

# 2013 Update to the Site Discharge Pollution Prevention Plan, Revision 1

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## Los Alamos/Pueblo Watershed

Receiving Waters:  
Pueblo Canyon, DP Canyon, and Los Alamos Canyon

**Volume 1**





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## 1.0 R-SMA-0.5: AOC C-00-020

### 1.1 Site Descriptions

One historical industrial activity area is associated with R001, R-SMA-0.5: Site C-00-020.

AOC C-00-020 is a suspected mortar impact area located along the north valley wall of Rendija Canyon on General Services Administration and USFS land. The 30-acre site also includes a tributary of Rendija Canyon. Most of the Site lies within the Santa Fe National Forest, except for a small area on the southeastern edge that is private property. AOC C-00-020 was suspected to be a former mortar-impact area because of a “U.S. Property—No Trespassing” sign and a nearly illegible bilingual sign posted in the area. The signs no longer remain. Extensive archival searches have revealed no documentation regarding the use of this site as a munitions-impact area. In addition, no field evidence of operations (e.g., MD, MEC, UXO, or impact scars) has ever been found at AOC C-00-020. RFI activities conducted in 1993 included an ordnance sweep followed by a geophysical sweep. No ordnance, MD, MEC, or UXO was located. In addition, no ordnance was found during the 2007 investigation or during the 2009 ordnance survey. The Site is located within an area burned by the 2000 Cerro Grande fire. The stream channel that runs through the center of the Site has been widened by flooding. Currently, there are burned and live trees on the steep slopes next to the stream.

Consent Order investigations are complete for AOC C-00-020; the Site meets residential risk levels. NMED issued a COC without controls for AOC C-00-020 in May 2012.

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

### 1.2 Control Measures

A large channel runs directly through the monitored area. Controls used at this SMA are primarily to stabilize and reduce sediment loading in the storm water discharge from the area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 1-1).

**Table 1-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00102040025	Established Vegetation		X	X		B
R00103030006	Log Berm		X		X	CB
R00103060013	Straw Wattles		X		X	B
R00103060017	Straw Wattles	X			X	B
R00103060018	Straw Wattles		X		X	B
R00103060019	Straw Wattles		X		X	B
R00103060021	Straw Wattles	X			X	B
R00103060022	Straw Wattles	X			X	B
R00103060023	Straw Wattles	X			X	B
R00103060024	Straw Wattles		X		X	B
R00103060026	Straw Wattles		X		X	B
R00103060027	Straw Wattles		X		X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.



### 1.3 Storm Water Monitoring

AOC C-00-020 is monitored within R-SMA-0.5. Following the installation of baseline control measures, a baseline storm water sample was collected on August 3, 2012 (Figures 1-2 and 1-3). On May 16, 2012, NMED issued a COC for AOC C-00-020. This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at R-SMA-0.5. No further sampling is required for R SMA-0.5 for the remainder of the IP.

### 1.4 Inspections and Maintenance

RG-NCOM recorded seven storm events at R-SMA-0.5 during the 2013 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 1-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30488	2-4-2013
Annual Erosion Evaluation	COMP-30819	5-6-2013
Storm Rain Event	BMP-32771	6-17-2013
Storm Rain Event	BMP-32985	7-9-2013
Storm Rain Event	BMP-33522	7-24-2013
Storm Rain Event	BMP-34969	8-22-2013
Storm Rain Event	BMP-35487	9-25-2013
Annual Erosion Evaluation	COMP-36758	11-20-2013

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

**Table 1-3 Maintenance during 2013**

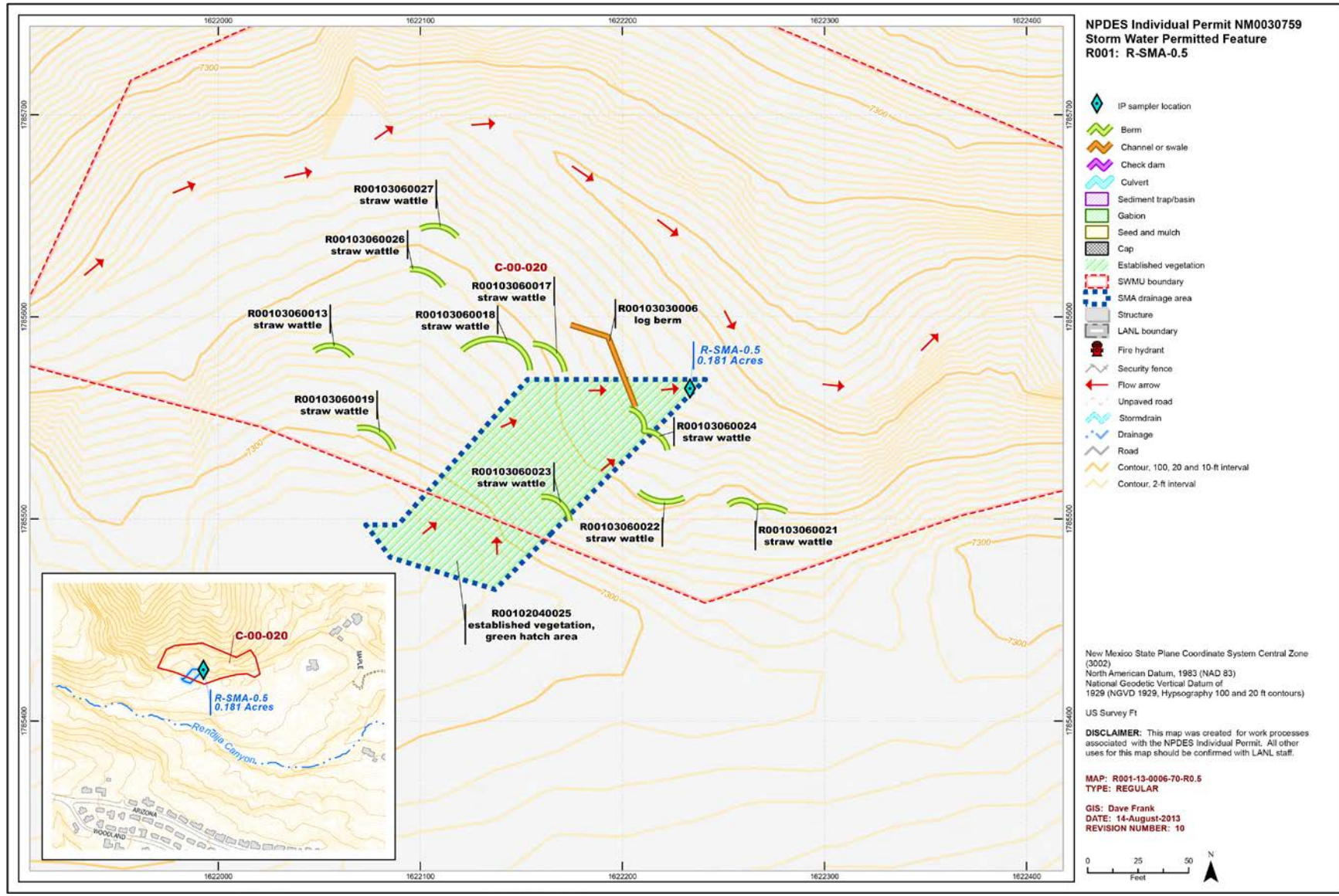
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-34084	Add new straw wattle to the west end of existing wattle -R00103060018	8-1-2013	8 day(s)	Maintenance conducted in timely manner.
BMP-34090	Add new straw wattle to the west end of existing wattle -R00103060023	8-1-2013	8 day(s)	Maintenance conducted in timely manner.
BMP-34091	Add new straw wattle to the west end of existing wattle -R00103060024.	8-1-2013	8 day(s)	Maintenance conducted in timely manner.

### 1.5 Compliance Status

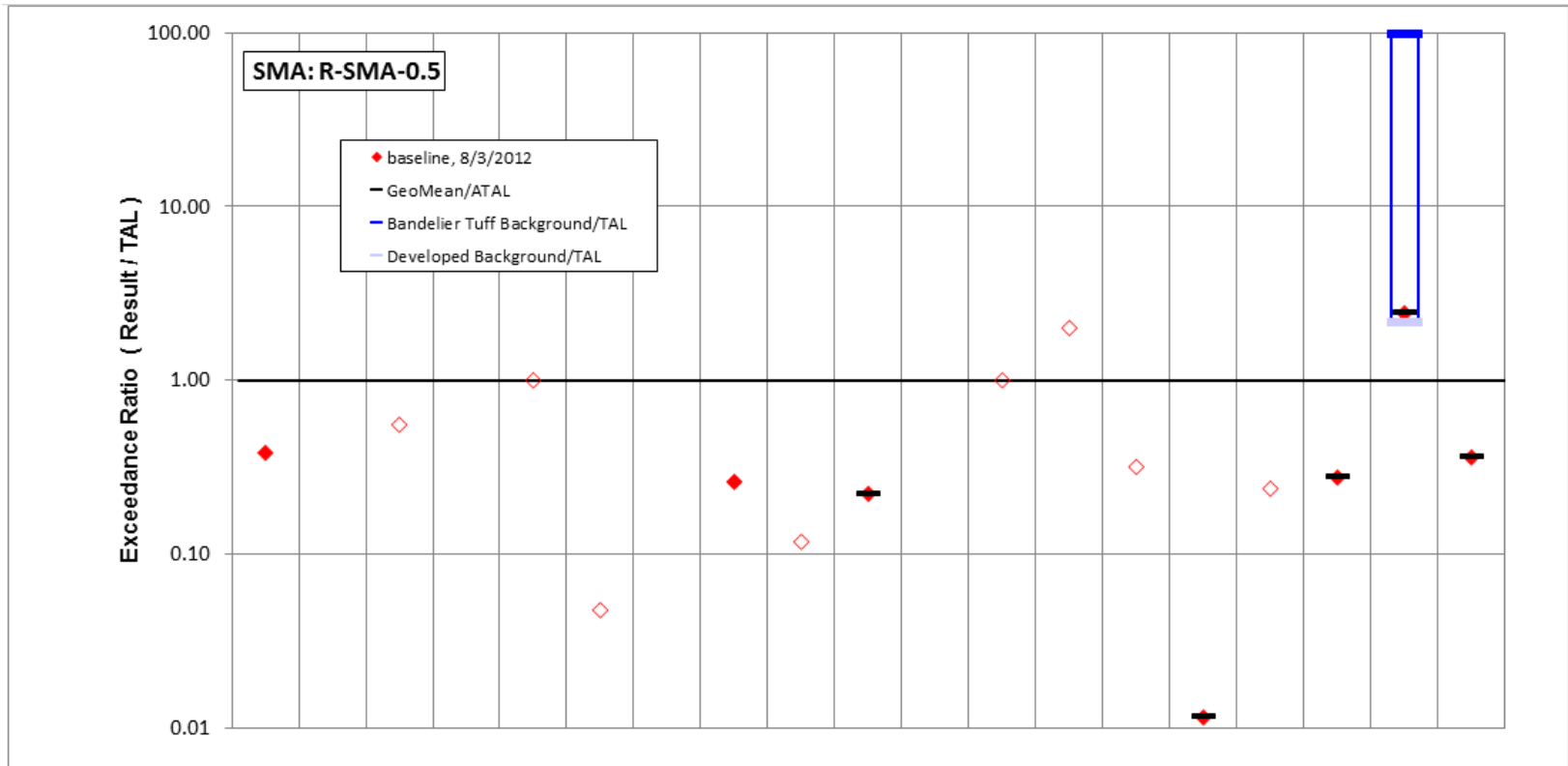
The Site associated with R-SMA-0.5 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 1-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC C-00-020	Corrective Action Complete	Corrective Action Complete	NMED, May 16, 2012, "Certificates of Completion One Solid Waste Management Unit and One Area of Concern in the Guaje/Barrancas/Rendija Canyons Aggregate Area"



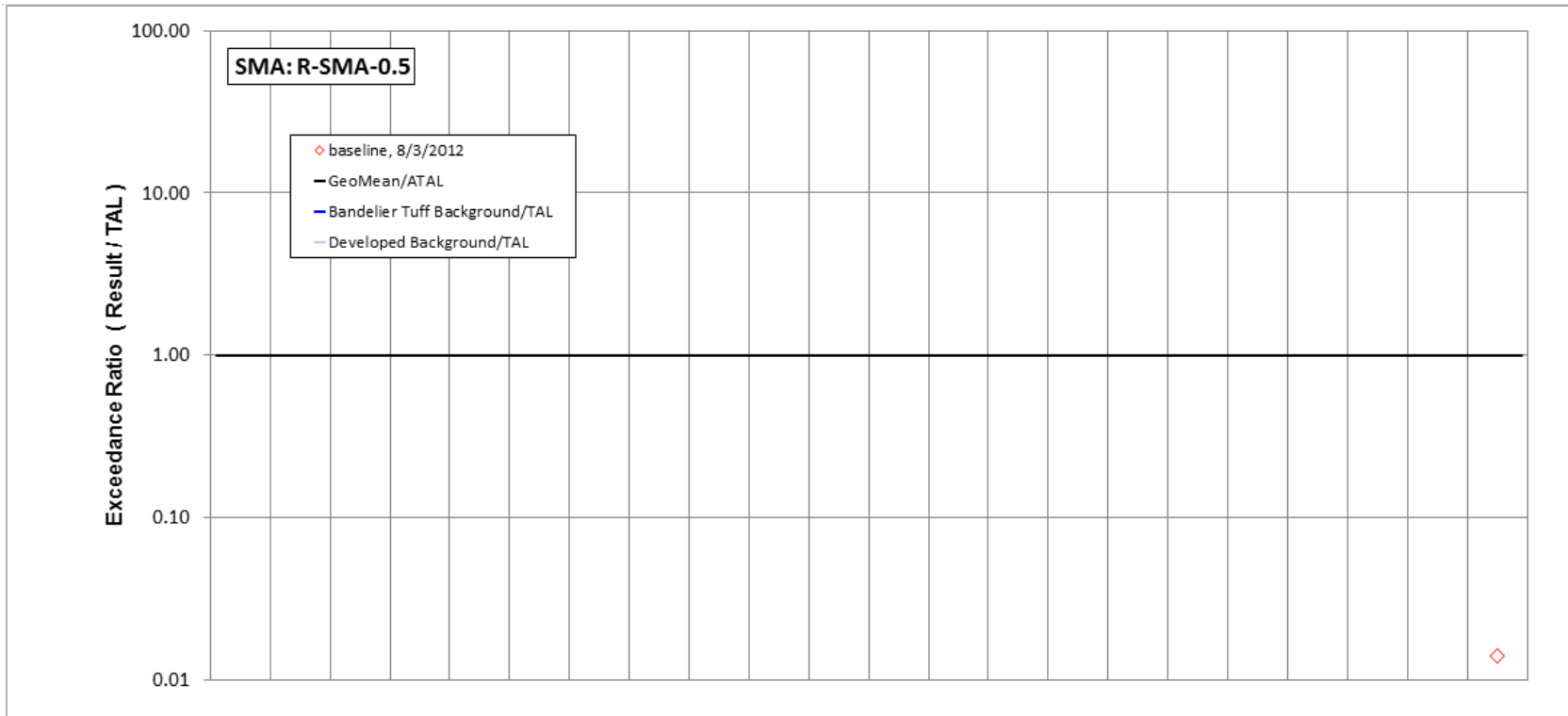




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	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
8/3/2012 result	287	3	5	17.4	1	10	2.66	1.12	2	0.171	0.755	5	1	2	1.15	10	0.0028	36.5	10.8
result / TAL	0.38	0.005	0.56	0.0035	1	0.048	0.0027	0.26	0.12	0.22	0.0044	1	2	0.32	0.012	0.24	0.28	2.4	0.36

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

Figure 1-2 Inorganic analytical results summary plot for R-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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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
8/3/2012 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.281	-	-	-	0.281
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	-	-	0.014

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

Figure 1-3 Organic analytical results summary plot for R-SMA-0.5



## 2.0 R-SMA-1: AOC C-00-041

### 2.1 Site Descriptions

One historical industrial activity area is associated with R002, R-SMA-1: Site C-00-041.

AOC C-00-041 is the site of a former asphalt batch plant located in a 50- × 600-ft portion of a side slope and ephemeral stream drainage channel that flows into Rendija Canyon on USFS land. Aerial photographs indicate the asphalt plant operated from the late 1940s to 1958, and site history indicates that the plant was removed sometime between 1958 and 1965. In 1969, after the plant had been removed, the land was transferred from the Atomic Energy Commission to USFS to manage as public land. A VCA, which was conducted in 1995, removed the asphalt in the stream channel and the building’s foundation. Currently, the Site is undeveloped and is located in a grassy open meadow bisected south to north by an ephemeral stream. A hiking trail, Rendija Trail, is located to the east of AOC C-00-041, and the Guaje Pines Cemetery is located to the west.

AOC C-00-041 was investigated under the Consent Order. The investigation demonstrated that the nature and extent of contamination were defined, and the Site posed no unacceptable human health risk under the residential scenario and no unacceptable ecological risk. The 2007 investigation report recommended corrective action complete without controls. NMED’s 2007 approval with direction of the investigation report required biennial inspections of the Site and downstream drainage for the presence of asphalt/tar. This approval also required collecting and removing any asphalt or tar identified on the ground surface. A request for COC has not yet been submitted to NMED.

The project map (Figure 2-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 2.2 Control Measures

Run-on has been controlled by the placement of a gabion blanket and gabions below the culvert outlet at the Guaje Pines Cemetery roundabout. The culvert is located on the eastern side of the roundabout associated with the cemetery. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 2-1).

**Table 2-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00202040008	Established Vegetation		X	X		B
R00204060006	Rip Rap	X		X		CB
R00204060007	Rip Rap	X		X		CB
R00206010005	Rock Check Dam		X		X	CB
R00207010002	Gabions	X			X	CB
R00207020004	Gabion Blanket	X		X		CB

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

## 2.3 Storm Water Monitoring

AOC C-00-041 is monitored within R-SMA-1. Following the installation of baseline control measures, baseline storm water samples were collected on July 2, 2011, and August 19, 2011 (Figure 2-2). Analytical results from these samples yielded three TAL exceedances:

- Aluminum concentration of 2010 µg/L (MTAL is 750 µg/L),
- Zinc concentration of 45.3 µg/L (MTAL is 42 µg/L), and
- Gross-alpha activities of 21.1 pCi/L and 51.1 pCi/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

### *AOC C-00-041:*

- Aluminum was not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above BV in 1 of 33 shallow (i.e., less than 3 ft bgs) Consent Order samples at a concentration 1.2 times the soil BV but below the maximum soil background concentration.
- Zinc was not known to have been associated with industrial materials historically managed at the Site. Zinc was detected above BV in 3 of 33 shallow Consent Order samples with a maximum concentration 1.5 times the soil BV but below the maximum soil background concentration.
- Alpha-emitting radionuclides were not known to have been associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for gross alpha radioactivity or 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 Figure 2-2. 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 2-2.

Monitoring location R-SMA-1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including zinc and 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 urban 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 2011 is between these two values.
- Zinc—The zinc UTL from developed urban landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. The zinc result from 2011 is less than 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 urban landscape is 32.5 pCi/L. One of the 2011 gross-alpha results is between these two values; the other is less than both of them.

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

## 2.4 Inspections and Maintenance

RG-NCOM recorded seven storm events at R-SMA-1 during the 2013 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 2-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30489	2-4-2013
Annual Erosion Evaluation	COMP-30921	5-6-2013
Storm Rain Event	BMP-32772	6-17-2013
Storm Rain Event	BMP-32986	7-3-2013
Storm Rain Event	BMP-33523	7-23-2013
Storm Rain Event	BMP-34970	8-22-2013
Storm Rain Event	BMP-35488	9-23-2013
Annual Erosion Evaluation	COMP-36860	11-21-2013

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

**Table 2-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-33334	Add rip rap to bottom of channel as necessary to repair existing rip rap - R00204060006	7-18-2013	15 day(s)	Maintenance conducted in timely manner.
BMP-33382	Add rip rap as necessary to repair existing rip rap -R00204060007.	7-18-2013	15 day(s)	Maintenance conducted in timely manner.

## 2.5 Compliance Status

The Site associated with R-SMA-1 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 2-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC C-00-041	Corrective Action Initiated	Corrective Action Initiated	Initiated 10-13-2011

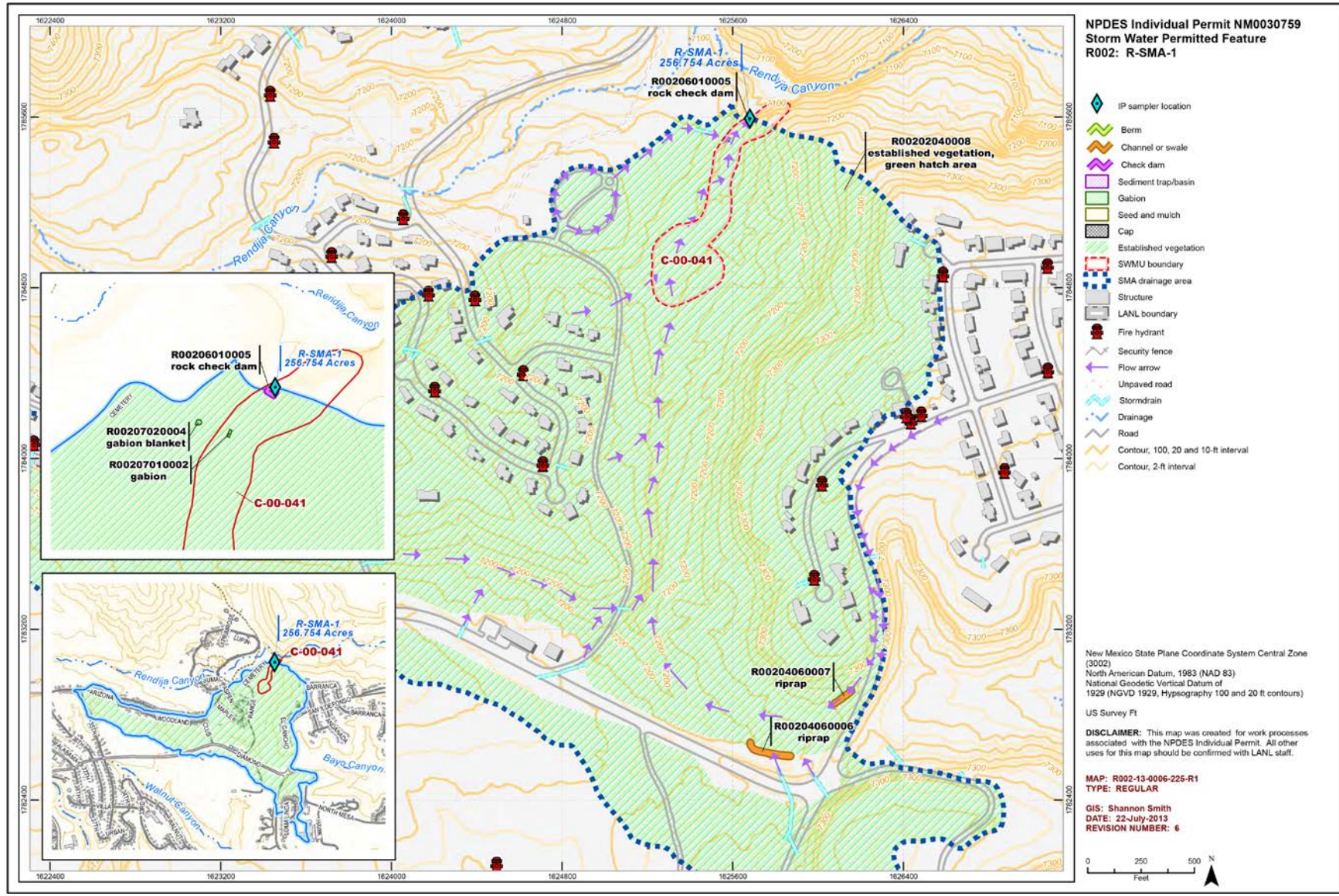
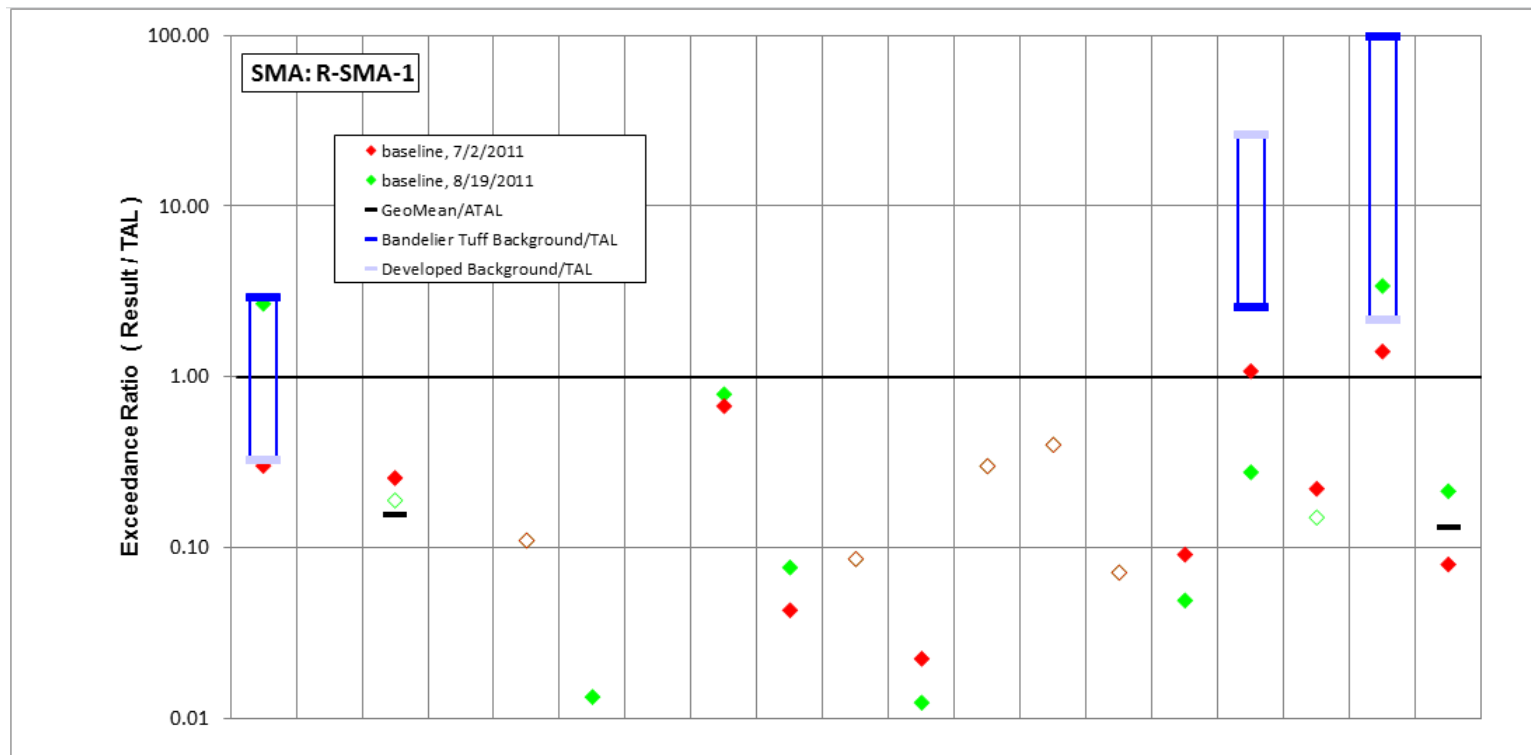


Figure 2-1 R-SMA-1 location map



	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	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>8/19/2011 result</b>	<b>2010</b>	<i>1</i>	<i>1.7</i>	<i>19.1</i>	<i>0.11</i>	<i>2.8</i>	<i>2.9</i>	<i>3.4</i>	<i>1.3</i>	<i>0.066</i>	<i>2.1</i>	<i>1.5</i>	<i>0.2</i>	<i>0.45</i>	<i>4.9</i>	<i>11.6</i>	<i>0.002</i>	<b>51.1</b>	<i>6.42</i>
result / TAL	<b>2.7</b>	<i>0.002</i>	<i>0.19</i>	<i>0.0038</i>	<i>0.11</i>	<i>0.013</i>	<i>0.0029</i>	<i>0.79</i>	<i>0.076</i>	<i>0.086</i>	<i>0.012</i>	<i>0.3</i>	<i>0.4</i>	<i>0.071</i>	<i>0.049</i>	<i>0.28</i>	<i>0.15</i>	<b>3.4</b>	<i>0.21</i>
<b>7/2/2011 result</b>	<b>226</b>	<i>1</i>	<i>2.3</i>	<i>24.2</i>	<i>0.11</i>	<i>2</i>	<i>3.6</i>	<i>2.9</i>	<i>0.73</i>	<i>0.066</i>	<i>3.8</i>	<i>1.5</i>	<i>0.2</i>	<i>0.45</i>	<i>9.1</i>	<b>45.3</b>	<i>0.0022</i>	<b>21.1</b>	<i>2.39</i>
result / TAL	<b>0.3</b>	<i>0.002</i>	<i>0.26</i>	<i>0.0048</i>	<i>0.11</i>	<i>0.01</i>	<i>0.0036</i>	<i>0.67</i>	<i>0.043</i>	<i>0.086</i>	<i>0.022</i>	<i>0.3</i>	<i>0.4</i>	<i>0.071</i>	<i>0.091</i>	<b>1.1</b>	<i>0.22</i>	<b>1.4</b>	<i>0.08</i>

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

**Figure 2-2 Inorganic analytical results summary plot for R-SMA-1**



### 3.0 R-SMA-1.95: AOC 00-015

#### 3.1 Site Descriptions

One historical industrial activity area is associated with R003, R-SMA-1.95: Site 00-015.

AOC 00-015 is the Los Alamos Sportsmen’s Club, an active firing range located on General Services Administration land leased from DOE in Rendija Canyon. The area covers approximately 30 acres. The firing range consists of several small-arms ranges and has operated since 1966. Lead is expected to be present in earthen berms and on the surface of the ranges. Shattered clay projectiles are present on the skeet and trap ranges.

Investigations under the Consent Order were not performed at AOC 00-015 as part of the Guaje/Barrancas/Rendija Canyons Aggregate Area investigation; the approved investigation work plan proposed delaying full characterization of this active firing until operations cease. At that time, the nature and extent of contamination at AOC 00-015 will be determined and any necessary corrective actions identified and implemented.

The project map (Figure 3-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

#### 3.2 Control Measures

Run-on at the pistol range is managed and there is no impact to the Site. Berms associated with the Sportsmen’s Club activity reduce the small amount of runoff potential. Dense vegetation in the area also effectively mitigates runoff. The area is maintained by club membership, and the club also addresses any runoff issues. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 3-1).

**Table 3-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00302040008	Established Vegetation		X	X		B
R00303010006	Earthen Berm		X		X	CB
R00303060005	Straw Wattles		X		X	CB
R00303060007	Straw Wattles		X		X	B
R00303140009	Coir Log		X		X	EC
R00303140010	Coir Log		X		X	EC
R00303140011	Coir Log		X		X	EC
R00303140012	Coir Log		X		X	EC
R00303140013	Coir Log		X		X	EC
R00303140014	Coir Log		X		X	EC
R00303140015	Coir Log		X		X	EC
R00303140016	Coir Log		X		X	EC
R00303140017	Coir Log		X		X	EC
R00303140018	Coir Log		X		X	EC
R00304010003	Earthen Channel/Swale	X		X		CB

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



Enhanced controls installation and/or certification are planned for 2014 as part of corrective action.

### 3.3 Storm Water Monitoring

AOC 00-015 is monitored within R-SMA-1.95. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figures 3-2 and 3-3). Analytical results from this sample yielded one TAL exceedance:

- Gross-alpha activity of 27.4 pCi/L (ATAL is 15 pCi/L).

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

*AOC 00-015:*

- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at AOC 00-015. Consent Order sampling has not yet been conducted. Any alpha-emitting radionuclides associated with the Site would be exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance. In addition, the gross-alpha TAL exceedance is below the undeveloped and developed BVs, which is consistent with the Site not being the source of this TAL exceedance.

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 3-2 and 3-3. 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 3-2 and 3-3.



R-SMA-1.95, Established Vegetation, R00302040008 (photo ID 34963-5)

R-SMA-1.95 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 sediment derived from Bandelier Tuff were compared gross-alpha ATAL exceedances. 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 result from 2011 is less than this value.

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

### 3.4 Inspections and Maintenance

RG038 recorded two storm events at R-SMA-1.95 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 3-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30492	2-4-2013
Annual Erosion Evaluation	COMP-30820	5-6-2013
Enhanced Control Measure Verification	BMP-34963	9-4-2013
Storm Rain Event	BMP-35744	9-23-2013
Annual Erosion Evaluation	COMP-36759	11-13-2013

No maintenance activities were conducted at R-SMA-1.95 in 2013.

