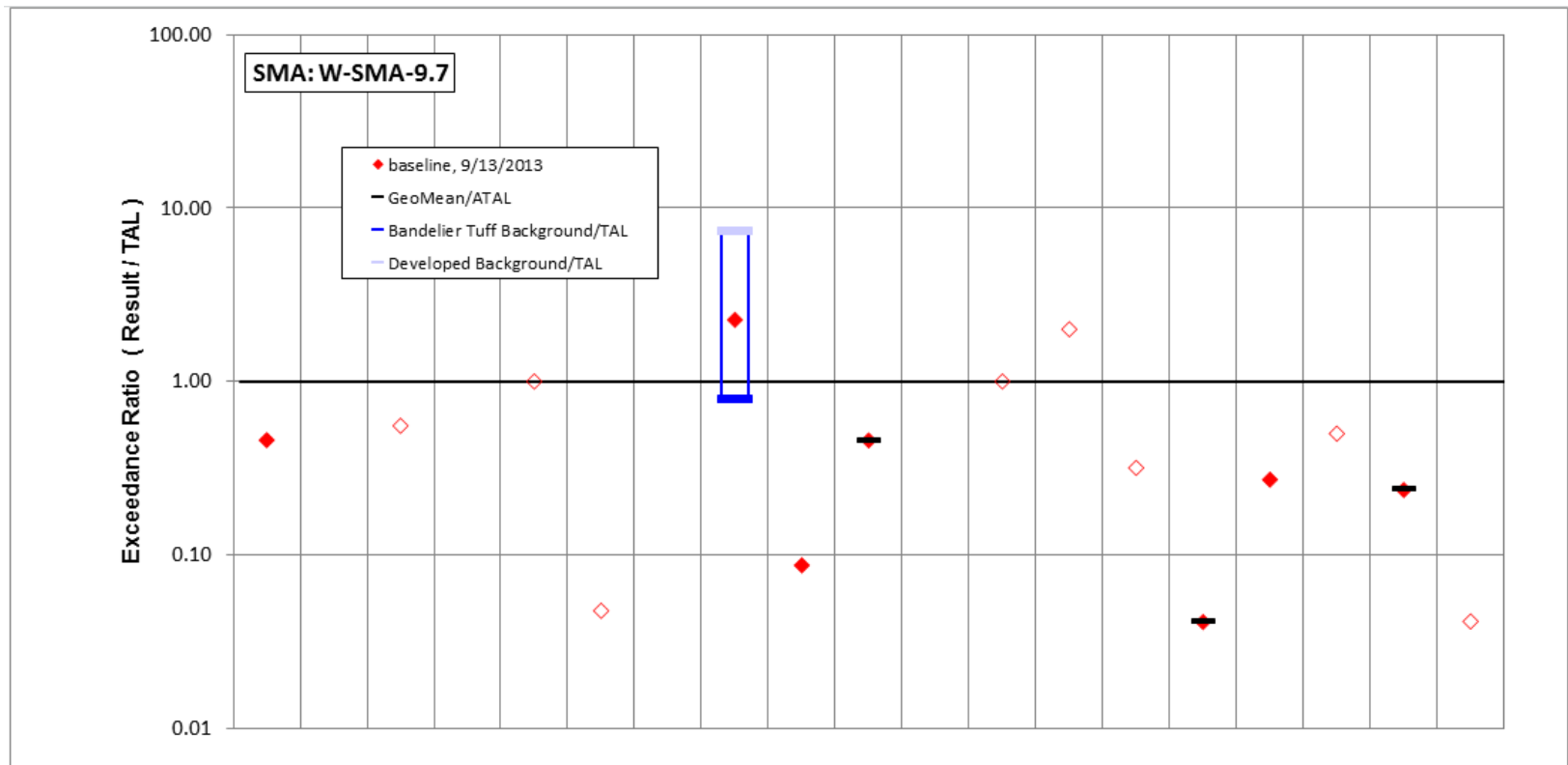
**Table 222-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 11-011(a)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 11-011(b)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 52 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."



**Figure 222-1 W-SMA-9.7 location map**





	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	Lead	Mercury	Nickel	Selenium	<b>Silver</b>	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
9/13/2013 result	344	3	5	43.2	1	10	5	<b>9.74</b>	1.48	0.352	0.738	5	<b>1</b>	2	4.1	11.4	0.005	3.55	1.24
result / TAL	0.46	0.005	0.56	0.0086	1	0.048	0.005	<b>2.3</b>	0.087	0.46	0.0043	1	<b>2</b>	0.32	0.041	0.27	0.5	0.24	0.041

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

Figure 222-2 Inorganic analytical results summary plot for W-SMA-9.7

## 223.0 W-SMA-9.8: SWMU 11-005(c)

### 223.1 Site Descriptions

One historical industrial activity area is associated with W016, W-SMA-9.8: Site 11-005(c).

SWMU 11-005(c) is a former outfall with a capped drainline north of the former Betatron Building (11-2) at TA-11. The drainline was installed in 1944 and served a sink, a hot water heater, and a floor drain. The outfall discharged to a slightly sloped area consisting of fill from an adjacent roadbed. The drainline was capped before the drop tower complex was constructed in 1956. Building 11-2 was used as a control room for the drop tower and is currently vacant.

Phase I Consent Order sampling is complete for SWMU 11-005(c). SWMU 11-005(c) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 11-005(c) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 223-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 223.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 223-1).

**Table 223-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01602040012	Established Vegetation	-	X	X	-	B
W01603020007	Base Course Berm	X	-	-	X	CB
W01603060010	Straw Wattle	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 223.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at W-SMA-9.8. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.

The monitoring station for W-SMA-9.8 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.

### 223.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-9.8 during the 2017 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized in the following table.

**Table 223-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62428	6-15-2017
Storm Rain Event	BMP-62939	7-5-2017
Storm Rain Event	BMP-63451	7-18-2017
Storm Rain Event	BMP-63630	7-26-2017
Storm Rain Event	BMP-64183	8-8-2017
Storm Rain Event	BMP-66414	10-11-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 223-3 Maintenance during 2017**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63698	Installed straw wattle as replacement for W01603060010	7-26-2017	8 day(s)	Maintenance conducted as soon as practicable

### 223.5 Compliance Status

The Site associated with W-SMA-9.8 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 223-4 presents the 2017 compliance status.

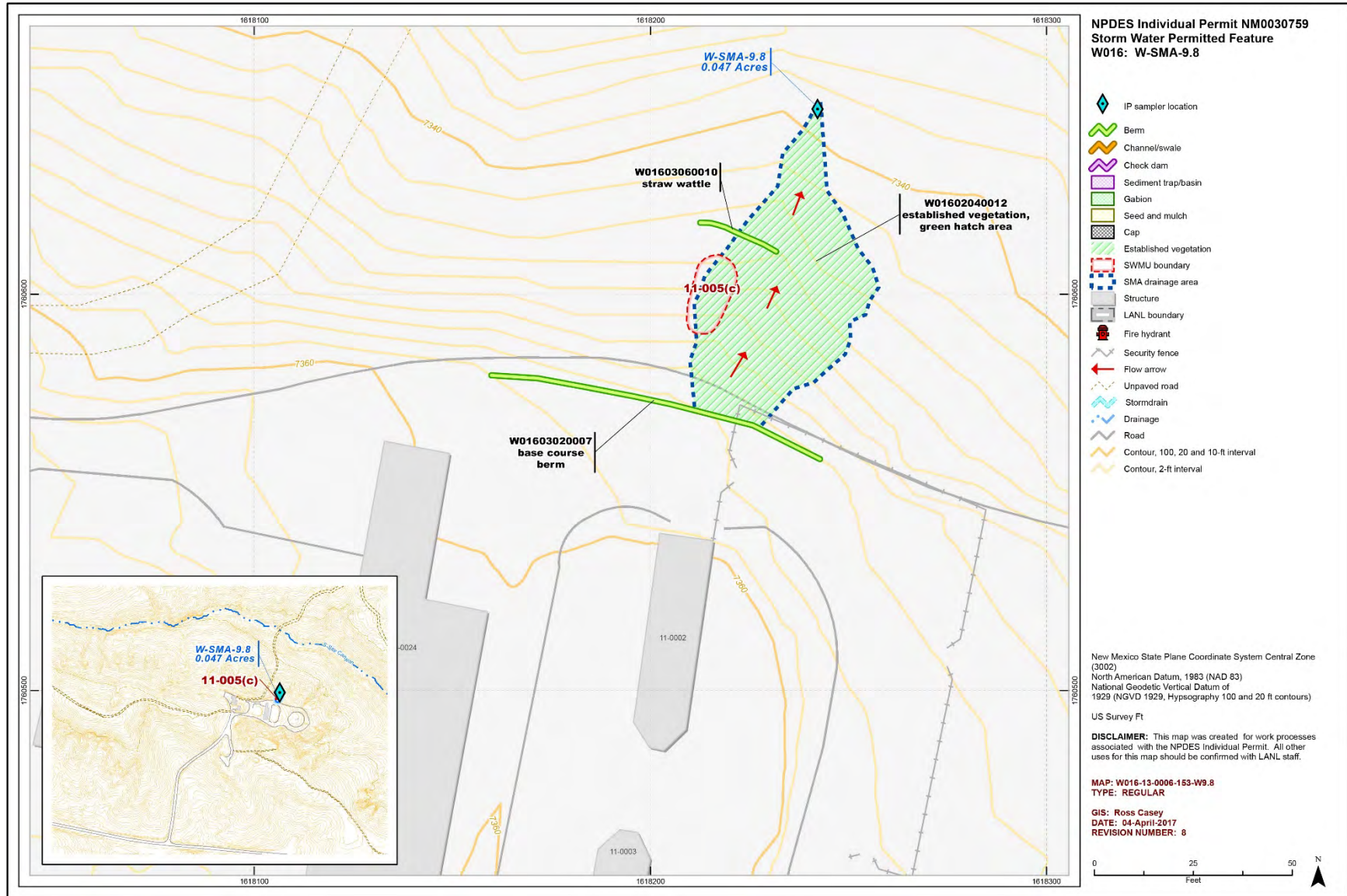
**Table 223-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 11-005(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.



W-SMA-9.8, Base Course Berm, W01603020007 (photo ID 10876-2r)





**Figure 223-1 W-SMA-9.8 location map**



## 224.0 W-SMA-9.9: SWMU 11-006(b)

### 224.1 Site Descriptions

One historical industrial activity area is associated with W017, W-SMA-9.9: Site 11-006(b).

SWMU 11-006(b) is one of three inactive catch basins and a former NPDES-permitted outfall (located EPA 05A069) at TA-11 near the drop tower complex. The SWMU 11-006(b) catch basin is located on the north side of the drop tower complex and consists of a concrete basin (structure 11-50) measuring 6 × 4 × 2 ft and equipped with an overflow drain. Historically, SWMU 11-006(b) received washdown water from the concrete pad and asphalt apron at the base of the drop tower via an HE sump [SWMU 11-006(a)]. Any HE particles remaining in the washdown water after it exited the sump were further filtered out in the catch basin. After exiting the catch basin, the remaining wash water was channeled to a drainage and the NPDES-permitted outfall on the northeast side of the catch basin. Waste collected from the catch basin was disposed of at the TA-16 Burning Ground. The outfall was removed from the NPDES permit in May 1998 after activities at the drop tower ceased. The drop tower underwent D&D in 2004. Currently, the catch basin is capped and sealed; however, the outfall still receives storm water runoff. Any runoff collected in the concrete pad and asphalt apron is now diverted to the other two catch basins associated with the former drop tower.

Phase I Consent Order sampling is complete for SWMU 11-006(b). SWMU 11-006(b) meets residential risk levels and was recommended for corrective action complete in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 11-006(b) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 224-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 224.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 224-1).

Enhanced controls were installed and certified on June 27, 2012, and submitted to EPA on July 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 224-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01702040022	Established Vegetation	-	X	X	-	B
W01703010017	Earthen Berm	X	-	-	X	EC
W01703010018	Earthen Berm	-	X	-	X	EC
W01703010019	Earthen Berm	-	X	-	X	EC
W01703010020	Earthen Berm	-	X	-	X	EC
W01703090001	Curbing	X	-	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 224.3 Storm Water Monitoring

SWMU 11-006(b) is monitored within W-SMA-9.9. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 224-2). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 962 µg/L (MTAL is 750 µg/L) and
- Gross-alpha activity of 95.9 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at W-SMA-9.9, a corrective action storm water sample was collected on September 13, 2013 (Figure 224-2). Analytical results from this corrective action monitoring sample yielded the following TAL exceedance:

- Gross-alpha activity of 74.4 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 11-006(b):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, the Site is an unlikely source of the TAL exceedance.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 224-2. 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 Figure 224-2.

The SMA receives runoff from undeveloped areas.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2011 and 2013 Annual Reports.

### 224.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-9.9 during the 2017 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 224-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62429	6-15-2017
Storm Rain Event	BMP-62940	7-5-2017
Storm Rain Event	BMP-63452	7-18-2017
Storm Rain Event	BMP-63631	7-26-2017
Storm Rain Event	BMP-64184	8-8-2017
Storm Rain Event	BMP-66415	10-11-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-9.9 in 2017.

**224.5 Compliance Status**

The Site associated with W-SMA-9.9 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 224-3 presents the 2017 compliance status.

**Table 224-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 11-006(b)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, July 25, 2012, "Submittal of Certification of Installation of Enhanced Control Measures for Twelve Site Monitoring Areas."

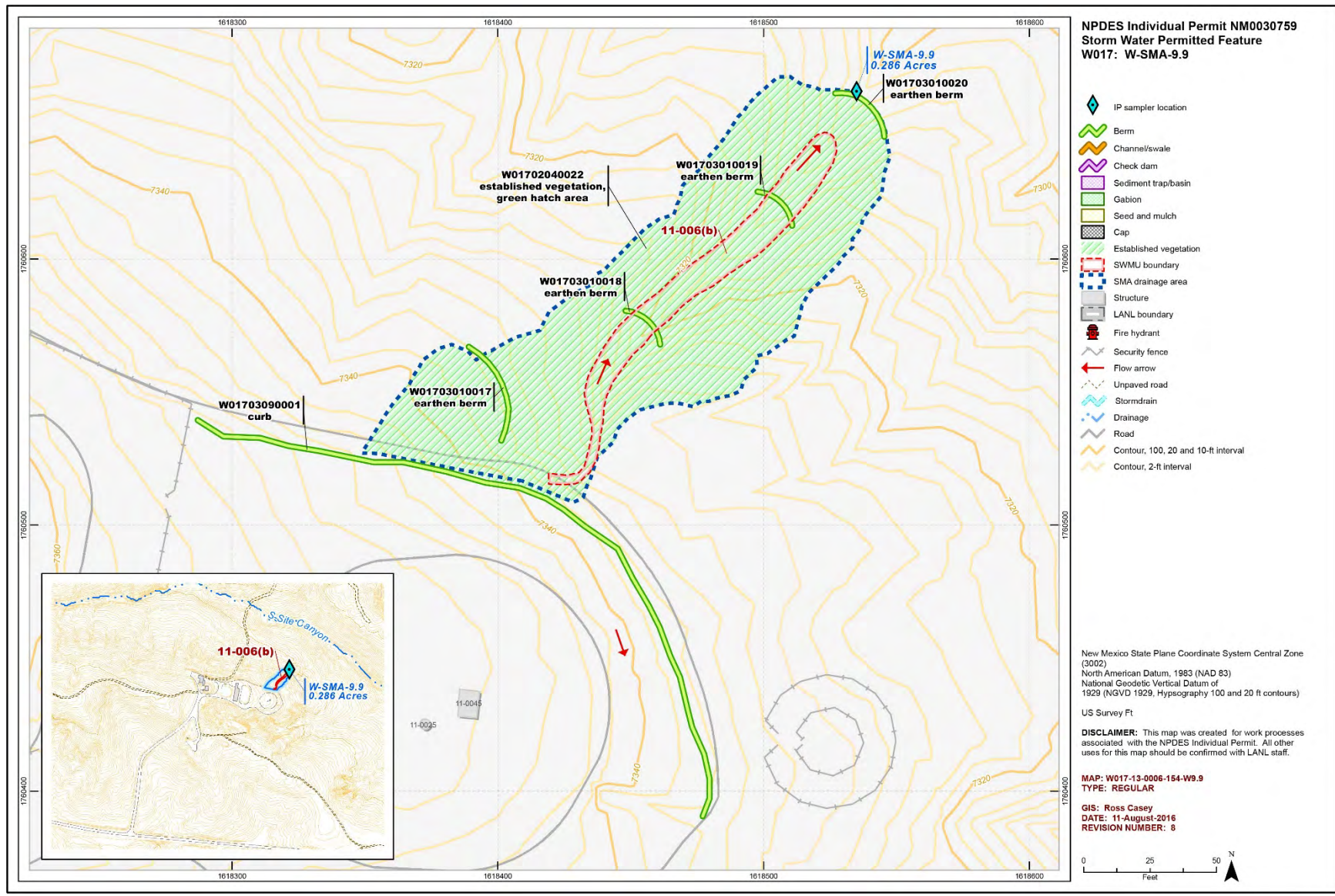
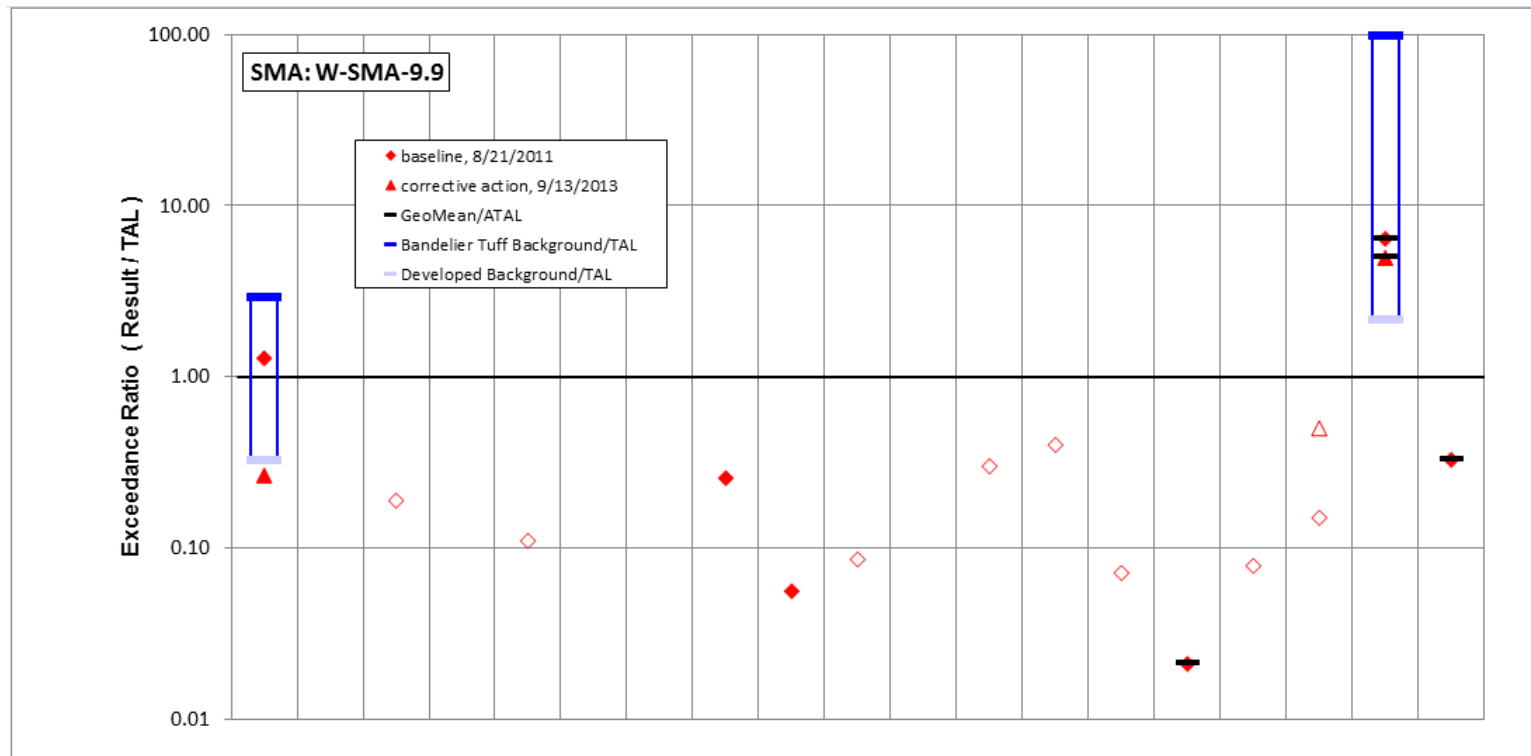