### 3.5 Compliance Status

The Site associated with R-SMA-1.95 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 3-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 00-015	Corrective Action Initiated	Corrective Action Initiated	Initiated 05-01-2012

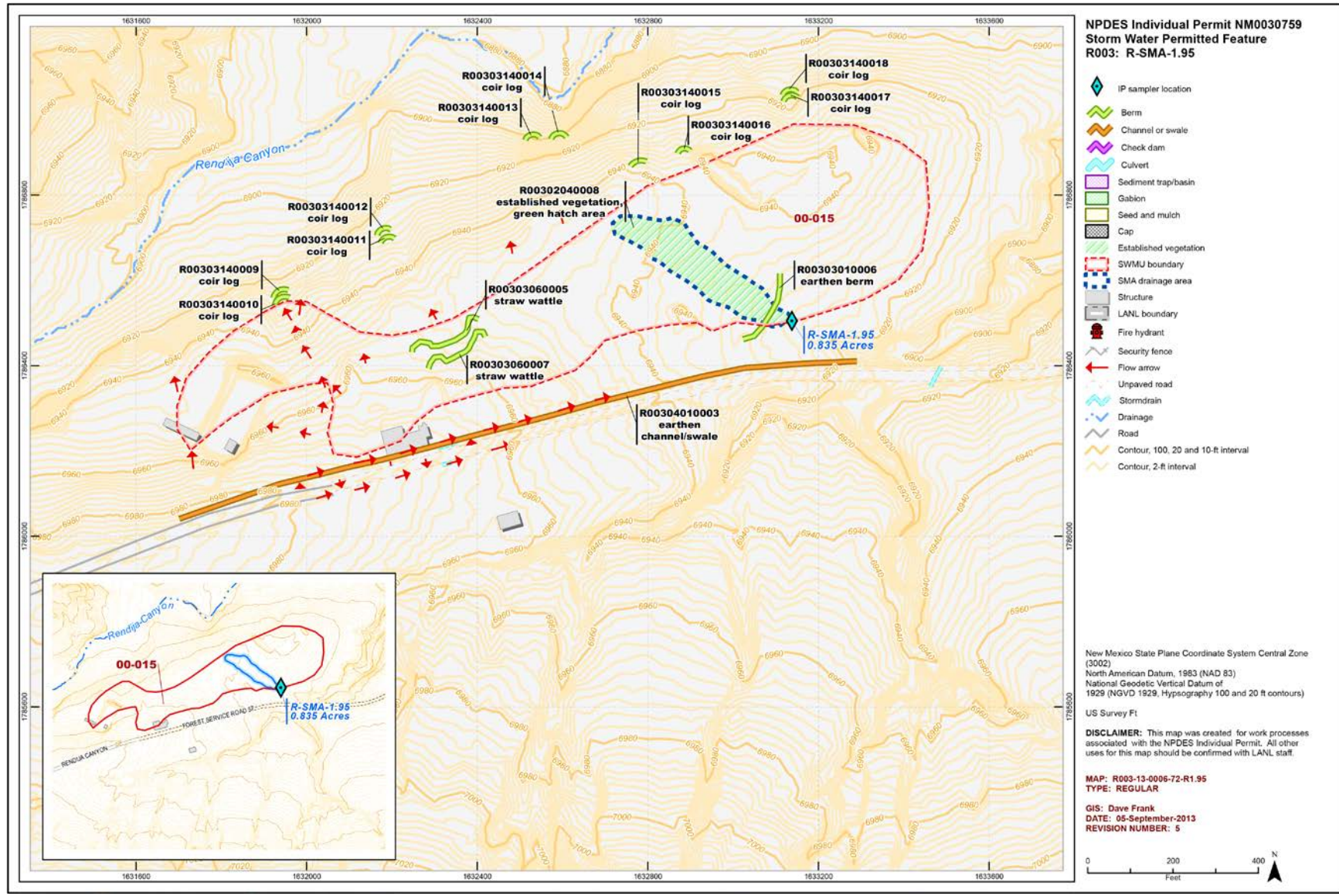
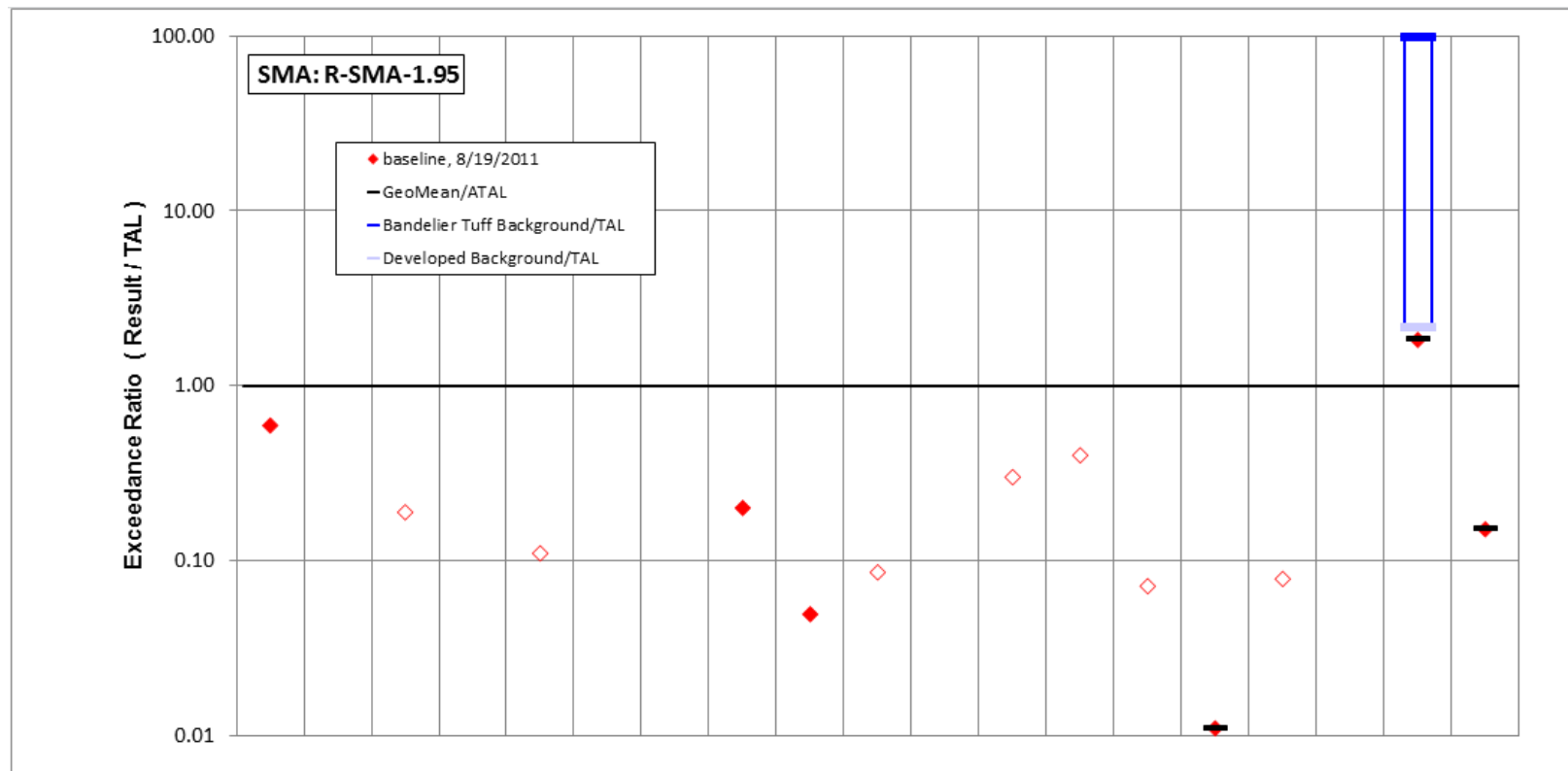


Figure 3-1 R-SMA-1.95 location map



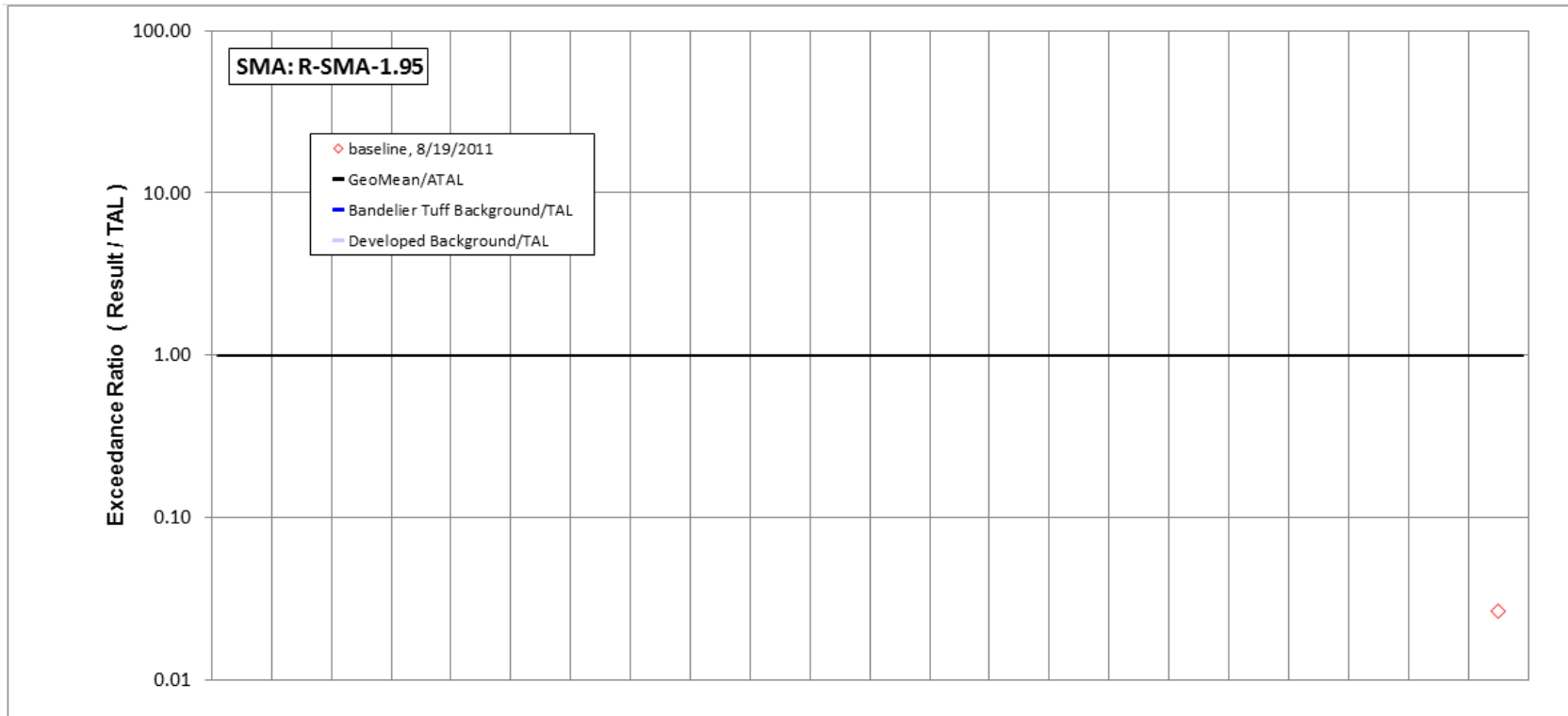


	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	-	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	-	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>8/19/2011 result</b>	<b>444</b>	<b>3.4</b>	<b>1.7</b>	<b>15</b>	<b>0.11</b>	<b>2</b>	<b>3</b>	<b>0.86</b>	<b>0.84</b>	<b>0.066</b>	<b>1</b>	<b>1.5</b>	<b>0.2</b>	<b>0.45</b>	<b>1.1</b>	<b>3.3</b>	-	<b>27.4</b>	<b>4.53</b>
result / TAL	0.59	0.0053	0.19	0.003	0.11	0.01	0.003	0.2	0.049	0.086	0.0059	0.3	0.4	0.071	0.011	0.079	-	<b>1.8</b>	0.15

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

**Figure 3-2 Inorganic analytical results summary plot for R-SMA-1.95**





	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
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.53	-	-	-	0.53	
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	-	-	-	0.027	

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

Figure 3-3 Organic analytical results summary plot for R-SMA-1.95

## 4.0 R-SMA-2.05: SWMU 00-011(c)

### 4.1 Site Descriptions

One historical industrial activity area is associated with R004, R-SMA-2.05: Site 00-011(c).

SWMU 00-011(c) is the potential location of a munitions-impact area. The Site is located on General Services Administration and USFS land within a tributary of Rendija Canyon north of the Sportsmen’s Club small-arms firing range (AOC 00-015). The area is approximately 9 acres in size. It was identified as a possible munitions-impact area because of nearly illegible historical signage posted at the Site in the 1940s. Extensive archival searches have revealed no documentation regarding the use of this Site as a munitions-impact area. In addition, no field evidence of munitions operations (e.g., MD, MEC, UXO, or impact scars) has been found at SWMU 00-011(c). During the 1993 Phase I RFI conducted at SWMU 00-011(c), the Site was surveyed for UXO and OEW. Scrap metal such as bailing wire and tin cans were found, but no ordnance, MD, MEC, or UXO was located. In addition, no ordnance was found during the 2007 investigation or during the 2009 ordnance survey.

The complete absence of UXO and OEW confirmed that the SWMU 00-011(c) was never used as an ordnance-impact area. In accordance with the approved Guaje/Barrancas/Rendija Canyons Aggregate Area investigation work plan, no further investigation was conducted at SWMU 00-011(c). NMED concurred with the conclusion that no additional ordnance surveys need to be conducted at this Site and issued a COC without controls in May 2012.

The project map (Figure 4-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 4.2 Control Measures

No run-on sources are associated with this Permitted Feature other than natural overland flow. Similarly, runoff from this SMA is minimal; baseline controls have been installed to address any potential runoff. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 4-1).

**Table 4-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00402040005	Established Vegetation		X	X		B
R00406030002	Juniper Bales		X		X	CB
R00406030003	Juniper Bales		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 4.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at R-SMA-2.05. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

#### 4.4 Inspections and Maintenance

RG-NCOM recorded seven storm events at R-SMA-2.05 during the 2013 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 4-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30481	2-4-2013
Annual Erosion Evaluation	COMP-30821	5-6-2013
Storm Rain Event	BMP-32770	6-19-2013
Storm Rain Event	BMP-32984	7-15-2013
Storm Rain Event	BMP-34968	8-26-2013
Storm Rain Event	BMP-35486	9-23-2013
Annual Erosion Evaluation	COMP-36760	11-13-2013

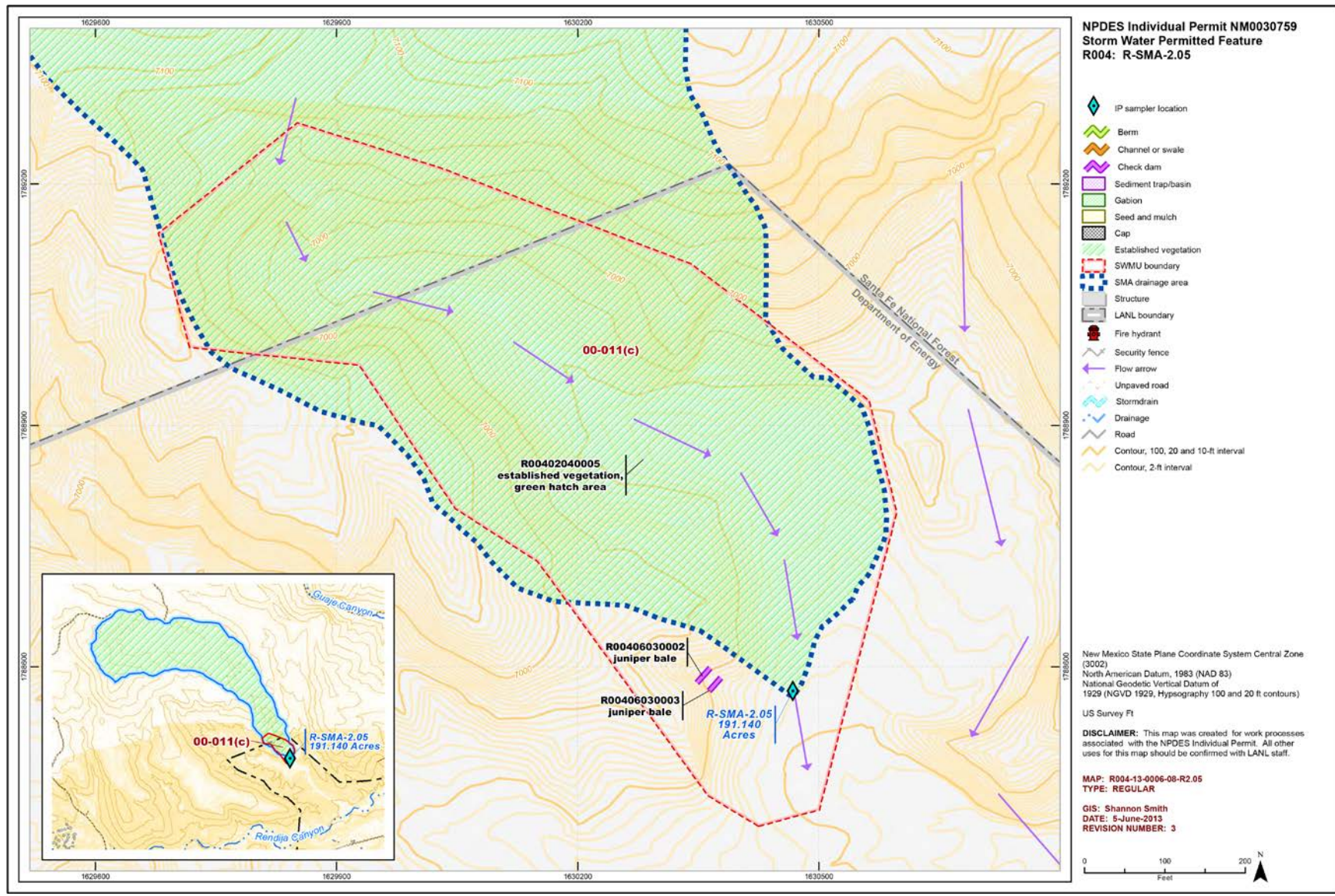
No maintenance activities were conducted at R-SMA-2.05 in 2013.

#### 4.5 Compliance Status

The Site associated with R-SMA-2.05 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 4-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-011(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	NMED, May 16, 2012, "Certificates of Completion One Solid Waste Management Unit and One Area of Concern in the Guaje/Barrancas/Rendija Canyons Aggregate Area"



**Figure 4-1 R-SMA-2.05 location map**



## 5.0 R-SMA-2.3: SWMU 00-011(e)

### 5.1 Site Descriptions

One historical industrial activity area is associated with R005, R-SMA-2.3: Site 00-011(e).

SWMU 00-011(e) is a former ammunition impact area located on USFS land in a tributary of Rendija Canyon known as Thirty-Seven Millimeter Canyon. The Site was used from the mid- to late 1940s for training U.S. Army personnel operating tanks firing 20- and 37-mm rounds. The impact area extends north along the tributary to the top of a cliff face and is approximately 15 acres in size. SWMU 00-011(e) is located within a very steep natural amphitheater with numerous loose rocks and boulders. Vegetation at the site consists of thick weeds and small shrubs. The Site is fenced with barbwire and posted with “Explosives No Trespassing” signs. During the 1993 Phase I RFI conducted at SWMU 00-011(e), the Site was surveyed for UXO and OEW. During the ordnance sweep, materials recovered included 37-mm rounds and fragments. Because it was not known if these rounds were HE or armor-piercing, they were all placed in shallow pits and detonated with explosives.

Consent Order investigations are complete for SWMU 00-011(e); the Site meets residential risk levels. NMED issued a COC with controls for SWMU 00-011(e) in May 2013.

The project map (Figure 5-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 5.2 Control Measures

There are no run-on issues with this Permitted Feature. Runoff is minimal and is currently controlled with a juniper bale check dam. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 5-1).

**Table 5-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00502040004	Established Vegetation		X	X		B
R00503060005	Straw Wattles		X		X	B
R00503060006	Straw Wattles		X		X	B
R00503060007	Straw Wattles		X		X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 5.3 Storm Water Monitoring

SWMU 00-011(e) is monitored within R-SMA-2.3. Following the installation of baseline control measures, a baseline storm water sample was collected on June 14, 2013 (Figures 5-2 and 5-3). Analytical results from this sample yielded no TAL exceedances. Baseline confirmation is complete for R-SMA-2.3 and the associated SWMU 00-011(e) because all applicable sampling results are below the applicable MTAL or ATAL. No further sampling is required for R-SMA-2.3 for the duration of the IP.

#### 5.4 Inspections and Maintenance

RG038 recorded two storm events at R-SMA-2.3 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 5-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30490	2-4-2013
Annual Erosion Evaluation	COMP-30822	5-6-2013
Storm Rain Event	BMP-35742	9-23-2013
Annual Erosion Evaluation	COMP-36761	11-13-2013

No maintenance activities were conducted at R-SMA-2.3 in 2013.

**Table 5-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-36463	Install at least 3 lines of straw wattles directly upgradient of existing juniper bale -R00506030003. Juniper bale will be retired when work is completed.	11/13/2013	51 day (s)	Maintenance conducted as soon as practicable.

#### 5.5 Compliance Status

The Site associated with R-SMA-2.3 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 5-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-011(e)	Baseline Monitoring Extended	Baseline Confirmation Complete	No Comment

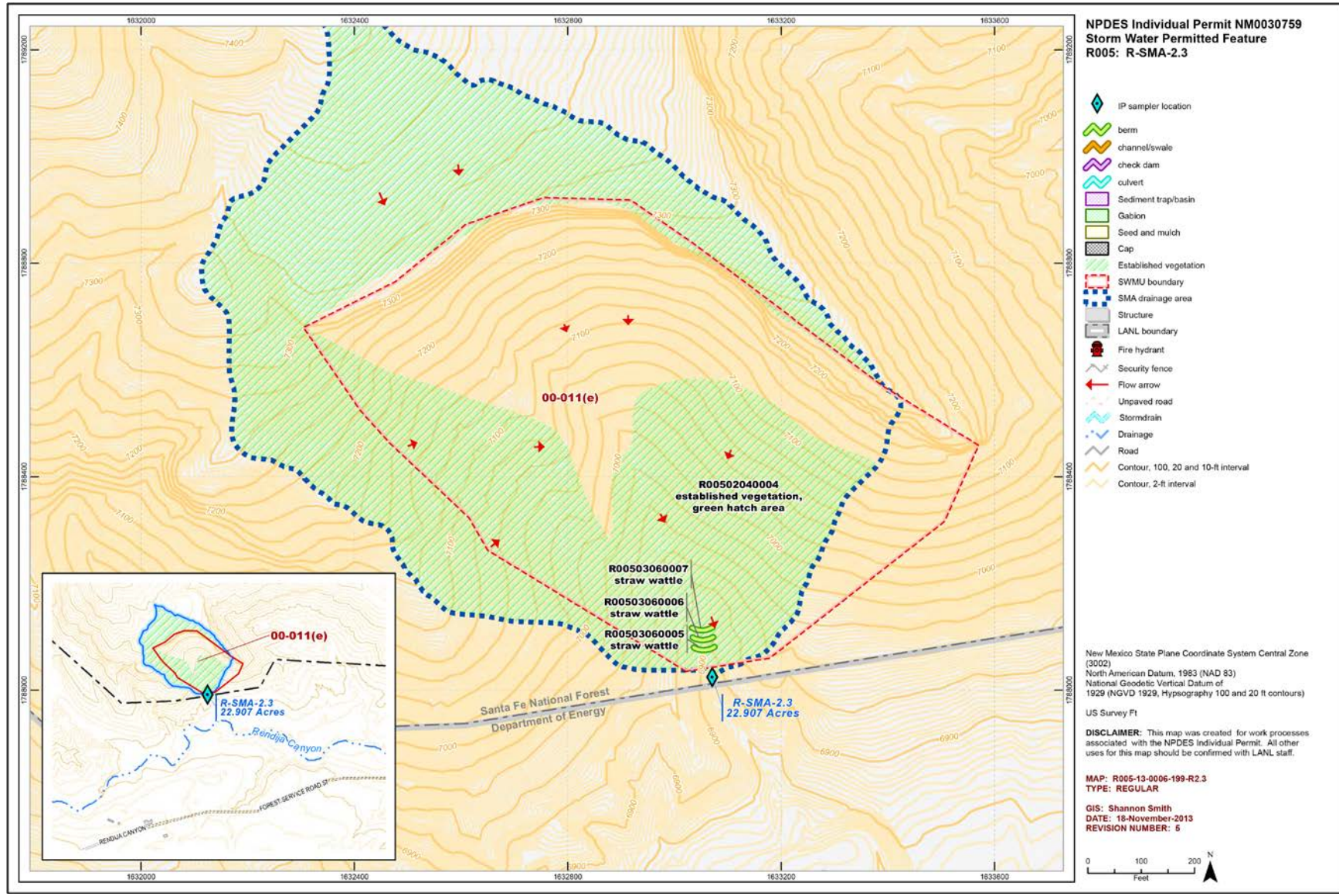
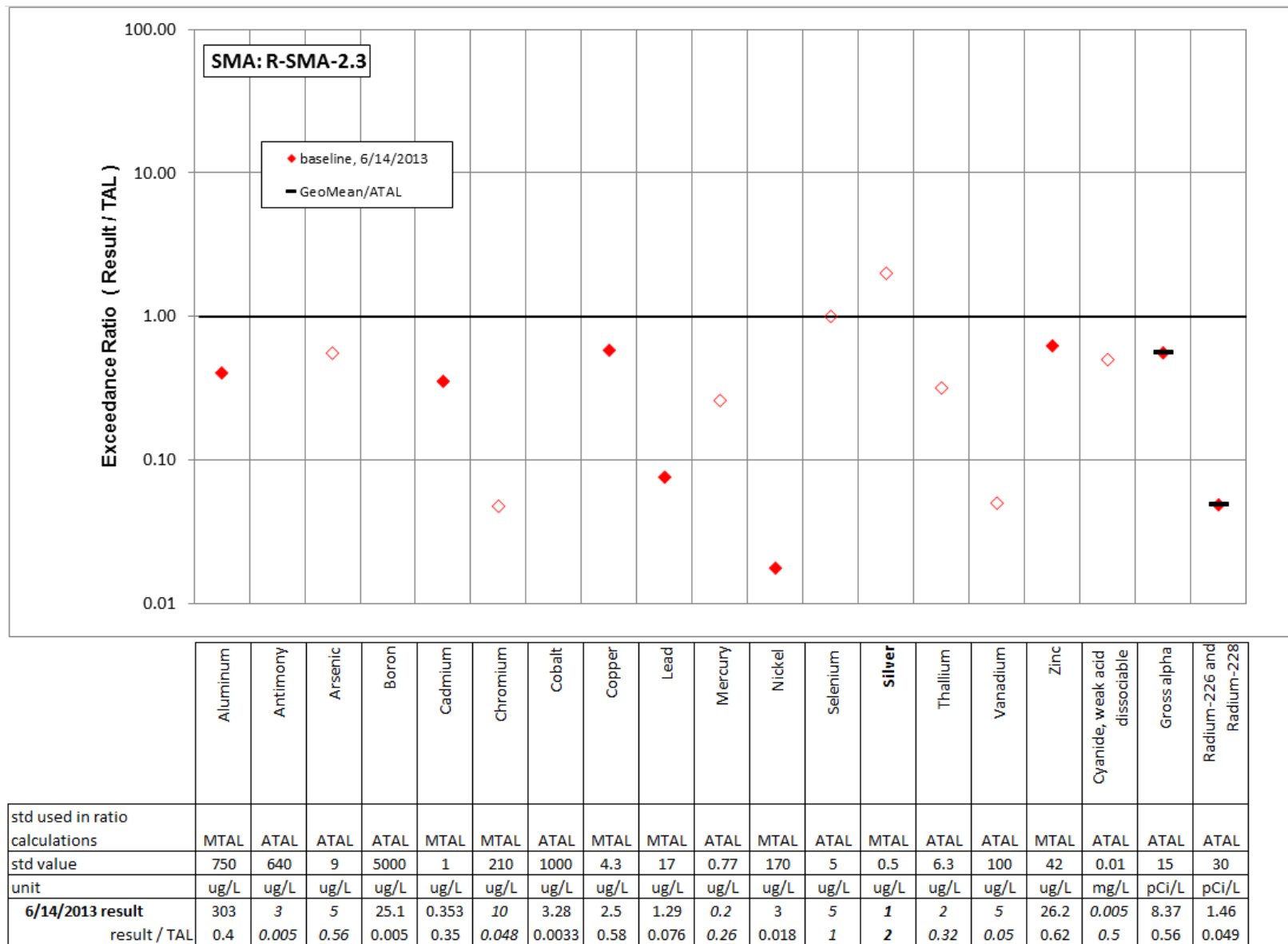


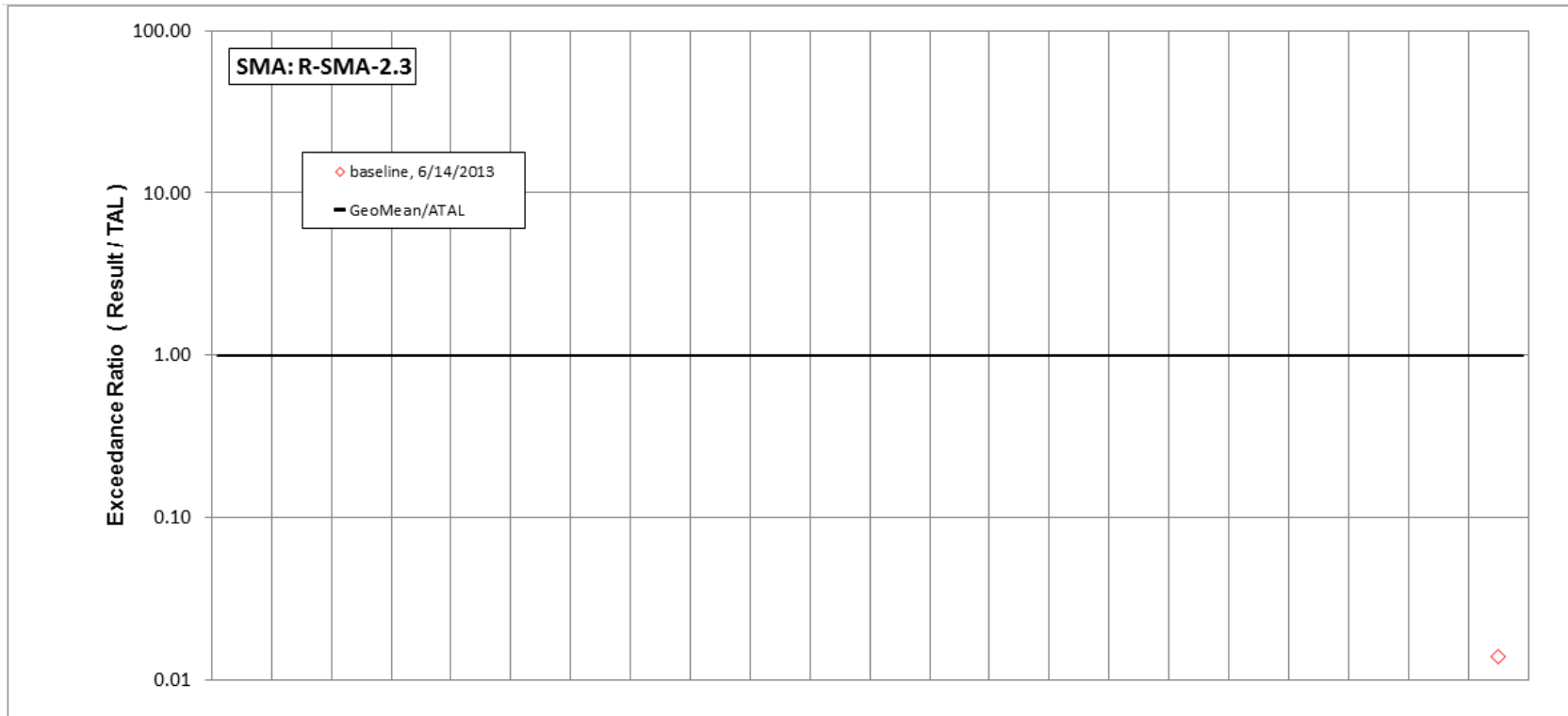
Figure 5-1 R-SMA-2.3 location map



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

Figure 5-2 Inorganic analytical results summary plot for R-SMA-2.3





	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
6/14/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.278	-	-	-	0.278
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	-	-	0.014

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

Figure 5-3 Organic analytical results summary plot for R-SMA-2.3

## **6.0 R-SMA-2.5: SWMU 00-011(a)**

### **6.1 Site Descriptions**

One historical industrial activity area is associated with R006, R-SMA-2.5: Site 00-011(a).

SWMU 00-011(a) is a 29-acre former mortar-impact area located on General Services Administration land about 0.4 mi east of the Sportsmen’s Club small-arms firing range (AOC 00-015) in Rendija Canyon. The Site was a mortar impact area in the mid-1940s for 60-mm and 82-mm rounds; operations ceased in the late 1940s. SWMU 00-011(a) is located in a relatively flat open grassland with scattered shrubs and trees. The Site is bisected east to west by Rendija Road (unpaved). On the north side of the road, the Site has a gradual to steep slope to the ephemeral stream channel. The slope is covered by mulch consisting of downed trees that burned during the 2000 Cerro Grande fire. Although, the Site is fenced and posted with DOE “No Trespassing” signs, evidence indicates the Site is used for recreational activities such as dirt-biking and target practice. During the 1993 Phase I RFI conducted at SWMU 00-011(a), the Site was surveyed for UXO and OEW; two live mortar rounds were found and destroyed. Other materials recovered during the ordnance sweep, included approximately 2400 pieces of ordnance fragments and three times as much scrap material. Geomorphic mapping was conducted including mapping of all drainage channels that drained the area enclosed within the boundaries of the site and the areas with high concentrations of ordnance fragments. Two pits containing tires and UXO/MD were excavated and removed.

Consent Order investigations are complete for SWMU 00-011(a); the Site meets residential risk levels. NMED issued a COC with controls for SWMU 00-011(a) in May 2013.

The project map (Figure 6-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **6.2 Control Measures**

The gravel road cutting through the site directs run-on into the channel containing the sampler. Dirt paths throughout the Site resulting from years of recreational activity have modified the natural flow patterns and created ponding areas west of the sampler location. Installation of Jersey barriers has prevented access, which has allowed for revegetation from recreational impact across the Site. Los Alamos County is responsible for maintaining the area roads. The only discharge point south of Rendija Canyon road is the channel below the sampler. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 6-1).