Figure 224-1 W-SMA-9.9 location map





	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>9/13/2013 result</b>	199	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.005	<b>74.4</b>	-
result / TAL	0.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	5	-
<b>8/21/2011 result</b>	962	1	1.7	15	0.11	2	4.4	1.1	0.95	0.066	1.2	1.5	0.2	0.45	2.1	3.3	0.002	95.9	9.82
result / TAL	<b>1.3</b>	0.002	0.19	0.003	0.11	0.01	0.004	0.26	0.056	0.086	0.007	0.3	0.4	0.071	0.021	0.079	0.15	6.4	0.33

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 224-2 Inorganic analytical results summary plot for W-SMA-9.9**

## **225.0 W-SMA-10: SWMUs 11-002, 11-005(a), 11-005(b), 11-006(c), 11-006(d), and 11-011(d) and AOC 11-003(b)**

### **225.1 Site Descriptions**

Seven historical industrial activity areas are associated with W018, W-SMA-10: Sites 11-002, 11-003(b), 11-005(a), 11-005(b), 11-006(c), 11-006(d), and 11-011(d).

SWMU 11-002 is a 30-ft-diameter burn area located east of the drop tower at the edge of its asphalt apron. Beginning in 1948, this area was used as an experimental burn area for components on or in assembled configurations with HE, propellants, and jet fuel. HE and propellants were burned directly on the sand pad, and jet fuel was burned within an open-top steel containment tank. Burning activities continued through 1992.

Investigation of SWMU 11-002 is deferred per Section XI and Appendix A of the 2016 Consent Order; therefore, Consent Order sampling has not been conducted at the Site. No investigations were conducted before the Consent Order went into effect in 2005.

SWMU 11-005(a) is an active septic system located at TA-11 approximately 70 ft southwest of building 11-24. This septic system consists of a septic tank (structure 11-20), associated drainlines from buildings 11-1 and 11-4, and a tile drain field that extends to an outfall on a sloped area to the south of the septic tank. The septic system began operation in 1944. The drainline from building 11-1 has been plugged. Currently, discharge to the septic system comes only from a restroom in building 11-4. Building 11-1 is currently a storage area for electrical equipment but was originally used as a control building for the Betatron Facility (building 11-2) and the Cloud Chamber (building 11-3). Building 11-4 is currently the control building for the Vibration-Test Facility (building 11-30), although it was historically used as a machine shop and photoprocessing facility. A memorandum from 1950 indicated a mercury spill occurred in building 11-4; however, the location, source, and extent of the spill are not known. The outflow drainline from SWMU 11-005(a) was plugged in 1992; since that time the septic tank has been pumped out on a regular basis.

Phase I Consent Order sampling is complete for SWMU 11-005(a). SWMU 11-005(a) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 11-005(a) will be eligible for a COC upon approval of the report by NMED.

SWMU 11-005(b) is an active septic system located at TA-11, approximately 70 ft south of building 11-3. This septic system consists of a septic tank (structure 11-43), an outlet drainline to an outfall to the south of the septic tank, and a drain field west of the drainline. The septic system serves restrooms added to the exterior of building 11-3 and was tied to a floor drain in the test room of building 11-3 until 1992 when the drain was plugged. Engineering drawings confirm the drainline for floor drains in building 11-24 was tied into the septic tank in 1992. Building 11-24 houses an office and light machine shop.

Phase I Consent Order sampling is complete for SWMU 11-005(b). SWMU 11-005(b) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 11-005(b) will be eligible for a COC upon approval of the report by NMED.

SWMU 11-006(c) is one of three catch basins and its associated outfall located at TA-11 near the drop tower complex. The SWMU 11-006(c) catch basin is located on the southeast side of the drop tower complex and consists of a concrete basin (structure 11-51) measuring 6 × 4 × 2 ft and a former NPDES-permitted outfall (EPA05A096) that discharged into Water Canyon. Historically, SWMU 11-006(c) received washdown water from the concrete pad and asphalt apron at the base of the drop tower via an HE sump [SWMU 11-006(a)]. Any HE particles remaining in the washdown water after it exited the sump were further filtered out in the catch basin. After exiting the catch basin, the remaining washdown water flowed through an asphalt-lined drainage channel to a natural drainage channel and the NPDES-permitted outfall. HE waste collected from the catch basin was disposed of at the TA-16 Burning Ground. The outfall was removed from the NPDES permit in May 1998 after drop tower operations ceased and discharges to the drainage channels stopped. Any storm water runoff collected in the catch basin since 1998 is pumped to the SWMU 11-006(d) basin.

Phase I Consent Order sampling is complete for SWMU 11-006(c). SWMU 11-006(c) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 11-006(c) will be eligible for a COC upon approval of the report by NMED.

SWMU 11-006(d) is one of three catch basins and its associated outfall located at TA-11 near the drop tower complex. The SWMU 11-006(d) catch basin is located on the south side of the drop tower complex and consists of a concrete basin (structure 11-52) measuring 6 × 4 × 2 ft and a former NPDES-permitted outfall (EPA05A097) that discharged to Water Canyon. Historically, SWMU 11-006(d) received washdown water from the concrete pad and asphalt apron at the base of the drop tower via an HE sump [SWMU 11-006(a)]. Any HE particles remaining in the washdown water after it exited the sump were further filtered out in the catch basin. After exiting the catch basin, the remaining washdown water flowed through an asphalt-lined drainage to a natural drainage channel and then east into Water Canyon. HE waste collected from the catch basin was disposed of at the burning grounds at TA-16. Since drop tower operations ceased in 1998, this catch basin has collected only storm water runoff that drains to the outfall.

Phase I Consent Order sampling is complete for SWMU 11-006(d). SWMU 11-006(d) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 11-006(d) will be eligible for a COC upon approval of the report by NMED.

SWMU 11-011(d) is an outfall located at TA-11 south of building 11-24, the air gun facility. The outfall consisted of a 4-in. steel pipe tied to floor drains the air gun facility. Originally, operations at building 11-24 consisted of acceleration and impact tests on full-scale warhead mockups. After World War II, building 11-24 was converted to an office and light machine shop. The drainline was tied into the SWMU 11-005(d) septic tank in 1992 and all discharges to the outfall ceased.

Phase I Consent Order sampling is complete for SWMU 11-011(d). SWMU 11-011(d) meets residential risk levels and was recommended for corrective action complete without controls in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015. SWMU 11-011(d) will be eligible for a COC upon approval of the report by NMED.

AOC 11-003(b) is a former mortar impact area used as a target by the decommissioned air gun facility (building 11-24). This AOC is located immediately adjacent to the inactive drop tower complex at TA-11 (K-Site). The air gun facility was completed in 1956. The gun was used to launch experimental packages into targets located south of building 11-24. The targets, located 150–250 ft south of building 11-24,

were 12-ft<sup>2</sup> by 12-in.-thick concrete slabs set in line with the gun bore. Firing into the targets tested various weapons packages designed to withstand extremes of acceleration and deceleration. Some devices contained HE and DU. On a single occasion in 1972, an impact test involved an inert mockup consisting of a 12-in.-diameter, hollow-steel sphere filled with steel or lead ball bearings suspended in a graphite matrix. The sphere fractured upon impact, potentially leaving behind 0.5-in.-diameter steel or lead balls.

Investigation of AOC 11-003(b) is deferred per Section XI and Appendix A of the 2016 Consent Order; therefore, Consent Order sampling has not been conducted at the Site. No investigations were conducted before the Consent Order went into effect in 2005.

The project map (Figure 225-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 225.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 225-1).

Enhanced controls were installed and certified on August 23, 2012, and submitted to EPA on September 20, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 225-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01802040025	Established Vegetation	-	X	X	-	B
W01803010022	Earthen Berm	-	X	-	X	EC
W01803010023	Earthen Berm	-	X	-	X	EC
W01803010024	Earthen Berm	-	X	-	X	EC
W01803040010	Asphalt Berm	X	-	-	X	CB
W01803040016	Asphalt Berm	X	-	-	X	CB
W01803060028	Straw Wattle	-	X	-	X	B
W01803060030	Straw Wattle	-	X	-	X	B
W01803090002	Curbing	X	-	-	X	CB
W01803100026	Gravel Bags	X	-	-	X	B
W01803100027	Gravel Bags	X	-	-	X	B
W01803140031	Coir Log	X	-	X	-	B
W01804060004	Rip Rap	-	-	X	-	CB
W01804060013	Rip Rap	X	-	X	-	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.



### 225.3 Storm Water Monitoring

SWMUs 11-002, 11-005(a), 11-005(b), 11-006(c), 11-006(d), and 11-011(d) and AOC 11-003(b) are monitored within W-SMA-10. Following the installation of baseline control measures, a baseline confirmation sample was collected on August 21, 2011 (Figure 225-2). Inorganic analytical results from this baseline sample yielded the following TAL exceedance:

- Gross-alpha activity of 106 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at W-SMA-10, a corrective action storm water sample was collected on August 1, 2015 (Figure 225-2). Analytical results from this corrective action monitoring sample yielded the following TAL exceedance:

- Gross-alpha activity of 77.8 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 11-002:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. No investigations have been conducted at this Site.

Based on the Site history and sampling data, the Site is an unlikely source of the TAL exceedance.

#### *SWMU 11-005(a):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, SWMU 11-005(a) is an unlikely source of the TAL exceedance

#### *SWMU 11-005(b):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, SWMU 11-005(b) is an unlikely source of the TAL exceedance.

#### *SWMU 11-006(c):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, SWMU 11-006(c) is an unlikely source of the TAL exceedance.

*SWMU 11-006(d):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, SWMU 11-006(d) is an unlikely source of the TAL exceedance.

*SWMU 11-011(d):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, SWMU 11-011(d) is an unlikely source of the TAL exceedance.

*AOC 11-003(b):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. No investigations have been conducted at this Site. Based on the Site history, AOC 11-003(b) is an unlikely source of the TAL exceedance.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 225-2. 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 Figure 225-2.

Monitoring location W-SMA-10 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as locations with sediment derived from Bandelier Tuff. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed landscape is 32.5 pCi/L. The gross-alpha results from 2011 and 2015 are between these two values.

All the analytical results for these samples are reported in the 2011 and 2015 Annual Reports.

### 225.4 Inspections and Maintenance

RG257 recorded seven storm events at W-SMA-10 during the 2017 season. These rain events triggered six post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 225-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-62419	6-15-2017
Storm Rain Event	BMP-62930	7-5-2017
Storm Rain Event	BMP-63442	7-18-2017
Storm Rain Event	BMP-63621	7-26-2017
Storm Rain Event	BMP-64174	8-8-2017
Storm Rain Event	BMP-66405	10-18-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 225-3 Maintenance during 2017**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-63182	Installed coir log as a replacement for straw wattle W01803060029	7-18-2017	13 day(s)	Maintenance conducted as soon as practicable

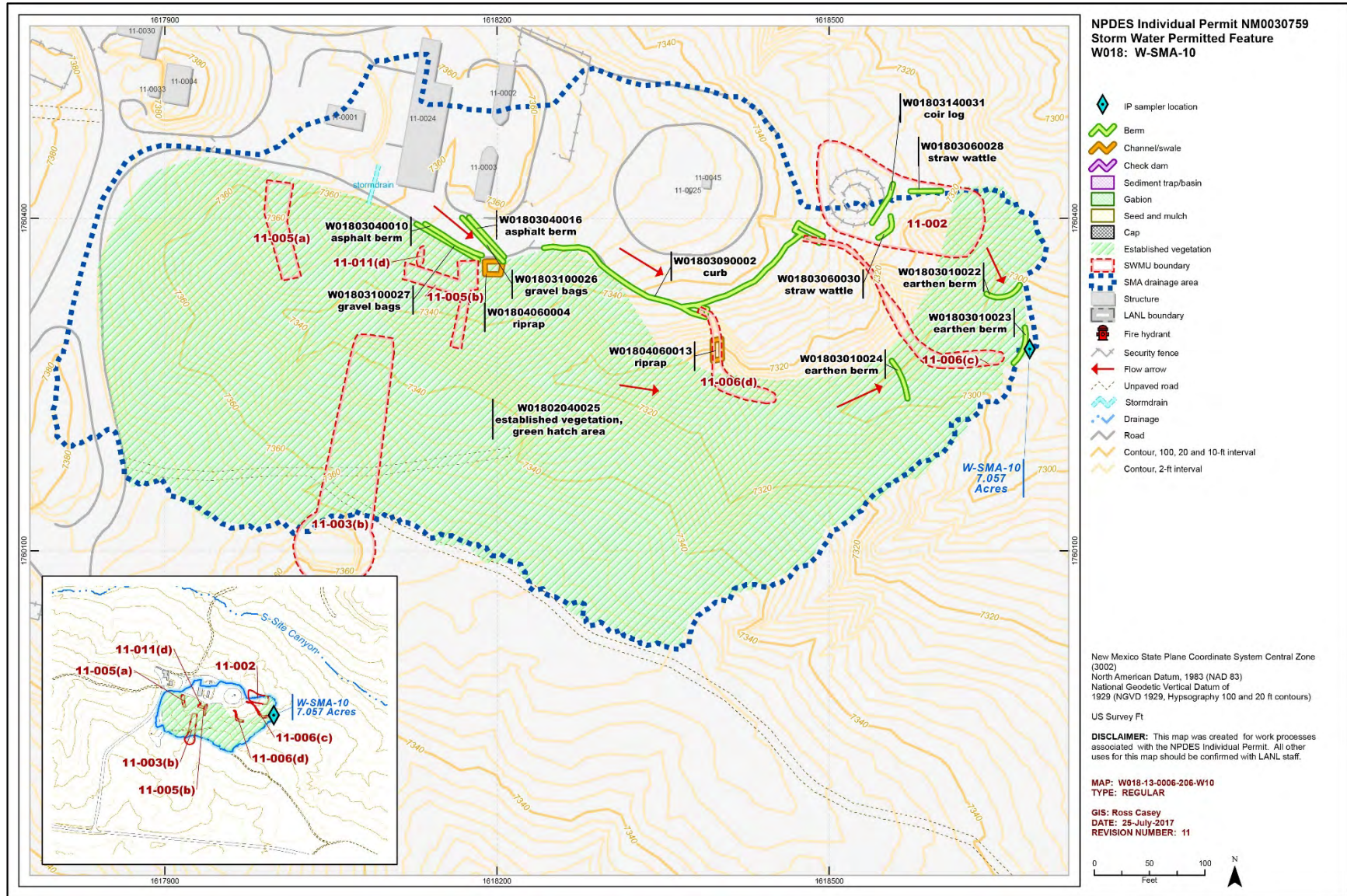
### 225.5 Compliance Status

The Sites associated with W-SMA-10 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 225-4 presents the 2017 compliance status.