**Table 6-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
R00602040007	Established Vegetation		X	X		B
R00604060004	Rip Rap	X		X		CB
R00606010003	Rock Check Dam		X		X	CB
R00606010005	Rock Check Dam	X			X	CB
R00606010006	Rock Check Dam	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 6.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at R-SMA-2.5. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 6.4 Inspections and Maintenance

RG038 recorded two storm events at R-SMA-2.5 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 6-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30491	2-4-2013
Annual Erosion Evaluation	COMP-30823	5-6-2013
Storm Rain Event	BMP-35743	9-23-2013
Annual Erosion Evaluation	COMP-36762	11-13-2013

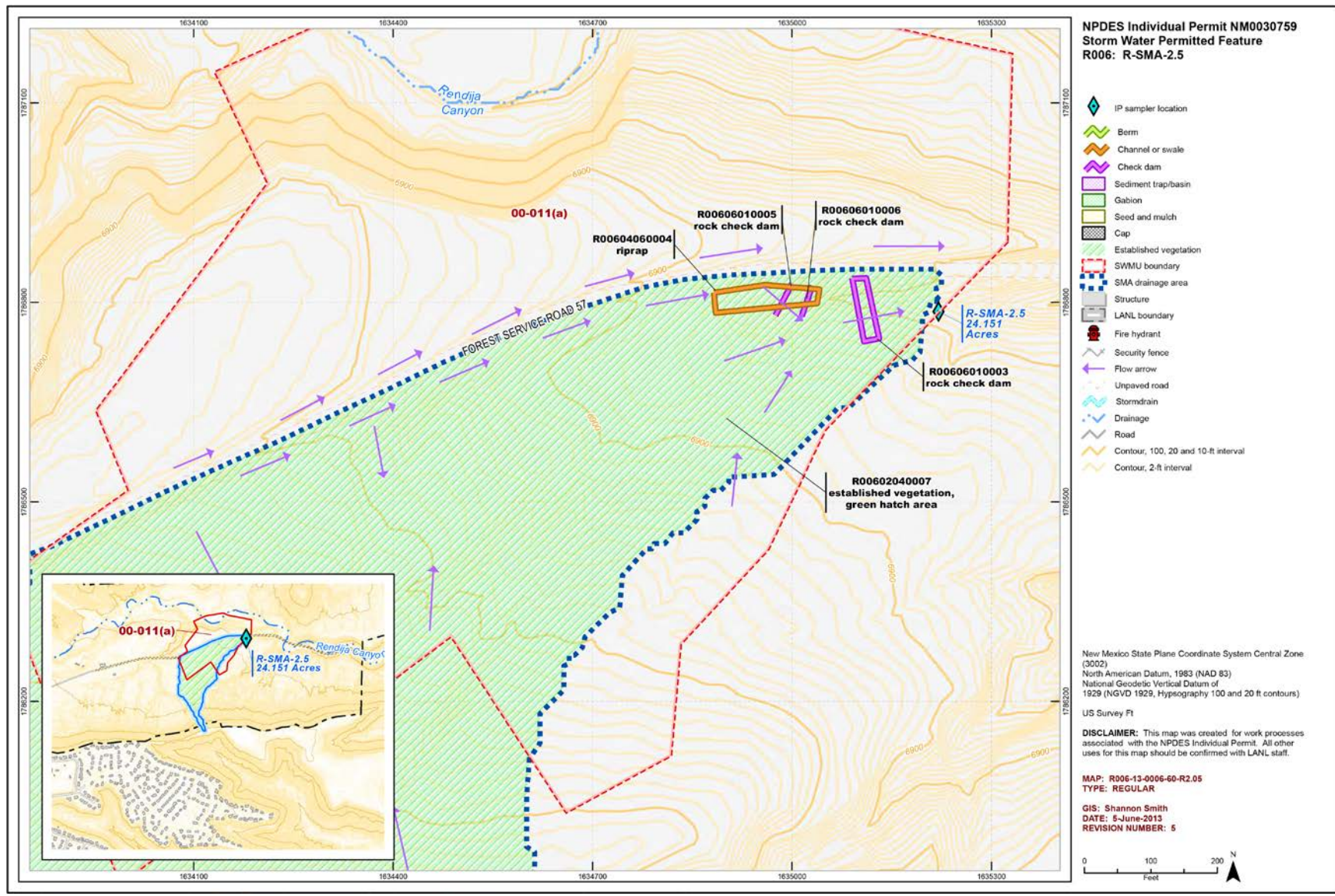
No maintenance activities were conducted at R-SMA-2.5 in 2013.

### 6.5 Compliance Status

The Site associated with R-SMA-2.5 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 6-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-011(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



**Figure 6-1 R-SMA-2.5 location map**



## **7.0 B-SMA-0.5: SWMUs 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), and 10-004(b) and AOCs 10-008 and 10-009**

### **7.1 Site Descriptions**

Eight historical industrial activity areas are associated with B001, B-SMA-0.5: Sites 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), 10-004(b), 10-008, and 10-009.

SWMU 10-001(a) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(a) firing site was used in rotation with the SWMUs 10-001(b–d) firing sites from 1943–1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.

SWMU 10-001(a) was investigated as part of Consolidated Unit 10-001(a)-99 along with SWMUs 10-001(b–d) and AOC 10-008. Consent Order investigations are complete for SWMU 10-001(a). The Site meets recreational risk levels. SWMU 10-001(a) was recommended for corrective action complete without controls in May 2008. The Site will be recommended for a COC without controls in 2014.

SWMU 10-001(b) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(b) firing site was used in rotation with the SWMUs 10-001(a, c, and d) firing sites from 1943–1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.

SWMU 10-001(b) was investigated as part of Consolidated Unit 10-001(a)-99, along with SWMUs 10-001(a, c, and d) and AOC 10-008. Consent Order investigations are complete for SWMU 10-001(b). The Site meets recreational risk levels. SWMU 10-001(b) was recommended for corrective action complete without controls in May 2008. The Site will be recommended for a COC without controls in 2014.

SWMU 10-001(c) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(c) firing site was used in rotation with the SWMUs 10-001(a, b, and d) firing sites from 1943–1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing all structures, from 1960 to 1963. All excavations were

backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.

SWMU 10-001(c) was investigated as part of Consolidated Unit 10-001(a)-99, along with SWMUs 10-001(a, b, and d) and AOC 10-008. Consent Order investigations are complete for SWMU 10-001(c). The Site meets recreational risk levels. SWMU 10-001(c) was recommended for corrective action complete without controls in May 2008. The Site will be recommended for a COC without controls in 2014.

SWMU 10-001(d) is a former firing site located in Bayo Canyon at former TA-10. The firing site consisted of five structures: a battery building (power source), a fire control building, an electronics chamber, an x-unit chamber, and an inspection building. The SWMU 10-001(d) firing site was used in rotation with the SWMU 10-001(a–c) firing sites from 1943–1961 for experiments using HE in conjunction with nuclear weapons research. After a shot, residual material was moved to the SWMU 10-005 disposal pit located near the firing sites. Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC. Former TA-10 underwent extensive D&D, including razing all structures, from 1960 to 1963. All excavations were backfilled and the Site graded. All concrete structures associated with each firing site were demolished using dynamite. All explosives testing ceased in 1961. The Site was released to Los Alamos County in 1967.

SWMU 10-001(d) was investigated as part of Consolidated Unit 10-001(a)-99, along with SWMUs 10-001(a–c). Consent Order investigations are complete for SWMU 10-001(d). The Site meets recreational risk levels. SWMU 10-001(d) was recommended for corrective action complete without controls in May 2008. The Site will be recommended for a COC without controls in 2014.

SWMU 10-004(a) was a former 1060-gal. septic tank (former structure 10-40) that discharged to a pit with associated lines and to an outfall located in a stream channel northeast of SWMU 10-002(a). The tank served the personnel building (former building 10-21) from 1949 to 1963 and was removed during the 1963 D&D activities. No information is available regarding the removal of the 4-in.-diameter tile drain or the soil surrounding the outfall; however, a 2007 geophysical survey did not identify subsurface anomalies, indicating the buried pipe was removed during previous D&D activities.

Consent Order investigations are complete for SWMU 10-004(a). The Site meets residential risk levels. SWMU 10-004(a) was recommended for corrective action complete without controls in May 2008. The Site will be recommended for a COC without controls in 2014.

SWMU 10-004(b) is a former reinforced-concrete sanitary septic tank that served the radiochemistry laboratory from 1944 to 1963. The tank was 4 × 10 × 4 ft deep, with a 540-gal. capacity. The tank handled sanitary waste but was suspected to have received liquid wastes from the radiochemistry laboratory. Overflow from the tank drained through a 4-in., open-joint, VCP drainline to the stream channel. The tank was removed during D&D activities in 1963 and disposed of at TA-54, Area G. A 2007 geophysical survey did not identify subsurface anomalies, indicating the buried pipe was removed during previous D&D activities.

SWMU 10-004(b) was investigated as part of Consolidated Unit 10-002(a)-99, along with 18 other SWMUs that are not IP Sites. Consent Order investigations are complete for SWMU 10-004(b). The Site meets residential risk levels. SWMU 10-004(b) was recommended for corrective action complete without controls in May 2008. The Site will be recommended for a COC without controls in 2014.

AOC 10-008 is a former satellite firing site located approximately 1400 ft northwest of the former primary firing sites [SWMUs 10-001(a–d)]. During a 1994 IA, shrapnel was found embedded in the

northwestern sides of trees in this area (opposite the known primary firing sites). Because of the proximity and overlapping dispersion areas of each firing site and use of the disposal pit, source terms cannot be separated by SWMU or AOC.

AOC 10-008 was investigated as part of Consolidated Unit 10-001(a)-99, along with SWMUs 10-001(a-d). Consent Order investigations are complete for AOC 10-008. The Site meets recreational risk levels. AOC 10-008 was recommended for corrective action complete without controls in May 2008. The Site will be recommended for a COC without controls in 2014.

AOC 10-009 is a former landfill discovered during routine surface shrapnel characterization activities in Bayo Canyon. A small depression was noted that contained materials, including asbestos siding, heavy-gauge and coaxial wire and cable, glass laboratory equipment, and other debris. A geophysical survey conducted in the area showed additional anomalies. The landfill area differed from the surrounding area; interviews conducted with former area workers confirmed the area had been used for disposal. EPA was notified of a new AOC in May 1995. The Site was fenced in 1995, pending further investigation and/or remediation. AOC C-10-001 is located within the fenced area that encompasses AOC 10-009 and consists of two former radioactive (strontium-90) soil contamination areas.

Consent Order investigations are complete for AOC 10-009. The Site meets recreational risk levels. AOC 10-009 was recommended for corrective action complete without controls in May 2008. The Site will be recommended for a COC without controls in 2014.

The project map (Figure 7-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## 7.2 Control Measures

Run-on contributions from area roads are minimal. There is concentrated run-on flow from the slope south of one of the Sites impacting the fenced area. Most of the run-on to this Permitted Feature originates in natural areas. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 7-1).

**Table 7-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
B00101010011	Seed and Wood Mulch			X		B
B00102040012	Established Vegetation		X	X		B
B00103010006	Earthen Berm	X			X	CB
B00103010007	Earthen Berm		X		X	CB
B00103060010	Straw Wattles	X			X	B
B00104010005	Earthen Channel/Swale	X		X		CB
B00104040003	Culvert	X		X		CB
B00104060009	Rip Rap	X		X		B
B00106010008	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 7.3 Storm Water Monitoring

SWMUs 10-001(a), 10-001(b), 10-001(c), 10-001(d), 10-004(a), and 10-004(b) and AOCs 10-008 and 10-009 are monitored within B-SMA-0.5. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 7-2). Analytical results from this sample yielded one TAL exceedance:

- Gross-alpha activity of 486 Ci/L (ATAL is 15 pCi/L).

This exceedance was 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 discussion is organized by Site and analyte.

#### *SWMU 10-001(a):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

#### *SWMU 10-001(b):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

#### *SWMU 10-001(c):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

#### *SWMU 10-001(d):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.



*SWMU 10-004(a):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*SWMU 10-004(b):*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and uranium isotopes, which are alpha-emitting radionuclides. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*AOC 10-008:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*AOC 10-009:*

- Alpha-emitting radionuclides are not known to be associated with industrial materials managed at this Site. Shallow samples collected during the 2007 Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for uranium isotopes, which are alpha-emitting radionuclides. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

The SMA sampler receives runoff from a 1088-acre area that is mostly undeveloped, with a minor contribution from the Los Alamos townsite in the upper watershed. The detected gross-alpha radioactivity in storm water is less than the background for undeveloped areas, which is consistent with what would be expected for runoff from a mostly undeveloped area.

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

## **7.4 Inspections and Maintenance**

RG-TA-53 recorded six storm events at B-SMA-0.5 during the 2013 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 7-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30695	5-14-2013
Storm Rain Event	BMP-34151	8-5-2013
Storm Rain Event	BMP-35514	9-26-2013
Storm Rain Event	BMP-37119	11-8-2013
Annual Erosion Evaluation	COMP-36634	11-8-2013
TAL Exceedance	COMP-37087	11-8-2013

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

**Table 7-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-37019	Repair washout on earthen berm - OB00103010007 using hand tools. Reapply seed and matting to berm as needed.	11-15-2013	50 day(s)	Maintenance was conducted as soon as practicable.

### 7.5 Compliance Status

The Sites associated with B-SMA-0.5 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 7-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 10-001(a)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13
SWMU 10-001(b)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13
SWMU 10-001(c)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13
SWMU 10-001(d)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13
SWMU 10-004(a)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13
SWMU 10-004(b)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13
SWMU 10-008	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13
AOC 10-009	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13

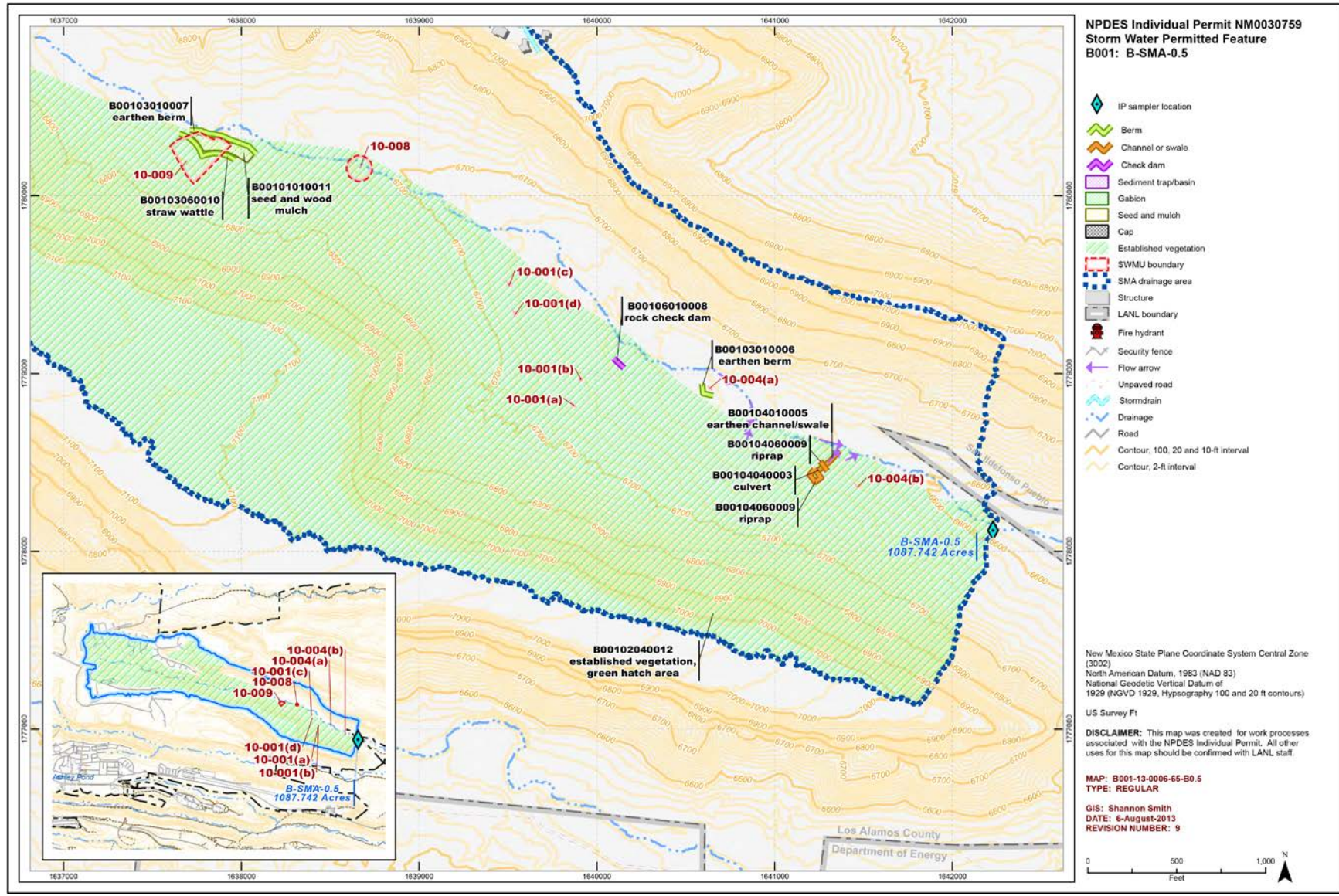
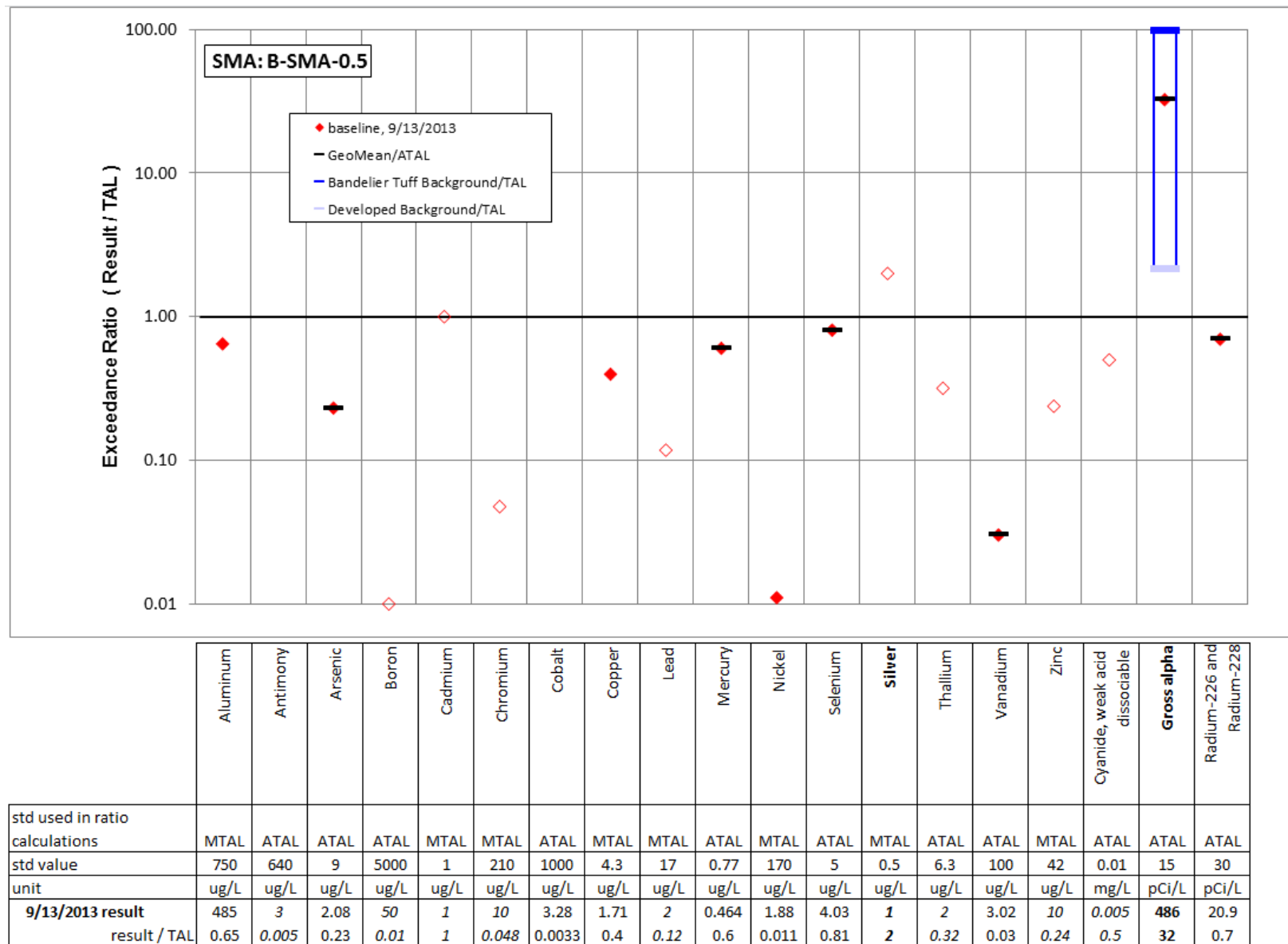


Figure 7-1 B-SMA-0.5 location map





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

Figure 7-2 Inorganic analytical results summary plot for B-SMA-0.5



## 8.0 B-SMA-1: SWMU 00-011(d)

### 8.1 Site Descriptions

One historical industrial activity area is associated with B002, B-SMA-1: Site 00-011(d).

SWMU 00-011(d) is a former bazooka firing area located on predominantly Los Alamos County land and a small section of private property in a small north-trending tributary of Bayo Canyon. The Site, which operated between 1944 and 1948, is located northeast of the intersection of San Ildefonso Road and Diamond Drive. The 6-acre Site is only partially fenced and is accessible to the public.

An investigation was conducted in 1992 to search for and remove UXO and OEW. OEW recovered from the Site was found in the subsurface and was composed of about 0.5 yd<sup>3</sup> of tail-fin assemblies, motors, bullets, and other fragments from bazookas. The 2007 Consent Order investigation report recommended the Site for corrective action complete without controls. The NMED approved the report with directions requiring biennial UXO surveys. NMED did not approve a request for COC without controls, but did approve a COC with controls for UXO. The Laboratory requested that NMED rescind the COC with controls and reconsider the request for COC without controls because the controls are not associated with requirements under the Consent Order.

The project map (Figure 8-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 8.2 Control Measures

There is significant run-on to the SMA from urban areas on the east and west sides. This run-on source is from engineered controls associated with paved roads and parking areas. There is also a small contribution from residences to the west. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 8-1).

**Table 8-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
B00202040008	Established Vegetation		X	X		B
B00206010003	Rock Check Dam	X			X	CB
B00206010004	Rock Check Dam	X			X	CB
B00206010005	Rock Check Dam		X		X	CB
B00206010006	Rock Check Dam		X		X	CB
B00206010007	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 8.3 Storm Water Monitoring

SWMU 00-011(d) is monitored within B-SMA-1. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 8-2 and 8-3). Analytical results from this sample yielded one TAL exceedance:

- Gross-alpha activities of 126 Ci/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

*SWMU 00-011(d):*

- Based on Site history, the Site is an unlikely source of the TAL exceedance. Shallow samples collected during the 2007 Consent Order investigation were not, however, analyzed for gross-alpha radioactivity or alpha-emitting radionuclides since 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 8-2 and 8-3. 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 8-2 and 8-3.

Monitoring location B-SMA-1 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, copper and lead 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.

- 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 urban 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 2013 Annual Report.

### 8.4 Inspections and Maintenance

RG055.5 recorded five storm events at B-SMA-1 during the 2013 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 8-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30485	2-5-2013
Annual Erosion Evaluation	COMP-30696	5-6-2013
Storm Rain Event	BMP-32777	6-19-2013
Storm Rain Event	BMP-33582	7-24-2013
Storm Rain Event	BMP-34565	8-7-2013
Storm Rain Event	BMP-35533	9-23-2013
Annual Erosion Evaluation	COMP-36635	11-20-2013
TAL Exceedance	COMP-36874	11-20-2013

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

**Table 8-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-34086	Modify rock check dam - B00206010003 by adding rock (can be native rock) as necessary to extend and/or build up.	8-1-2013	8 day(s)	Maintenance conducted in timely manner.
BMP-36912	Repair rock check dam - B00206010006 by building up with native rock.	11-6-2013	44 day(s)	Maintenance conducted as soon as practicable.

### 8.5 Compliance Status

The Site associated with B-SMA-1 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 8-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-011(d)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-22-13

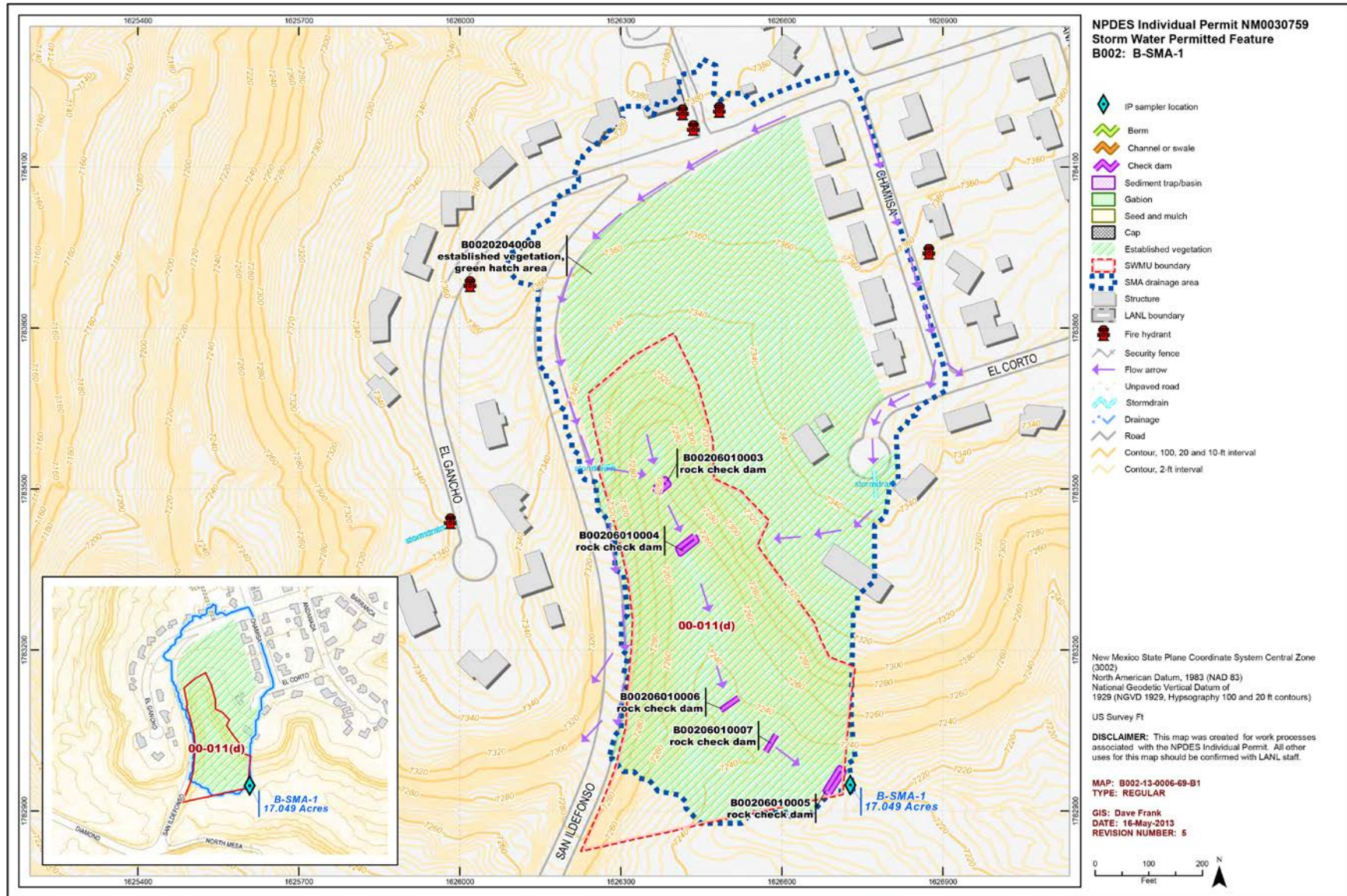
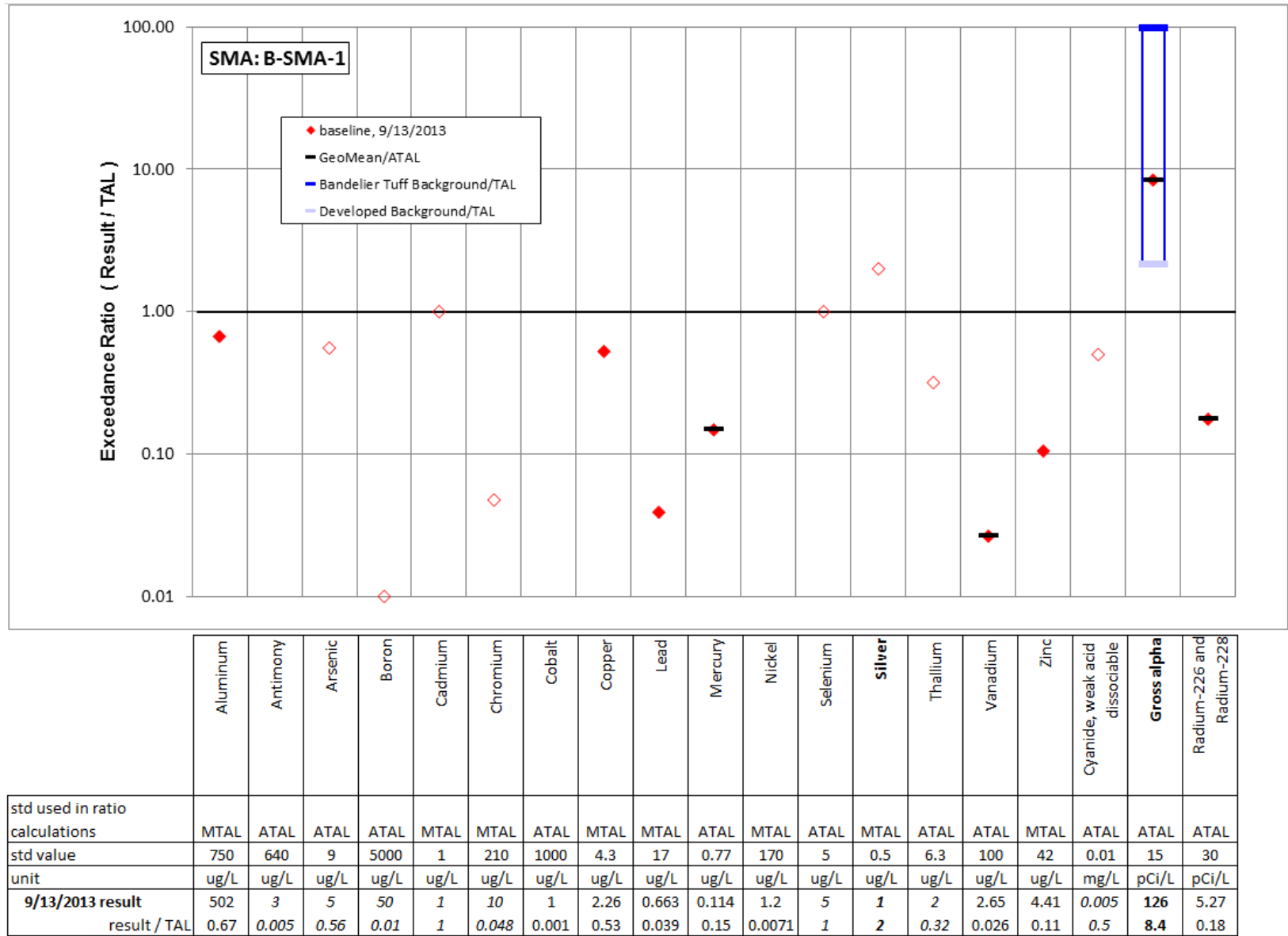


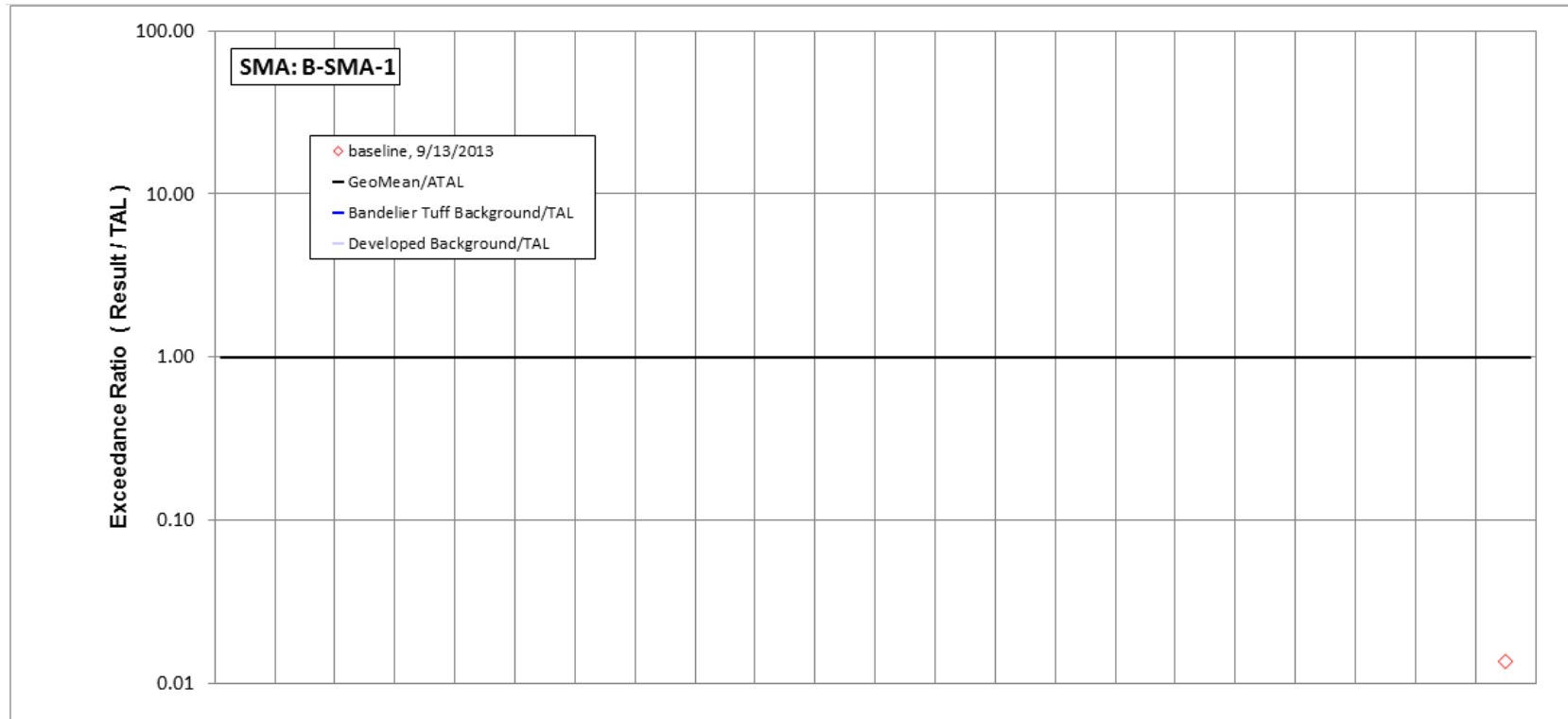
Figure 8-1 B-SMA-1 location map





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

Figure 8-2 Inorganic analytical results summary plot for B-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
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.272	-	-	-	0.272
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	-	-	0.014

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

Figure 8-3 Organic analytical results summary plot for B-SMA-1

## 9.0 ACID-SMA-1.05: SWMU 00-030(g)

### 9.1 Site Descriptions

One historical industrial activity area is associated with P001, ACID-SMA-1.05: Site 00-030(g).

SWMU 00-030(g) consists of a former septic system and outfall that were located near the former Catholic Church (3200 Canyon Road) in an area now covered by a paved parking lot for apartments. The septic system was installed in the early 1940s and received wastes from former TA-01 facilities. The former septic tank (structure 6) consisted of reinforced concrete and measured 32 ft long × 22 ft wide × 6.5 ft deep. A center baffle separated the tank into east and west chambers. Drainage from the septic system discharged through an outfall to Acid Canyon in an area owned by Los Alamos County. The septic system ceased operating when the CWWTP came online in 1947 and was subsequently removed in 1993. The inlet line was never discovered and may have been removed during the installation of the gas pipeline that crosses the site.