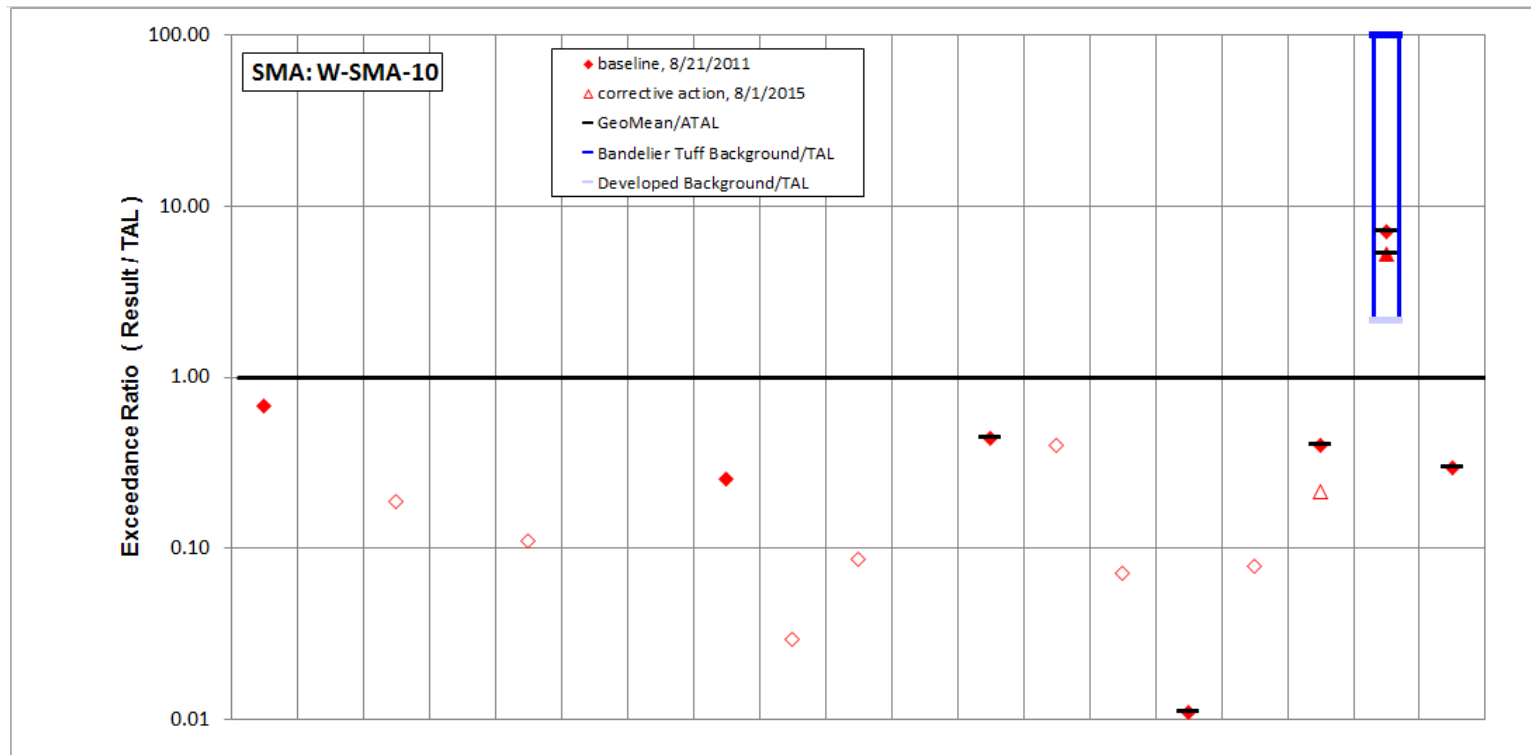
**Table 225-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 11-002	Enhanced Control Corrective Action Monitoring	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 – Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
AOC 11-003(b)	Enhanced Control Corrective Action Monitoring	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 – Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 11-005(a)	Enhanced Control Corrective Action Monitoring	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 – Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 11-005(b)	Enhanced Control Corrective Action Monitoring	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 – Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 11-006(c)	Enhanced Control Corrective Action Monitoring	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 – Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 11-006(d)	Enhanced Control Corrective Action Monitoring	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 – Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."
SWMU 11-011(d)	Enhanced Control Corrective Action Monitoring	Alternative Compliance Requested	LANL, February 26, 2016, "NPDES Permit No. NM0030759 – Alternative Compliance Request for 17 Site Monitoring Area/Site Combinations Exceeding Target Action Levels from Nonpoint Sources."





**Figure 225-1 W-SMA-10 location map**



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	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
<b>8/1/2015 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.002</b>	<b>77.8</b>	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.21</b>	<b>5.2</b>	-
<b>8/21/2011 result</b>	512	<i>1</i>	1.7	15	0.11	2	3.4	1.1	0.5	<i>0.066</i>	0.72	2.2	0.2	0.45	1.1	3.3	0.004	<b>106</b>	8.79
result / TAL	0.68	<i>0.002</i>	0.19	0.003	0.11	0.01	0.003	0.26	0.029	<i>0.086</i>	0.004	0.44	0.4	0.071	0.011	0.079	0.4	<b>7.1</b>	0.29

Bold font indicates result>TAL or MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 225-2 Inorganic analytical results summary plot for W-SMA-10**

## 226.0 W-SMA-11.7: AOC 49-008(c)

### 226.1 Site Descriptions

One historical industrial activity area is associated with W019, W-SMA-11.7: Site 49-008(c).

AOC 49-008(c) consists of an area of potentially contaminated soil from historical radiochemistry operations and small-scale containment experiments at Area 11 within the northern portion of the MDA AB NES boundary at TA-49. Area 11 is approximately 220 × 300 ft. Activities conducted at Area 11 from 1959 to 1961 supported hydronuclear experiments conducted elsewhere at TA-49. Radiochemistry operations were conducted in a former laboratory and change house (former building 49-15) that was the main structure at Area 11. Other structures included a small storage building, latrines, and butane and propane tanks. The former building 49-15 laboratory was used to analyze samples collected during experiments in the experimental shafts at Areas 2, 2A, 2B, and 4. Laboratory processes included sample dissolution in acids (nitric, hydrochloric, hydrofluoric, sulfuric, and perchloric) and solvent extraction using methyl isobutyl ketone, ammonium hydroxide, and sodium hydroxide. Wastes generated during radiochemical operations were typically collected in containers and taken to radioactive waste disposal facilities elsewhere at the Laboratory. Interim waste storage boxes were stored south of former building 49-15. Small-scale containment experiments were conducted in 13 underground shafts located on the west side of Area 11. These shafts were drilled to a depth of 12 ft and lined with 10-in.-diameter steel casing. HE was placed in the shafts, which were backfilled to contain the explosions. Small amounts of irradiated uranium-238 tracer were used in some experiments. The structures in Area 11 were decontaminated and removed in 1970 and 1971. Radiological contamination was detected in sinks, ducts, and hoods in former building 49-15. Contaminated debris was removed and disposed of at TA-54 and uncontaminated debris (approximately 2160 ft<sup>3</sup>) was taken to the open-burning/landfill area at Area 6 (SWMU 49-004).

During the 1987 soil and vegetation radiological-screening survey of TA-49, 22 surface samples were collected from within Area 11, and 20 vegetation samples were collected within and around Area 11. The samples were analyzed for radionuclides, and the results showed radionuclides detected at background levels for most sampling locations; however, elevated levels of americium-241 and plutonium and uranium isotopes were present in a sample from a location next to the east corner of former building 49-15, possibly where the sink drain was located. Vegetation samples showed no elevated radioactivity.

Phase I Consent Order sampling is complete for AOC 49-008(c). AOC 49-008(c) was recommended for corrective action without controls in the supplemental investigation report for TA-49 Sites inside the NES boundary, submitted to NMED in 2016. AOC 49-008(c) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 226-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 226.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 226-1).



Enhanced controls were installed and certified on October 23, 2012, and submitted to EPA on October 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 226-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W01902040052	Established Vegetation	-	X	X	-	B
W01903010040	Earthen Berm	X	-	-	X	B
W01903010041	Earthen Berm	-	X	-	X	EC
W01903010042	Earthen Berm	-	X	-	X	EC
W01903010043	Earthen Berm	-	X	-	X	EC
W01903010044	Earthen Berm	-	X	-	X	EC
W01903010045	Earthen Berm	-	X	-	X	EC
W01903010046	Earthen Berm	-	X	-	X	EC
W01903010047	Earthen Berm	-	X	-	X	EC
W01903010048	Earthen Berm	-	X	-	X	EC
W01903010049	Earthen Berm	-	X	-	X	EC
W01903010050	Earthen Berm	-	X	-	X	EC
W01904010051	Earthen Channel/Swale	X	-	X	-	EC

CB: Certified baseline control measure.  
 B: Additional baseline control measure.  
 EC: Enhanced control measure.

### 226.3 Storm Water Monitoring

AOC 49-008(c) is monitored within W-SMA-11.7. Following the installation of baseline control measures, a baseline storm water sample was collected on September 1, 2011 (Figure 226-2). Analytical results from this sample yielded the following TAL exceedances:

- Aluminum concentration of 1020 µg/L (MTAL is 750 µg/L) and
- Gross-alpha activity of 38.1 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at W-SMA-11.7, a corrective action storm water sample was collected on September 13, 2013 (Figure 226-2). Analytical results from this corrective action monitoring sample yielded the following TAL exceedance:

- Gross-alpha activity of 39.6 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*AOC 49-008(c):*

- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at SWMU 49-008(c). Shallow Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.



Site history and Consent Order sampling results indicate the Site is an unlikely source of the TAL exceedance.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 226-2. 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 Figure 226-2.

W-SMA-11.7 receives runoff from undeveloped areas.

- Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2013 gross-alpha result is less than this value.

All the analytical results for these samples are reported in the 2011 and 2013 Annual Reports.

#### 226.4 Inspections and Maintenance

RG262.4 recorded three storm events at W-SMA-11.7 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 226-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61402	4-7-2017
Pre-SIP Field Walkdown	COMP-54466	5-2-2017
Storm Rain Event	BMP-62440	6-14-2017
Storm Rain Event	BMP-62951	7-5-2017
Storm Rain Event	BMP-64195	8-9-2017

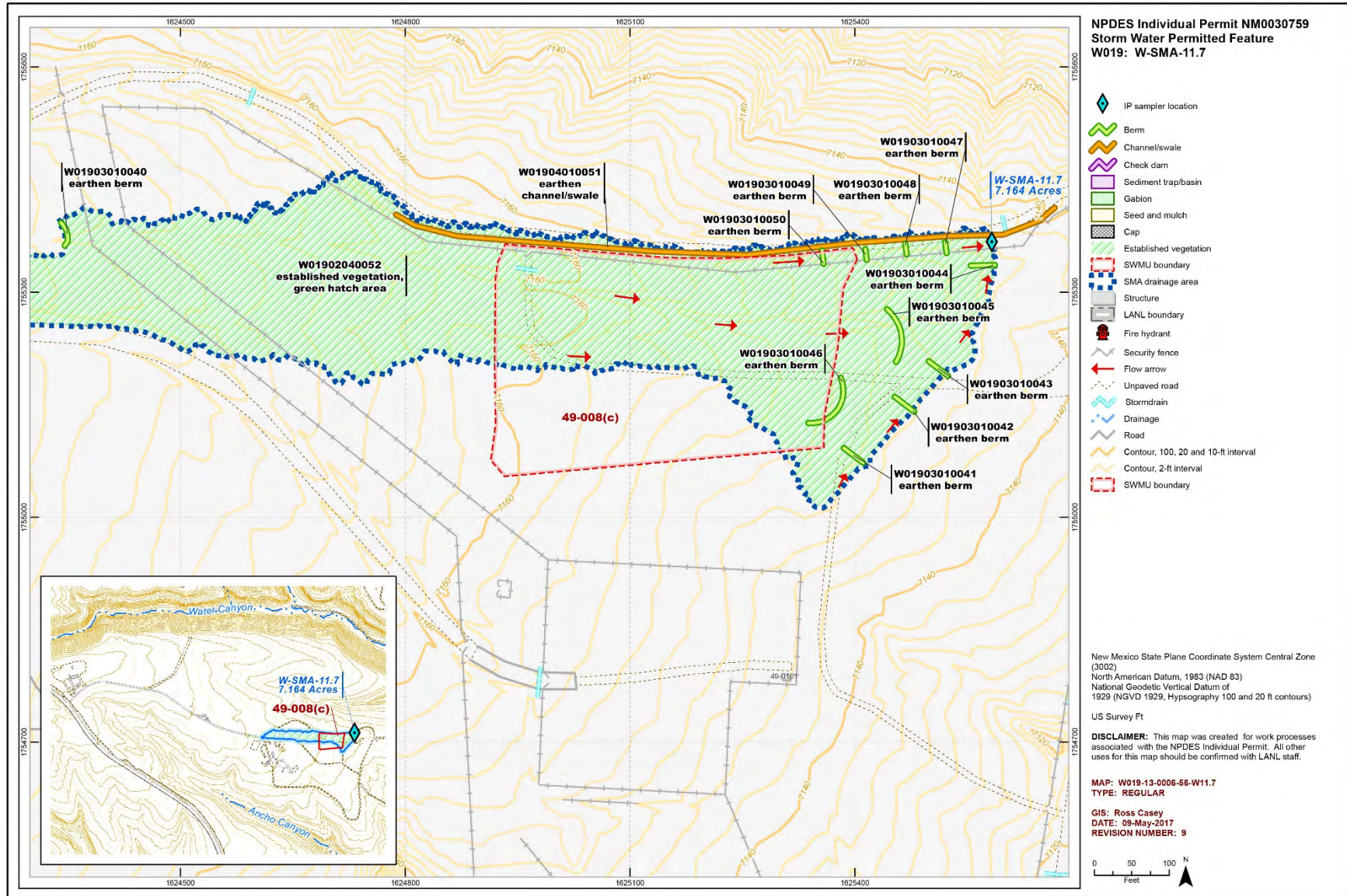
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-11.7 in 2017.

#### 226.5 Compliance Status

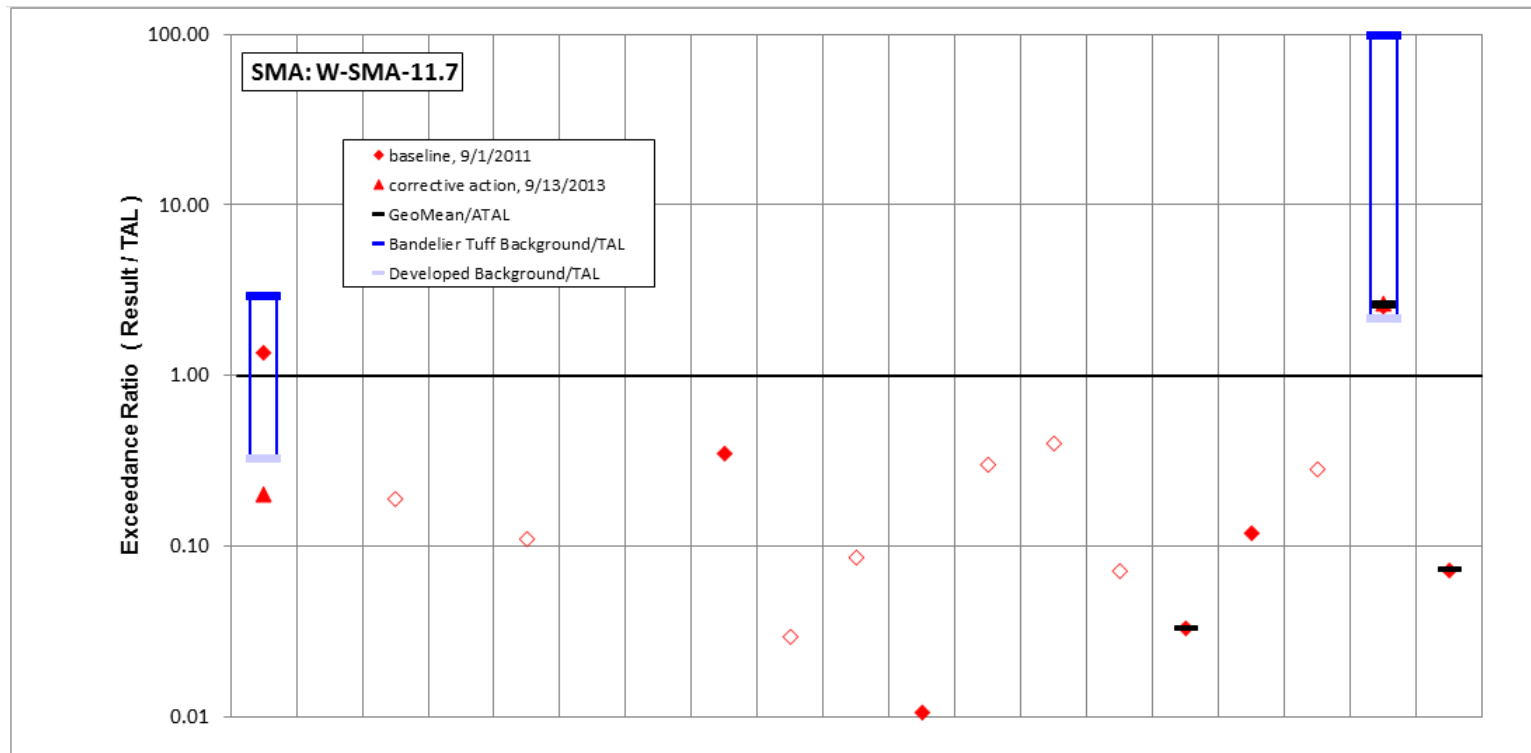
The Site associated with W-SMA-11.7 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 226-3 presents the 2017 compliance status.

**Table 226-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 49-008(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 25, 2012, “Submittal of Certification of Installation of Enhanced Control Measures for Nine Site Monitoring Areas.”



**Figure 226-1 W-SMA-11.7 location map**



	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	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>9/13/2013 result</b>	151	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>39.6</b>	-
result / TAL	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.6	-
<b>9/1/2011 result</b>	1020	1	1.7	15	0.11	2	2.5	1.5	0.5	0.066	1.8	1.5	0.2	0.45	3.3	5	0.003	<b>38.1</b>	2.16
result / TAL	<b>1.4</b>	0.002	0.19	0.003	0.11	0.01	0.0025	0.35	0.029	0.086	0.011	0.3	0.4	0.071	0.033	0.12	0.28	2.5	0.072

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 226-2 Inorganic analytical results summary plot for W-SMA-11.7**

## 227.0 W-SMA-12.05: SWMU 49-001(g)

### 227.1 Site Descriptions

One historical industrial activity area is associated with W020, W-SMA-12.05: Site 49-001(g).

SWMU 49-001(g) is an area of contaminated surface soil at TA-49, north and east of MDA AB, resulting from the transport of surface and near-surface radionuclide contamination associated with an historical release from shaft 2-M at Area 2 (MDA AB). SWMU 49-001(g), the area of highest runoff and erosion potential, is located on a slope that runs from the mesa-top portion of the MDA AB NES north to the bottom of Water Canyon. Erosion-control BMPs were installed at the Site in 1999 and are routinely inspected and maintained.

Phase I Consent Order sampling is complete for SWMU 49-001(g). SWMU 49-001(g) was recommended for corrective action without controls for this Site in the supplemental investigation report for TA-49 Sites inside the NES boundary, submitted to NMED in 2016. SWMU 49-001(g) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 227-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 227.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 227-1).

**Table 227-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W02002040018	Established Vegetation	-	X	X	-	B
W02003010015	Earthen Berm	-	X	-	X	B
W02003010016	Earthen Berm	-	X	-	X	B
W02003010017	Earthen Berm	-	X	-	X	B
W02004060002	Rip Rap	X	-	X	-	CB
W02006010001	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 227.3 Storm Water Monitoring

Through calendar year 2017, storm water flow has not been sufficient for full-volume sample collection at W-SMA-12.05. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.