Consent Order investigations are complete for SWMU 00-030(g). Decision-level data indicate the former SWMU 00-030(g) septic tank location meets residential risk levels, and the former outfall location and drainage meet recreational risk levels. A COC will be requested from NMED for this Site in 2014.

The project map (Figure 9-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 9.2 Control Measures

Potential sources of run-on to this Permitted Feature include Canyon Road, which runs east to west, north of the SMA. Additional run-on may originate in the parking areas around the Canyon Village apartments. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 9-1).

**Table 9-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00103010005	Earthen Berm		X		X	CB
P00103090003	Curbing	X			X	CB
P00104040004	Culvert	X		X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 9.3 Storm Water Monitoring

SWMU 00-030(g) is monitored within ACID-SMA-1.05. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figures 9-2 and 9-3). Analytical results from this sample yielded no TAL exceedances. Baseline confirmation is complete for ACID-SMA-1.05 and the associated SWMU 00-030(g) because all applicable sampling results are below the applicable MTAL or ATAL. No further sampling is required for ACID-SMA-1.05 for the duration of the IP.

### 9.4 Inspections and Maintenance

RG055.5 recorded five storm events at ACID-SMA-1.05 during the 2013 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 9-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30484	2-4-2013
Annual Erosion Evaluation	COMP-30691	5-8-2013
Storm Rain Event	BMP-32776	6-20-2013
Storm Rain Event	BMP-33581	7-23-2013
Storm Rain Event	BMP-34564	8-19-2013
Storm Rain Event	BMP-35532	9-25-2013
Annual Erosion Evaluation	COMP-36630	11-20-2013

No maintenance activities were conducted at ACID-SMA-1.05 in 2013.

### 9.5 Compliance Status

The Site associated with ACID-SMA-1.05 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

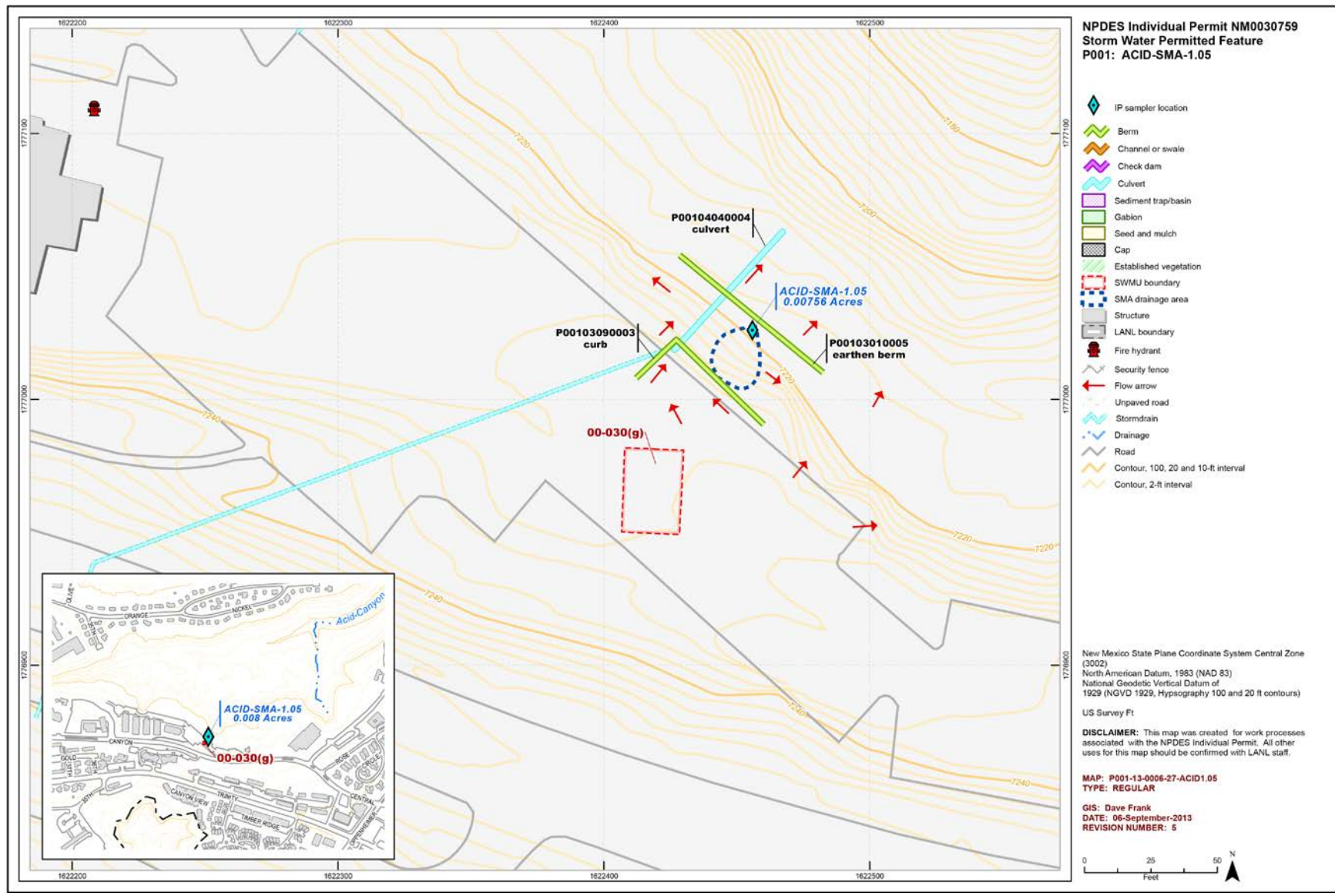
**Table 9-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-030(g)	Baseline Confirmation Complete	Baseline Confirmation Complete	No Comment

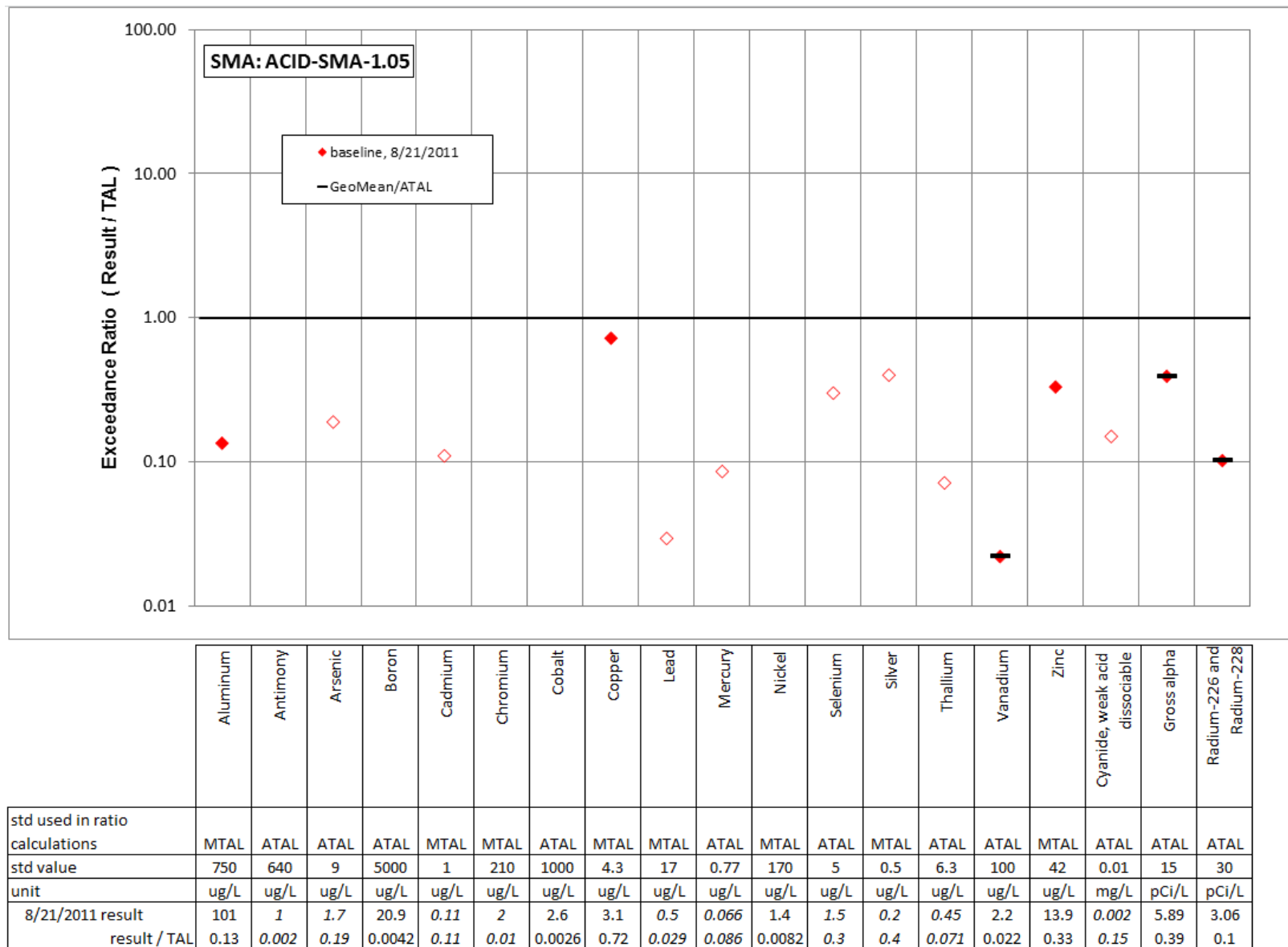


ACID-SMA-1.05, Earthen Berm, P00103010005 (photo ID 7409-2)



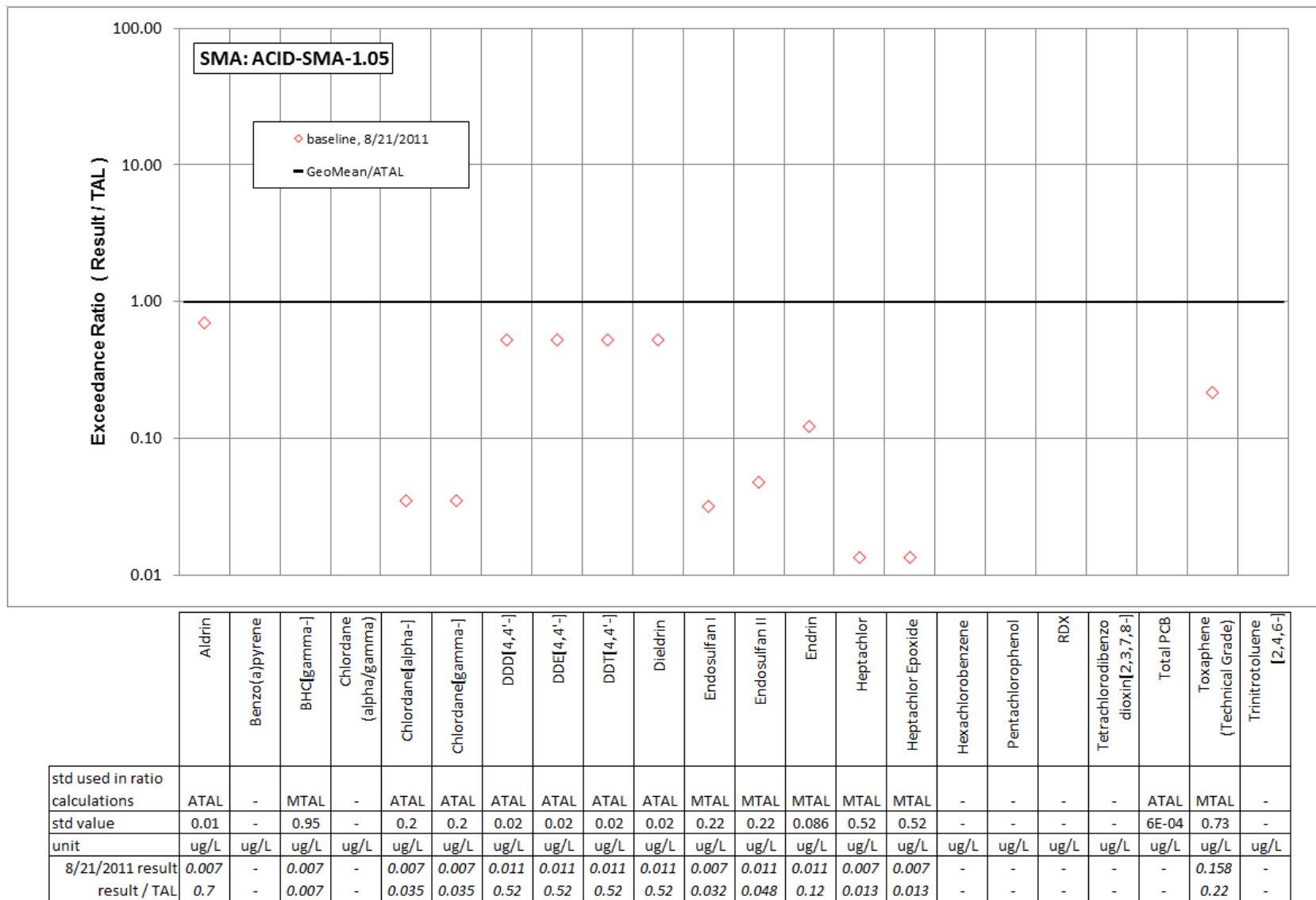


**Figure 9-1 ACID-SMA-1.05 location map**



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

Figure 9-2 Inorganic analytical results summary plot for ACID-SMA-1.05



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

Figure 9-3 Organic analytical results summary plot for ACID-SMA-1.05

## 10.0 ACID-SMA-2: SWMUs 01-002(b)-00, 45-001, 45-002, and 45-004

### 10.1 Site Descriptions

Four historical industrial activity areas are associated with P002, ACID-SMA-2: Sites 01-002(b)-00, 45-001, 45-002, and 45-004.

SWMU 01-002(b)-00 consists of a former industrial waste line outfall and its drainage into Acid Canyon. The outfall was located within the boundaries of former TA-45 at the head of a small branch of Acid Canyon known as the south fork of Acid Canyon. This outfall was used from 1943 to 1951 to discharge untreated RLW generated in laboratories and research facilities at former TA-01. Discharges of untreated RLW ceased when the TA-45 RLW treatment plant began operation in 1951. In 1966, the SWMU 01-002(b)-00 outlet pipe, associated weir box, tuff around the outfall, and tuff from the canyon wall below the outfall were removed. In September 1967, the TA-45 property was transferred to Los Alamos County.

SWMU 01-002(b)-00 was remediated during a 2001 IA. Although the focus of the IA was to remove plutonium-contaminated sediment, PCBs are collocated with plutonium; therefore, the IA also resulted in the removal of PCB-contaminated sediment. The entire drainage area below the former outfall was remediated and sampled. Risk-assessment results indicated SWMU 01-002(b)-00 poses no unacceptable risk to recreational receptors and poses no risk to ecological receptors. Based on the results of the IA and the Los Alamos/Pueblo Canyon investigation, no additional characterization sampling for SWMU 01-002(b)-00 was required under the Consent Order Pueblo Canyon Aggregate Area investigation. SWMU 01-002(b)-00 is currently eligible for a COC with controls, limiting land use to recreational. A COC request has not been submitted because the Site is not owned by DOE and a mechanism for administering land use controls has to be agreed to by the property owner, Los Alamos County.

SWMU 45-001 consists of the former TA-45 liquid waste treatment plant and its two associated outfalls. The TA-45 liquid waste treatment plant (building 45-2) was the first such facility at the Laboratory and was located near the current intersection of Canyon Road and Central Avenue in the Los Alamos townsite. The treatment plant began operation in 1951 and operated until 1961. The capacity of the plant was originally 90 gal./min but was expanded to 145 gal./min in 1957. The treatment plant included neutralization and storage tanks, flocculation tanks, sedimentation basins, vacuum filters, and granular media filters. Effluent from the plant discharged to Acid Canyon through outfalls located near the canyon rim. One outfall was used to discharge treated wastewater and the other was connected to floor drains in building 45-2. Operation of the treatment plant ceased after the new RLW treatment facility was constructed at TA-50. D&D of SWMU 45-001 began in October 1966 and included demolition and removal of the treatment plant equipment, facilities, and waste lines and excavation of contaminated soil. In September 1967, the TA-45 property was transferred to Los Alamos County.

The 2007 and 2010 Consent Order investigations of inorganic and organic chemical contamination at SWMU 45-001 were conducted jointly with SWMUs 45-002, 45-003, and 45-004 and AOC C-45-001 as Consolidated Unit 45-001-00. NMED issued a COC without controls for SWMU 45-001 in February 2013.

SWMU 45-002 was a vehicle decontamination facility located adjacent to the TA-45 WWTP, which received radioactive liquid waste from TA-01 and TA-3. TA-45 began operations in 1951 and underwent D&D in 1966 and 1967.

SWMU 45-002 consists of a former vehicle decontamination facility (former building 45-1) used to remove radioactive contamination from vehicles and large equipment, including filters from the Sigma Building, trash dumpsters, and wing tanks from airplanes. SWMU 45-002 was located approximately 40 ft south of the TA-45 RLW treatment plant (SWMU 45-001). Vehicles and other



equipment were decontaminated by steam cleaning. Decontamination wastewater was initially discharged to Acid Canyon and later routed to the RLW treatment plant. The decontamination facility began operation in 1952 and was operated approximately once per month. The facility was decommissioned in 1966. Potential contaminants associated with industrial materials historically managed at this Site are metals and radionuclides. The outfall areas from Sites 01-002(b)-00, 45-001, 45-002, and 45-004 overlap and COPCs are commingled.

SWMU 45-002 received a COC without controls under the Consent Order in February 2013.

SWMU 45-004 consists of a former sanitary sewer outfall. This outfall was associated with the sanitary sewer system that was constructed at TA-45 in 1947 to serve the Los Alamos townsite. This sewer system included a sanitary sewer lift station (structure 45-3) and sanitary sewer manholes (structures 45-5 and 45-6). The outfall was located to the north of the lift station, approximately 100 ft north of the TA-45 treatment plant (SWMU 45-001) and was used for emergency discharge of overflow. The outfall discharged into a drainage channel leading into Acid Canyon. The sanitary sewer system was transferred to Los Alamos County in 1967.

Consent Order investigations are complete for SWMU 45-004; the Site meets residential risk levels. NMED issued a COC without controls for SWMU 45-004 in February 2013.

The project map (Figure 10-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## 10.2 Control Measures

Check dams are dissipating velocity from urban run-on. A berm in the northern area of the storage yard operated by Los Alamos County serves to control runoff from the area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 10-1).

**Table 10-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00202040018	Established Vegetation		X	X		B
P00203010004	Earthen Berm		X		X	CB
P00203060015	Straw Wattles	X			X	B
P00203060016	Straw Wattles	X			X	B
P00203060017	Straw Wattles	X			X	B
P00206010002	Rock Check Dam	X			X	CB
P00206010013	Rock Check Dam	X			X	CB

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

Enhanced controls installation and certification are being planned for the end of 2014 or early in 2015 as part of corrective action.

### 10.3 Storm Water Monitoring

SWMUs 01-002(b)-00, 45-001, 45-002, and 45-004 are monitored within ACID-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figures 10-2 and 10-3). Analytical results from this sample yielded three TAL exceedances:

- Aluminum concentration of 789 µg/L (MTAL is 750 µg/L),
- Gross-alpha activity of 40.5 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 80 ng/L (ATAL is 0.6 ng/L).

These exceedances were 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 discussion is organized by Site and analyte.

#### *SWMU 01-002(b)-00:*

- Aluminum—Aluminum was not detected above BV in shallow (0 to 3 ft bgs) the IA confirmation samples.
- Although PCBs were not known to have been associated with industrial materials historically discharged from this outfall, the results of sediment samples collected below the outfall indicate PCBs were likely present in wastes discharged from the outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IA samples collected within that portion of SWMU 01-002(b)-00 in the ACID-SMA-2.1 drainage area. Aroclor-1254 was detected in 15 of 18 shallow samples with a maximum concentration 5.5 times of the residential SSL. Aroclor-1260 was detected in 8 of 18 shallow samples with a maximum concentration 6.0% of the residential SSL.

Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

#### *SWMU 45-001:*

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1242, and Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha

radioactivity detected in the IP sample they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

**SWMU 45-002:**

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1242, and Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.



ACID-SMA-2, Rock Check Dam, P00206010013 (photo ID 10870-1)

**SWMU 45-004:**

- Aluminum is not known to have been associated with industrial materials managed at the Site. Aluminum was not detected above the soil, sediment, or tuff BVs in 33 shallow Consent Order and RFI samples.
- PCBs are not known to have been associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1242, and Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 2 of 31 shallow samples with a maximum concentration 0.9% of the residential SSL. Aroclor-1254 was detected in 13 of 31 shallow samples with a maximum concentration 5.3% of the residential SSL. Aroclor-1260 was detected in 16 of 31 shallow samples with a maximum concentration 7.2% of the residential SSL.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Consent Order samples were not analyzed for gross alpha radioactivity or alpha-emitting radionuclides, but RFI samples were analyzed for several alpha-emitting radionuclides including isotopes of plutonium and uranium. These radionuclides are exempt from regulation under the CWA. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

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 10-2 and 10-3. 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 10-2 and 10-3.

Monitoring location ACID-SMA-2 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape 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. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Aluminum—The aluminum UTL from developed urban 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 2011 is between these 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 urban landscape is 32.5 pCi/L. The 2011 gross-alpha result is between these two values.
- PCBs—The PCB UTL from developed urban 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 result from 2011 is between these values.

These results indicate the concentrations of TAL exceedance constituents in the SMA samples are within the expected range, given the land use in the SMA drainage area.

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

#### 10.4 Inspections and Maintenance

RG055.5 recorded five storm events at ACID-SMA-2 during the 2013 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 10-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30486	2-4-2013
Annual Erosion Evaluation	COMP-30692	5-8-2013
Storm Rain Event	BMP-32778	6-20-2013
Storm Rain Event	BMP-33583	7-23-2013
Storm Rain Event	BMP-34566	8-12-2013
Storm Rain Event	BMP-35534	9-25-2013
Annual Erosion Evaluation	COMP-36631	11-19-2013



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

**Table 10-3 Maintenance during 2013**

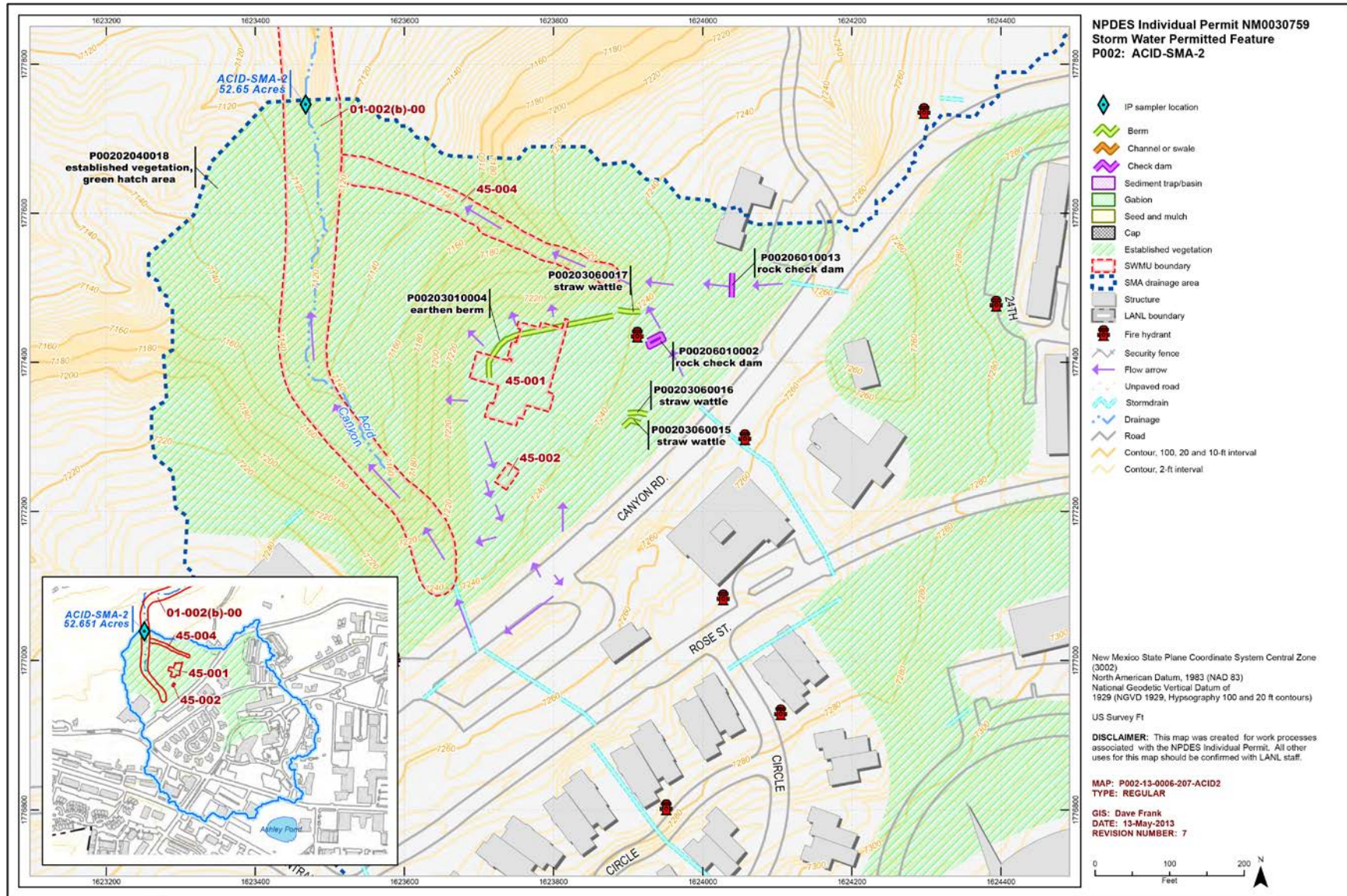
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-34048	Modify rock check dam P00206010002 by adding rock to build up and or extend.	8-1-2013	9 day(s)	Maintenance conducted in timely manner.
BNP-34092	Modify rock check dam P00206010013 by adding rock to build up and/or modify.	8-1-2013	9 day(s)	Maintenance conducted in timely manner.

**10.5 Compliance Status**

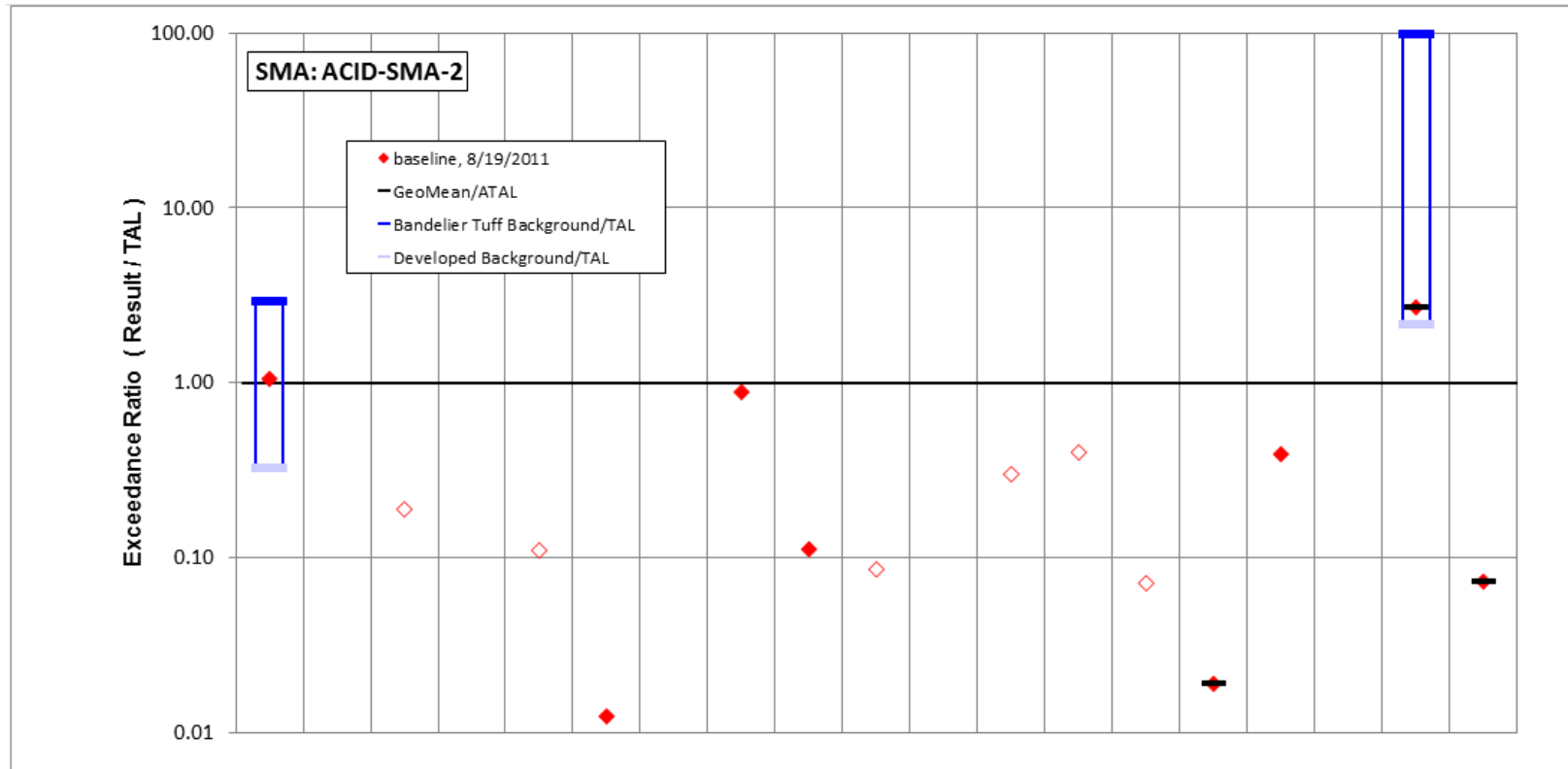
The Sites associated with ACID-SMA-2 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 10-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-002(b)-00	Corrective Action Initiated	Corrective Action Initiated	Initiated 11-03-2011
SWMU 45-001	Corrective Action Initiated	Corrective Action Complete	LANL, February 22, 2013, "Certificates of Completion, Four Solid Waste Management Units and One Area of Concern in the Pueblo Canyon Aggregate Area"
SWMU 45-002	Corrective Action Initiated	Corrective Action Complete	
SWMU 45-004	Corrective Action Initiated	Corrective Action Complete	



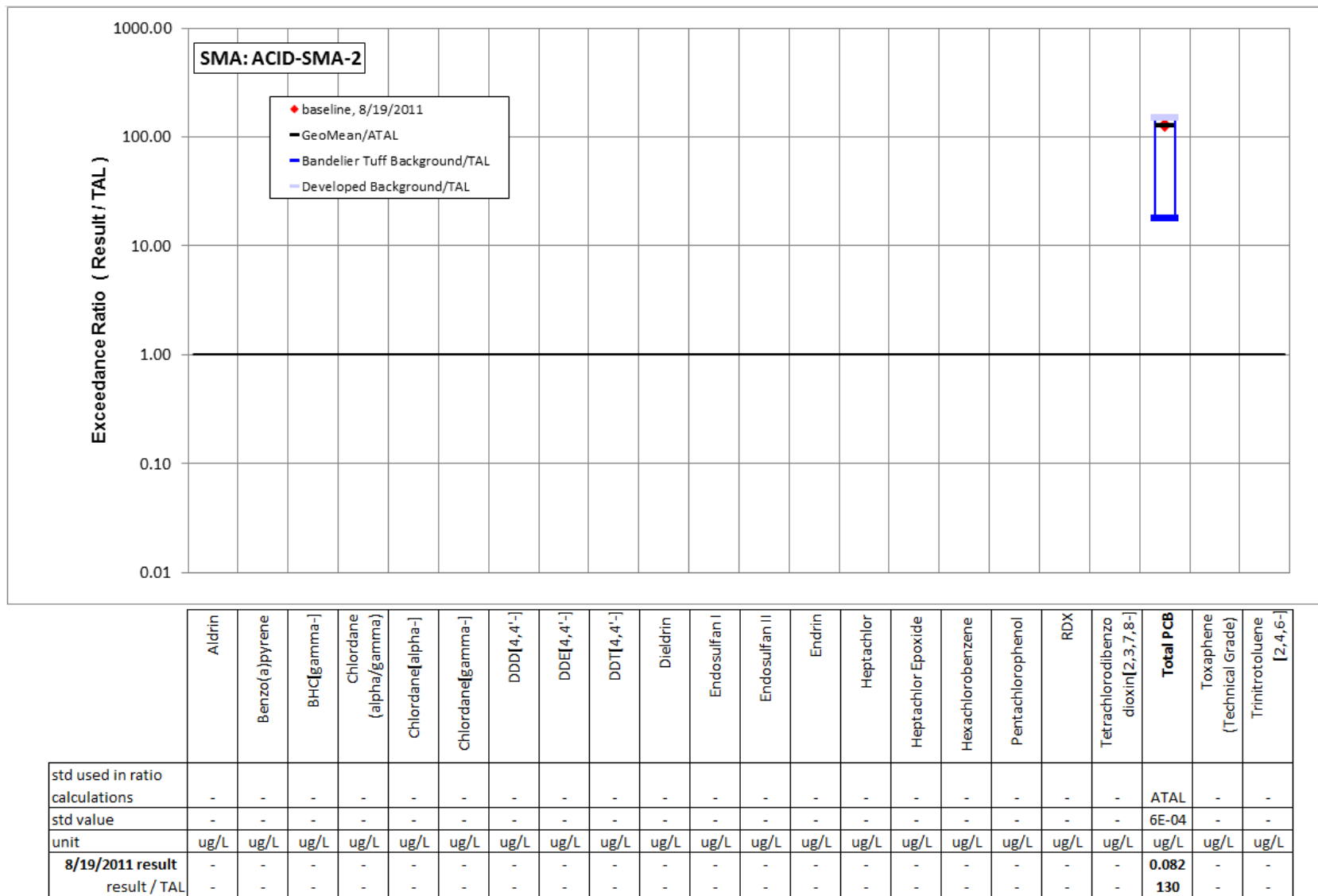
**Figure 10-1 ACID-SMA-2 location map**



	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	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	-	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	-	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
8/19/2011 result	<b>789</b>	<i>1</i>	<i>1.7</i>	<i>15</i>	<i>0.11</i>	<i>2.6</i>	<i>1.6</i>	<i>3.8</i>	<i>1.9</i>	<i>0.066</i>	<i>1.2</i>	<i>1.5</i>	<i>0.2</i>	<i>0.45</i>	<i>1.9</i>	<i>16.4</i>	-	<b>40.5</b>	<i>2.19</i>
result / TAL	<b>1.1</b>	<i>0.002</i>	<i>0.19</i>	<i>0.003</i>	<i>0.11</i>	<i>0.012</i>	<i>0.0016</i>	<i>0.88</i>	<i>0.11</i>	<i>0.086</i>	<i>0.0071</i>	<i>0.3</i>	<i>0.4</i>	<i>0.071</i>	<i>0.019</i>	<i>0.39</i>	-	<b>2.7</b>	<i>0.073</i>

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

Figure 10-2 Inorganic analytical results summary plot for ACID-SMA-2



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

Figure 10-3 Organic analytical results summary plot for ACID-SMA-2



## 11.0 ACID-SMA-2.01: AOC 00-030(f)

### 11.1 Site Descriptions

One historical industrial activity area is associated with P002A, ACID-SMA-2.01: Site 00-030(f).