### 227.4 Inspections and Maintenance

RG262.4 recorded three storm events at W-SMA-12.05 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 227-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61403	4-6-2017
Pre-SIP Field Walkdown	COMP-54467	5-2-2017
Storm Rain Event	BMP-62443	6-14-2017
Storm Rain Event	BMP-62954	6-28-2017
Storm Rain Event	BMP-64198	8-4-2017

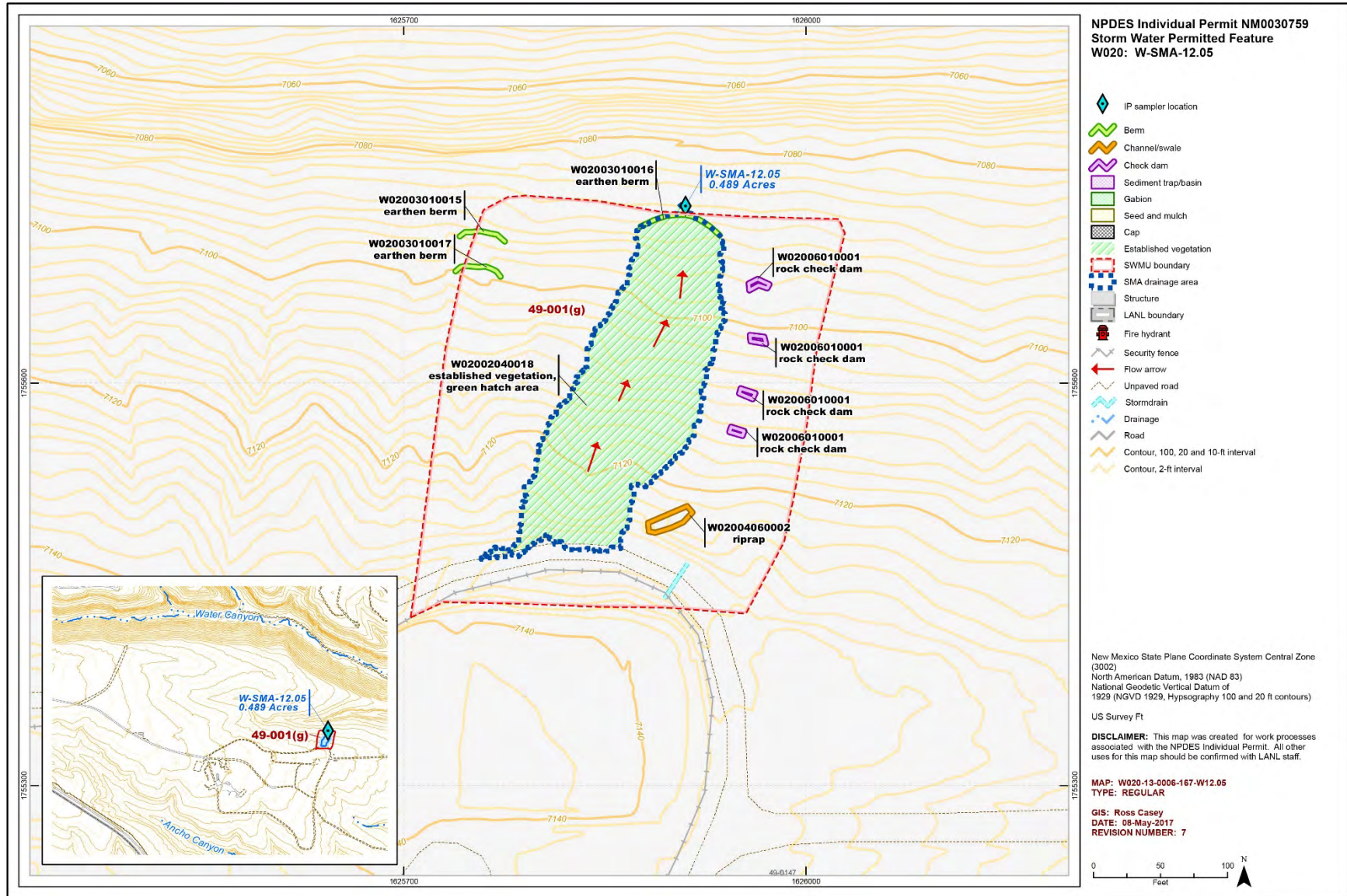
No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-12.05 in 2017.

### 227.5 Compliance Status

The Site associated with W-SMA-12.05 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 227-3 presents the 2017 compliance status.

**Table 227-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 49-001(g)	Baseline Monitoring Extended	Baseline Monitoring Extended	Initiated 4-30-2012. No samples have been collected since initiation of the Permit.



**Figure 227-1 W-SMA-12.05 location map**

## **228.0 W-SMA-14.1: SWMU 15-014(l) and AOC 15-004(h)**

### **228.1 Site Descriptions**

Two historical industrial activity areas are associated with W021, W-SMA-14.1: Sites 15-014(l) and 15-004(h).

SWMU 15-014(l) is a drainline and formerly permitted outfall (EPA 03A028) for a cooling tower (structure 15-202) located within the PHERMEX facility in TA-15. This drainline and outfall received blowdown discharge from the cooling tower that was built in 1961. It is not known if the outfall is still active.

Consent Order investigations have not been performed at SWMU 15-014(l). SWMU 15-014(l) will be included in the future Consent Order Lower Water/Indio Canyons Aggregate Area investigation. No investigations were conducted at SWMU 15-014(l) before the Consent Order went into effect in 2005.

AOC 15-004(h) is inactive Firing Site H located west of the PHERMEX facility at TA-15. Firing Site H is located approximately 100 ft north of the power control building for PHERMEX (structure 15-185). This firing site was built in 1948 and included an instrument chamber (structure 15-17) and a camera chamber (structure 15-92) and was used for explosives testing. The exact nature of the materials used during tests is not known but is believed to include DU, beryllium, lead, and HE. Firing site operations were discontinued in 1953. The surface of the Site was reportedly regraded in 1992. The camera chamber (structure 15-92) remains on-site.

Consent Order investigations have not been performed at SWMU 15-004(h). AOC 15-004(h) will be included in the future Consent Order Lower Water/Indio Canyons Aggregate Area investigation. No investigations were conducted at AOC 15-004(h) before the Consent Order went into effect in 2005.

The project map (Figure 228-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **228.2 Control Measures**

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 228-1).

Enhanced controls were installed and certified on September 25, 2012, and submitted to EPA on October 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 228-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W02102040021	Established Vegetation	-	X	X	-	B
W02103010016	Earthen Berm	-	X	-	X	EC
W02103010017	Earthen Berm	-	X	-	X	EC
W02103010018	Earthen Berm	-	X	-	X	EC
W02103010019	Earthen Berm	-	X	-	X	EC
W02103010020	Earthen Berm	X	-	-	X	EC
W02104060014	Rip Rap	X	-	X	-	CB
W02106010008	Rock Check Dam	X	-	-	X	CB
W02106010009	Rock Check Dam	X	-	-	X	CB
W02106010011	Rock Check Dam	X	-	-	X	CB
W02106010012	Rock Check Dam	-	X	-	X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 228.3 Storm Water Monitoring

SWMU 15-014(l) and AOC 15-004(h) are monitored within W-SMA-14.1. Following the installation of baseline control measures, two baseline storm water samples were collected on July 25, 2011, and August 18, 2011 (Figures 228-2 and 228-3). In Figures 228-2 and 228-3, cadmium, selenium, and silver are reported as nondetectable results equal or greater than their respective TALs. These values are reported at the PQL; however, the MDLs for these analytes are below the TALs. Analytical results from these samples yielded the following TAL exceedances:

- Copper concentrations of 20 µg/L and 42.6 µg/L (MTAL is 4.3 µg/L) and
- Zinc concentration of 49.3 µg/L (MTAL is 42 µg/L).

Following the installation of enhanced control measures at W-SMA-14.1, corrective action storm water samples were collected on September 13, 2013, and July 15, 2014 (Figures 228-2 and 228-3). Analytical results from these corrective action monitoring samples yielded the following TAL exceedances:

- Gross-alpha activities of 38.7 pCi/L and 96.2 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

#### *SWMU 15-014(l):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.



AOC 15-004(h):

- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. No investigations have been conducted at this Site.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. 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 228-2 and 228-3. 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 228-2 and 228-3.



W-SMA-14.1, Rock Check Dam, W02106010012 (photo ID 25735-4)

Monitoring location W-SMA-14.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as locations with sediment derived from Bandelier Tuff. Metals including copper and zinc are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Gross alpha—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 landscape is 32.5 pCi/L. The 2013 and 2014 gross-alpha results are between these two values.

All the analytical results for these samples are reported in the 2011, 2013, and 2014 Annual Reports.

#### 228.4 Inspections and Maintenance

RG262.4 recorded three storm events at W-SMA-14.1 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 228-2 Control Measure Inspections during 2017**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event and Annual Erosion Evaluation	BMP-61404	4-3-2017
Storm Rain Event	BMP-62441	6-19-2017
Storm Rain Event	BMP-62952	6-29-2017
Storm Rain Event	BMP-64196	8-2-2017
Pre-SIP Field Walkdown	COMP-54468	10-26-2017

Maintenance activities conducted at the SMA are summarized in the following table.

**Table 228-3 Maintenance during 2017**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-62952	Added rock to the north end of rock check dam W02106010010	6-29-2017	10 day(s)	Maintenance conducted as soon as practicable
BMP-62828	Rearranged and added rock as necessary to increase the height on the low side of rock check dam W02106010012	6-29-2017	10 day(s)	Maintenance conducted as soon as practicable

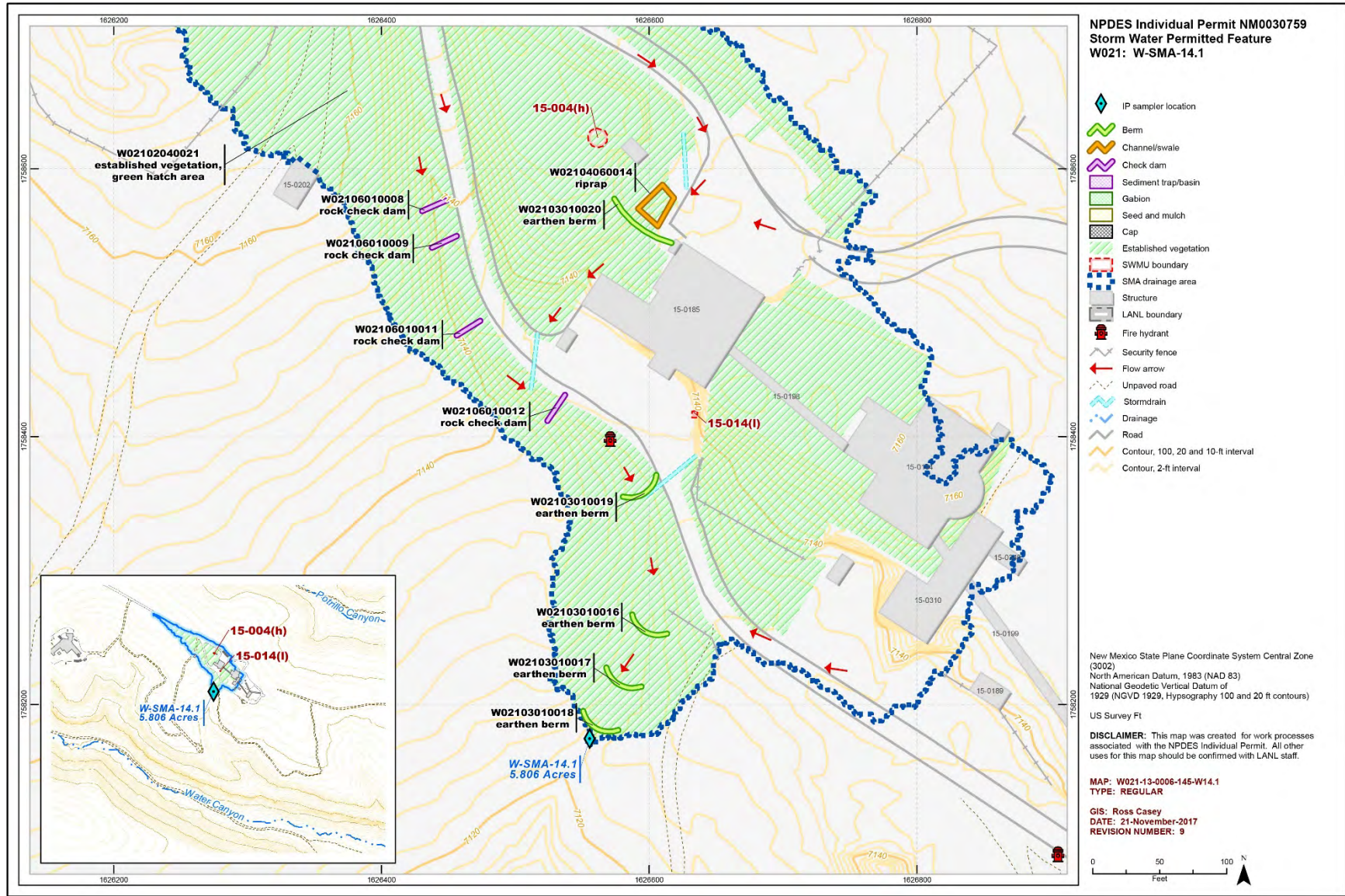
**228.5 Compliance Status**

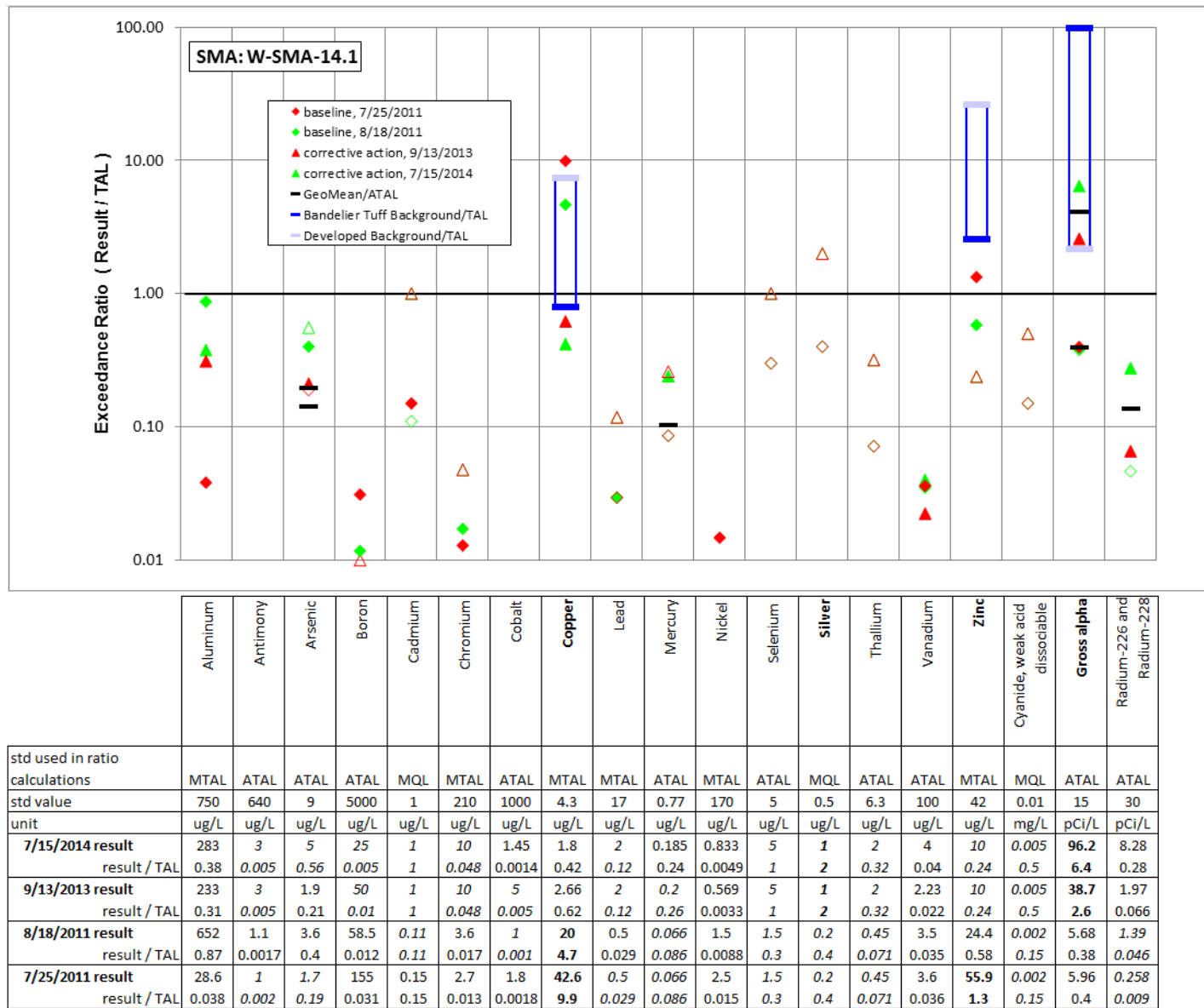
The Sites associated with W-SMA-14.1 are Moderate Priority Sites. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 228-4 presents the 2017 compliance status.

**Table 228-4 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
AOC 15-004(h)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."
SWMU 15-014(l)	Alternative Compliance Requested	Alternative Compliance Requested	LANL, May 6, 2015, "Alternative Compliance Request for 19 Site Monitoring Area/Site Combinations Exceeding Target Action Levels for Gross-Alpha Radioactivity."



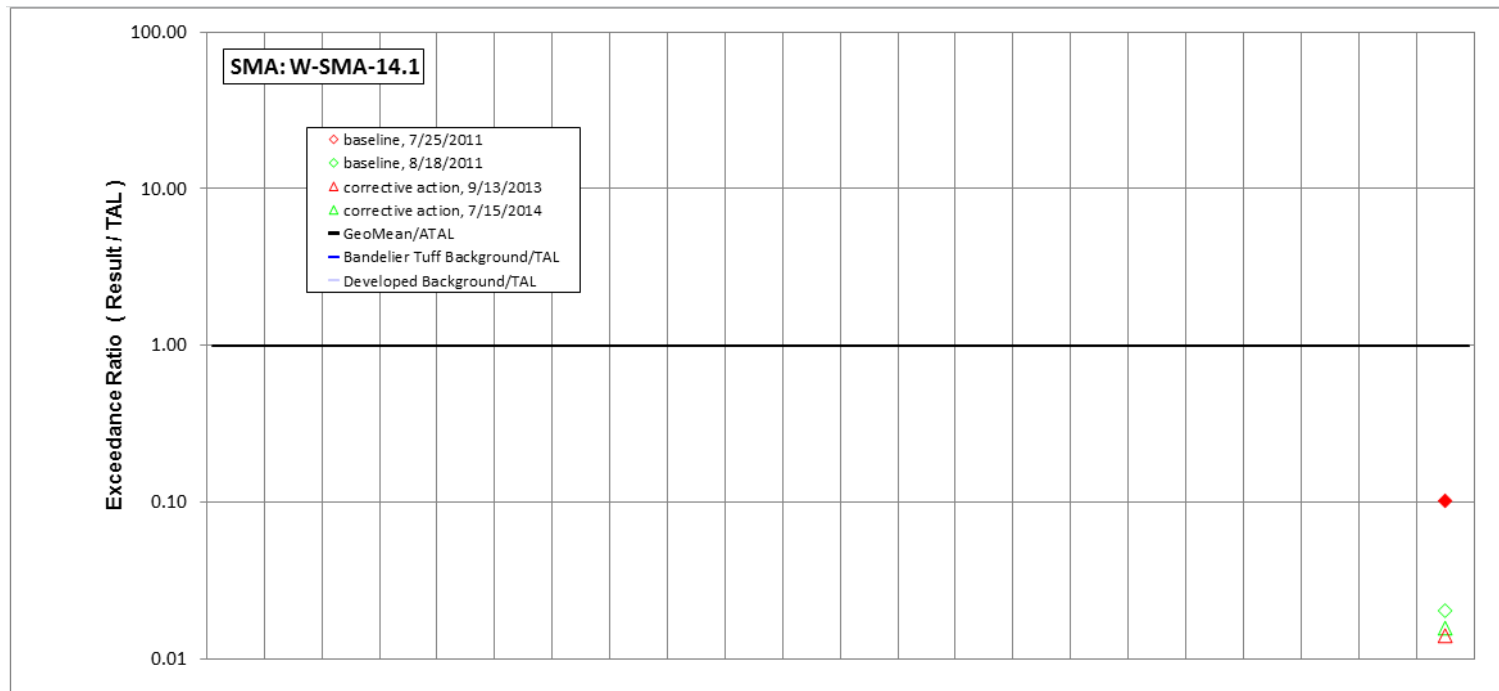




Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 228-2 Inorganic analytical results summary plot for W-SMA-14.1**





	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	-	-	-	ATAL
std value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	20
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
7/15/2014 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.314</b>	-	-	-	<b>0.314</b>
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.002</b>	-	-	-	<b>0.016</b>
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.281</b>	-	-	-	<b>0.281</b>
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.001</b>	-	-	-	<b>0.014</b>
8/18/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.406</b>	-	-	-	<b>0.406</b>
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.002</b>	-	-	-	<b>0.02</b>
7/25/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.406</b>	-	-	-	<b>2.04</b>
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.002</b>	-	-	-	<b>0.1</b>

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 228-3 Organic analytical results summary plot for W-SMA-14.1**

## 229.0 W-SMA-15.1: SWMU 49-005(a)

### 229.1 Site Descriptions

One historical industrial activity area is associated with W022, W-SMA-15.1: Site 49-005(a).

SWMU 49-005(a) is an inactive landfill located east of Area 10. The landfill, described as a small pit, was constructed north of the road that runs east from Area 10 and is approximately 50–100 ft northeast of the Area 10 experimental chamber and shafts (AOC 49-002). SWMU 49-005(a) was constructed in 1984 as a disposal area for nonradiologically contaminated debris generated during the 1984 general surface cleanup of TA-49.

Phase I Consent Order sampling is complete for SWMU 49-005(a). All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order and RFI samples were below residential SSLs and SALs. SWMU 49-005(a) was recommended for corrective action complete without controls for this Site in the supplemental investigation report for the TA-49 Sites outside the NES boundary, submitted to NMED in 2016. SWMU 49-005(a) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 229-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 229.2 Control Measures

All active control measures are listed in the following table, and their locations are shown on the project map (Figure 229-1).

Enhanced controls were installed and certified on October 23, 2012, and submitted to EPA on October 25, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 229-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
W02202040006	Established Vegetation	-	X	X	-	B
W02203010004	Earthen Berm	X	-	-	X	EC
W02203010005	Earthen Berm	-	X	-	X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 229.3 Storm Water Monitoring

SWMU 49-005(a) is monitored within W-SMA-15.1. Following the installation of baseline control measures, a baseline confirmation sample was collected on September 1, 2011 (Figure 229-2). Inorganic analytical results from this baseline sample yielded the following TAL exceedance:

- Gross-alpha activity of 33.2 pCi/L (ATAL is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent.

*SWMU 49-005(a):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at SWMU 49-005(a). Shallow Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha-emitting radionuclides.

Based on the Site history and Consent Order sampling data, the Site is an unlikely source of the TAL exceedance.

TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 229-2. 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 Figure 229-2.

W-SMA-15.1 receives runoff from portions of the inactive landfill and from undeveloped areas. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—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 landscape is 32.5 pCi/L. The 2011 gross-alpha result is between these two values.

All the analytical results for these samples are reported in the 2011 Annual Report.

#### **229.4 Inspections and Maintenance**

RG262.4 recorded three storm events at W-SMA-15.1 during the 2017 season. These rain events triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 229-2 Control Measure Inspections during 2017**

<b>Inspection Type</b>	<b>Inspection Reference</b>	<b>Inspection Date</b>
Storm Rain Event and Annual Erosion Evaluation	BMP-61405	4-6-2017
Pre-SIP Field Walkdown	COMP-54469	5-2-2017
Storm Rain Event	BMP-62442	6-14-2017
Storm Rain Event	BMP-62953	6-28-2017
Storm Rain Event	BMP-64197	8-4-2017

No maintenance activities or facility modifications affecting discharge were conducted at W-SMA-15.1 in 2017.

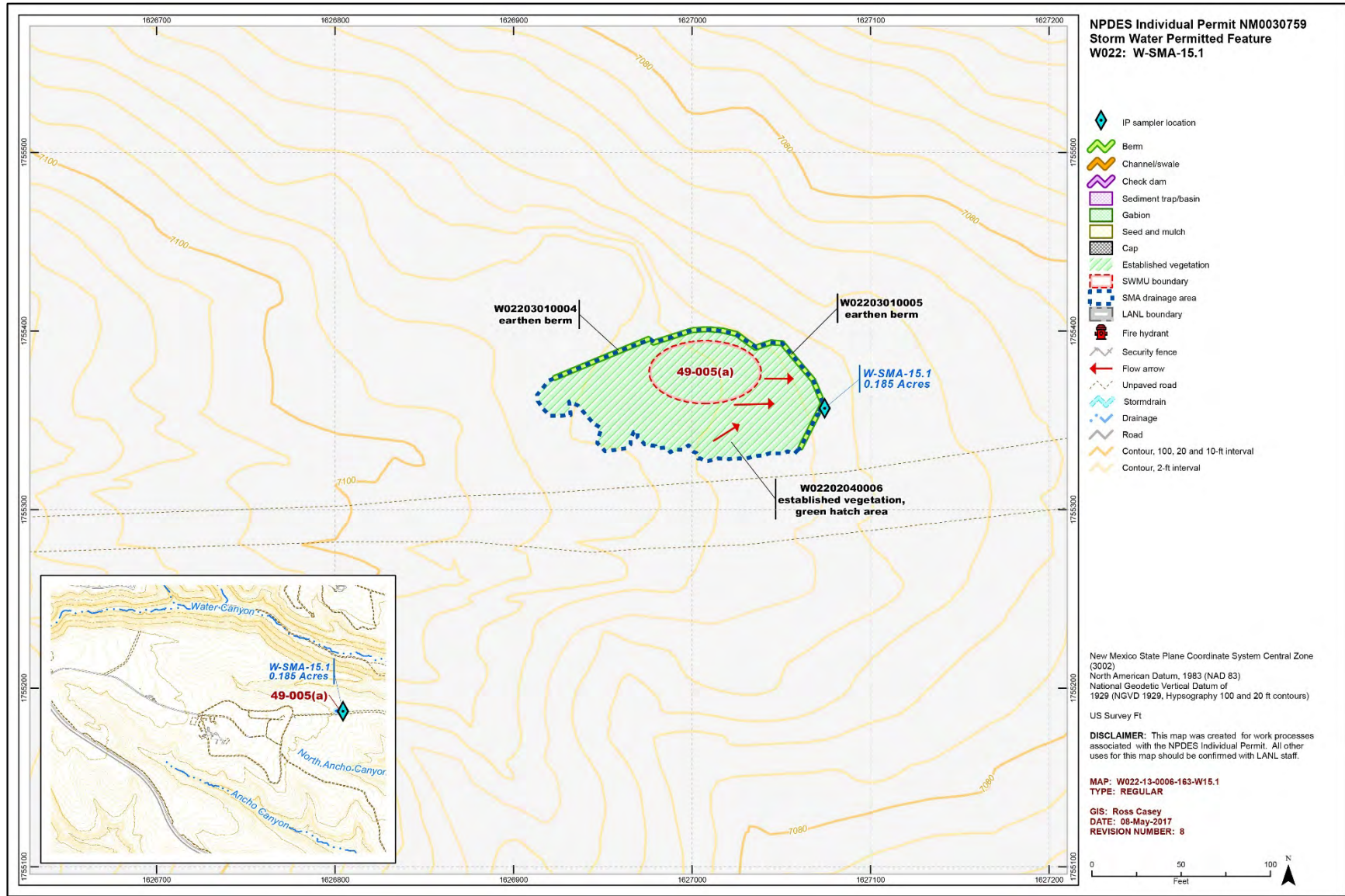
**229.5 Compliance Status**

The Site associated with W-SMA-15.1 is a Moderate Priority Site. Corrective action should be certified complete within 5 yr of the effective date of the IP. The IP was under administrative continuance at the end of 2017. Table 229-3 presents the 2017 compliance status.

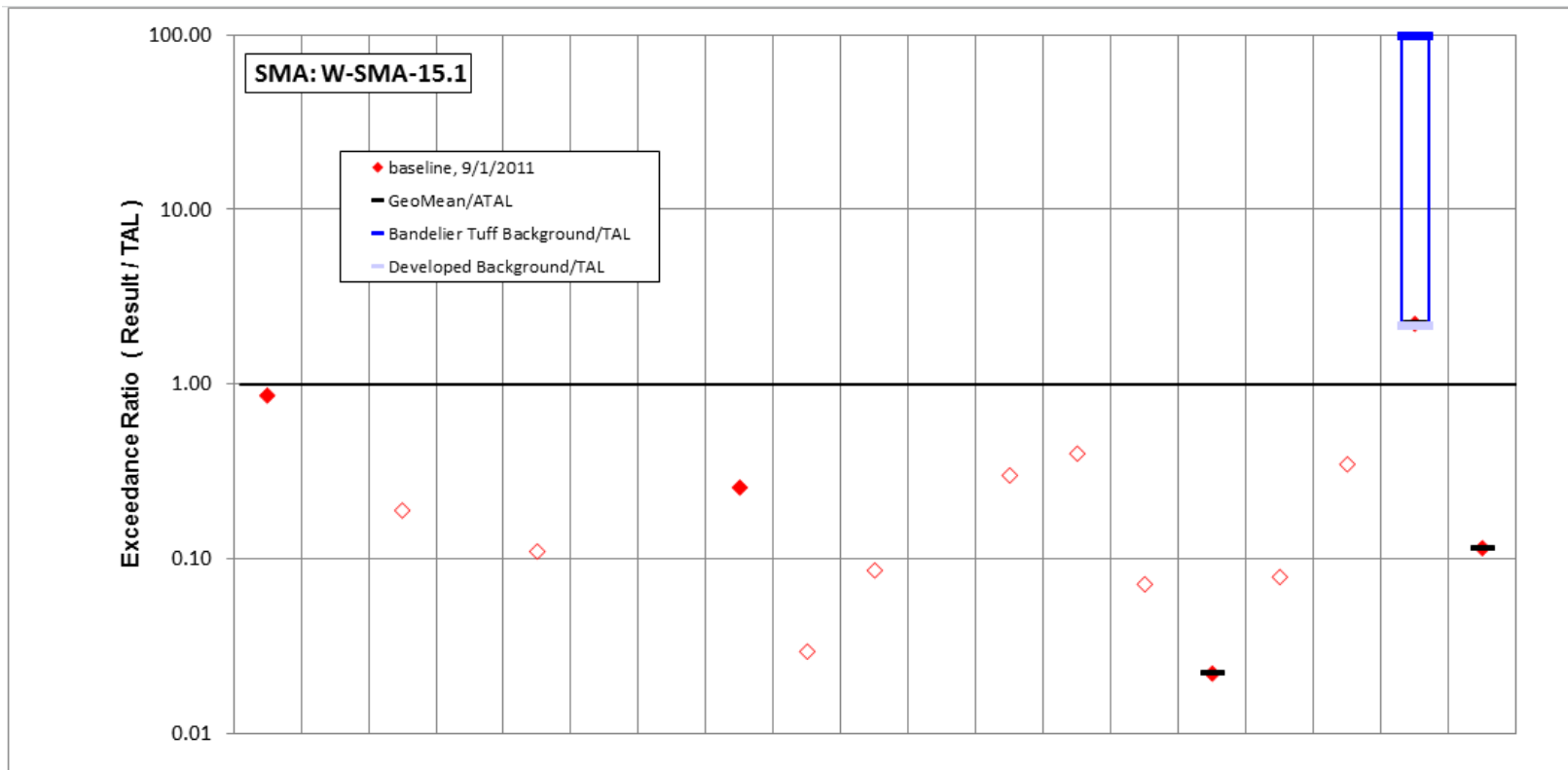
**Table 229-3 Compliance Status during 2017**

Site	Compliance Status on Jan 1, 2017	Compliance Status on Dec 31, 2017	Comments
SWMU 49-005(a)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	LANL, October 25, 2012, "Submittal of Certification of Installation of Enhanced Control Measures for Nine Site Monitoring Areas."





**Figure 229-1 W-SMA-15.1 location map**



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MQL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MQL	ATAL	ATAL	MTAL	MQL	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
<b>9/1/2011 result</b>	645	1	1.7	15	0.11	2	3.1	1.1	0.5	0.066	0.87	1.5	0.2	0.45	2.2	3.3	0.003	33.2	3.45
result / TAL	0.86	0.002	0.19	0.003	0.11	0.01	0.0031	0.26	0.029	0.086	0.0051	0.3	0.4	0.071	0.022	0.079	0.35	2.2	0.12

Bold font indicates result>TAL/MQL; italic font and hollow symbols indicate undetected results; "-" is used if no analytical results were available.

**Figure 229-2 Inorganic analytical results summary plot for W-SMA-15.1**

## Attachment 1 Amendments

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.3068	3/24/2017	PT-SMA-4.2	Errata - Per data QA/QC reviews in preparation for 2016 IP Annual Report and SDPPP data pulls, please update Mainconn as follows: -Add straw wattle I00703060056 to map. Wattle was identified on verification work order BMP-59415 but was not included in the labor report for CCN-59534. Control was added to Mainconn 12/19/16 outside of the change control notification process and is included in active control measure lists for SDPPP and IP Annual Report. -Correct map legend on page 2 of rev 11 to be consistent with IP SDPPP map legend template. -Correct map label for Gabion -0052 from gabiongabions to gabion.	E	CCN - 60868
V4.3069	4/25/2017	PT-SMA-1	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 61292
V4.3070	4/25/2017	PT-SMA-1	Map Revision - (12)	T	CCN - 61292
V4.3071	4/25/2017	W-SMA-6	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 61303
V4.3072	4/25/2017	W-SMA-6	Map Revision - (6)	T	CCN - 61303
V4.3073	4/25/2017	W-SMA-9.5	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 61294
V4.3075	3/24/2017	PT-SMA-4.2	Map Revision - (11)	T	CCN - 60868
V4.3076	4/25/2017	W-SMA-9.8	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 61293
V4.3077	4/25/2017	W-SMA-9.8	Map Revision - (8)	T	CCN - 61293
V4.3078	5/18/2017	W-SMA-4.1	Errata - Per BMP-61547 conducted on 4/21/17, please update as necessary to: -Add coir log as additional roff/sc. Install date 4/21/17. See GPS coordinates for location. Modify SDPPP map and map inset to reflect update to SMA drainage. The addition of a coir log has modified the extent of the drainage. Update the hydro map based on the addition of the new control.	E	CCN - 61544
V4.3079	5/18/2017	W-SMA-4.1	New Control - Corrective Action - Control ID: W00503140010	T	CCN - 61544
V4.3080	5/18/2017	W-SMA-4.1	Map Revision - (10)	T	CCN - 61544

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.3081	5/18/2017	W-SMA-11.7	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is accurate but is missing a portion of the drainage to the south of the sampler. A pore point was established and the drainage was updated to include the area. The map has been marked to show the location. Per COMP-54466 conducted on 5/2/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61645
V4.3082	5/18/2017	W-SMA-7.8	New Control - Corrective Action - Control ID: W00903100010	T	CCN - 61545
V4.3083	5/18/2017	W-SMA-7.8	Map Revision - (8)	T	CCN - 61545
V4.3084	5/18/2017	W-SMA-11.7	Map Revision - (9)	T	CCN - 61645
V4.3085	5/18/2017	W-SMA-12.05	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The Archydro drainage is accurate and does not require modification. Per COMP-54467 conducted on 5/2/17, please update as necessary to: -Update the location of earthen berm -0016. See orthophotographic map for location. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61647
V4.3086	5/18/2017	W-SMA-12.05	Map Revision - (7)	T	CCN - 61647



Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.3087	5/18/2017	W-SMA-15.1	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The orthophotographic map is inaccurate and does not have the sampler in the proper location. A pore point was established and the orthophotographic map was updated to accurately reflect the scope of the drainage. Per COMP-54469 conducted on 5/2/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 61646
V4.3088	5/18/2017	W-SMA-15.1	Map Revision - (8)	T	CCN - 61646
V4.3089	6/23/2017	W-SMA-7	Retire Control - Lifecycle Expired - Control ID: W00803140039	T	CCN - 62709
V4.3090	6/23/2017	W-SMA-7	Retire Control - Lifecycle Expired - Control ID: W00803140040	T	CCN - 62709
V4.3091	6/23/2017	W-SMA-7	Map Revision - (11)	T	CCN - 62709
V4.3092	7/18/2017	CDV-SMA-3	Retire Control - Lifecycle Expired - Control ID: V01004060007	T	CCN - 62745
V4.3093	7/18/2017	CDV-SMA-3	Map Revision - (13)	T	CCN - 62745
V4.3094	7/18/2017	W-SMA-14.1	Retire Control - Lifecycle Expired - Control ID: W02106010010	T	CCN - 62829
V4.3095	7/18/2017	W-SMA-14.1	Map Revision - (8)	T	CCN - 62829
V4.3096	7/18/2017	CDV-SMA-8	Retire Control - Lifecycle Expired - Control ID: V01406010004	T	CCN - 62844
V4.3097	7/18/2017	CDV-SMA-8	Map Revision - (10)	T	CCN - 62844
V4.3098	7/28/2017	W-SMA-9.7	Retire Control - Damaged and/or Replaced - Control ID: W01503060011	T	CCN - 63547
V4.3099	7/28/2017	W-SMA-9.7	New Control - Augment Existing - Control ID: W01503140020	T	CCN - 63547
V4.4000	7/28/2017	W-SMA-9.7	Map Revision - (16)	T	CCN - 63547
V4.4001	8/2/2017	W-SMA-10	Retire Control - Lifecycle Expired - Control ID: W01803060029	T	CCN - 63752
V4.4002	8/2/2017	W-SMA-10	New Control - Corrective Action - Control ID: W01803140031	T	CCN - 63752
V4.4003	8/2/2017	W-SMA-10	Map Revision - (11)	T	CCN - 63752
V4.4004	8/23/2017	W-SMA-9.7	Retire Control - Lifecycle Expired - Control ID: W01503060009	T	CCN - 63813
V4.4005	8/23/2017	W-SMA-9.7	Map Revision - (17)	T	CCN - 63813