AOC 00-030(f) consists of a former septic system that included two septic tanks located on private property south of Canyon Road and north of Rose Street, slightly northeast of the United Church school building. On a 1943 engineering drawing, the tanks are labeled “Septic Tank No. 2.” The system was tied to sewer lines in the “Apartment Area” and handled sanitary waste from a school, a post exchange, and some of the original Ranch School buildings but did not handle waste from former TA-01 operations. The septic system ceased operating when the central WWTP came online in 1947. Portions of the tanks were previously removed; however, remnants of the tank remain under a sidewalk and existing retaining wall; the outfall was not located until 2009.

Consent Order investigations are complete for AOC 00-030(f). NMED issued a COC without controls for AOC 00-030(f) in December 2008. However, since the outfall location was identified in 2009, NMED rescinded the COC pending sampling at the outfall, which was conducted in 2010. Revised risk-assessment results indicate that AOC 00-030(f) still meets residential risk levels. The Laboratory recommended corrective action complete without controls in the approved Phase II report.

The project map (Figure 11-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 11.2 Control Measures

There is the potential for run-on contributions from the adjacent developed and paved areas at this SMA. Existing controls are in place to divert run-on around the SMA. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 11-1).

**Table 11-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P002A02040007	Established Vegetation		X	X		B
P002A03010004	Earthen Berm	X			X	CB
P002A03060006	Straw Wattles		X		X	B
P002A04060002	Rip Rap	X		X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 11.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at ACID-SMA-2.01. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

#### 11.4 Inspections and Maintenance

RG055.5 recorded five storm events at ACID-SMA-2.01 during the 2013 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 11-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30483	2-4-2013
Annual Erosion Evaluation	COMP-30693	5-8-2013
Storm Rain Event	BMP-32775	6-18-2013
Storm Rain Event	BMP-33580	7-23-2013
Storm Rain Event	BMP-34563	8-12-2013
Storm Rain Event	BMP-35531	9-25-2013
Annual Erosion Evaluation	COMP-36632	11-20-2013

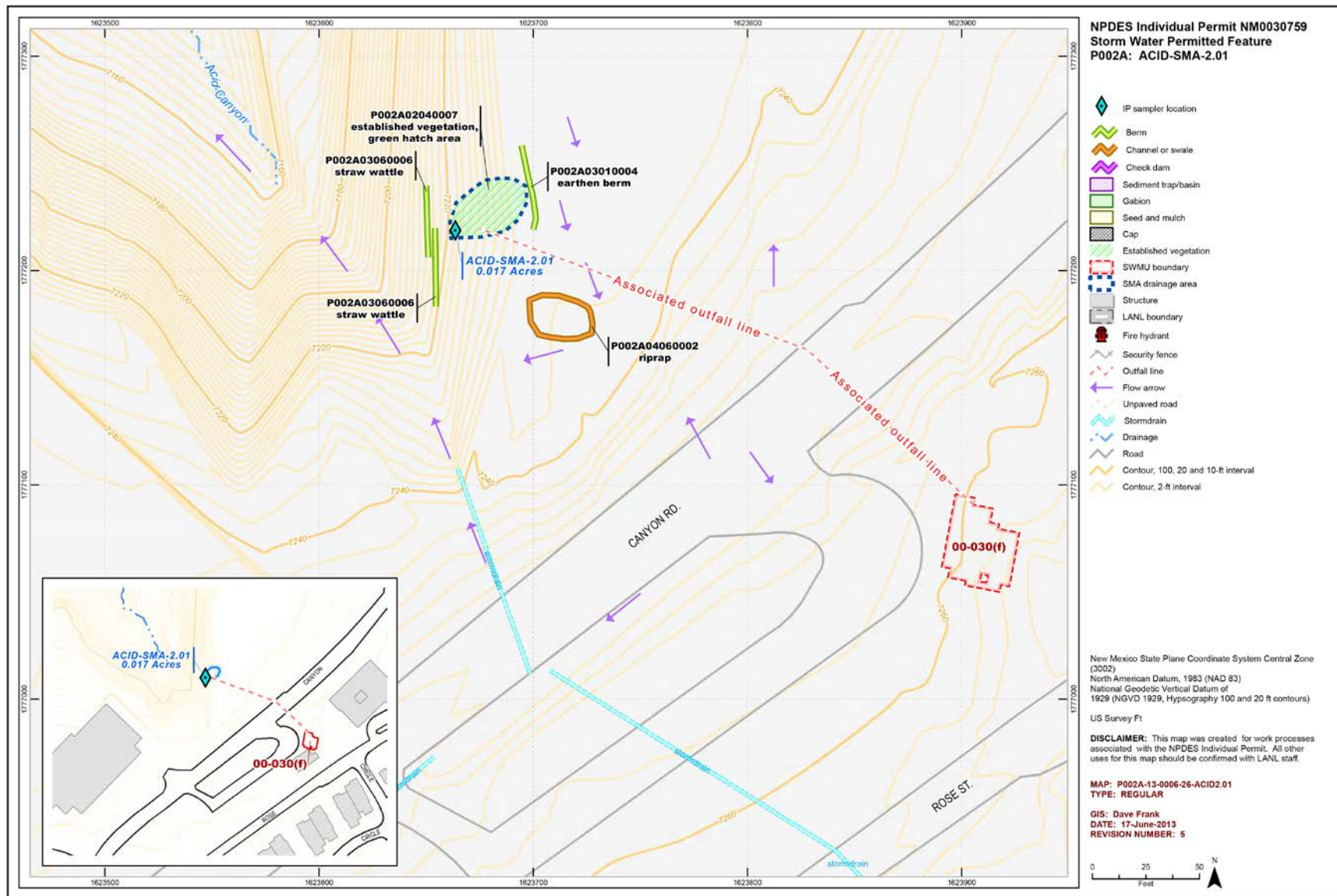
No maintenance activities were conducted at ACID-SMA-2.01 in 2013.

#### 11.5 Compliance Status

The Site associated with ACID-SMA-2.01 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 11-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 00-030(f)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



**Figure 11-1 ACID-SMA-2.01 location map**

## **12.0 ACID-SMA-2.1: SWMU 01-002(b)-00**

### **12.1 Site Descriptions**

One historical industrial activity area is associated with P003, ACID-SMA-2.1: Site 01-002(b)-00.

SWMU 01-002(b)-00 consists of a former industrial waste line outfall and its drainage into Acid Canyon. The outfall was located within the boundaries of former TA-45 at the head of a small branch of Acid Canyon known as the south fork of Acid Canyon. This outfall was used from 1943 to 1951 to discharge untreated RLW generated in laboratories and research facilities at former TA-01. Discharges of untreated RLW ceased when the TA-45 RLW treatment plant began operation in 1951. In 1966, the SWMU 01-002(b)-00 outlet pipe, associated weir box, tuff around the outfall, and tuff from the canyon wall below the outfall were removed. In September 1967, the TA-45 property was transferred to Los Alamos County.

SWMU 01-002(b)-00 was remediated during a 2001 IA. Although the focus of the IA was to remove plutonium-contaminated sediment, PCBs are collocated with plutonium; therefore, the IA also resulted in the removal of PCB-contaminated sediment. The entire drainage below the former outfall was remediated and sampled. Risk-assessment results indicated SWMU 01-002(b)-00 poses no unacceptable risk to recreational receptors and poses no risk to ecological receptors. Based on the results of the IA and the Los Alamos/Pueblo Canyon investigation, no additional characterization sampling for SWMU 01-002(b)-00 was required under the Consent Order Pueblo Canyon Aggregate Area investigation. SWMU 01-002(b)-00 is currently eligible for a COC with controls, limiting land use to recreational. A COC request has not been submitted because the Site is not owned by DOE and a mechanism for administering land use controls has to be agreed to by the property owner, Los Alamos County.

The project map (Figure 12-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **12.2 Control Measures**

There is potential for significant run-on to this SMA from urban areas within and around the Site. Run-on could originate on paved roads, parking areas, and roof top drains that are located primarily in the southern portion of the SMA. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 12-1).



**Table 12-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00302030012	Permanent Vegetation Vegetative Buffer Strip		X	X	X	CB
P00302040019	Established Vegetation		X	X		B
P00303010002	Earthen Berm	X			X	CB
P00303010009	Earthen Berm	X			X	CB
P00303060016	Straw Wattles	X			X	B
P00303060017	Straw Wattles	X			X	B
P00303060018	Straw Wattles	X			X	B
P00304060011	Rip Rap	X		X		CB
P00306010004	Rock Check Dam	X			X	CB
P00306010015	Rock Check Dam	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls installation and certification are being planned for the end of 2014 or early in 2015 as part of corrective action.

### 12.3 Storm Water Monitoring

SWMU 01-002(b)-00 is monitored within ACID-SMA-2.1. Following the installation of baseline control measures, a baseline storm water sample was collected on August 3, 2012 (Figures 12-2 and 12-3).

Analytical results from this sample yielded two TAL exceedances:

- Gross-alpha activity of 24.8 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 20 ng/L (ATAL is 0.6 ng/L).

These exceedances were 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 discussion is organized by Site and analyte.

*SWMU 01-002(b)-00:*

- Although PCBs were not known to have been associated with industrial materials historically discharged from this outfall, the results of sediment samples collected below the outfall indicate PCBs were likely present in wastes discharged from the outfall. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IA samples collected within that portion of SWMU 01-002(b)-00 in the ACID-SMA-2.1 drainage area. Aroclor-1254 was detected in 15 of 18 shallow samples with a maximum concentration 5.5 times of the residential SSL. Aroclor-1260 was detected in 8 of 18 shallow samples with a maximum concentration 6.0% of the residential SSL.
- Americium-241 and plutonium and uranium isotopes are known to have been associated with industrial materials historically managed at this Site. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha

radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

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 12-2 and 12-3. 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 12-2 and 12-3.

Monitoring location ACID-SMA-2.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. 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 urban landscape is 32.5 pCi/L. The 2012 gross-alpha result is less than both of these two values.
- PCBs—The PCB UTL from developed urban 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 result from 2012 is between these values.

These results indicate the concentrations of TAL constituents in the SMA sample are within the expected range, given the land use in the SMA drainage area.

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

#### 12.4 Inspections and Maintenance

RG055.5 recorded five storm events at ACID-SMA-2.1 during the 2013 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 12-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30487	2-4-2013
Annual Erosion Evaluation	COMP-30694	5-8-2013
Storm Rain Event	BMP-32779	6-20-2013
Storm Rain Event	BMP-33584	7-23-2013
Storm Rain Event	BMP-34567	8-12-2013
Storm Rain Event	BMP-35535	9-25-2013
Annual Erosion Evaluation	COMP-36633	11-20-2013

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

**Table 12-3 Maintenance during 2013**

<b>Maintenance Reference</b>	<b>Maintenance Conducted</b>	<b>Maintenance Date</b>	<b>Response Time</b>	<b>Response Discussion</b>
BMP-34048	Modify rock check dam P00206010002 by adding rock to build up and or extend.	8-1-2013	9 day(s)	Maintenance conducted in timely manner.
BNP-34092	Modify rock check dam P00206010013 by adding rock to build up and/or modify.	8-1-2013	9 day(s)	Maintenance conducted in timely manner.

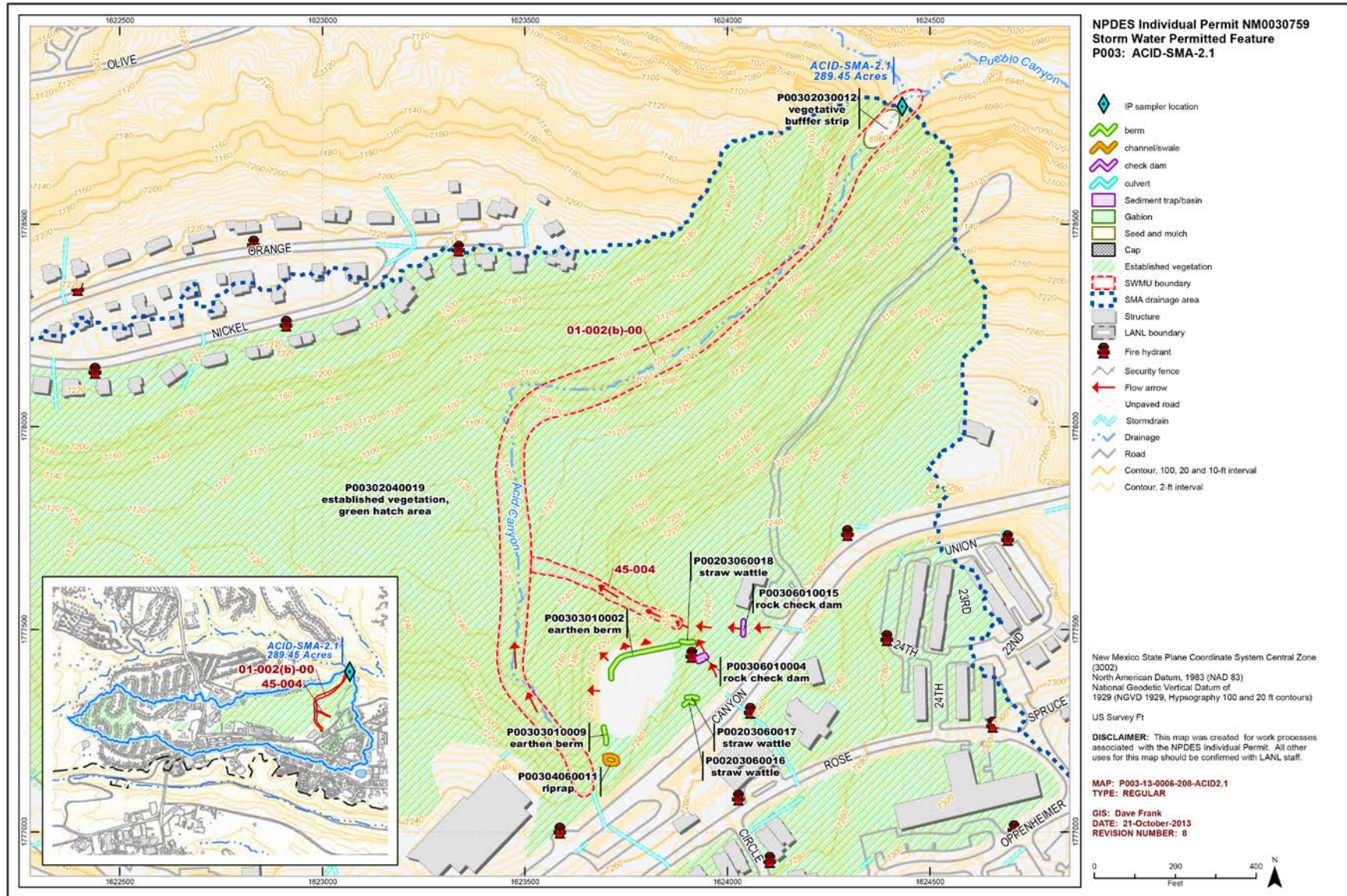
**12.5 Compliance Status**

The Sites associated with ACID-SMA-2.1 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 12-4 Compliance Status during 2013**

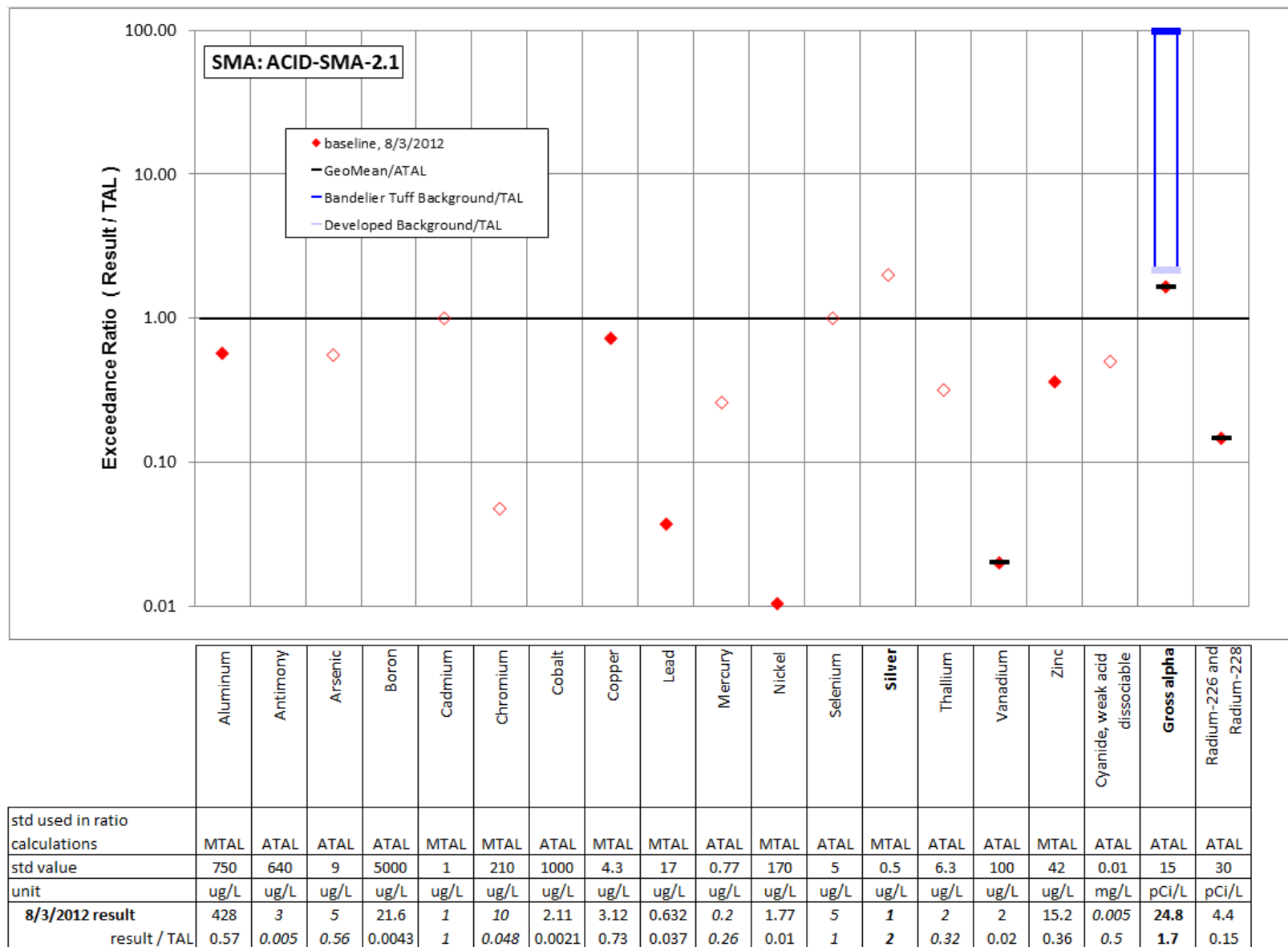
<b>Site</b>	<b>Compliance Status on Jan 1, 2013</b>	<b>Compliance Status on Dec 31, 2013</b>	<b>Comments</b>
SWMU 01-002(b)-00	Corrective Action Initiated	Corrective Action Initiated	Initiated 09-07-2012





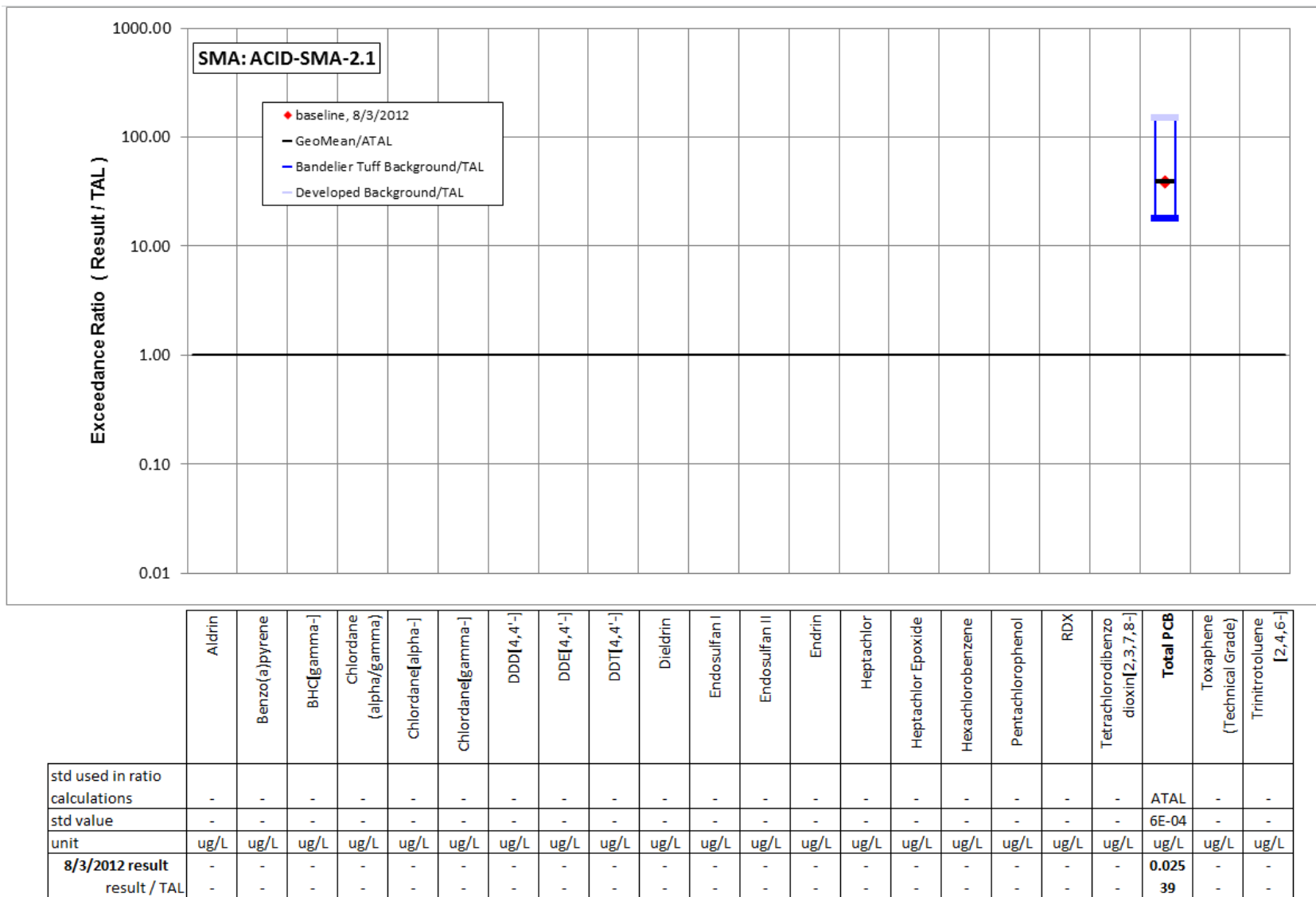
**Figure 12-1 ACID-SMA-2.1 location map**





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

**Figure 12-2 Inorganic analytical results summary plot for ACID-SMA-2.1**



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

Figure 12-3 Organic analytical results summary plot for ACID-SMA-2.1

## 13.0 P-SMA-0.3: AOC 00-018(b)

### 13.1 Site Descriptions

One historical industrial activity area is associated with P004, P-SMA-0.3: Site 00-018(b).

AOC 00-018(b) is the former Bayo Canyon WWTP that was located at the intersection of Pueblo and Bayo Canyons. It was owned and operated by Los Alamos County and began operating in 1963 and was upgraded in 1966. The plant treated the sanitary waste stream that previously was routed to the former central WWTP (SWMU 00-019) and sanitary waste from residences on Barranca Mesa. Most wastes treated at the plant were from businesses, eastern Los Alamos residences, and Barranca Mesa residences. After the Pueblo Canyon WWTP [SWMU 00-018(a)] was decommissioned in 1992, the remaining northern and western Los Alamos residential sanitary waste streams were routed to the Bayo Canyon WWTP. This plant was the primary supplier of effluent for irrigation at the Los Alamos golf course and recreational ball fields from 1992 until it was decommissioned in 2007. Mercury was historically used to seal and lubricate the hubs of trickling filters at the former WWTP. The Bayo WWTP was demolished by Los Alamos County in 2009 and 2010. Residual mercury was found to be present in the trickling filter seals during demolition.

The Consent Order investigation of AOC 00-018(b) is complete. The Site meets residential risk levels. NMED issued a COC without controls for AOC 00-018(b) in January 2011.

The project map (Figure 13-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 13.2 Control Measures

Most of the potential run-on to the Permitted Feature would originate on the undeveloped land surrounding the SMA. The run-on is controlled through the use of a culvert that diverts run-on away from the SMA. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 13-1).

**Table 13-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00402040008	Established Vegetation		X	X		B
P00403010002	Earthen Berm	X			X	CB
P00403010006	Earthen Berm		X		X	CB
P00404040003	Culvert	X		X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 13.3 Storm Water Monitoring

AOC 00-018(b) is monitored within P-SMA-0.3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 25, 2013 (Figure 13-2). On January 14, 2011, NMED

issued a COC for AOC 00-018(b). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at P-SMA-0.3. No further sampling is required for P-SMA-0.3 for the remainder of the IP.

### 13.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at P-SMA-0.3 during the 2013 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 13-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30813	5-7-2013
Storm Rain Event	BMP-34154	8-5-2013
Storm Rain Event	BMP-35517	9-26-2013
Annual Erosion Evaluation	COMP-36752	11-14-2013
Storm Rain Event	BMP-37122	11-18-2013

No maintenance activities were conducted at P-SMA-0.3 in 2013.

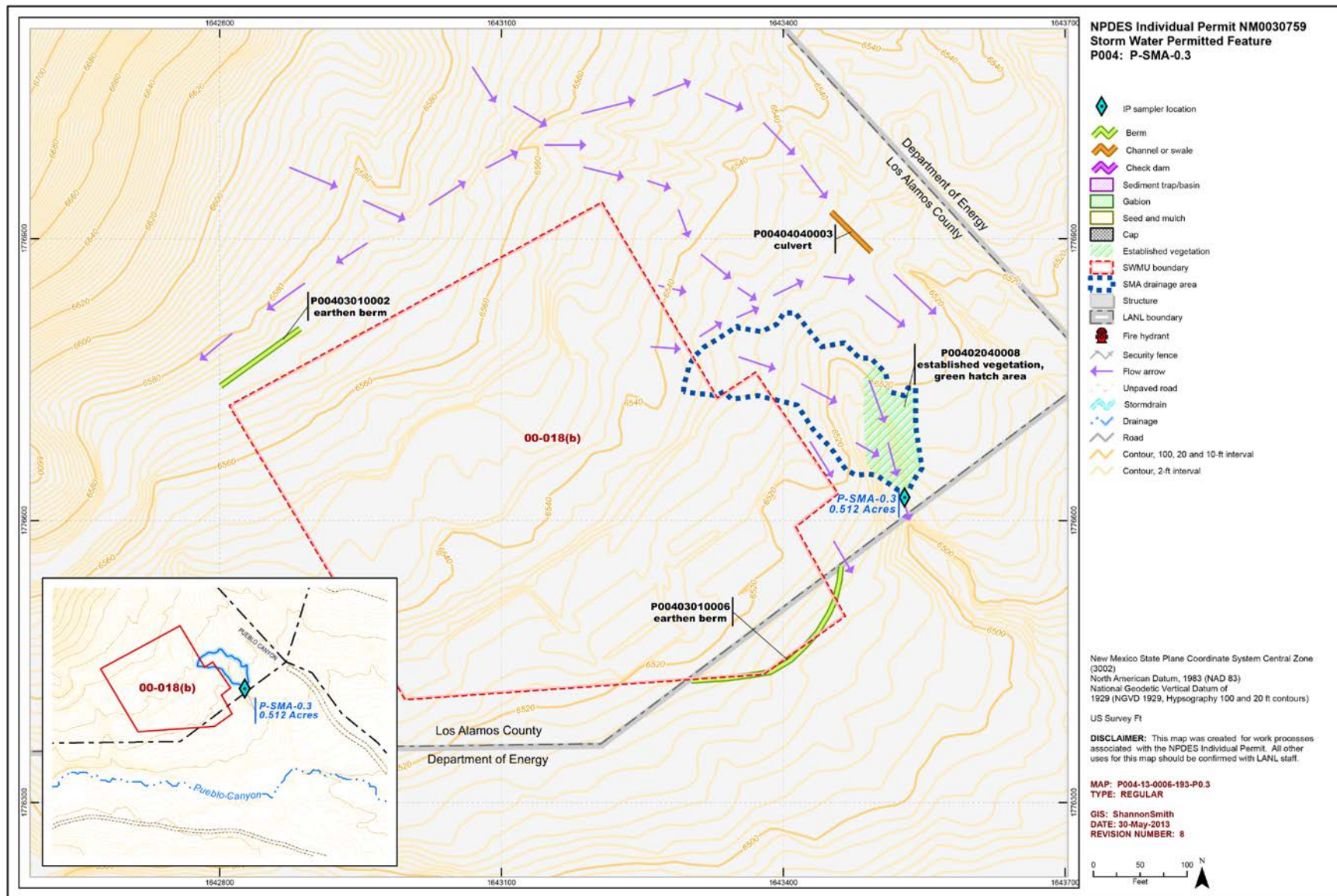
### 13.5 Compliance Status

The Site associated with P-SMA-0.3 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

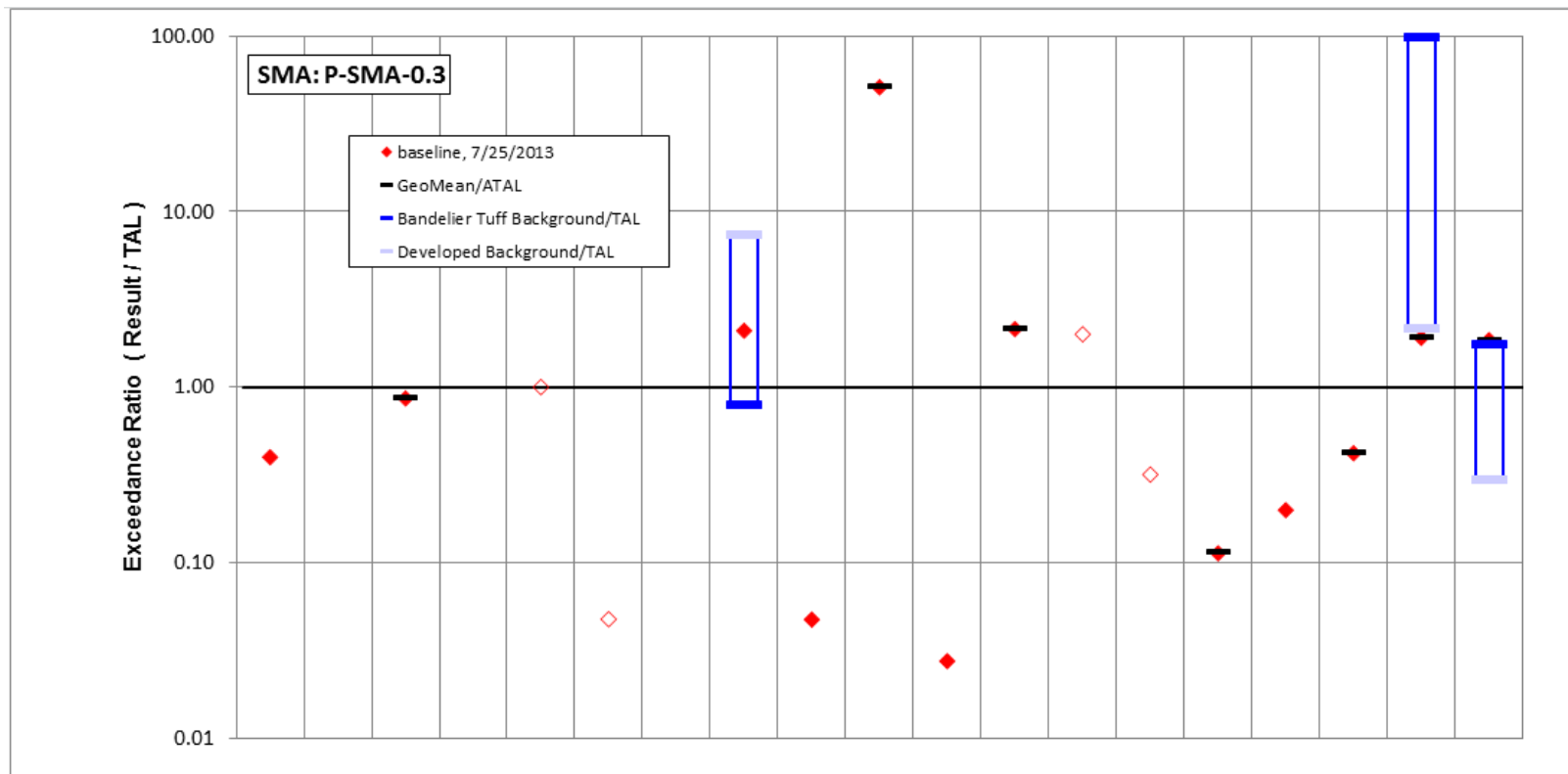
**Table 13-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 00-018(b)	Baseline Monitoring Extended	Corrective Action Complete	NMED, January 14, 2011, "Certificate of Completion Pueblo Canyon Aggregate Area of Concern (AOC) 00-018(b) Los Alamos National Laboratory"





**Figure 13-1 P-SMA-0.3 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	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
7/25/2013 result	299	3	7.76	41.7	1	10	5.35	<b>9.01</b>	0.805	<b>39.3</b>	4.67	<b>10.7</b>	1	2	11.3	8.36	0.0042	28.6	55.6
result / TAL	0.4	<i>0.005</i>	0.86	0.0083	1	<i>0.048</i>	0.0054	<b>2.1</b>	0.047	<b>51</b>	0.027	<b>2.1</b>	2	0.32	0.11	0.2	0.42	<b>1.9</b>	<b>1.9</b>

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

Figure 13-2 Inorganic analytical results summary plot for P-SMA-0.3

## **14.0 P-SMA-1: SWMUs 73-001(a) and 73-004(d)**

### **14.1 Site Descriptions**

Two historical industrial activity areas are associated with P005, P-SMA-1: Sites 73-001(a) and 73-004(d).