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.4006	8/23/2017	W-SMA-1.5	Retire Control - Lifecycle Expired - Control ID: W00206010011	T	CCN - 64654
V4.4007	8/23/2017	W-SMA-1.5	Map Revision - (14)	T	CCN - 64654
V4.4008	11/30/2017	PT-SMA-3	Retire Control - Lifecycle Expired - Control ID: I00504010029	T	CCN - 64798
V4.4009	11/30/2017	PT-SMA-3	Retire Control - Lifecycle Expired - Control ID: I00506010025	T	CCN - 64798
V4.4010	11/30/2017	PT-SMA-3	Map Revision - (15)	T	CCN - 64798
V4.4011	8/30/2017	CDV-SMA-6.02	New Control - Corrective Action - Control ID: V012A03140010	T	CCN - 64990
V4.4012	8/30/2017	CDV-SMA-6.02	Map Revision - (12)	T	CCN - 64990
V4.4013	11/30/2017	CDV-SMA-9.05	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54077 conducted on 10/18/17, please update as necessary to: -Update the location/extent of earthen berms -0002, -0003, and -0004. Utilize orthophotographic map for locations. -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Update the locations of several flow arrows based on the updated BMP locations. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66798
V4.4014	11/30/2017	CDV-SMA-9.05	Map Revision - (6)	T	CCN - 66798
V4.4015	11/16/2017	CDV-SMA-7	Retire Control - Lifecycle Expired - Control ID: V01303140012	T	CCN - 66811
V4.4016	11/16/2017	CDV-SMA-7	Map Revision - (9)	T	CCN - 66811
V4.4017	12/18/2017	W-SMA-14.1	Errata - Utilized 2014 LiDAR DEM and Arc Hydro to develop a draft SMA drainage polygon. Field observations were conducted and the Arc Hydro SMA drainage polygon was modified to represent on the ground conditions that the 2014 LiDAR did not detect including: -The ArcHydro drainage is accurate and does not require modification. Per COMP-54468 conducted on 10/26/17, please update as necessary to: -Modify SDPPP map, map inset, and SIP map to reflect update to SMA drainage. See attached Orthophotographic and SDPPP maps. -Update extent of established vegetation to match new drainage. -Remove any flow arrows outside new drainage. -Discuss map changes with TPMC in safety briefing once map update complete.	E	CCN - 66902
V4.4018	12/18/2017	W-SMA-14.1	Map Revision - (8)	T	CCN - 66902

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.4019	11/16/2017	PT-SMA-4.2	Retire Control - Lifecycle Expired - Control ID: I00703060056	T	CCN - 66908
V4.4020	11/16/2017	PT-SMA-4.2	Map Revision - (12)	T	CCN - 66908
V4.4021	1/9/2018	PT-SMA-4.2	Errata - Per data QA/QC reviews in preparation for 2017 IP Annual Report and SDPPP data pulls, please update as necessary to: -Correct Classification ID portion of assets IDs I00701010042 and I00701010047. Controls were identified as rock check dams I00706010042 and I00706010047 per CCN-59534 but were added into Mainconn using classification ID for Seed and Wood mulch (0101). Labels on map revision produced on CCN-59534 are correct.	E	CCN - 67136
V4.4022	3/19/2018	CDV-SMA-1.4	Change to SDPPP - Cañon de Valle Aggregate Area <a href="#">TA-16</a> investigation.	T	
V4.4023	3/19/2018	CDV-SMA-1.45	Change to SDPPP - Cañon de Valle Aggregate Area <a href="#">TA-16</a> investigation.	T	
V4.4024	3/19/2018	CDV-SMA-2.3	Change to SDPPP - The Site was recommended for corrective action complete in the approved 2009 <a href="#">Phase II</a> investigation report <a href="#">for the TA-16-34 complex</a> .	T	
V4.4025	3/19/2018	CDV-SMA-2.42	<p>Change to SDPPP - <a href="#">Following enhanced controls installation, two corrective action monitoring storm water samples were collected on June 25, 2017, and October 5, 2017 (Figures 188-2 and 188-3). Analytical results from these samples yielded the following TAL exceedances:</a></p> <ul style="list-style-type: none"> <li>• <a href="#">Aluminum concentration of 3470 µg/L (MTAL is 750 µg/L),</a></li> <li>• <a href="#">Copper concentration of 5.51 µg/L (MTAL is 4.3 µg/L),</a></li> <li>• <a href="#">Gross-alpha activities of 136 pCi/L and 29.2 pCi/L (ATAL is 15 pCi/L), and</a></li> <li>• <a href="#">PCB concentrations of 34 ng/L and 26 ng/L (ATAL is 0.6 ng/L).</a></li> </ul> <p>Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent. <a href="#">There are no Consent Order soil sampling data available for this Site.</a></p>	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.4025	3/19/2018	CDV-SMA-2.42	<p>SWMU 16-010(b):</p> <ul style="list-style-type: none"> <li>Based on site history and RCRA closure confirmation sampling, the Site is an unlikely a source of the TAL exceedances for <a href="#">aluminum</a>, copper, PCBs, and gross-alpha radioactivity.</li> <li><a href="#">Aluminum—The aluminum UTL from developed landscape storm water run-on is 245 µg/L; the aluminum UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The aluminum result from 2017 is above these values.</a></li> <li>Copper—The copper UTL from developed landscape storm water run-on is 32.3 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2013 <del>is</del> <a href="#">and 2017 are</a> between these two values.</li> <li>Gross alpha—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 landscape is 32.5 pCi/L. The 2013 <a href="#">and one of the 2017</a> gross-alpha results <del>is</del> <a href="#">are</a> between these two values. <a href="#">One of the 2017 gross-alpha results is less than both these values.</a></li> <li>PCBs—The PCB UTL from developed landscape storm water run-on is 98 ng/L; the PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. The PCB results from 2013 <del>and 2017 are</del> <a href="#">is</a> between these values.</li> </ul> <p>All the analytical results for these samples are reported in the 2013 <a href="#">and 2017</a> Annual Reports.</p>	T	
V4.4026	3/19/2018	CDV-SMA-2.42	Change to SDPPP - Compliance status table updated.	T	
V4.4027	3/19/2018	CDV-SMA-2.42	Change to SDPPP - Additional graphs with 2017 data inserted.	T	
V4.4028	3/19/2018	CDV-SMA-3	Change to SDPPP - Phase I Consent Order investigation is complete for SWMU 14-009. SWMU 14-009 was recommended for corrective action complete without controls in the supplemental investigation report for Cañon de Valle Aggregate Area <a href="#">TA-14</a>	T	
V4.4029	3/19/2018	CDV-SMA-3	Change to SDPPP - SWMU 14-010 was recommended for corrective action complete without controls in the supplemental investigation report for Cañon de Valle Aggregate Area <a href="#">TA-14</a>	T	
V4.4030	3/19/2018	CDV-SMA-6.01	Change to SDPPP - SWMU 14-006 was recommended for corrective action complete in the supplemental investigation report for Cañon de Valle Aggregate Area <a href="#">TA-14</a>	T	



Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.4031	3/19/2018	CDV-SMA-6.02	Change to SDPPP - SWMU 14-002(c) was recommended for corrective action complete without controls in the supplemental investigation report for Cañon de Valle Aggregate Area <a href="#">TA-14</a>	T	
V4.4032	3/19/2018	CDV-SMA-6.02	Change to SDPPP - • Mercury concentrations of 1.6 µg/L and 0.95 µg/L ( <del>ATAL</del> <del>MTAL</del> is 0.77 µg/L), and	E	
V4.4033	3/19/2018	PT-SMA-1	<p>Change to SDPPP - <a href="#">Following a sampler move to a more representative monitoring location, a corrective action monitoring storm water sample was collected on September 26, 2017 (Figures 201-2 and 201-3). Analytical results from this sample yielded the following TAL exceedances:</a></p> <ul style="list-style-type: none"> <li>• <a href="#">Copper concentration of 4.8 µg/L (MTAL is 4.3 µg/L) and</a></li> <li>• <a href="#">Gross-alpha activity of 17.6 pCi/L (ATAL is 15 pCi/L).</a></li> </ul> <p>• Copper—The copper UTL for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L; the results from 2011, <del>and</del> 2014, <a href="#">and 2017</a> are greater than this value.</p> <p>• Gross alpha—The gross-alpha UTL for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L; the results from 2011 and <a href="#">2017</a> and one result from 2014 are less than this value. The other result from 2014 is greater than this value.</p> <p>All the analytical results for these samples are reported in the 2011, <a href="#">2014</a>, and <a href="#">2017</a> Annual Reports.</p> <p><a href="#">The monitoring station for PT-SMA-1 has been relocated. The sampler has been repositioned to be in a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.</a></p>	T	
V4.4034	3/19/2018	PT-SMA-1	Change to SDPPP - Compliance status table updated.	T	
V4.4035	3/19/2018	PT-SMA-1	Change to SDPPP - Additional graphs with 2017 data inserted.	T	
V4.4036	3/19/2018	PT-SMA-2.01	Change to SDPPP - Compliance status table updated.	T	
V4.4037	3/19/2018	W-SMA-1	Change to SDPPP - This SWMU was originally designated as part of SWMU 16-017, a group of 24 structures in central TA- <del>1601</del> .	E	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.4038	3/19/2018	W-SMA-1.5	Change to SDPPP - <u>A corrective action storm water sample was collected on September 28, 2017 (Figure 208-2). Analytical results from this sample yielded no TAL exceedances. No further sampling is required for W-SMA-1.5 for the duration of the IP.</u> All the analytical results for these samples are reported in the 2011, <del>and</del> 2014, <u>and 2017</u> Annual Reports.	T	
V4.4039	3/19/2018	W-SMA-1.5	Change to SDPPP - Additional graph with 2017 data inserted.	T	
V4.4040	3/19/2018	W-SMA-5	Change to SDPPP - <del>SWMU</del> <u>SMWU</u> 16 026(e) was recommended for additional field characterization activities in the supplemental investigation report for S-Site Aggregate Area, submitted to NMED in 2015.	E	
V4.4041	3/19/2018	W-SMA-6	Change to SDPPP - <u>The monitoring station for W-SMA-6 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA.</u> <u>Sampler coordinates and the SMA drainage area have been updated in Attachment 4.</u>	T	
V4.4042	3/19/2018	W-SMA-8.7	SWMU 16-026(j2) was investigated under the Consent Order and recommended for corrective action complete in the Phase II investigation report <u>for the TA-16-340 complex.</u>	T	

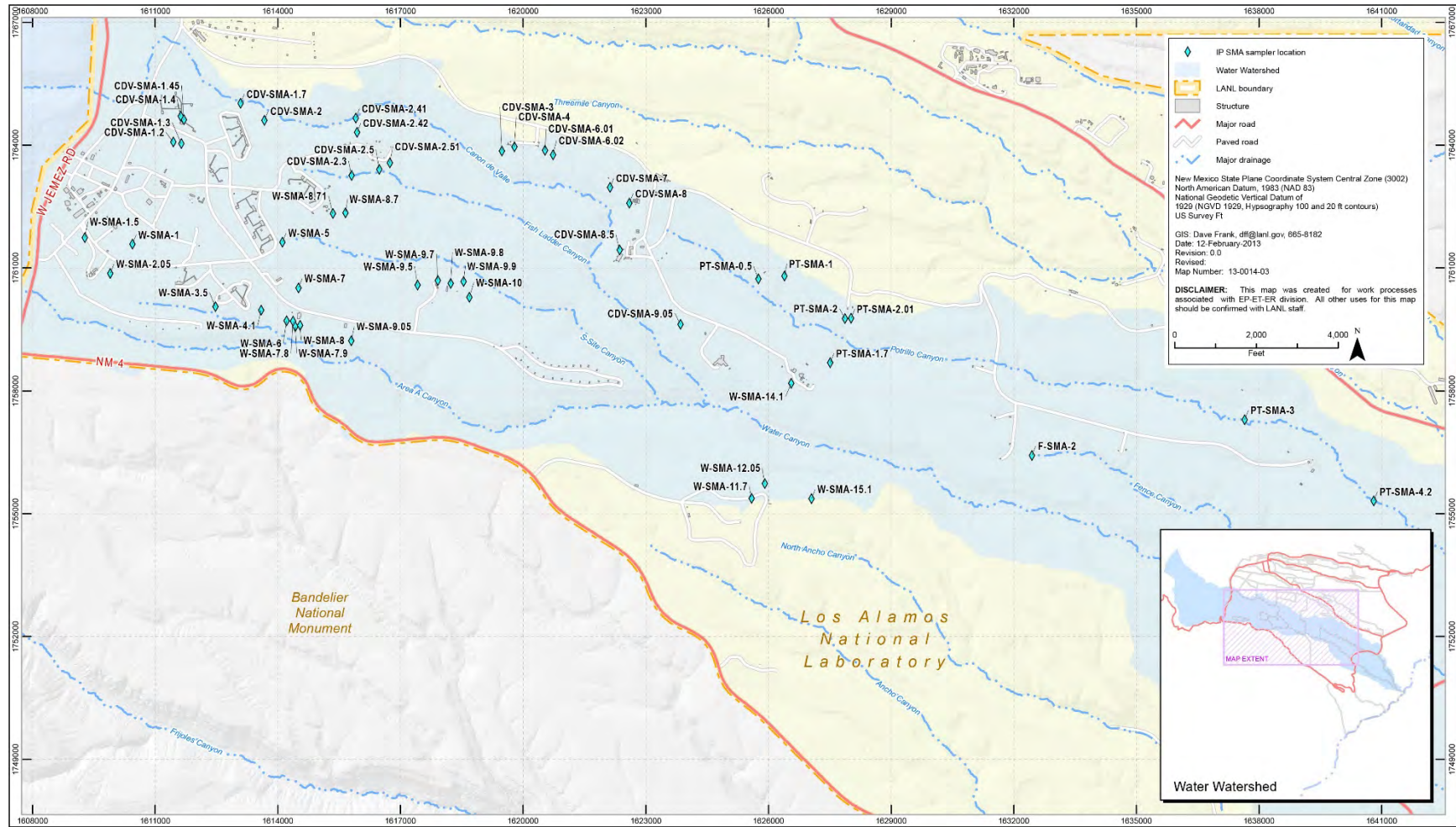
Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.4043	3/19/2018	W-SMA-9.5	<p>Change to SDPPP - <u>AOC 11-012(c) is monitored within W-SMA-9.5. Following the installation of baseline control measures and a sampler move to a more representative location, a baseline storm water sample was collected on June 25, 2017 (Figure 221-2). The sample collected on September 27, 2017, was not of sufficient volume to be in compliance with the volume required by the IP. Analytical results from the June sample yielded the following TAL exceedances: Through-calendar year 2016, storm water flow has not been sufficient for full-volume sample collection at W-SMA-9.5. Baseline monitoring will be extended until one confirmation sample is collected from this SMA.</u></p> <ul style="list-style-type: none"> <li>• <u>Mercury concentration of 1.1 µg/L (ATAL is 0.77 µg/L) and</u></li> <li>• <u>Gross-alpha activity of 81 pCi/L (ATAL is 15 pCi/L).</u></li> </ul> <p><u>Site history and shallow (i.e., less than 3 ft bgs) soil sampling data (where available) are used to determine whether the TAL exceedance constituent(s) may be related to historical industrial activities. The discussion is organized by Site and TAL exceedance constituent. There are no soil data available for this Site.</u></p> <p><u>AOC 11-012(c):</u></p> <ul style="list-style-type: none"> <li>• <u>Mercury is not known to be associated with industrial materials historically managed at the Site.</u></li> <li>• <u>Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site.</u></li> </ul>	T	

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change*	Reference
V4.4043	3/19/2018	W-SMA-9.5	<p><u>Based on the Site history and Consent Order sampling data, the Site is an unlikely source of the TAL exceedances.</u></p> <p><u>TAL exceedances were also evaluated against the appropriate storm water BV, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. BVs are expressed as UTLs using the approved EPA method for calculating BVs. UTLs for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff and are labeled “Bandelier Tuff Background” in Figure 221-2. 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 Figure 221-2.</u></p> <p><u>The SMA receives runoff from undeveloped areas.</u></p> <ul style="list-style-type: none"> <li><u>• Mercury—There are no UTLs for mercury.</u></li> <li><u>• Gross alpha—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L. The 2017 gross-alpha result is less than this value.</u></li> </ul> <p><u>All the analytical results for this sample are reported in the 2017 Annual Report. The monitoring station for W-SMA-9.5 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA. Sampler coordinates and the SMA drainage area have been updated in Attachment 4.</u></p>	T	
V4.4044	3/19/2018	W-SMA-9.5	Change to SDPPP - Compliance status table updated.	T	
V4.4045	3/19/2018	W-SMA-9.5	Change to SDPPP - Graph with 2017 data inserted.	T	
V4.4046	3/19/2018	W-SMA-9.8	<p><u>Change to SDPPP - The monitoring station for W-SMA-9.8 has been relocated. The sampler has been repositioned to a location determined to be more representative of the SMA.</u></p> <p><u>Sampler coordinates and the SMA drainage area have been updated in Attachment 4.</u></p>	T	

\*T = technical, E = errata.