SWMU 73-001(a) is a former municipal landfill located at TA-73, north of the runway at the Los Alamos County Airport. Use of the landfill began in 1943, and wastes were disposed of in a natural hanging valley on the south rim of Pueblo Canyon. As more capacity was required, trenches were excavated into the tuff. A hot-mix asphalt batch plant operated in the vicinity of the landfill from the mid-1940s until 1954. Ash and burn residues from an incinerator (SWMU 73-002) were also deposited in the landfill. Los Alamos County operated the landfill from 1965 until it closed in 1973. Between 1984 and 1986, the western portion of the landfill was excavated and moved to the debris disposal pit [SWMU 73-001(d)] to allow for the construction of the hangars and tie-down areas at the airport. Clean fill was used to backfill the excavated area. During the 2003 IM conducted at SWMU 73-001(a), approximately 430 yd<sup>3</sup> of debris was removed from four drainages that extended into Pueblo Canyon north of the landfill. The final remedy was implemented at SWMU 73-001(a) in 2006 and 2007. Activities included regrading and compacting the main landfill surface and the north and east slopes, construction of five concrete hangar pads, construction of a MatCon asphalt cap, construction of a gas collection system beneath the MatCon surface, construction of a storm water collection system, installation of a retaining wall and a mechanically stabilized earth wall at the toe of the east slope, and installation of a low-permeability soil/geocomposite/vegetated soil cover on the upper east slope and the north slope.

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-001(a). The Site meets recreational risk levels. The long-term monitoring plan is being implemented; the landfill cover, MatCon surface, gas vents, and the vegetated slope are all inspected annually.

SWMU 73-004(d) is a former septic system, including a leach field, that was located east of the present Los Alamos County Airport terminal building at TA-73. Installed in the early 1970s, the septic system served the former landfill office and was located approximately 20 ft northeast of the building. A 4-in.-diameter VCP connected the building's toilet to the septic tank. The building and septic tank were removed as part of the decommissioning operation conducted in the early 1970s. The final remedy implemented at SWMU 73-001(a) (former landfill) in 2006 and 2007 included the former location of SWMU 73-004(d).

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-004(d). The Site meets recreations risk levels. The long-term monitoring plan being implemented for the SWMU 73-001(a) landfill includes the former location of the SWMU 73-004(d) septic system; the landfill cover, MatCon surface, gas vents, and the vegetated slope are all inspected annually.

The project map (Figure 14-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **14.2 Control Measures**

Minimal run-on is generated from the airport runway itself. The most significant run-on source is the culvert outlet that captures runoff (airport) from the five grated pad drains. Run-on to the SMA is generated from the paved areas, hanger roof tops, and pads associated with the airport. This run-on has the potential to erode the slope below the discharge point at the head of the primary drainage channel above the sampler. Vegetated buffer strips, riprap, and berms are used together to control this run-on

source. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 14-1).

**Table 14-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00501060020	Erosion Control Blanket			X		B
P00502040040	Established Vegetation		X	X		B
P00503010018	Earthen Berm		X		X	B
P00503010019	Earthen Berm		X		X	B
P00503060021	Straw Wattles		X		X	B
P00503060022	Straw Wattles		X		X	B
P00503060025	Straw Wattles		X		X	B
P00503060030	Straw Wattles		X		X	B
P00503060031	Straw Wattles		X		X	B
P00503060033	Straw Wattles		X		X	B
P00503060034	Straw Wattles		X		X	B
P00503060035	Straw Wattles		X		X	B
P00503060036	Straw Wattles		X		X	B
P00503060037	Straw Wattles		X		X	B
P00503060038	Straw Wattles		X		X	B
P00503060039	Straw Wattles		X		X	B
P00503080003	Retaining Wall		X		X	CB
P00503120017	Rock Berm		X		X	B
P00504020005	Concrete/Asphalt Channel/Swale		X	X		CB
P00504020009	Concrete/Asphalt Channel/Swale	X		X		CB
P00504040004	Culvert	X		X		CB
P00504040016	Culvert	X		X		CB
P00504060002	Rip Rap		X	X		CB
P00504060013	Rip Rap		X	X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 14.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at P-SMA-1. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 14.4 Inspections and Maintenance

RG038 recorded two storm events at P-SMA-1 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.



**Table 14-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30814	5-7-2013
Storm Rain Event	BMP-33574	7-17-2013
Storm Rain Event	BMP-35738	9-19-2013
Annual Erosion Evaluation	COMP-36753	12-6-2013

No maintenance activities were conducted at P-SMA-1 in 2013.

**14.5 Compliance Status**

The Sites associated with P-SMA-1 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is now 1 yr from the date of any observed TAL exceedance.

**Table 14-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 73-001(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 73-004(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

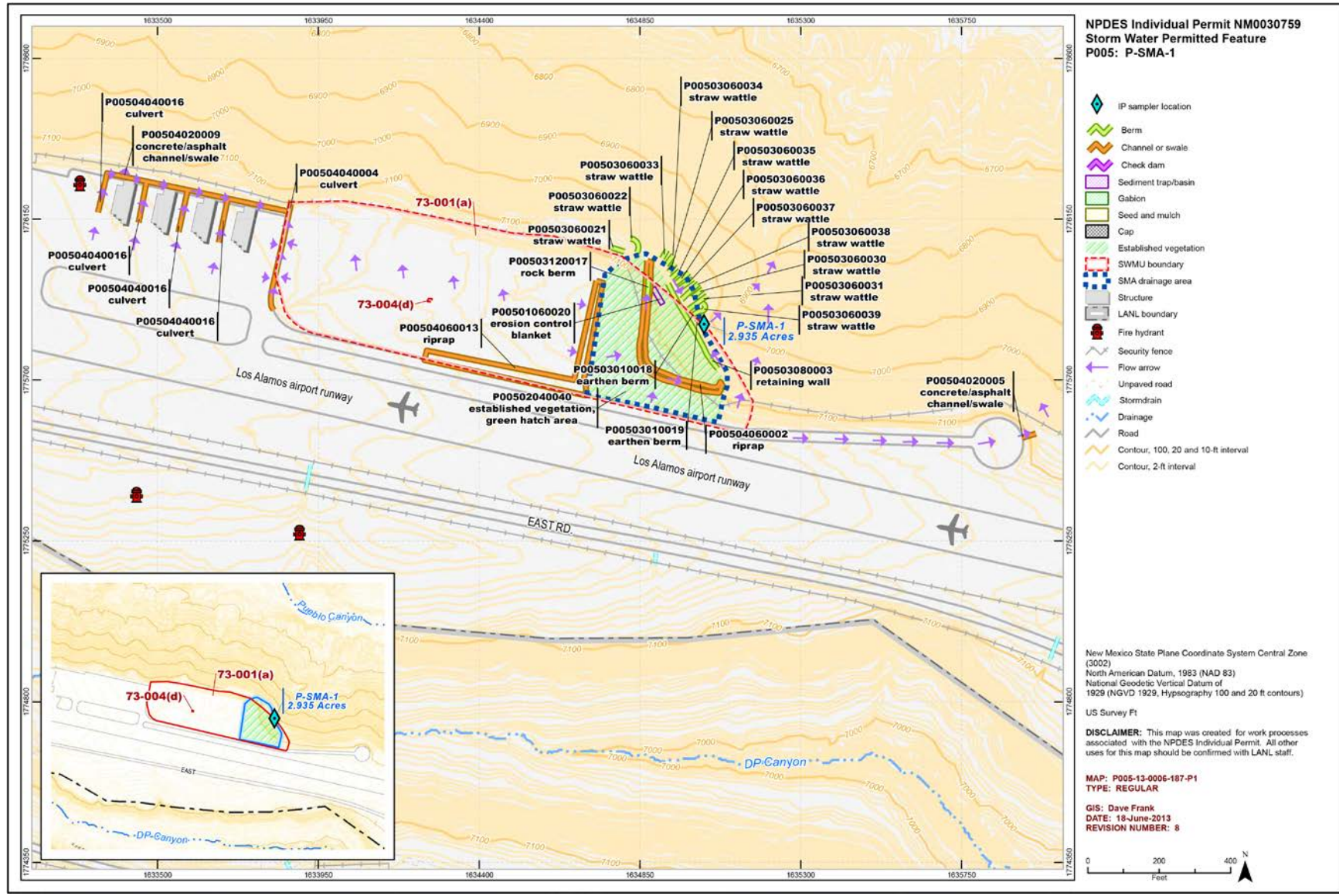


Figure 14-1 P-SMA-1 location map

## 15.0 P-SMA-2: SWMUs 73-002 and 73-006

### 15.1 Site Descriptions

Two historical industrial activity areas are associated with P006, P-SMA-2: Sites 73-002 and 73-006.

SWMU 73-002 consists of a former inactive incinerator that was located in building 73-2 and a former associated ash pile located at TA-73, west of the Los Alamos Airport terminal and on the south rim of Pueblo Canyon. The incinerator was housed in the two-story concrete building, 73-2, and a 6-ft-diameter stack was located on the north side of the building. The incinerator was originally used to destroy classified documents from the Laboratory; however, this practice was discontinued after a short period because combustion was incomplete. The incinerator was then used to burn municipal trash. Ash and debris were deposited over the edge of the mesa, which resulted in an ash pile that was approximately 150 ft wide by 160 ft long and up to 8 ft deep. Incinerator operations ceased in 1973, and the incinerator equipment and stack were removed. The ash pile and the associated incinerator debris were removed between 2005 and 2007. Building 73-2 remains in place.

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-002. Decision-level data indicate the nature and extent of contamination are defined, and risk-screening assessment results confirm SWMU 73-002 meets residential levels. NMED issued a COC with controls in August 2007.

SWMU 73-006 consists of two former cast-iron drainlines that discharged to Pueblo Canyon from the former incinerator building (structure 73-2), located west of the airport terminal building at TA-73. The west drainline originated from two floor drains within the west side of the building. The east drainline originated from drains located on the east side of the building. The drainlines discharged directly onto the ash pile (SWMU 73-002). The floor drains were plugged in 1973 when incinerator operations ceased. The west drainline was removed during the 1997 RFI; the east drainline could not be located.

RFI and Consent Order investigation and remediation activities are complete for SWMU 73-006. Decision-level data indicate the nature and extent of contamination are defined, and risk-screening assessment results confirm SWMU 73-006 meets residential levels. NMED issued a COC with controls in August 2007.

The project map (Figure 15-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 15.2 Control Measures

Control measures at Permitted Feature P006 are primarily designed to divert run-on from the larger paved area south of the outfall onto hillsides to the east and western portion of the permitted area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 15-1).

**Table 15-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00602040011	Established Vegetation		X	X		B
P00603020009	Base Course Berm	X			X	CB
P00603020010	Base Course Berm	X			X	CB
P00603120008	Rock Berm		X		X	CB
P00604010001	Earthen Channel/Swale	X		X		CB
P00604020006	Concrete/Asphalt Channel/Swale	X		X		CB
P00604060002	Rip Rap	X		X		CB
P00604060003	Rip Rap	X		X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 15.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at P-SMA-2. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 15.4 Inspections and Maintenance

RG038 recorded two storm events at P-SMA-2 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 15-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30815	5-7-2013
Storm Rain Event	BMP-33575	7-17-2013
Storm Rain Event	BMP-35739	9-25-2013
Annual Erosion Evaluation	COMP-36754	11-15-2013

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

**Table 15-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-33878	Repair or modify base-course berm P00603020009 as necessary.	8-1-2013	15 day(s)	Maintenance conducted in timely manner.

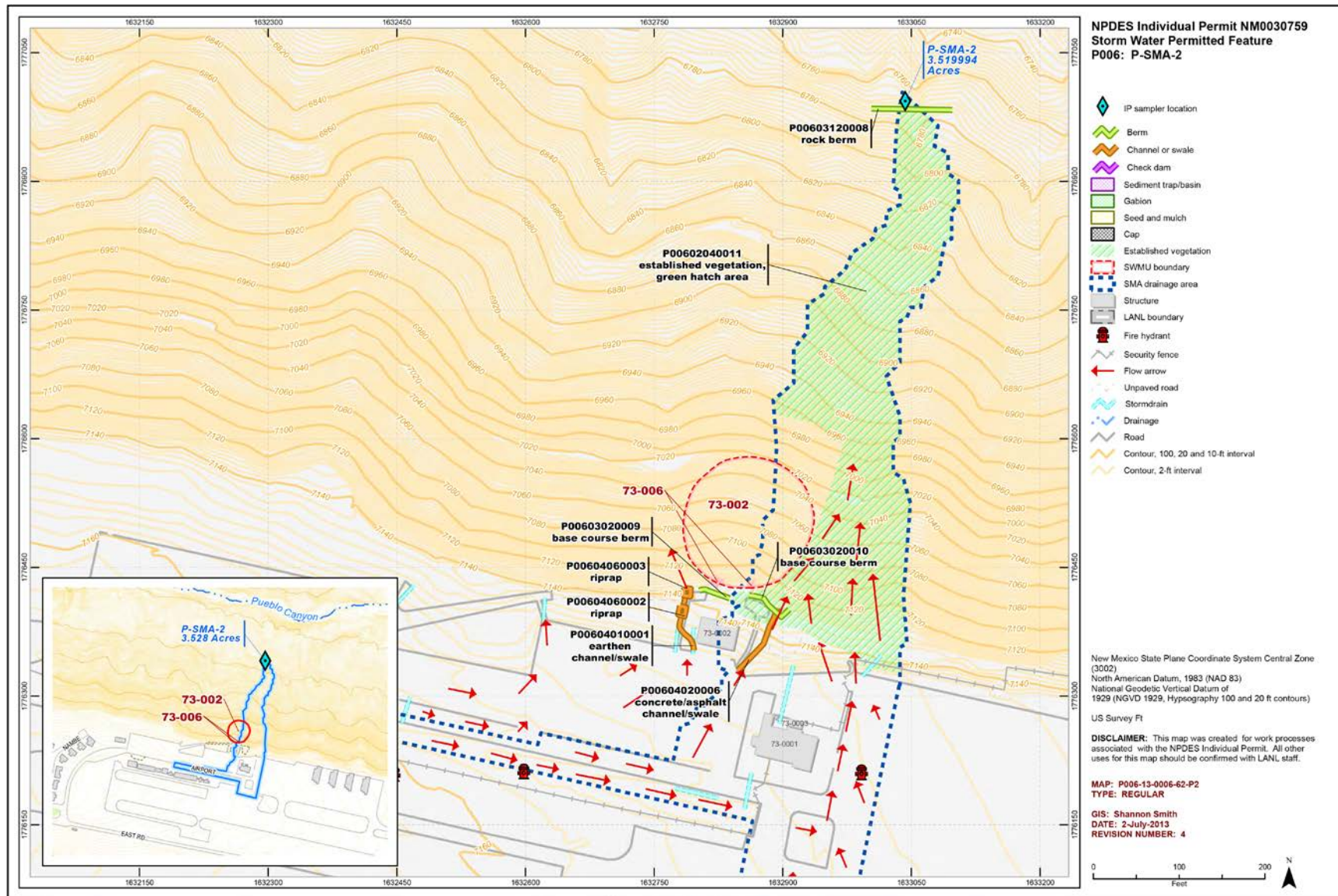


### 15.5 Compliance Status

The Sites associated with P-SMA-2 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 15-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 73-002	Baseline Monitoring Extended	Baseline Monitoring Extended	NMED, 2007, "Approval of the Consolidated Unit 73-002-99 and Corrective Action of Solid Waste Management Unit 73-002, at Technical Area 73"
SWMU 73-006	Baseline Monitoring Extended	Baseline Monitoring Extended	NMED, 2007, "Approval of the Consolidated Unit 73-002-99 and Corrective Action of Solid Waste Management Unit 73-002, at Technical Area 73"



**Figure 15-1 P-SMA-2 location map**

## 16.0 P-SMA-2.15: SWMU 31-001

### 16.1 Site Descriptions

One historical industrial activity area is associated with P007, P-SMA-2.15: Site 31-001.

SWMU 31-001 consists of a former septic system located in former TA-31. This septic system consisted of a septic tank (structure 00-7), two sanitary sewer manholes (structures 00-41 and 00-42), associated waste lines, and an outfall. The septic tank was constructed in 1949, operated until 1954, and was removed in 1988. The waste line was not encountered when the septic tank was removed in 1988. The contents of the septic tank were sampled when the tank was removed and was found to contain no hazardous materials. The septic system served former building 31-7, which was constructed in 1949 and served as the main warehouse at former TA-31. TA-31 served as the receiving area for all truck shipments to the Laboratory from 1945 to 1954. The septic tank (former structure 00-7) was constructed of reinforced concrete and was 4 × 3 ft and believed to be several feet in depth. This septic tank was located aboveground on a small bench above the rim of Pueblo Canyon, north of building 31-7; the outfall from the tank discharged into Pueblo Canyon. Former TA-31 was located in what is now the eastern residential area of Los Alamos, just west of the Los Alamos Airport. During the 1995 VCA conducted at SWMU 31-001, soil was excavated to the underlying tuff from an area approximately 2 ft upgradient of the outfall to 4 ft downgradient of the outfall, to depths ranging from 1 to 2 ft bgs.

Phase I and Phase II Consent Order sampling is complete for SWMU 31-001. SWMU 31-001 meets residential and recreational risk levels. A request for COC for SWMU 31-001 was submitted to NMED in October 2010.

The project map (Figure 16-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 16.2 Control Measures

Drainage from roads above is minimal because of the curbing and residential lawns. The two areas where the underground culvert daylight on the vegetated right of way are lined with rock and are not eroding. The culvert that daylight at the canyon edge discharges to a riprap apron that is currently functioning as intended. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 16-1).

**Table 16-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00702040007	Established Vegetation		X	X		B
P00704060003	Rip Rap	X		X		CB
P00704060006	Rip Rap		X	X		CB
P00706010004	Rock Check Dam	X			X	CB
P00706010005	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 16.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at P-SMA-2.15. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 16.4 Inspections and Maintenance

RG038 recorded two storm events at P-SMA-2.15 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 16-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30816	5-7-2013
Storm Rain Event	BMP-33576	7-18-2013
Storm Rain Event	BMP-35740	9-25-2013
Annual Erosion Evaluation	COMP-36755	11-15-2013

No maintenance activities were conducted at P-SMA-2.15 in 2013.

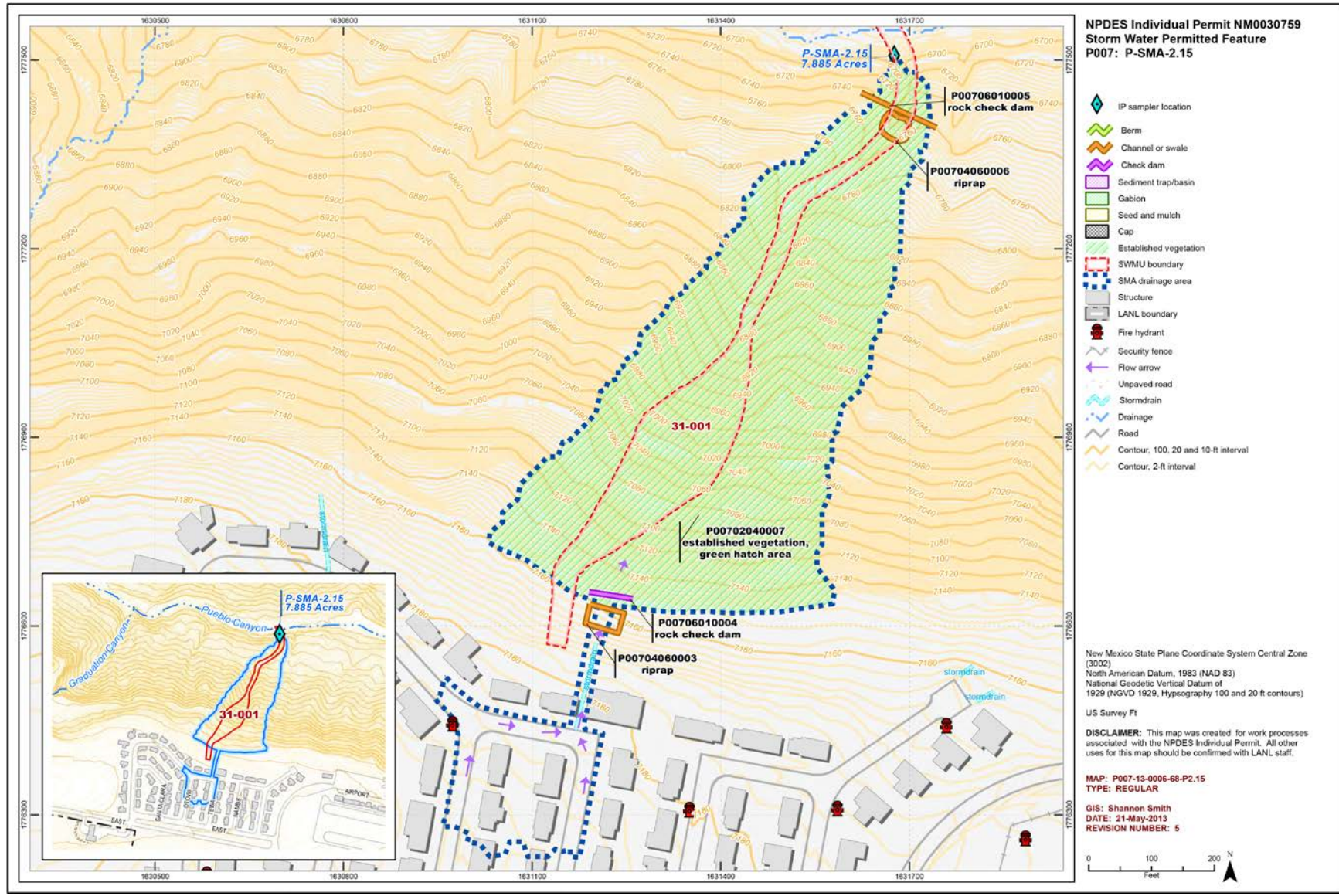
### 16.5 Compliance Status

The Site associated with P-SMA-2.15 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 16-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 31-001	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment





**Figure 16-1 P-SMA-2.15 location map**

## **17.0 P-SMA-2.2: SWMU 00-019**

### **17.1 Site Descriptions**

One historical industrial activity area is associated with P008, P-SMA-2.2: Site 00-019.

SWMU 00-019 is the former CWWTP, which was first installed to replace a series of septic tanks serving original Laboratory facilities and some residential areas of the Los Alamos townsite. The Laboratory operated the CWWTP from 1947 to 1961. The Site is located in the eastern part of the Los Alamos townsite at the current location of the Sombrillo assisted-living facility, at the north edge of Townsite Mesa above Graduation Canyon, a hanging tributary canyon of Pueblo Canyon. Former CWWTP components included a primary settling tank, sludge digestion tank, final settling tank, trickling filter, chlorine contact tank, clarifier, pump house, two sludge drying beds, two outfall areas, manholes, and associated underground piping. CWWTP operations were confined to the mesa top; however, two outfalls from the CWWTP discharged onto the canyon slope above Graduation Canyon.

The plant was decommissioned in 1961. In 1967, the Site was transferred intact, but out of service, to County ownership. Although the County never operated the plant as a wastewater treatment plant, the Site was used for various activities, and over time the County removed portions of the treatment plant structures. The County used the mesa-top portion of the Site for various maintenance-related activities, primarily to house the Roads and Grounds Headquarters and a storage area. As a result, the mesa top was heavily reworked by the County over more than 30 yr of ownership. During the VCA conducted by the Laboratory in 1999 and 2000, remaining process pipelines were removed, along with the pump house and asbestos in the pump house. During the VCA, it was discovered process structures (the primary settling tank, sludge digestion tank, trickling filter, final settling tank, and chlorine contact tank) remained in place. Preliminary investigation indicates that each of the tanks was emptied, then completely or partially collapsed, filled, and buried with soil of unknown origin by the County. Construction of a senior citizen assisted-living facility was completed in 2004 over the Site.

Consent Order sampling has not been conducted at SWMU 00-019. Decision-level data from the 1999–2000 VCA indicate the Site meets residential risk levels for the mesa-top portion of the Site and recreational risk levels for the hillside portion. The VCA report recommended NFA for SWMU 00-019 and was approved by NMED in May 2002. Recently, NMED required additional investigations to characterize potential historical releases to Graduation Canyon, including potential releases from SWMU 00-019. Storm water and sediment sampling results from the drainage downgradient of SWMU 00-019 have been reported to NMED; detected constituent concentrations were all below residential SSLs and SALs. A request for a COC without controls will be submitted to NMED in 2014.

The project map (Figure 17-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **17.2 Control Measures**

Run-on contributions to this SMA are from roof drains on the north side of the Sombrillo facility, paved areas to the channel east of the center, and paved run-on to the access road north of Sombrillo. Most of the discharge is captured along the road to Graduation Canyon north of Sombrillo and on the bench below the channel east of Sombrillo. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 17-1).

**Table 17-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00802040025	Established Vegetation		X	X		B
P00803020012	Base Course Berm	X			X	CB
P00803060026	Straw Wattles	X			X	B
P00804020005	Concrete/Asphalt Channel/Swale		X	X		CB
P00804060001	Rip Rap	X		X		CB
P00804060006	Rip Rap		X	X		CB
P00804080017	TRM-Lined Swale	X		X		CB
P00806010018	Rock Check Dam	X			X	CB
P00806010019	Rock Check Dam	X			X	CB
P00806010020	Rock Check Dam	X			X	CB
P00806010021	Rock Check Dam	X			X	CB
P00806010022	Rock Check Dam	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 17.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at P-SMA-2.2. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

The P-SMA-2.2 monitoring station was relocated. The new location of the sampler is positioned to provide a more representative sample of storm water discharge from the SMA. Sampler coordinates and SMA drainage area are updated in Attachment 4.

### 17.4 Inspections and Maintenance

RG038 recorded two storm events at P-SMA-2.2 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 17-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30817	5-7-2013
Construction	COMP-32568	6-6-2013
Construction	COMP-32692	6-12-2013
Construction	COMP-32147	6-20-2013
Construction	COMP-32176	7-1-2013
Construction	COMP-33488	7-12-2013
Construction	COMP-33879	7-19-2013
Storm Rain Event	BMP-33577	7-23-2013
Construction	COMP-34030	7-25-2013
Storm Rain Event	BMP-35741	9-26-2013
Annual Erosion Evaluation	COMP-36756	11-21-2013

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

**Table 17-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-34033	Install straw wattle(s) to the west of existing base course berm - P00803020012 to divert channel run on back into the existing channel. Remove brush from channel.	7/31/2013	6 day (s)	Maintenance conducted in timely manner.
BMP-34085	Add rock to rip rap -P00804010001 as necessary for overflow protection.	8/1/2013	9 day (s)	Maintenance conducted in timely manner.

### 17.5 Compliance Status

The Site associated with P-SMA-2.2 is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is now 1 yr from the date of any observed TAL exceedance.

**Table 17-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-019	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



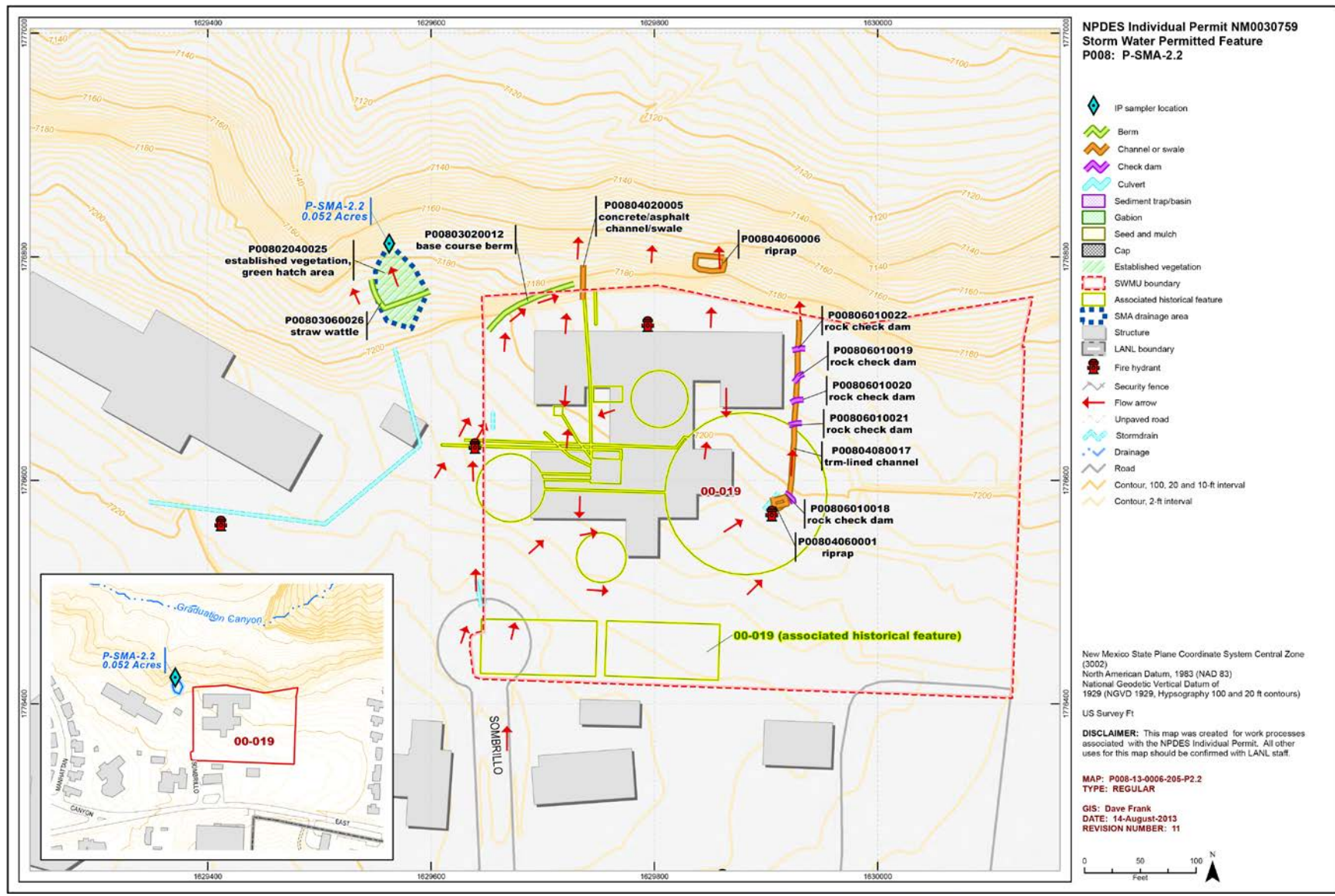


Figure 17-1 P-SMA-2.2 location map

## **18.0 P-SMA-3.05: SWMU 00-018(a)**

### **18.1 Site Descriptions**

One historical industrial activity area is associated with P009, P-SMA-3.05: Site 00-018(a).

SWMU 00-018(a) consists of the decommissioned Pueblo Canyon WWTP, located at the end of Olive Street in Pueblo Canyon on Los Alamos County property. The plant, which was built between 1946 and 1948, began operating in 1951 and received waste from HRL at TA-43 until 1983 and from Los Alamos business and residential customers until 1991. From 1983 to 1991, the plant received only sanitary waste from Los Alamos businesses and residences. The plant was the primary supplier of irrigation for the Los Alamos golf course and recreational ball fields. From 1953 to 1983, this WWTP received laboratory waste (less than 10 L/mo) from the HRL at TA-43, the only known laboratory contributor to the waste stream at the plant. The HRL generated chemical and radioactive wastes, but Laboratory policy required that radioactive wastes not be discharged to the drains. In the early 1960s, Los Alamos County assumed control and decommissioned it in 1992.

Formerly, Los Alamos County held a NPDES permit for the Pueblo Canyon WWTP. After the plant was decommissioned in 1992, sludge in the plant's digester was transferred to sludge drying beds. In 1996, Los Alamos County removed the dried sludge from the sludge drying beds in accordance with regulations applicable to publicly owned treatment works and New Mexico operation practices for WWTPs. The final D&D of the WWTP was completed in 2008. The Site is currently accessible to the public for recreational activities.

Consent Order Phase I and Phase II investigation sampling for SWMU 00-018(a) is complete. The Phase II investigation report recommended SWMU 00-018(a) for corrective action complete without controls. NMED approved the Phase II investigation report with modifications in December 2010. NMED required the Laboratory to evaluate the vapor-intrusion pathway to request a COC without controls. The Laboratory will perform the vapor-intrusion evaluation and will submit a request for COC without controls in 2014.

The project map (Figure 18-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **18.2 Control Measures**

Urban and natural drainage run-on is of concern at this Permitted Feature. The significant run-on is a result of channel flow and the culvert directing water to the SWMU. The only runoff discharge from the area is a result of the channel/culvert run-on. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 18-1).

**Table 18-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
P00901010011	Seed and Wood Mulch			X		B
P00902040012	Established Vegetation		X	X		B
P00903010008	Earthen Berm		X		X	CB
P00903010009	Earthen Berm		X		X	CB
P00903010010	Earthen Berm		X		X	B
P00903020007	Base Course Berm		X		X	CB
P00904050005	Water Bar	X		X		CB
P00904050006	Water Bar	X		X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 18.3 Storm Water Monitoring

SWMU 00-018(a) is monitored within P-SMA-3.05. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 18-2 and 18-3). Analytical results from this sample yielded two TAL exceedances:

- Copper concentrations of 5.2 µg/L (MTAL is 4.3 µg/L), and
- PCB concentration of 87 ng/L (ATAL is 0.6 ng/L).

These exceedances were 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 discussion is organized by Site and analyte.

#### *SWMU 00-018(a):*

- Copper is not known to be associated with industrial materials historically managed at the Site but is commonly present in sewage sludge at low concentrations. Copper was detected above soil, sediment, and tuff BVs in shallow (i.e., less than 3 ft bgs) Consent Order and RFI soil, sediment, and tuff samples. Copper was detected above BVs in 17 of 36 shallow samples with a maximum concentration 10 times the soil BV, which was detected in a sample of soil and dried sludge from a sludge fill area.
- PCBs are not known to be associated with industrial materials historically managed at the Site but are commonly present in sewage sludge at low concentrations. One PCB mixture (Aroclor-1242) was detected in 1 of 19 shallow samples below the EQL. PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in 13 to 19 shallow samples at maximum concentrations 20% and 10% of the residential SSLs, respectively.

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 18-2 and 18-3. 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 18-2 and 18-3.