# Attachment 2 Vicinity Map



## Attachment 3 Precipitation Network

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG253	03/24/2017	0.11	0.04	54.6
RG253	03/25/2017	0.04	0.03	19.8
RG253	03/26/2017	0.01	0.01	4.8
RG253	03/27/2017	0.01	0.01	4.8
RG253	04/01/2017	0.17	0.04	84.6
RG253	04/25/2017	0.14	0.12	39.6
RG253	05/08/2017	0.11	0.11	19.8
RG253	05/09/2017	0.52	0.14	154.8
RG253	05/10/2017	0.05	0.02	24.6
RG253	05/11/2017	0.01	0.01	4.8
RG253	05/17/2017	0.01	0.01	4.8
RG253	05/25/2017	0.01	0.01	4.8
RG253	05/29/2017	0.01	0.01	4.8
RG253	05/30/2017	0.1	0.09	34.8
RG253	05/31/2017	0.03	0.03	15
RG253	06/01/2017	0.09	0.06	34.8
RG253	06/02/2017	0.02	0.02	4.8
RG253	06/04/2017	0.13	0.09	30
RG253	06/05/2017	0.02	0.01	9.6
RG253	06/06/2017	0.17	0.12	45
RG253	06/08/2017	0.01	0.01	4.8
RG253	06/22/2017	0.02	0.02	9.6
RG253	06/24/2017	0.05	0.04	9.6
RG253	06/25/2017	1.18	0.56	79.8
RG253	06/26/2017	0.36	0.16	94.8
RG253	06/27/2017	0.01	0.01	4.8
RG253	07/08/2017	0.01	0.01	4.8
RG253	07/09/2017	0.05	0.03	19.8
RG253	07/11/2017	0.01	0.01	4.8
RG253	07/12/2017	0.66	0.32	129.6
RG253	07/13/2017	0.02	0.01	9.6
RG253	07/15/2017	0.02	0.02	9.6
RG253	07/16/2017	0.01	0.01	4.8
RG253	07/18/2017	0.19	0.17	30
RG253	07/24/2017	0.03	0.03	9.6

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG253	07/25/2017	0.03	0.03	9.6
RG253	07/26/2017	0.08	0.07	24.6
RG253	07/27/2017	0.12	0.04	60
RG253	07/28/2017	0.02	0.01	9.6
RG253	07/29/2017	0.57	0.37	64.8
RG253	07/30/2017	0.1	0.05	39.6
RG253	07/31/2017	0.17	0.06	79.8
RG253	08/03/2017	0.1	0.1	19.8
RG253	08/04/2017	0.1	0.03	45
RG253	08/06/2017	0.25	0.19	49.8
RG253	08/07/2017	0.05	0.04	24.6
RG253	08/11/2017	0.4	0.13	154.8
RG253	08/12/2017	0.03	0.01	15
RG253	08/14/2017	0.1	0.06	60
RG253	08/19/2017	0.01	0.01	4.8
RG253	08/20/2017	0.21	0.05	105
RG253	08/21/2017	0.01	0.01	4.8
RG253	08/23/2017	0.37	0.34	39.6
RG253	08/24/2017	0.05	0.02	24.6
RG253	08/25/2017	0.01	0.01	4.8
RG253	08/26/2017	0.03	0.03	15
RG253	08/29/2017	0.08	0.06	39.6
RG253	09/01/2017	0.25	0.13	69.6
RG253	09/06/2017	0.04	0.03	19.8
RG253	09/07/2017	0.03	0.02	9.6
RG253	09/12/2017	0.1	0.08	30
RG253	09/13/2017	0.01	0.01	4.8
RG253	09/14/2017	0.06	0.03	24.6
RG253	09/22/2017	0.02	0.01	9.6
RG253	09/23/2017	0.25	0.13	75
RG253	09/24/2017	0.01	0.01	4.8
RG253	09/26/2017	0.6	0.17	189.6
RG253	09/27/2017	1.69	0.19	510
RG253	09/28/2017	1.28	0.4	300
RG253	09/29/2017	0.11	0.08	34.8
RG253	09/30/2017	0.36	0.15	114.6
RG253	10/04/2017	0.39	0.17	84.6
RG253	10/05/2017	0.93	0.3	154.8

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG253	10/19/2017	0.02	0.02	15
RG253	11/07/2017	0.05	0.02	24.6
RG253	11/08/2017	0.01	0.01	4.8
RG253	11/17/2017	0.05	0.03	24.6
RG257	03/24/2017	0.1	0.07	39.6
RG257	03/25/2017	0.03	0.02	15
RG257	04/01/2017	0.15	0.04	69.6
RG257	04/25/2017	0.09	0.08	30
RG257	05/08/2017	0.02	0.01	9.6
RG257	05/09/2017	0.47	0.12	129.6
RG257	05/10/2017	0.13	0.05	60
RG257	05/17/2017	0.01	0.01	4.8
RG257	05/30/2017	0.03	0.03	9.6
RG257	06/01/2017	0.13	0.08	30
RG257	06/02/2017	0.01	0.01	4.8
RG257	06/04/2017	0.02	0.02	9.6
RG257	06/05/2017	0.01	0.01	4.8
RG257	06/06/2017	0.7	0.35	169.8
RG257	06/08/2017	0.03	0.03	9.6
RG257	06/22/2017	0.02	0.02	9.6
RG257	06/24/2017	0.06	0.05	24.6
RG257	06/25/2017	1.17	0.63	99.6
RG257	06/26/2017	0.3	0.1	99.6
RG257	07/08/2017	0.04	0.03	19.8
RG257	07/09/2017	0.04	0.03	19.8
RG257	07/11/2017	0.02	0.02	9.6
RG257	07/12/2017	0.51	0.31	99.6
RG257	07/13/2017	0.01	0.01	4.8
RG257	07/14/2017	0.02	0.02	4.8
RG257	07/18/2017	0.35	0.31	49.8
RG257	07/22/2017	0.25	0.24	34.8
RG257	07/24/2017	0.02	0.02	9.6
RG257	07/25/2017	0.04	0.02	15
RG257	07/26/2017	0.06	0.06	19.8
RG257	07/27/2017	0.24	0.07	84.6
RG257	07/28/2017	0.05	0.03	24.6
RG257	07/29/2017	0.46	0.31	64.8
RG257	07/30/2017	0.03	0.02	15



<b>Rain Gage</b>	<b>Date</b>	<b>Total (in.)</b>	<b>Intensity (in./30 min)</b>	<b>Duration (min)</b>
RG257	07/31/2017	0.17	0.07	79.8
RG257	08/03/2017	0.14	0.14	9.6
RG257	08/04/2017	0.04	0.02	19.8
RG257	08/06/2017	0.46	0.23	60
RG257	08/07/2017	0.11	0.06	45
RG257	08/08/2017	0.01	0.01	4.8
RG257	08/11/2017	0.37	0.13	139.8
RG257	08/12/2017	0.02	0.01	9.6
RG257	08/14/2017	0.13	0.07	60
RG257	08/19/2017	0.02	0.02	9.6
RG257	08/20/2017	0.28	0.08	124.8
RG257	08/21/2017	0.01	0.01	4.8
RG257	08/23/2017	0.2	0.17	45
RG257	08/24/2017	0.05	0.02	24.6
RG257	08/26/2017	0.05	0.05	15
RG257	08/28/2017	0.03	0.03	9.6
RG257	08/29/2017	0.15	0.13	30
RG257	09/01/2017	0.11	0.04	49.8
RG257	09/06/2017	0.02	0.01	9.6
RG257	09/07/2017	0.21	0.19	24.6
RG257	09/12/2017	0.09	0.08	19.8
RG257	09/14/2017	0.08	0.07	19.8
RG257	09/17/2017	0.01	0.01	4.8
RG257	09/22/2017	0.01	0.01	4.8
RG257	09/23/2017	0.19	0.05	79.8
RG257	09/26/2017	0.6	0.17	174.6
RG257	09/27/2017	1.49	0.17	465
RG257	09/28/2017	1.07	0.23	289.8
RG257	09/29/2017	0.14	0.09	34.8
RG257	09/30/2017	0.19	0.05	79.8
RG257	10/04/2017	0.79	0.64	99.6
RG257	10/05/2017	0.52	0.31	120
RG257	10/19/2017	0.02	0.02	15
RG257	11/07/2017	0.09	0.06	24.6
RG257	11/08/2017	0.01	0.01	4.8
RG257	11/17/2017	0.03	0.02	15
RG262.4	03/24/2017	0.03	0.01	15
RG262.4	03/27/2017	0.01	0.01	4.8

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG262.4	04/01/2017	0.25	0.05	124.8
RG262.4	04/25/2017	0.08	0.07	30
RG262.4	05/09/2017	0.47	0.16	144.6
RG262.4	05/10/2017	0.11	0.06	49.8
RG262.4	06/01/2017	0.19	0.14	30
RG262.4	06/06/2017	0.55	0.32	120
RG262.4	06/07/2017	0.09	0.09	9.6
RG262.4	06/22/2017	0.02	0.02	9.6
RG262.4	06/24/2017	0.05	0.05	15
RG262.4	06/25/2017	0.71	0.37	90
RG262.4	06/26/2017	0.15	0.05	49.8
RG262.4	07/07/2017	0.01	0.01	4.8
RG262.4	07/08/2017	0.06	0.05	30
RG262.4	07/09/2017	0.01	0.01	4.8
RG262.4	07/11/2017	0.05	0.05	15
RG262.4	07/12/2017	0.22	0.11	69.6
RG262.4	07/13/2017	0.04	0.04	19.8
RG262.4	07/14/2017	0.01	0.01	4.8
RG262.4	07/18/2017	0.23	0.16	39.6
RG262.4	07/22/2017	0.2	0.16	34.8
RG262.4	07/24/2017	0.03	0.03	9.6
RG262.4	07/25/2017	0.01	0.01	4.8
RG262.4	07/26/2017	0.13	0.13	15
RG262.4	07/27/2017	0.22	0.08	90
RG262.4	07/28/2017	0.1	0.05	34.8
RG262.4	07/29/2017	0.4	0.25	60
RG262.4	07/30/2017	0.01	0.01	4.8
RG262.4	07/31/2017	0.08	0.04	39.6
RG262.4	08/03/2017	0.11	0.11	19.8
RG262.4	08/04/2017	0.02	0.02	9.6
RG262.4	08/06/2017	0.22	0.14	60
RG262.4	08/07/2017	0.06	0.03	24.6
RG262.4	08/08/2017	0.02	0.02	9.6
RG262.4	08/11/2017	0.49	0.22	139.8
RG262.4	08/14/2017	0.07	0.03	60
RG262.4	08/19/2017	0.01	0.01	4.8
RG262.4	08/20/2017	0.32	0.12	114.6
RG262.4	08/21/2017	0.03	0.03	9.6

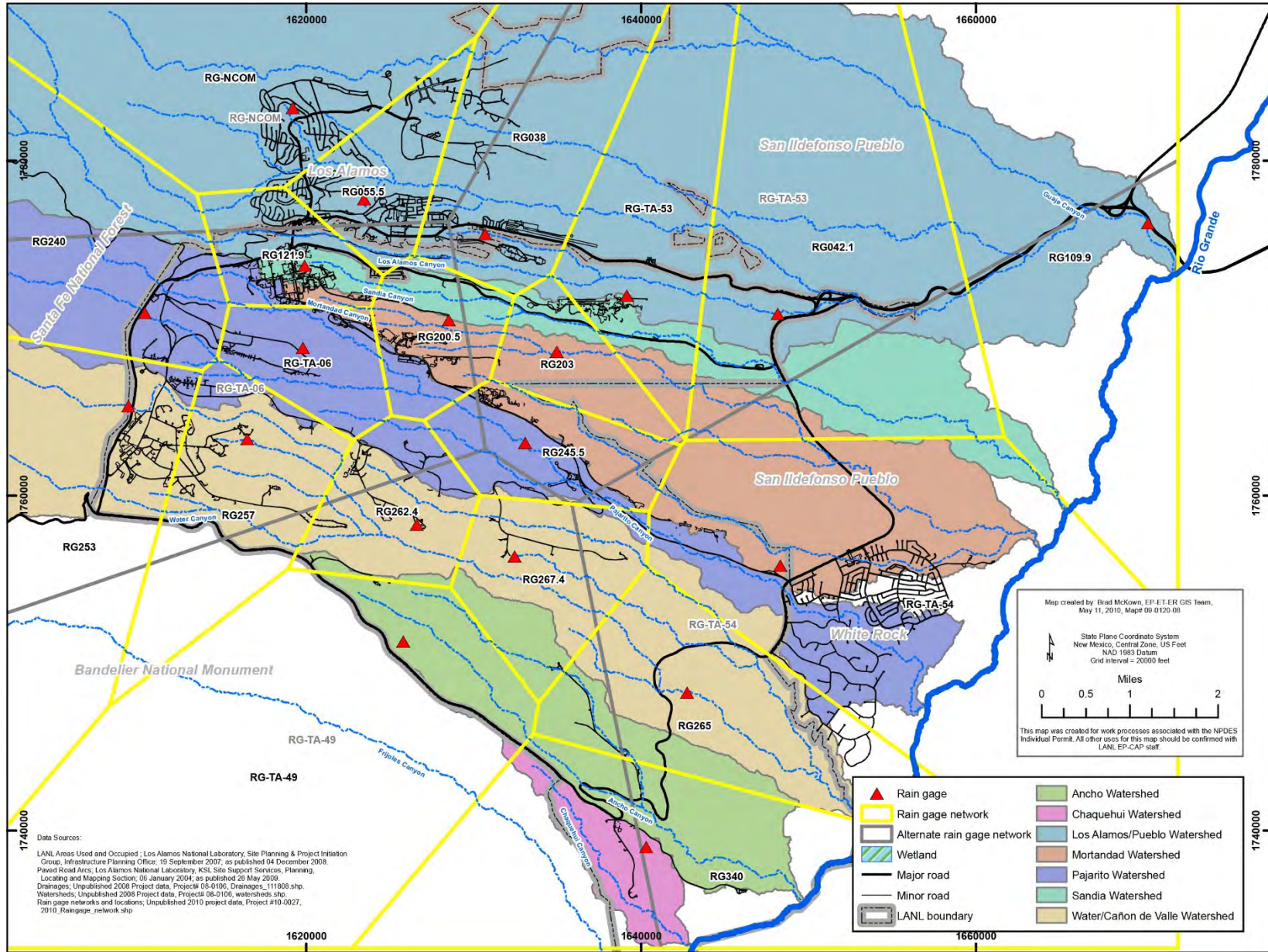
Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG262.4	08/23/2017	0.08	0.07	30
RG262.4	08/24/2017	0.09	0.03	45
RG262.4	08/26/2017	0.15	0.14	24.6
RG262.4	08/28/2017	0.03	0.03	15
RG262.4	08/29/2017	0.02	0.02	9.6
RG262.4	09/01/2017	0.07	0.05	30
RG262.4	09/06/2017	0.01	0.01	4.8
RG262.4	09/07/2017	0.08	0.07	15
RG262.4	09/12/2017	0.16	0.16	19.8
RG262.4	09/14/2017	0.07	0.05	19.8
RG262.4	09/15/2017	0.02	0.02	4.8
RG262.4	09/17/2017	0.01	0.01	4.8
RG262.4	09/23/2017	0.25	0.07	75
RG262.4	09/26/2017	0.6	0.19	144.6
RG262.4	09/27/2017	1.25	0.15	435
RG262.4	09/28/2017	0.89	0.2	270
RG262.4	09/29/2017	0.06	0.03	24.6
RG262.4	09/30/2017	0.13	0.05	60
RG262.4	10/04/2017	0.59	0.16	189.6
RG262.4	10/05/2017	0.66	0.08	315
RG262.4	10/19/2017	0.01	0.01	15
RG262.4	10/20/2017	0.01	0.01	4.8
RG262.4	11/07/2017	0.09	0.05	39.6
RG262.4	11/17/2017	0.01	0.01	4.8
RG267.4	03/24/2017	0.02	0.01	9.6
RG267.4	03/27/2017	0.03	0.02	15
RG267.4	04/01/2017	0.21	0.08	90
RG267.4	04/25/2017	0.09	0.09	30
RG267.4	05/09/2017	0.33	0.12	99.6
RG267.4	05/10/2017	0.04	0.02	19.8
RG267.4	05/17/2017	0.01	0.01	4.8
RG267.4	06/01/2017	0.15	0.13	34.8
RG267.4	06/06/2017	0.39	0.23	60
RG267.4	06/07/2017	0.25	0.24	19.8
RG267.4	06/22/2017	0.01	0.01	4.8
RG267.4	06/24/2017	0.03	0.03	9.6
RG267.4	06/25/2017	0.49	0.22	84.6
RG267.4	06/26/2017	0.07	0.03	30

<b>Rain Gage</b>	<b>Date</b>	<b>Total (in.)</b>	<b>Intensity (in./30 min)</b>	<b>Duration (min)</b>
RG267.4	07/07/2017	0.02	0.02	9.6
RG267.4	07/09/2017	0.01	0.01	4.8
RG267.4	07/11/2017	0.03	0.02	15
RG267.4	07/12/2017	0.11	0.03	49.8
RG267.4	07/13/2017	0.15	0.15	15
RG267.4	07/14/2017	0.01	0.01	4.8
RG267.4	07/18/2017	0.08	0.06	19.8
RG267.4	07/22/2017	0.2	0.2	24.6
RG267.4	07/24/2017	0.09	0.06	30
RG267.4	07/25/2017	0.02	0.01	9.6
RG267.4	07/26/2017	0.17	0.17	15
RG267.4	07/27/2017	0.23	0.05	94.8
RG267.4	07/28/2017	0.06	0.03	19.8
RG267.4	07/29/2017	0.62	0.4	64.8
RG267.4	07/30/2017	0.01	0.01	4.8
RG267.4	07/31/2017	0.06	0.02	30
RG267.4	08/03/2017	0.18	0.09	30
RG267.4	08/04/2017	0.02	0.02	9.6
RG267.4	08/05/2017	0.03	0.03	4.8
RG267.4	08/06/2017	0.06	0.03	24.6
RG267.4	08/07/2017	0.06	0.05	19.8
RG267.4	08/08/2017	0.06	0.06	9.6
RG267.4	08/11/2017	0.47	0.16	135
RG267.4	08/13/2017	0.03	0.03	4.8
RG267.4	08/14/2017	0.07	0.04	60
RG267.4	08/19/2017	0.01	0.01	4.8
RG267.4	08/20/2017	0.32	0.14	114.6
RG267.4	08/21/2017	0.02	0.01	9.6
RG267.4	08/23/2017	0.04	0.03	19.8
RG267.4	08/24/2017	0.07	0.04	19.8
RG267.4	08/26/2017	0.2	0.19	19.8
RG267.4	08/28/2017	0.02	0.02	4.8
RG267.4	08/29/2017	0.04	0.04	19.8
RG267.4	09/01/2017	0.05	0.04	24.6
RG267.4	09/07/2017	0.03	0.03	15
RG267.4	09/12/2017	0.3	0.3	30
RG267.4	09/14/2017	0.04	0.03	15
RG267.4	09/23/2017	0.21	0.07	75



<b>Rain Gage</b>	<b>Date</b>	<b>Total (in.)</b>	<b>Intensity (in./30 min)</b>	<b>Duration (min)</b>
RG267.4	09/26/2017	0.36	0.13	120
RG267.4	09/27/2017	1.23	0.21	399.6
RG267.4	09/28/2017	0.96	0.22	270
RG267.4	09/29/2017	0.05	0.02	24.6
RG267.4	09/30/2017	0.11	0.04	54.6
RG267.4	10/04/2017	0.45	0.21	99.6
RG267.4	10/05/2017	0.81	0.36	144.6
RG267.4	10/19/2017	0.02	0.02	30
RG267.4	11/07/2017	0.1	0.06	45
RG267.4	11/17/2017	0.02	0.01	9.6
RG-TA-49	03/28/2017	0.75	0.29	378
RG-TA-54	03/28/2017	0.66	0.25	378