Monitoring location P-SMA-3.05 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 urban 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.
- PCBs—The PCB UTL from developed urban 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 result from 2013 is between these values.

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

#### 18.4 Inspections and Maintenance

RG055.5 recorded five storm events at P-SMA-3.05 during the 2013 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 18-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Storm Rain Event	BMP-30482	2-4-2013
Annual Erosion Evaluation	COMP-30818	5-7-2013
Storm Rain Event	BMP-32773	6-18-2013
Storm Rain Event	BMP-33578	7-24-2013
Storm Rain Event	BMP-34561	8-12-2013
Storm Rain Event	BMP-35529	9-26-2013
Annual Erosion Evaluation	COMP-36757	11-22-2013
TAL Exceedance	COMP-36886	11-22-2013

No maintenance activities were conducted at P-SMA-3.05 in 2013.

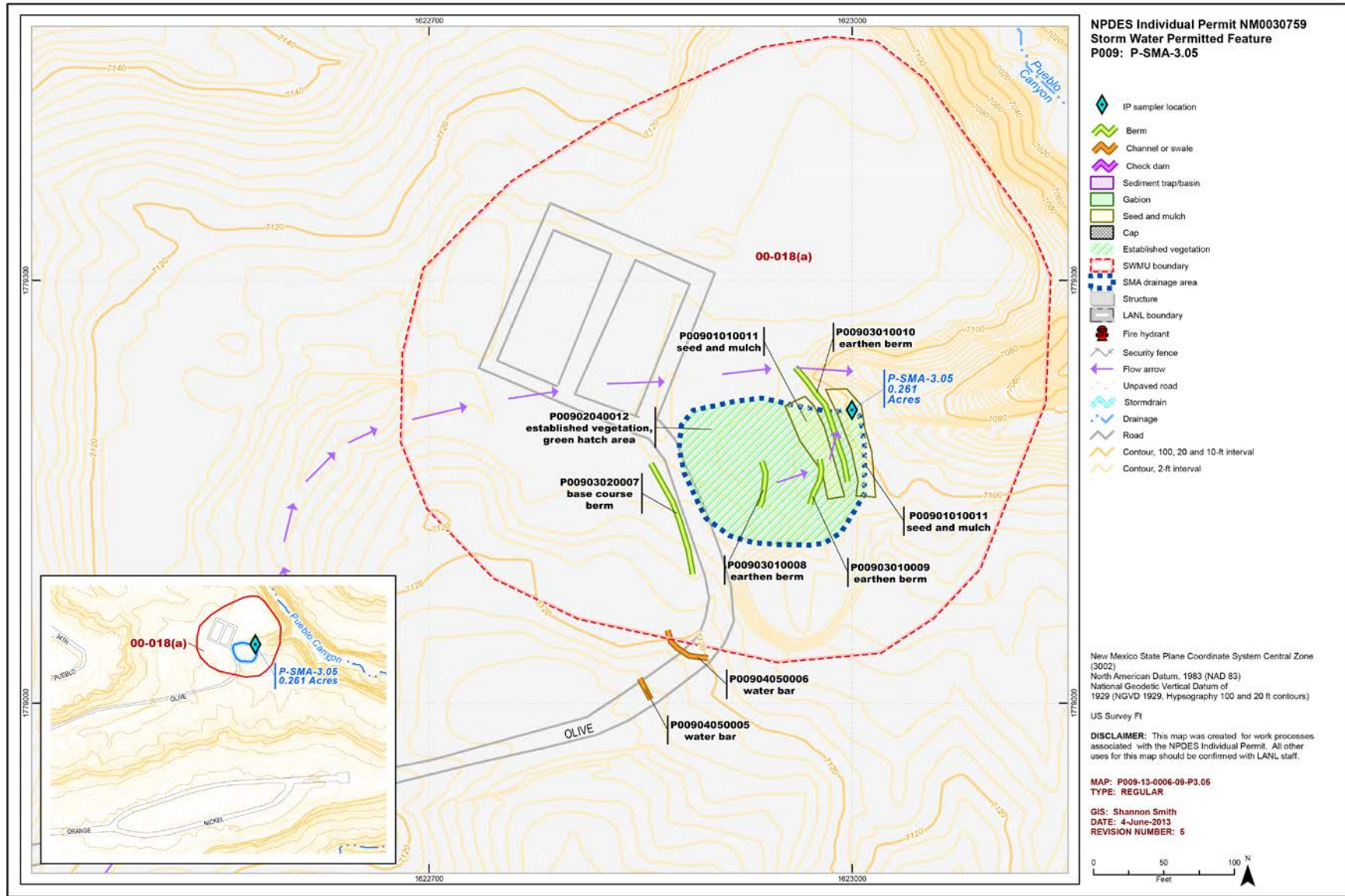
#### 18.5 Compliance Status

The Site associated with P-SMA-3.05 is a High Priority Site. The High Priority Site deadline for the certification of corrective action is now 1 yr from the date of an observed TAL exceedance, which for P-SMA-3.05 is October 21, 2014.

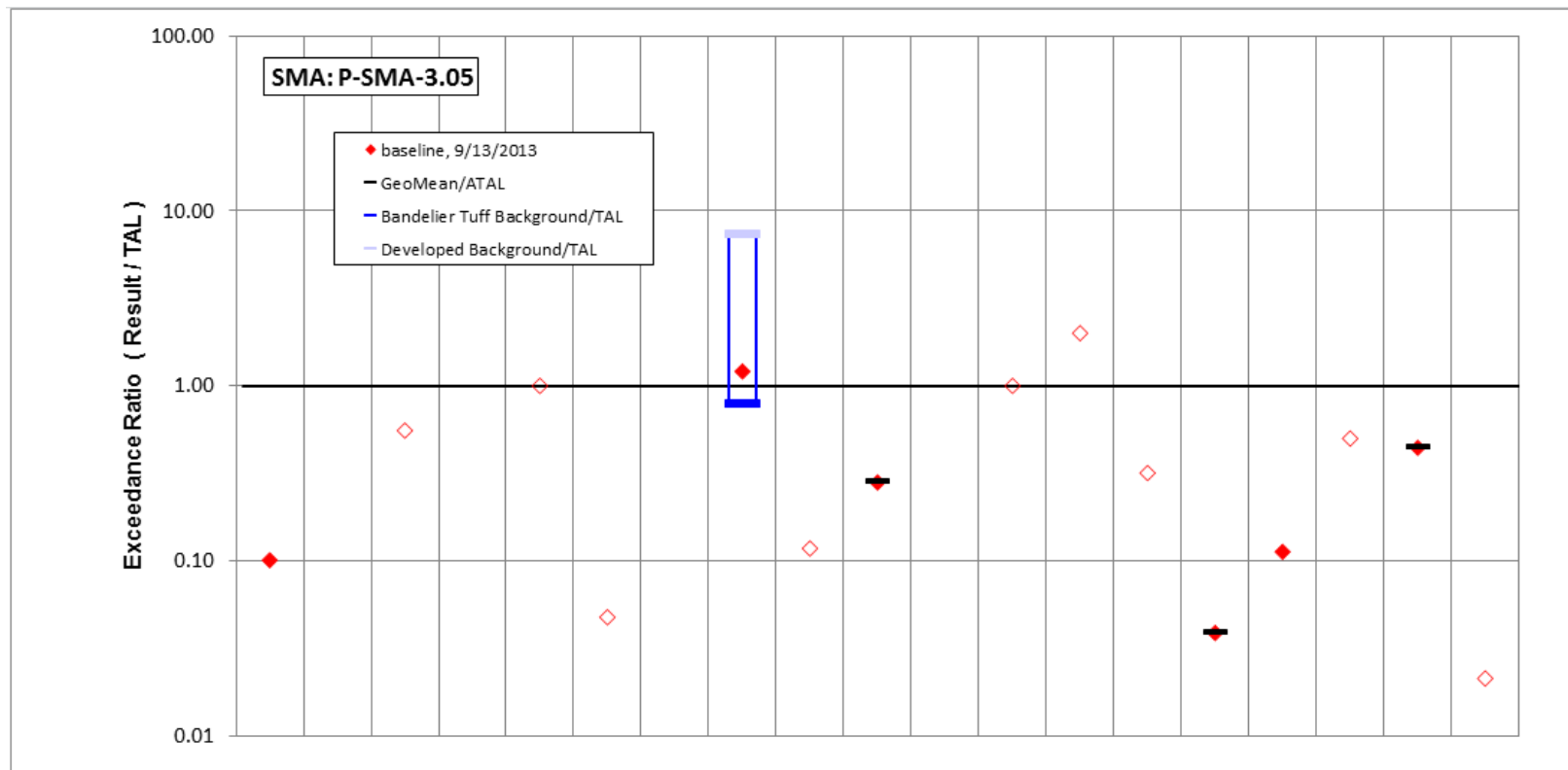
**Table 18-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-018(a)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-22-2013





**Figure 18-1 P-SMA-3.05 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	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>9/13/2013 result</b>	75.6	3	5	18.1	1	10	2.87	5.2	2	0.216	0.914	5	1	2	3.87	4.73	0.005	6.64	0.638
result / TAL	0.1	0.005	0.56	0.0036	1	0.048	0.0029	1.2	0.12	0.28	0.0054	1	2	0.32	0.039	0.11	0.5	0.44	0.021

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

Figure 18-2 Inorganic analytical results summary plot for P-SMA-3.05

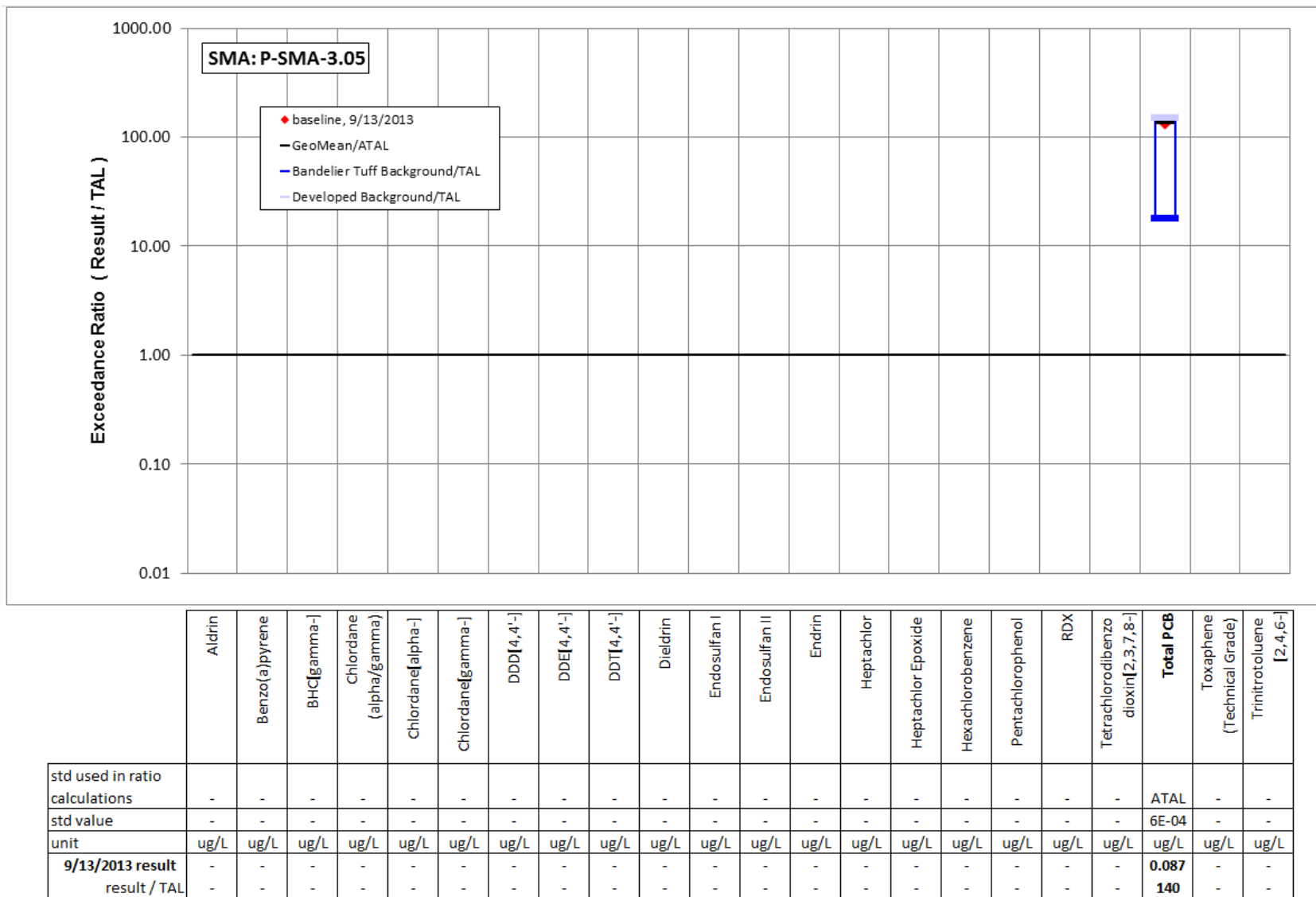


Figure 18-3 Organic analytical results summary plot for P-SMA-3.05

## 19.0 LA-SMA-0.85: SWMU 03-055(c)

### 19.1 Site Descriptions

One historical industrial activity area is associated with L001, LA-SMA-0.85: Site 03-055(c).

SWMU 03-055(c) is an outfall located northeast of the fire station (building 03-41). SWMU 03-055(c) channels storm water toward Los Alamos Canyon through a galvanized CMP. Previously, the storm drain was connected to the building 03-41 (fire station) floor drains until 1991 but currently collects and channels only storm water runoff from parking lots and paved roadways located in the northern portion of TA-03. In 1992, the storm water drainage channel into which the outfall flows was sampled by EM-8 as part of a reconnaissance survey associated with the construction of the Industrial Partnership Center at TA-03. The Site is currently an undeveloped wooded area on DOE property. Phase I and Phase II Consent Order investigation sampling are complete. SWMU 03-055(c) is expected to be eligible for a COC after submittal and approval of the Phase II investigation report.

The project map (Figure 19-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 19.2 Control Measures

The curb along the northern portion of the parking area prevents parking lot run-on to the SMA. The channel banks are elevated, thus preventing run-on from the east and west. Existing culverts are the primary run-on source. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 19-1).

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

**Table 19-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00102040009	Established Vegetation		X	X		B
L00103010008	Earthen Berm		X		X	EC
L00103090006	Curbing	X			X	CB
L00107010004	Gabions		X		X	CB

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

### 19.3 Storm Water Monitoring

SWMU 03-055(c) is monitored within LA-SMA-0.85. Following the installation of baseline control measures, two baseline storm water samples were collected on July 30, 2011, and August 14, 2011 (Figure 19-2). Analytical results from these samples yielded four TAL exceedances:

- Aluminum concentrations of 1310 µg/L and 4170 µg/L (MTAL is 750 µg/L),
- Copper concentrations of 18.9 µg/L and 47.1 µg/L (MTAL is 4.3 µg/L),



- Lead concentration of 17.7 µg/L (MTAL is 17 µg/L), and
- Zinc concentrations of 55.7 µg/L and 186 µg/L (MTAL is 42 µg/L).

Following the installation of enhanced control measures at LA-SMA-0.85, corrective action storm water samples were collected on November 9, 2012, and May 15, 2013 (Figure 19-2). Analytical results from this corrective action monitoring sample yielded three TAL exceedances:

- Copper concentrations of 26.4 µg/L and 22.8 µg/L (MTAL is 4.3 µg/L),
- Zinc concentrations of 56.1 µg/L and 78.2 µg/L (MTAL is 42 µg/L), and
- Gross-alpha activity of 22.9 pCi/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

*SWMU 03-055(c):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the sediment BV in 2 of 18 shallow (i.e., less than 3 ft bgs) Consent Order samples with a maximum concentration 1.4 times the BV.
- Zinc is not known to be associated with industrial materials historically managed at the Site. Zinc was detected above the sediment BV in 13 of 18 shallow Consent Order samples with a maximum concentration of 5 times the BV.

Aluminum and lead are also not associated with industrial materials historically managed at the Site. Aluminum was not detected above the sediment BV in 18 shallow Consent Order samples. Lead was detected above the sediment BV in 4 of 18 Consent Order shallow samples with a maximum concentration 3.6 times the BV. Aluminum and lead were not detected above TALs after installation of enhanced controls and gross-alpha radioactivity was only detected above TAL after installation of enhanced controls. Concentrations of copper and zinc were similar before and after installation of enhanced controls.

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 19-2. 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 19-2.

Monitoring location LA-SMA-0.85 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape containing 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 in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed urban 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 the 2012 and 2013 corrective action samples are between these two values.

- Zinc—The zinc UTL from developed urban landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. The zinc results from the 2012 and 2013 corrective action samples are less than both of these 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 urban landscape is 32.5 pCi/L. The gross-alpha result from the 2012 corrective action sample is less than both of these values.

All the analytical results for these samples are reported in the 2011, 2012, and 2013 Annual Reports.

#### 19.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-0.85 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 19-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30894	5-9-2013
Storm Rain Event	BMP-33599	7-24-2013
Storm Rain Event	BMP-35550	9-24-2013
Annual Erosion Evaluation	COMP-36833	11-12-2013
TAL Exceedance	COMP-34938	8-22-2013

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

**Table 19-3 Maintenance during 2013**

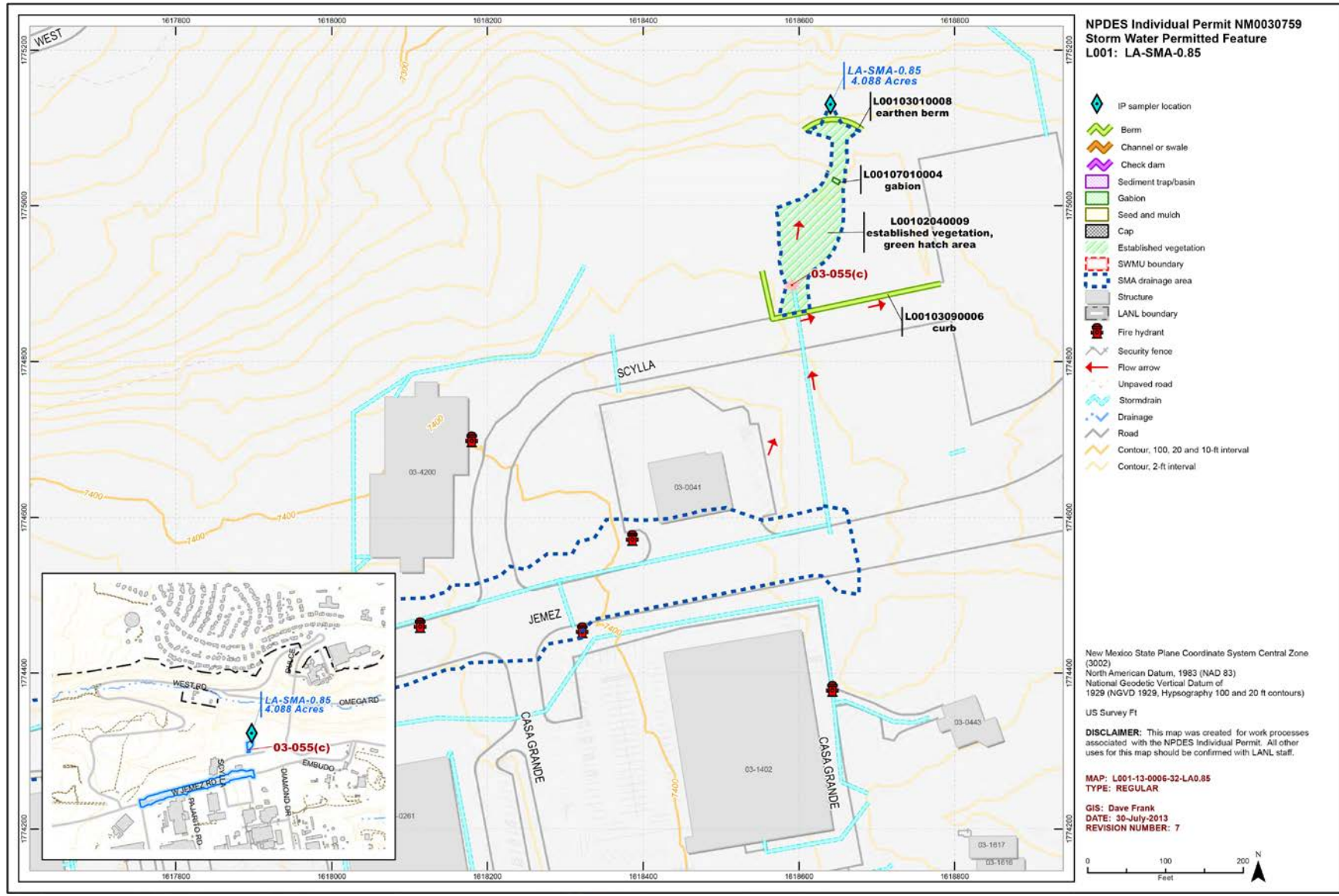
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-32115	All rebar removed and replaced with wood stakes.	5-16-2013	7 day(s)	Maintenance conducted in timely manner.

#### 19.5 Compliance Status

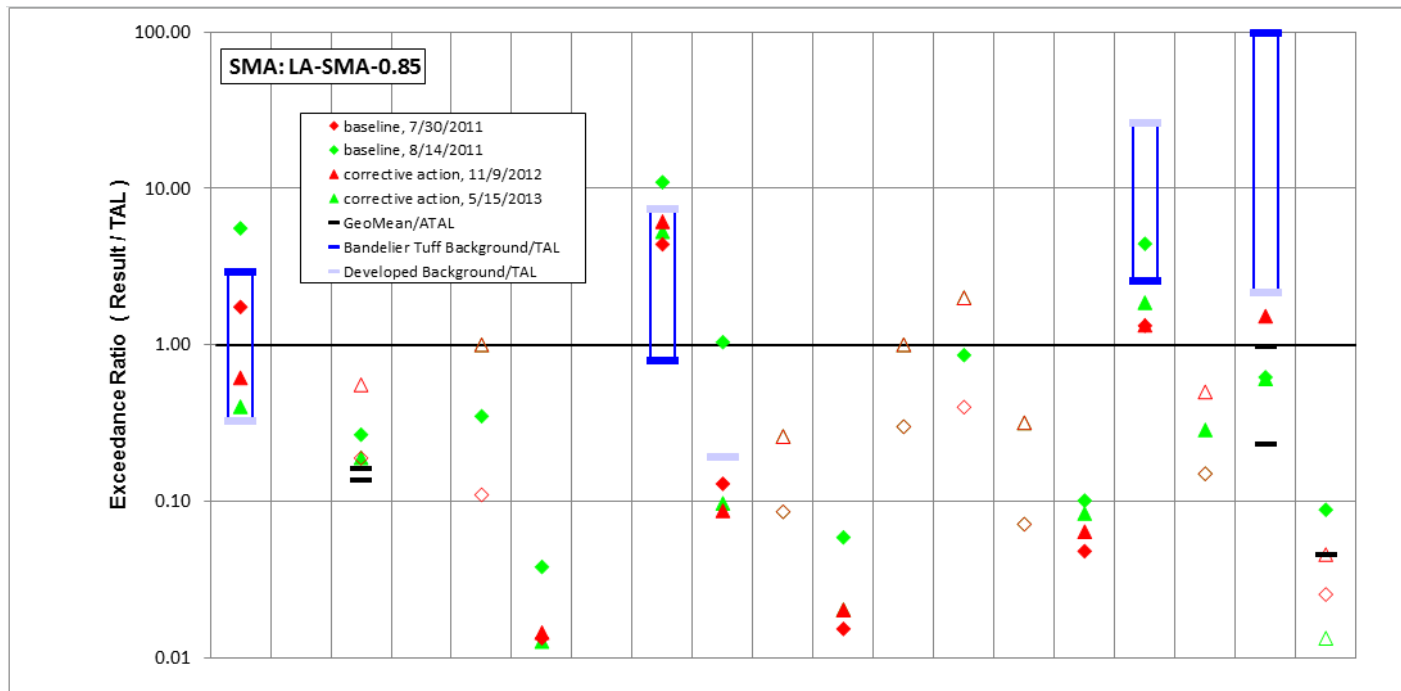
The Site associated with LA-SMA-0.85 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 19-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 03-055(c)	Enhanced Control Corrective Action Monitoring	Corrective Action Initiated after 2 <sup>nd</sup> TAL exceedance	2 <sup>nd</sup> initiation on 6-24-13



**Figure 19-1 LA-SMA-0.85 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>5/15/2013 result</b>	302	3	1.71	26.4	1	2.67	3.35	<b>22.8</b>	1.65	0.2	3.44	5	1	2	8.37	<b>78.2</b>	0.0029	9.1	0.4
result / TAL	0.4	0.005	0.19	0.0053	1	0.013	0.0034	5.3	0.097	0.26	0.02	1	2	0.32	0.084	1.9	0.29	0.61	0.013
<b>11/9/2012 result</b>	462	1.28	5	28.4	1	3.04	1.73	26.4	1.48	0.2	3.44	5	1	2	6.4	56.1	0.005	22.9	1.37
result / TAL	0.62	0.002	0.56	0.0057	1	0.014	0.0017	6.1	0.087	0.26	0.02	1	2	0.32	0.064	1.3	0.5	1.5	0.046
<b>8/14/2011 result</b>	4170	1	2.4	49.6	0.35	8	3.8	47.1	17.7	0.066	10	1.5	0.43	0.45	10.1	186	0.002	9.32	2.65
result / TAL	5.6	0.002	0.27	0.0099	0.35	0.038	0.0038	11	1	0.086	0.059	0.3	0.86	0.071	0.1	4.4	0.15	0.62	0.088
<b>7/30/2011 result</b>	1310	1	1.7	22.3	0.11	2.8	1.4	18.9	2.2	0.066	2.6	1.5	0.2	0.45	4.8	55.7	0.002	0.125	0.762
result / TAL	1.7	0.002	0.19	0.0045	0.11	0.013	0.0014	4.4	0.13	0.086	0.015	0.3	0.4	0.071	0.048	1.3	0.15	0.008	0.025

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

Figure 19-2 Inorganic analytical results summary plot for LA-SMA-0.85



## **20.0 LA-SMA-0.9: SWMU 00-017 and AOC C-00-044**

### **20.1 Site Descriptions**

Two historical industrial activity areas are associated with L002, LA-SMA-0.9: Sites 00-017 and C-00-044.

SWMU 00-017 consists of former industrial waste line 167, former manhole ULR-33, and former industrial waste lines 170 and 171. Former line 167 and former manhole ULR-33 were removed before 1985, except for the anchors and sections of pipe encased in anchors. Lines 170 and 171 are the only sections of industrial waste line known to remain in Los Alamos townsite. The site of former line 167 and former manhole ULR-33 under the Omega Bridge remains undeveloped. Nine concrete anchors and 3-ft-long sections of pipe encased in each of the anchors remain at the site. The industrial waste lines were installed to serve the entire Laboratory from its beginning in 1943. With an estimated total length of 39,000 ft, the underground industrial waste lines and associated sumps and pumps were used to transport RLW generated by various operations in Former TA-01 to treatment facilities. The estimated operation period for the majority of these waste lines is from the 1950s to the 1970s. Phased decommissioning and removal of the waste lines began in 1964 and were completed in 1986.

SWMU 00-017 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

AOC C-00-044 consists of surface contamination resulting from the historical use of lead-based paint on the Los Alamos Canyon Bridge (also known as Omega Bridge). The bridge was constructed in 1951 and is located in both TA-00 and TA-03. This AOC was identified in 1999 during RFI activities. Surface samples collected from locations on the north and south end of the bridge during investigation of SWMU 00-017 contained elevated lead concentrations. The lead could not reasonably be attributed to SWMU 00-017, an inactive underground industrial waste line. During further research and interviews of Los Alamos County and Laboratory maintenance staff, it was discovered that lead paint chips were deposited beneath the bridge on the north and south slopes of Los Alamos Canyon as a result of periodic bridge maintenance activities, including scraping and chipping old paint before new paint was applied.

AOC C-00-044 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

The project map (Figure 20-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **20.2 Control Measures**

The western portion of the bridge is curbed. There is no evidence of run-on impact from the bridge. There is minimal run-on because of engineered controls, specifically, curbs, drop inlets, and grading. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 20-1).

**Table 20-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00202040020	Established Vegetation		X	X		B
L00203010013	Earthen Berm		X		X	B
L00203010014	Earthen Berm		X		X	B
L00203010015	Earthen Berm		X		X	B
L00203010016	Earthen Berm		X		X	B
L00203010017	Earthen Berm		X		X	B
L00203010018	Earthen Berm		X		X	B
L00203090002	Curbing	X			X	CB
L00203090003	Curbing	X			X	CB
L00204040004	Culvert	X		X		CB

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

### 20.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-0.9. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 20.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-0.9 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 20-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30743	5-16-2013
Storm Rain Event	BMP-33597	7-23-2013
Storm Rain Event	BMP-35548	9-25-2013
Annual Erosion Evaluation	COMP-36682	11-12-2013

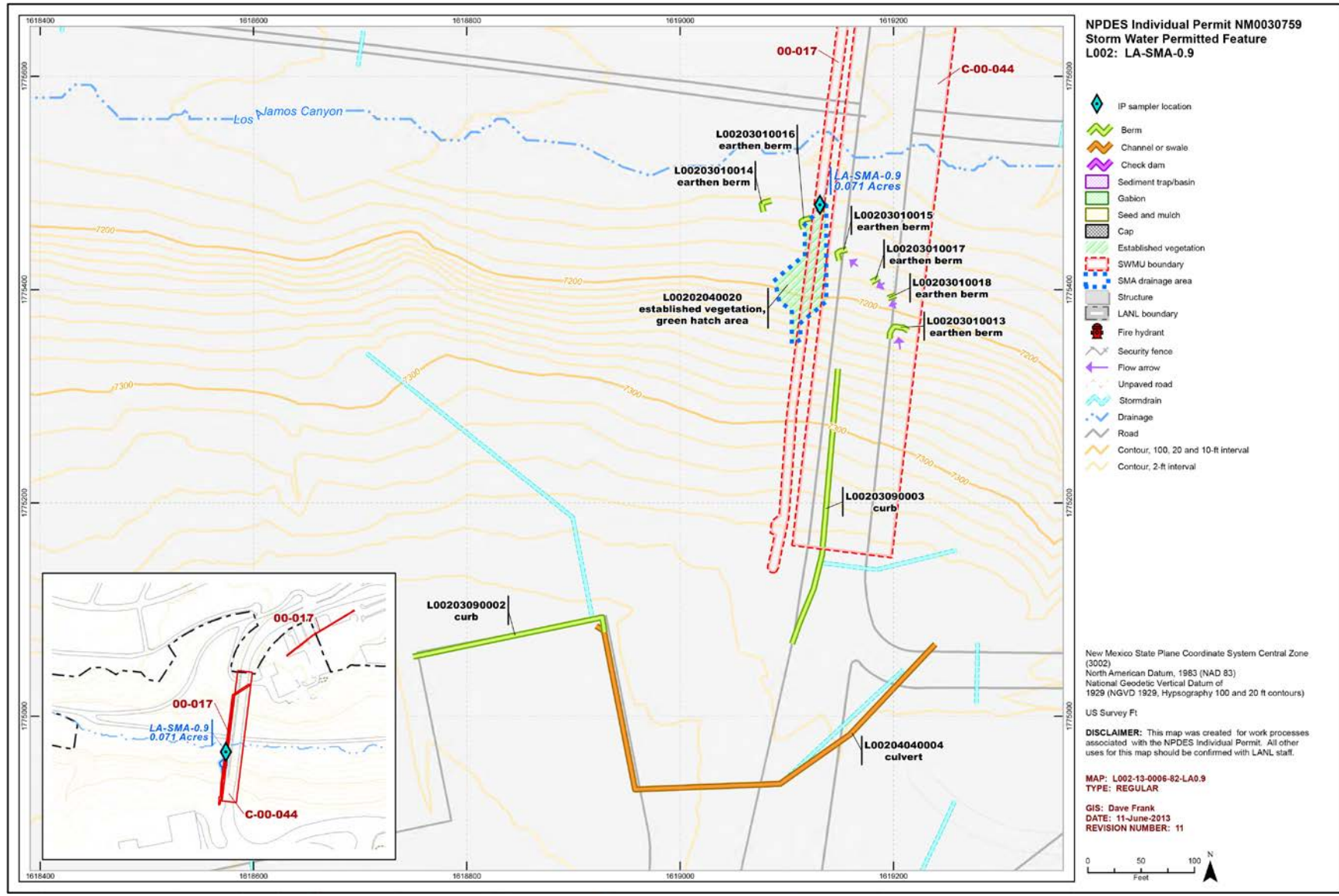
No maintenance activities were conducted at LA-SMA-0.9 in 2013.

### 20.5 Compliance Status

The Sites associated with LA-SMA-0.9 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 20-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-017	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
AOC C-00-044	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



**Figure 20-1 LA-SMA-0.9 location map**



## 21.0 LA-SMA-1: SWMU 00-017 and AOC C-00-044

### 21.1 Site Descriptions

Two historical industrial activity areas are associated with L003, LA-SMA-1: Sites 00-017, and C-00-044.

SWMU 00-017 consists of former industrial waste line 167, former manhole ULR-33, and former industrial waste lines 170 and 171. Former line 167 and former manhole ULR-33 were removed before 1985, except for the anchors and sections of pipe encased in anchors. Lines 170 and 171 are the only sections of industrial waste line known to remain in Los Alamos townsite. The site of former line 167 and former manhole ULR-33 under the Omega Bridge remains undeveloped. Nine concrete anchors and 3-ft-long sections of pipe encased in each of the anchors remain at the Site. The industrial waste lines were installed to serve the entire Laboratory from its beginning in 1943. With an estimated total length of 39,000 ft, the underground industrial waste lines and associated sumps and pumps were used to transport liquid radioactive waste generated by various operations in Former TA-01 to treatment facilities. The estimated operation period for the majority of these waste lines is from the 1950s to the 1970s. Phased decommissioning and removal of the waste lines began in 1964 and were completed in 1986.

SWMU 00-017 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II report for Upper Los Alamos Canyon Aggregate Area.



AOC C-00-044 consists of surface contamination resulting from the historical use of lead-based paint on the Los Alamos Canyon Bridge (also known as Omega Bridge). The bridge was constructed in 1951 and is located in both TA-00 and TA-03. This AOC was identified in 1999 during RFI activities. Surface samples collected from locations on the north and south end of the bridge during investigation of SWMU 00-017 contained elevated lead concentrations. The lead could not reasonably be attributed to SWMU 00-017, an inactive underground industrial waste line. During further research and interviews of

Los Alamos County and Laboratory maintenance staff, it was discovered that lead paint chips were deposited beneath the bridge on the north and south slopes of Los Alamos Canyon as a result of periodic bridge maintenance activities, including scraping and chipping old paint before new paint was applied.