**Attachment 3, Precipitation Network (continued)**



## Attachment 4 Physical Characteristics

Canyon	Permitted Feature	SMA Number	Sampler X Coordinate (Latitude)	Sampler Y Coordinate (Longitude)	SMA Drainage Area (ft <sup>2</sup> )	Site Number	Site Drainage Area (ft <sup>2</sup> )
Cañon de Valle	V001	CDV-SMA-1.2	1611432 (35.84835)	1764078 (-106.3478)	121,649.25	16-017(b)-99 16-029(k)	1,892.39 9,450.25
Cañon de Valle	V002	CDV-SMA-1.3	1611628 (35.848233)	1764036 (-106.34715)	2,026.82	16-017(a)-99 16-026(m)	0.00 1,004.56
Cañon de Valle	V003	CDV-SMA-1.4	1611746 (35.850131)	1764727 (-106.346749)	664,981.13	16-020 16-026(l) 16-028(c) 16-030(c)	33,144.05 1.53 1,140.44 0.00
Cañon de Valle	V004	CDV-SMA-1.45	1611691 (35.84985)	1764622 (-106.346933)	1,049.17	16-026(i)	320.68
Cañon de Valle	V005	CDV-SMA-1.7	1613080 (35.850933)	1765018 (-106.34225)	4,629.84	16-019	4,629.84
Cañon de Valle	V006	CDV-SMA-2	1613663 (35.8498)	1764602 (-106.340283)	146,055.33	16-021(c)	16,809.77
Cañon de Valle	V007	CDV-SMA-2.3	1615798 (35.8461)	1763255 (-106.333067)	4,401,017.58	13-001 13-002 16-003(n) 16-003(o) 16-029(h) 16-031(h)	151,725.99 32,210.20 3,775.39 66,547.90 917.51 440.35
Cañon de Valle	V008	CDV-SMA-2.41	1615900 (35.849967)	1764662 (-106.332733)	90,548.26	16-018	34,642.91
Cañon de Valle	V008A	CDV-SMA-2.42	1616091 (35.849084)	1764341 (-106.332085)	35,481.13	16-010(b)	24,021.18
Cañon de Valle	V009	CDV-SMA-2.5	1616475 (35.846517)	1763407 (-106.330783)	1,023,500.26	16-010(c) 16-010(d) 16-028(a)	25,088.91 28,218.90 10,948.58
Cañon de Valle	V009A	CDV-SMA-2.51	1616733 (35.846967)	1763567 (-106.329917)	102,432.62	16-010(i)	4,032.03
Cañon de Valle	V010	CDV-SMA-3	1619475 (35.847767)	1763859 (-106.320667)	19,531.45	14-009	3,321.77
Cañon de Valle	V011	CDV-SMA-4	1619753 (35.847971)	1763933 (-106.319726)	7,763.15	14-010	62.24
Cañon de Valle	V012	CDV-SMA-6.01	1620581 (35.8478)	1763869. (-106.316932)	60,525.00	14-001(g) 14-006	67.47 239.68
Cañon de Valle	V012A	CDV-SMA-6.02	1620774 (35.847745)	1763751 (-106.316283)	3,576.60	14-002(c) 14-002(d) 14-002(e)	294.25 16.61 20.92
Cañon de Valle	V013	CDV-SMA-7	1622123 (35.8453)	1762963 (-106.311733)	17,000.02	15-008(d)	262.26
Cañon de Valle	V014	CDV-SMA-8	1622591 (35.844267)	1762583 (-106.31015)	1,214,320.24	15-011(c)	0.00

**Attachment 4, Physical Characteristics (continued)**

Canyon	Permitted Feature	SMA Number	Sampler X Coordinate (Latitude)	Sampler Y Coordinate (Longitude)	SMA Drainage Area (ft <sup>2</sup> )	Site Number	Site Drainage Area (ft <sup>2</sup> )
Cañon de Valle	V015	CDV-SMA-8.5	1622359 (35.841117)	1761436 (-106.310933)	781.92	15-014(a)	100.48
Cañon de Valle	V016	CDV-SMA-9.05	1623846 (35.836117)	1759616 (-106.3059)	106,576.0009	15-007(b)	12,853.47
Fence	F001	F-SMA-2	1632493 (35.827319)	1756410 (-106.267673)	1,747,981.91	36-004(c)	8,461.09
Potrillo	I001	PT-SMA-0.5	1625751 (35.839183)	1760731 (-106.299483)	296,295.95	15-009(e) C-15-004	0.00 65.85
Potrillo	I002	PT-SMA-1	1626314 (35.837828)	1760238 (-106.297583)	661,860.90	15-004(f) 15-008(a)	27,885.79 1,651.92
Potrillo	I003	PT-SMA-1.7	1627221 (35.833404)	1758627 (-106.294518)	82,798.85	15-006(a)	146.37
Potrillo	I004	PT-SMA-2	1627867 (35.836517)	1759759 (-106.29235)	128,520.02	15-008(f) 36-003(b) 36-004(e)	2,906.55 641.17 4,895.21
Potrillo	I004A	PT-SMA-2.01	1627976.76 (35.836535)	1759680.16 (-106.291838)	9,960.09	C-36-001 C-36-006(e)	0.00 1,617.18
Potrillo	I005	PT-SMA-3	1637651 (35.829733)	1757290 (-106.259333)	32,570,365.84	36-004(a) 36-006	5,923.58 22,024.19
Potrillo	I007	PT-SMA-4.2	1640805 (35.824283)	1755302 (-106.248683)	46,479,398.93	36-004(d)	4,745.91
Water	W001	W-SMA-1	1610435 (35.842278)	1761579 (-106.351884)	257,402.03	16-017(j)-99 16-026(c2) 16-026(v)	0.00 1.56 7.03
Water	W002	W-SMA-1.5	1609178 (35.84177)	1761686 (-106.355403)	535,734.95	16-026(b2) 16-028(d)	7.03 7.03
Water	W003	W-SMA-2.05	1609892 (35.839517)	1760865 (-106.353)	30,483.41	16-028(e)	7.03
Water	W004	W-SMA-3.5	1612463 (35.837283)	1760051 (-106.344317)	82,312.49	16-026(y)	0.00
Water	W005	W-SMA-4.1	1613587 (35.83705)	1759967 (-106.340517)	7,891.557322	16-003(a)	242.83
Water	W006	W-SMA-5	1614101 (35.841617)	1761625 (-106.3388)	2,980,044.68	16-001(e) 16-003(f) 16-026(b) 16-026(c) 16-026(d) 16-026(e)	211.80 0.00 2,770.92 12,687.20 7,240.25 6,643.29
Water	W007	W-SMA-6	1613836 (35.837602)	1760164 (-106.339682)	5,874.276045	11-001(c)	0.00
Water	W008	W-SMA-7	1614549 (35.838521)	1760498 (-106.337276)	97,573.73	16-026(h2) 16-029(e)	0.00 47.73



**Attachment 4, Physical Characteristics (continued)**

Canyon	Permitted Feature	SMA Number	Sampler X Coordinate (Latitude)	Sampler Y Coordinate (Longitude)	SMA Drainage Area (ft <sup>2</sup> )	Site Number	Site Drainage Area (ft <sup>2</sup> )
Water	W009	W-SMA-7.8	1614363 (35.836317)	1759695 (-106.3379)	33,820.81433	16-031(a)	7.03
Water	W010	W-SMA-7.9	1614423 (35.83595)	1759563 (-106.3377)	4,071.56	16-006(c)	355.82
Water	W011	W-SMA-8	1614541 (35.836126)	1759626 (-106.337299)	7,809.07	16-016(g) 16-028(b)	312.57 7.03
Water	W012	W-SMA-8.7	1615647 (35.843583)	1762343 (-106.333583)	713,083.70	13-001 13-002 16-004(a) 16-026(j2) 16-029(h) 16-035	129,708.58 136,842.58 602.27 14,230.33 4,632.95 1,316.58
Water	W012A	W-SMA-8.71	1615273.3 (35.843552)	1762405.91 (-106.334599)	12,342.89	16-004(c)	335.04
Water	W013	W-SMA-9.05	1615787 (35.83502)	1759218 (-106.3331)	23,643.37	16-030(g)	7.03
Water	W014	W-SMA-9.5	1617434 (35.838565)	1760512 (-106.327545)	1,257.253741	11-012(c)	630.98
Water	W015	W-SMA-9.7	1617908 (35.83905)	1760691 (-106.32595)	6,496.57	11-011(a) 11-011(b)	163.16 52.29
Water	W016	W-SMA-9.8	1618242 (35.838938)	1760647 (-106.324817)	2,067.916425	11-005(c)	132.90
Water	W017	W-SMA-9.9	1618535 (35.838983)	1760663 (-106.323833)	12,461.62	11-006(b)	1,713.60
Water	W018	W-SMA-10	1618681 (35.837933)	1760282 (-106.323333)	307,380.35	11-002 11-003(b) 11-005(a) 11-005(b) 11-006(c) 11-006(d) 11-011(d)	6,216.09 7,483.51 1,769.65 1,723.32 2,115.85 1,343.42 96.85
Water	W019	W-SMA-11.7	1625583 (35.82445)	1755367 (-106.300033)	312,076.2278	49-008(c)	82,834.81
Water	W020	W-SMA-12.05	1625910 (35.82545)	1755732 (-106.298933)	21,318.77764	49-001(g)	21,260.17
Water	W021	W-SMA-14.1	1626602.93 (35.83215)	1758304.06 (-106.296763)	252,723.368	15-004(h) 15-014(l)	163.74 19.27
Water	W022	W-SMA-15.1	1627047 (35.824433)	1755361 (-106.2951)	8,058.700466	49-005(a)	1,736.58

## Attachment 5 Sampling Requirements and Plan

### Sampling and Analysis Requirements

Sampling Conditions	Analytical Suite									
	Gross Alpha	Ra-226/ Ra-228	Cyanide	Dissolved Metals	Total Metals	Aluminum	Copper	PCBs	High Explosives	SVOCs
Analytical method	EPA 900.0	EPA 903.0 EPA 904.1	SM 4500 CN-I	EPA:200.7 EPA:200.8	EPA:200.7 EPA:200.8 EPA:245.2	EPA:200.8	EPA:200.8	EPA 1668A	SW8321	EPA 625 EPA 8310 EPA 8081B
Order code	SW-IP- Gross Alpha	SW-Ra226/ Ra-228	SW-IP- Cyanide	SW-Metals- Dissolved	SW-Metals- Total	SW-IP-Al F	SW-IP-Cu F	SW-PCB- 1668A-PQL	SW-HEXP- 8330	SW-SVOC-625 SW-SVOC-8310 SW-SVOC-8081B
Field prep code	UF	UF	UF	F	UF	F	F	UF	UF	UF
Preservation	HNO3	HNO3	NaOH, Ice	HNO3	HNO3	HNO3	HNO3	Ice	Ice	Ice, store some analytes in dark
Holding time (days)	180	180	14	180	180	180	180	365	7	7
Preferred volume (L)	2	2	1	0.5	0.5	0.5	0.5	3	2.5	3
Minimum volume required (L)	1	2	0.5	0.25	0.25	0.25	0.25	1	0.77	1
Shipping container	Poly	Poly	Poly	Poly	Poly	Poly	Poly	Glass	Glass	Amber glass

UF = Unfiltered.

F = Filtered.

## Attachment 5, Sampling Requirements and Plan (continued)

### Sampling and Analysis Plan

Permit SMA Number	SDPPP Section	Station Name	Stage	Gross Alpha	Ra-226/Ra-228	Cyanide	Dissolved Metals	Total Metals	Aluminum (Filtered)	Arsenic (Filtered)	Copper (Filtered)	Mercury (Unfiltered)	Zinc (Filtered)	PCBs	High Explosives	Dioxins/Furans	Pesticides	SVOCs
CDV-SMA-1.2	180	SS100421	BComp															
CDV-SMA-1.3	181	SS100422	CCompD															
CDV-SMA-1.4	182	SS130425	CAM5	X	X	X	X	X										
CDV-SMA-1.45	183	SS090406	CAM5	X														
CDV-SMA-1.7	184	SS2547	CAM5	X	X	X	X	X							X			
CDV-SMA-2	185	SS255	AltCompR															
CDV-SMA-2.3	186	SS080404	AltCompR															
CDV-SMA-2.41	187	SS090407	CAM5	X									X					
CDV-SMA-2.42	188	SS150427	S7															
CDV-SMA-2.5	189	SS090420	BComp															
CDV-SMA-2.51	190	SS090409	AltCompR															
CDV-SMA-3	191	SS25605	CAM5	X											X			
CDV-SMA-4	192	SS130424	MEx	X	X	X	X	X							X			
CDV-SMA-6.01	193	SS150428	CAM5	X	X	X	X	X							X			
CDV-SMA-6.02	194	SS130423	CAM5	X	X	X	X	X							X			
CDV-SMA-7	195	SS252625	CAM5	X	X	X	X	X										
CDV-SMA-8	196	SS25630	AltCompR															
CDV-SMA-8.5	197	SS090418	MEx	X	X	X	X	X										
CDV-SMA-9.05	198	SS090412	MEx	X	X	X	X	X										X
F-SMA-2	199	SS152402	CAM5-2	X	X	X	X	X							X			

## Attachment 5, Sampling Requirements and Plan (continued)

### Sampling and Analysis Plan (continued)

Permit SMA Number	SDPPP Section	Station Name	Stage	Gross Alpha	Ra-226/Ra-228	Cyanide	Dissolved Metals	Total Metals	Aluminum (Filtered)	Arsenic (Filtered)	Copper (Filtered)	Mercury (Unfiltered)	Zinc (Filtered)	PCBs	High Explosives	Dioxins/Furans	Pesticides	SVOCs
PT-SMA-0.5	200	SS26565	CAM5	X					X		X				X			X
PT-SMA-1	201	SS154818	AltCompR	X	X	X	X	X							X			X
PT-SMA-1.7	202	SS134817	CAM5	X	X	X	X	X							X			
PT-SMA-2	203	SS2658	CAM5	X	X	X	X	X							X			X
PT-SMA-2.01	204	SS124816	CACompC-Inv	X	X	X	X	X							X			X
PT-SMA-3	205	SS094807	CAM5	X											X			
PT-SMA-4.2	206	SS094806	CAM5	X	X													
W-SMA-1	207	SS133939	CACompC-Inv	X	X	X	X	X										
W-SMA-1.5	208	SS153942	CACompA															
W-SMA-2.05	209	SS093903	CAM5			X			X									
W-SMA-3.5	210	SS103929	MEx	X	X	X	X	X										
W-SMA-4.1	211	SS103930	MEx	X	X	X	X	X							X			
W-SMA-5	212	SS2528	AltCompR															
W-SMA-6	213	SS133940	MEx	X	X	X	X	X							X			
W-SMA-7	214	SS153943	CAM5	X	X	X	X	X										
W-SMA-7.8	215	SS103931	MEx	X	X	X	X	X										
W-SMA-7.9	216	SS103932	MEx	X	X	X	X	X										X
W-SMA-8	217	SS143941	CAM5	X	X	X	X	X										X
W-SMA-8.7	218	SS103933	AltCompR															
W-SMA-8.71	219	SS123938	CAM5-2	X	X	X	X	X										
W-SMA-9.05	220	SS093914	BCComp															



## Attachment 5, Sampling Requirements and Plan (continued)

### Sampling and Analysis Plan (continued)

Permit SMA Number	SDPPP Section	Station Name	Stage	Gross Alpha	Ra-226/Ra-228	Cyanide	Dissolved Metals	Total Metals	Aluminum (Filtered)	Arsenic (Filtered)	Copper (Filtered)	Mercury (Unfiltered)	Zinc (Filtered)	PCBs	High Explosives	Dioxins/Furans	Pesticides	SVOCs
W-SMA-9.5	221	SS093915	S7															
W-SMA-9.7	222	SS093916	AltCompR															
W-SMA-9.8	223	SS093917	MEx	X	X	X	X	X										
W-SMA-9.9	224	SS103934	CAM5	X		X			X									
W-SMA-10	225	SS25245	AltCompR															
W-SMA-11.7	226	SS103935	CAM5	X					X									
W-SMA-12.05	227	SS093922	MEx	X	X	X	X	X							X			
W-SMA-14.1	228	SS123937	AltCompR															
W-SMA-15.1	229	SS093927	CAM5	X														

AltCompR = Alternative compliance requested.

BCComp = Baseline Confirmation Complete: All confirmation monitoring results for all pollutants of concern at the SMA are at or below TALs, and corrective action is not required at the Sites. No further sampling is required.

CACompA = Corrective action is complete with a certification that all pollutants of concern are at or below applicable TALs per IP Part I.E.2(a).

CACompC-Inv = Corrective action is complete with a certification that no pollutants are exposed to storm water. Investigation sample being collected.

CACompD = The Site has achieved RCRA "corrective action complete" status or a certificate of completion under NMED's Compliance Order on Consent.

CAM5 = Corrective Action Enhanced Control Monitoring: Two confirmation monitoring samples are collected following completion of corrective action control measures at moderate priority sites within 5 yr of effective date of the Permit.

CAM5-2 = Corrective Action Enhanced Control Monitoring: Two confirmation monitoring samples are collected following completion of corrective action control measures at moderate priority sites within 5 yr of effective date of the Permit. Corrective action enhanced controls were installed twice at this Site. This is the second round of sampling.

MEx = Extended Baseline Monitoring: One confirmation monitoring sample is collected to determine if corrective action is required.

S7 = Alternatives analysis. Permittees are preparing an analysis of alternatives to complete corrective action.

## Attachment 6

### Additional Compliance Status Details for SMAs/Sites in Corrective Action

SMA	Site List	Additional Compliance Status Details
PT-SMA-1	73-001(a) and 73-004(d)	Alternative compliance documentation is being completed for this SMA.
PT-SMA-2.01	C-36-001	Completion of corrective action under no exposure was requested in August 2017.
CDV-SMA-2.42	16-010(b)	The Permittees requested this Site be removed from the IP in 2015. There has been no response from EPA. Therefore, this Site was still being monitored in 2017. A sample was collected with TAL exceedances. Alternatives analysis is being completed for this SMA.
W-SMA-1.5	16-026(b2) 16-028(d)	There were no TAL exceedances in the 2017 storm water sample Therefore, this Site is corrective action complete.
W-SMA-9.5	11-012(c)	Alternatives analysis is being completed for this SMA.