AOC C-00-044 is expected to be eligible for a COC under the Consent Order after submittal and approval of the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

The project map (Figure 21-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 21.2 Control Measures

Wattles, check dams, and other controls are in place, including the two culverts and an asphalt swale, controlling run-on to the Permitted Feature. In addition, curbing on the Omega Bridge above the Site directs run-on away from the area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 21-1).

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

**Table 21-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00302040025	Established Vegetation		X	X		B
L00303010019	Earthen Berm		X		X	EC
L00303060016	Straw Wattles	X			X	B
L00303060017	Straw Wattles	X			X	B
L00303100015	Gravel Bags	X			X	B
L00303120018	Rock Berm		X		X	B
L00304020005	Concrete/Asphalt Channel/Swale	X		X		CB
L00304030020	Rock Channel/Swale	X		X		EC
L00304040004	Culvert	X		X		CB
L00304040021	Culvert	X		X		EC
L00304060022	Rip Rap	X		X		EC
L00304060023	Rip Rap	X		X		B
L00304060024	Rip Rap	X		X		B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 21.3 Storm Water Monitoring

SWMU 00-017 and AOC C-00-044 are monitored within LA-SMA-1. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 21-2).

Analytical results from this sample yielded four TAL exceedances:

- Aluminum concentration of 6510 µg/L (MTAL is 750 µg/L),
- Copper concentration of 7.8 µg/L (MTAL is 4.3 µg/L),
- Lead concentration of 42.1 µg/L (MTAL is 17 µg/L), and
- Gross-alpha activity of 1800 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at LA-SMA-1, a corrective action storm water sample was collected on September 13, 2013 (Figures 21-2 and 21-3). Analytical results from this corrective action monitoring sample yielded three TAL exceedances:

- Aluminum concentration of 800 µg/L (MTAL is 750 µg/L),
- Gross-alpha activity of 434 Ci/L (ATAL is 15 pCi/L).
- PCB concentration of 18 ng/L (ATAL is 0.6 ng/L).

Corrective action has resulted in a decrease in copper and lead concentrations and gross-alpha activity detected in storm water samples collected at LA-SMA-1.

These exceedances were 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 discussion is organized by Site and analyte.

*SWMU 00-017:*

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the 17 shallow Consent Order or 1998 RFI soil, sediment, and tuff samples collected at the Site.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site. PCBs were not detected in any of the shallow 1998 RFI samples collected at the Site.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Consent Order and RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, and uranium and plutonium isotopes, which are alpha-emitting radionuclides. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

Historical waste management activities were all belowground. As a result, no residual contaminants could be exposed to storm water. The Consent Order and RFI sampling results support this conclusion.

*AOC C-00-044:*

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the 22 shallow Consent Order samples collected at the Site.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site.
- 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 or alpha-emitting radionuclides because they were not identified as potential contaminants at this Site. Any alpha-emitting radionuclides associated with the Site would be exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BV.

Based on the Site history and Consent Order and RFI sampling results, this Site is an unlikely source of the TAL exceedances. 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 21-2. 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 21-2.

Monitoring location LA-SMA-1 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. Aluminum and PCBs are associated with building materials, parking lots, and automobiles. Aluminum is also present at 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 urban 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 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 urban landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these values.
- PCBs—The PCB UTL from developed urban 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 result from 2013 is between these values.

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

#### 21.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-1 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 21-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30895	5-9-2013
Storm Rain Event	BMP-33598	7-23-2013
Storm Rain Event	BMP-35549	9-26-2013
Annual Erosion Evaluation	COMP-36834	11-22-2013
TAL Exceedance	COMP-37065	11-22-2013

No maintenance activities were conducted at LA-SMA-1 in 2013.

#### 21.5 Compliance Status

The Sites associated with LA-SMA-1 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 21-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 00-017	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	Initiated 11-27-2012
AOC C-00-044	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	Initiated 11-27-2012



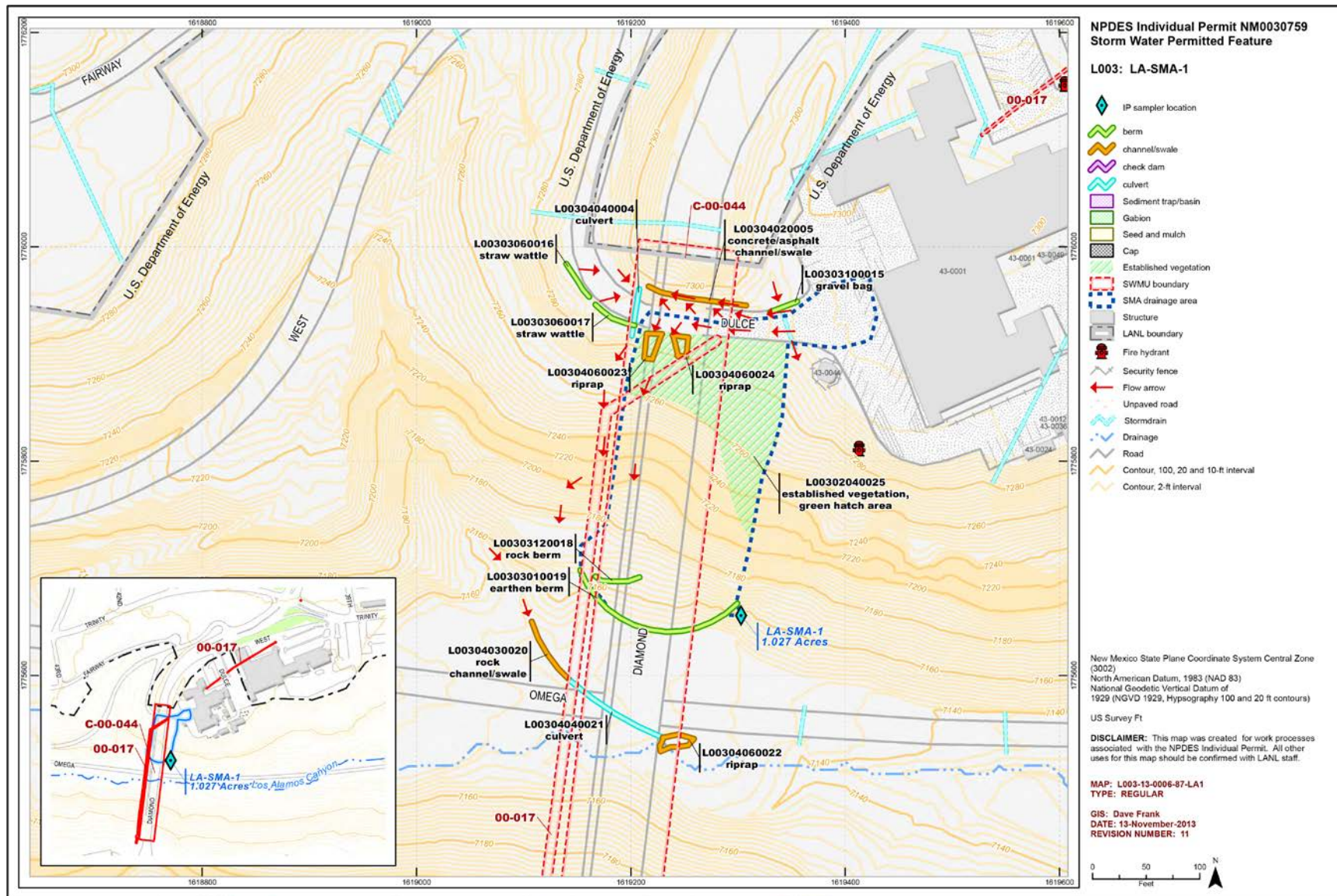
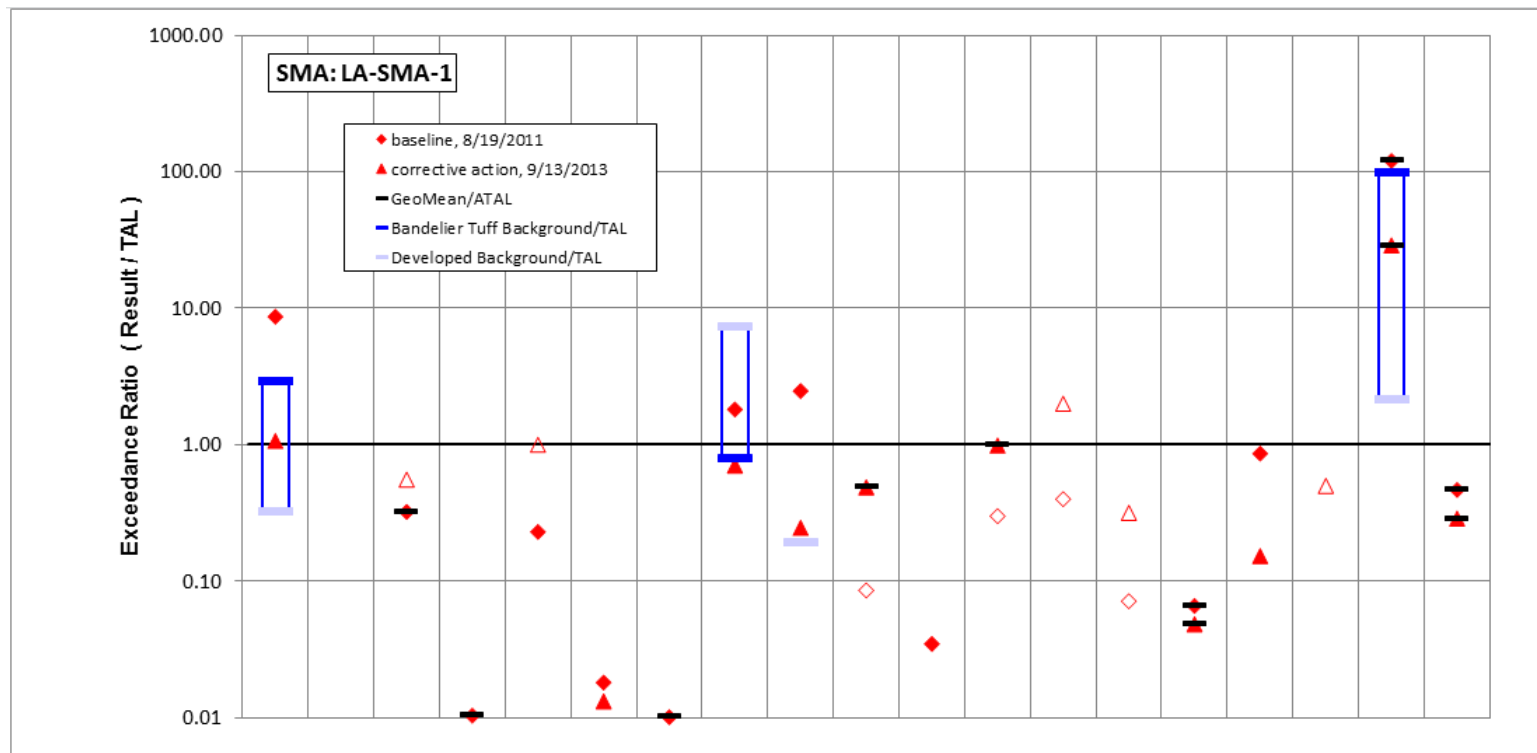


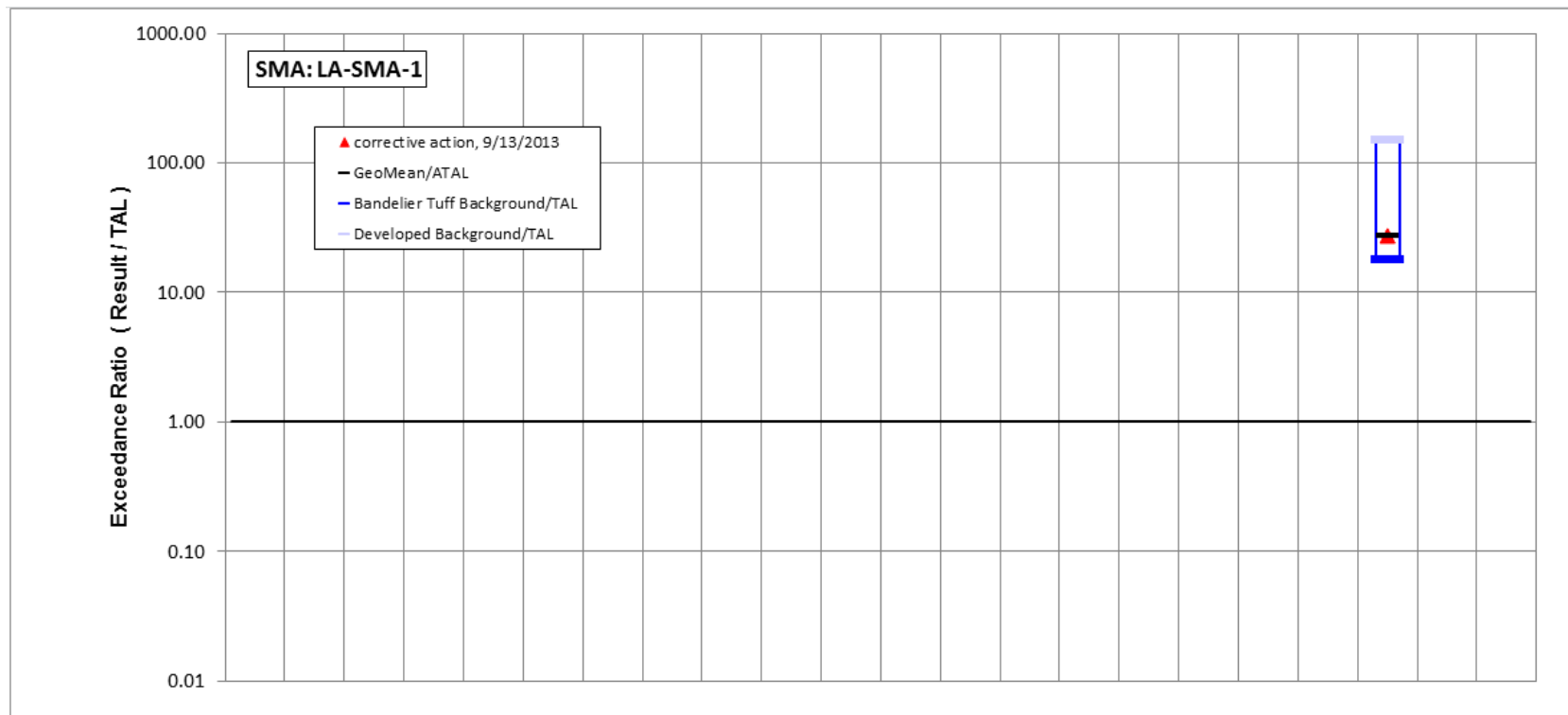
Figure 21-1 LA-SMA-1 location map



	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	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>9/13/2013 result</b>	<b>800</b>	3	5	19.3	1	2.77	2.18	3.03	4.19	0.376	1.36	4.94	1	2	4.85	6.43	<i>0.005</i>	<b>434</b>	8.65
result / TAL	<b>1.1</b>	<i>0.005</i>	<i>0.56</i>	<i>0.0039</i>	<i>1</i>	<i>0.013</i>	<i>0.0022</i>	<i>0.7</i>	<i>0.25</i>	<i>0.49</i>	<i>0.008</i>	<i>0.99</i>	<i>2</i>	<i>0.32</i>	<i>0.048</i>	<i>0.15</i>	<i>0.5</i>	<b>29</b>	<i>0.29</i>
<b>8/19/2011 result</b>	<b>6510</b>	1	2.9	51.8	0.23	3.8	10.1	7.8	42.1	<i>0.066</i>	5.9	1.5	0.2	0.45	6.6	36.2	-	<b>1800</b>	14
result / TAL	<b>8.7</b>	<i>0.002</i>	<i>0.32</i>	<i>0.01</i>	<i>0.23</i>	<i>0.018</i>	<i>0.01</i>	<b>1.8</b>	<b>2.5</b>	<i>0.086</i>	<i>0.035</i>	<i>0.3</i>	<i>0.4</i>	<i>0.071</i>	<i>0.066</i>	<i>0.86</i>	-	<b>120</b>	<i>0.47</i>

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

Figure 21-2 Inorganic analytical results summary plot for LA-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	-	-
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
9/13/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.018</b>	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>27</b>	-	-
8/19/2011 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Figure 21-3 Organic analytical results summary plot for LA-SMA-1

## 22.0 LA-SMA-1.1: AOC 43-001(b2)

### 22.1 Site Descriptions

One historical industrial activity area is associated with L004, LA-SMA-1.1: Site 43-001(b2).

AOC 43-001(b2) is a storm drain outfall that was permitted in the mid-to-late 1970s under the Laboratory’s NPDES Permit as Outfall 03A040. The outfall was removed from the NPDES Permit on January 11, 1999. The outfall received effluent from six floor drains in the subbasement at HRL (building 43-1), blowdown from the evaporative cooler, and storm water from 13 roof drains on the west side of HRL. These wastewaters were discharged west of HRL through a 130-ft-long, 12-in.-diameter CMP to Los Alamos Canyon. The outfall may have historically discharged radioactively contaminated water and/or once-through and treated cooling water. No historical quantitative information is available about possible residual contamination as a result of the discharges from this outfall. Currently, the outfall is located on the undeveloped slope west of HRL

Consent Order investigations are complete for AOC 43-001(b2); the Site meets recreational risk levels. NMED issued a COC with controls for AOC 43-001(b2) in September 2010.

The project map (Figure 22-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 22.2 Control Measures

Established vegetation is in place to control run-on at this Permitted Feature. Curbing along the eastern side of Diamond Drive diverts run-on from the road away from the SMA to a culvert drop inlet, which discharges flow at the southern edge of the Permitted Feature. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 22-1).

**Table 22-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00402040007	Established Vegetation		X	X		B
L00404060003	Rip Rap		X	X		CB
L00404060005	Rip Rap	X		X		B
L00406010004	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 22.3 Storm Water Monitoring

AOC 43-001(b2) is monitored within LA-SMA-1.1. Following the installation of baseline control measures, two baseline storm water samples were collected on July 28, 2011, and August 19, 2011 (Figure 22-2). Following the installation of enhanced control measures at LA-SMA-1.1, a corrective action storm water sample was collected on September 28, 2012. On September 10, 2010, NMED issued a COC for AOC 43-001(b2). This Site is now certified as corrective action complete and monitoring of storm



water discharges has ceased at LA-SMA-1.1. No further sampling is required for LA-SMA-1.1 for the duration of the IP.

#### 22.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-1.1 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 22-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30744	5-9-2013
Storm Rain Event	BMP-33600	7-24-2013
Storm Rain Event	BMP-35551	9-24-2013
Annual Erosion Evaluation	COMP-36683	11-14-2013

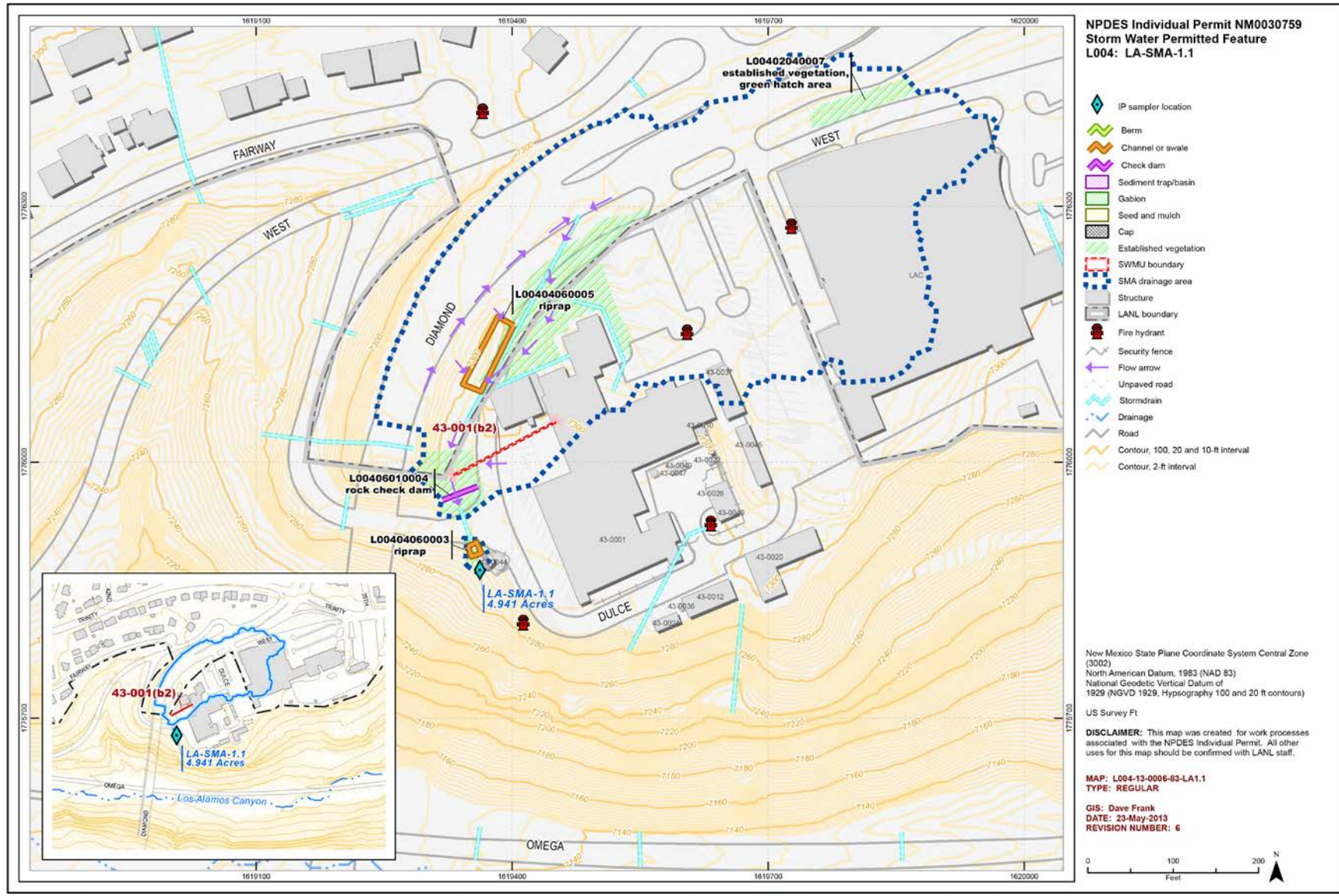
No maintenance activities were conducted at LA-SMA-1.1 in 2013.

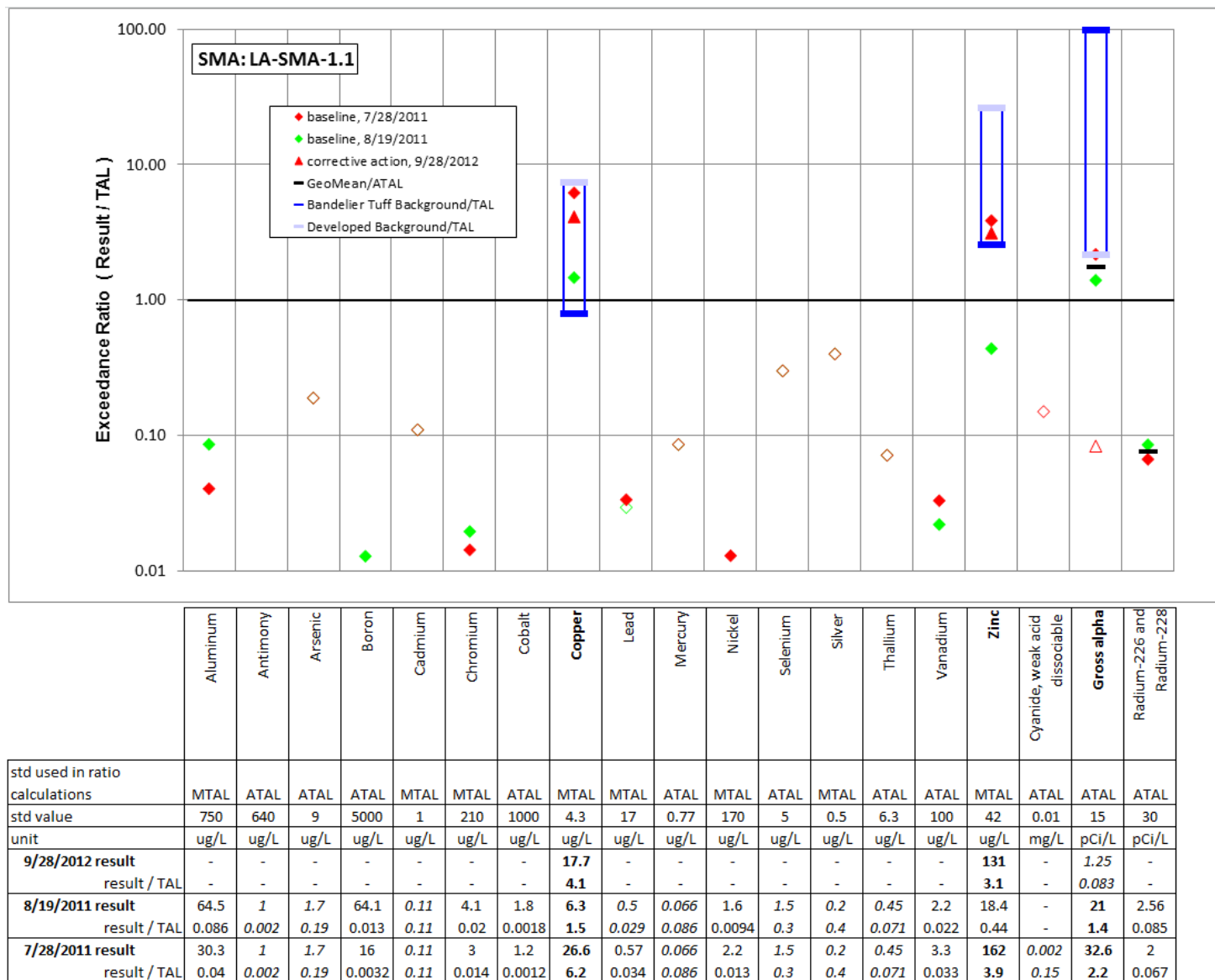
#### 22.5 Compliance Status

The Site associated with LA-SMA-1.1 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 22-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 43-001(b2)	Corrective Action Complete	Corrective Action Complete	NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory"





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

Figure 22-2 Inorganic analytical results summary plot for LA-SMA-1.1

## 23.0 LA-SMA-1.25: AOC C-43-001

### 23.1 Site Descriptions

One historical industrial activity area is associated with L005, LA-SMA-1.25: Site C-43-001.

AOC C-43-001 is a storm drain outfall that flows into Los Alamos Canyon. It collects runoff from the HRL (building 43-1) loading dock and also functions as the overflow from the lift station (structure 43-10). The overflow line is an 8-in.-diameter VCP that extends from structure 43-10, 130 ft south to a manhole. A 12-in.-diameter CMP, which receives discharge from two storm drains and any effluent from the overflow, flows southwest for 160 ft and drains into the canyon south of the HRL. The sanitary waste lines for the HRL [SWMU 43-001(a1) and AOC 43-001(a2)] may have become clogged at some time, causing an overflow. Any sanitary waste carried through the sewer lines could have discharged into the storm drains. Although no documentation was found to confirm any routine non-storm water releases into the storm drains, the outfall may have received non-sanitary cooling water. Currently, the outfall is located on the undeveloped north slope of Los Alamos Canyon on DOE property.

The project map (Figure 23-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 23.2 Control Measures

Run-on enters the Permitted Feature via Dulce Road and paved areas around building 43-0001 at the northern end of the SMA. A roof drain from the building also contributes to the run-on. A culvert running under the paved area north and east of the area daylights near the west side of building 43-0024 and also contributes run-on to this Permitted Feature. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 23-1).

Enhanced controls were installed and certified on September 20, 2012, as part of corrective action.

Photographs of the enhanced controls are available at <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 23-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00502040008	Established Vegetation		X	X		B
L00503010007	Earthen Berm		X		X	EC
L00503020001	Base Course Berm	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.



### 23.3 Storm Water Monitoring

AOC C-43-001 is monitored within LA-SMA-1.25. Following the installation of baseline control measures, two baseline storm water samples were collected on July 30, 2011, and August 28, 2011 (Figure 23-2). Analytical results from these samples yielded two TAL exceedances:

- Copper concentrations of 13.8 µg/L and 33.3 µg/L (MTAL is 4.3 µg/L), and
- Zinc concentrations of 109 µg/L and 112 µg/L (MTAL is 42 µg/L).

Following the installation of enhanced control measures at LA-SMA-1.25, two corrective action storm water samples were collected on September 10, 2012, and October 12, 2012 (Figure 23-2). Analytical results from these corrective action monitoring samples yielded two TAL exceedances:

- Copper concentrations of 7.31 µg/L and 25 µg/L (MTAL is 4.3 µg/L), and
- Zinc concentrations of 53.2 µg/L and 111 µg/L (MTAL is 42 µg/L).

Corrective action has resulted in a slight decrease in copper and zinc concentrations detected in storm water samples collected at LA-SMA-1.25.

These exceedances were 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 discussion is organized by Site and analyte.

#### *AOC C-43-001:*

- Copper is not known to have been associated with industrial materials historically managed at this Site. Copper was detected above sediment and tuff BVs in shallow (i.e., less than 3 ft bgs) soil, sediment, and tuff samples collected during 2009 and 2012 Consent Order investigations. Copper was detected above BVs in 8 of 20 shallow samples with a maximum concentration 4.6 times the sediment BV.
- Zinc is not known to have been associated with industrial materials historically managed at this Site. Zinc was detected above soil and sediment BVs in 8 of 20 shallow soil, sediment, and tuff samples with a maximum concentration 2.4 times the sediment 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 23-2. 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 23-2.

Monitoring location LA-SMA-1.25 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 and zinc are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Copper—The copper UTL from developed urban 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. One of the copper results from the 2012 corrective action sample is between these two values, and the other is greater than both of them.

- Zinc—The zinc UTL from developed urban landscape storm water run-on is 1120 µg/L; the zinc UTL for background storm water containing sediment derived from Bandelier Tuff is 109 µg/L. One of the zinc results from the 2012 corrective action sample is between these two values, and the other is less than both of them.

All the analytical results for these samples are reported in the 2011 and 2012 Annual Reports.

The LA-SMA-1.25 monitoring station was relocated. The new location of the sampler is positioned to provide a more representative sample of storm water discharge from the SMA. Sampler coordinates and SMA drainage area are updated in Attachment 4.

### 23.4 Inspections and Maintenance

RG121.9 recorded three storm events at LA-SMA-1.25 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 23-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30745	5-9-2013
Storm Rain Event	BMP-33601	7-24-2013
Storm Rain Event	BMP-35552	9-24-2013
Annual Erosion Evaluation	COMP-36684	11-14-2013

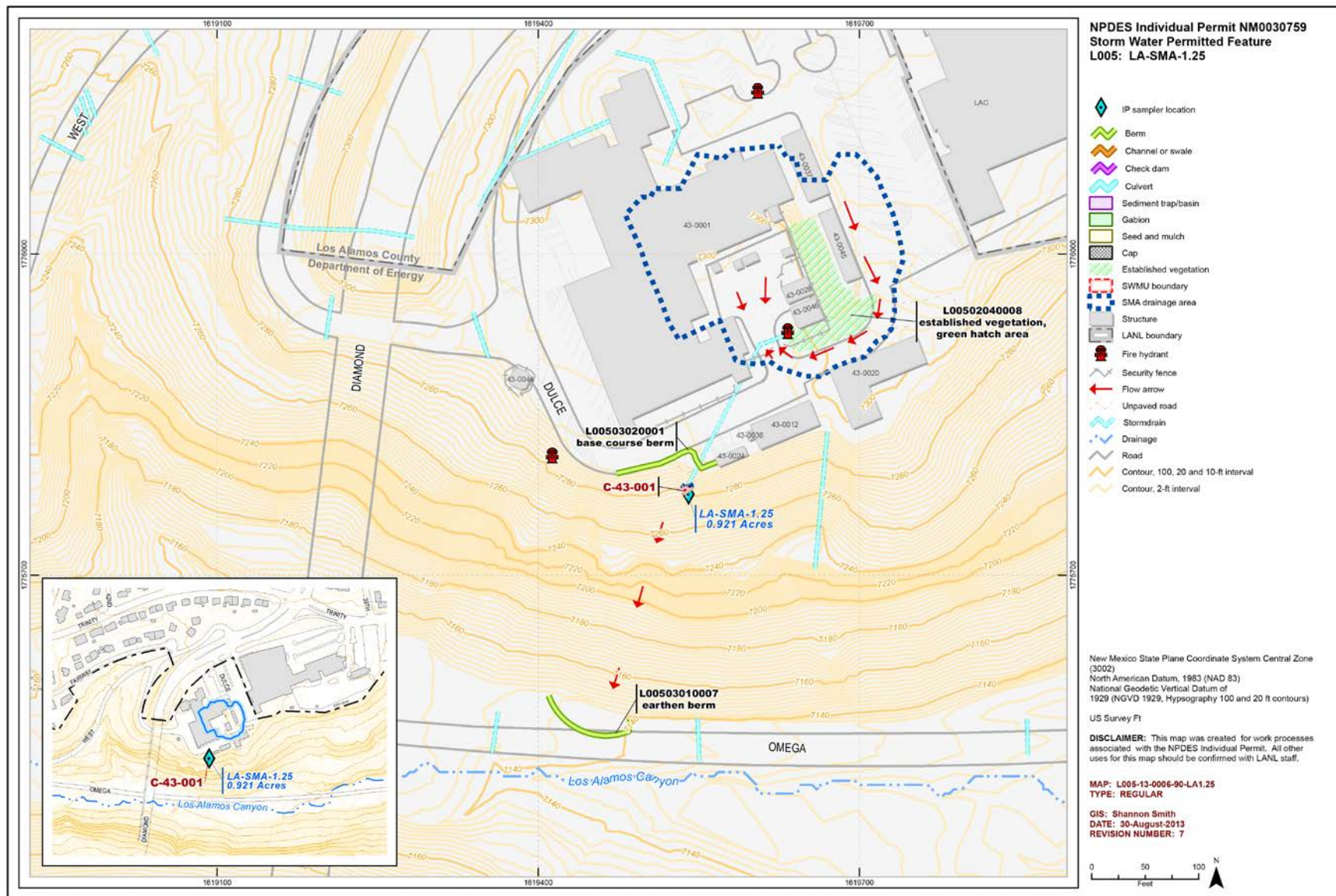
No maintenance activities were conducted at LA-SMA-1.25 in 2013.

### 23.5 Compliance Status

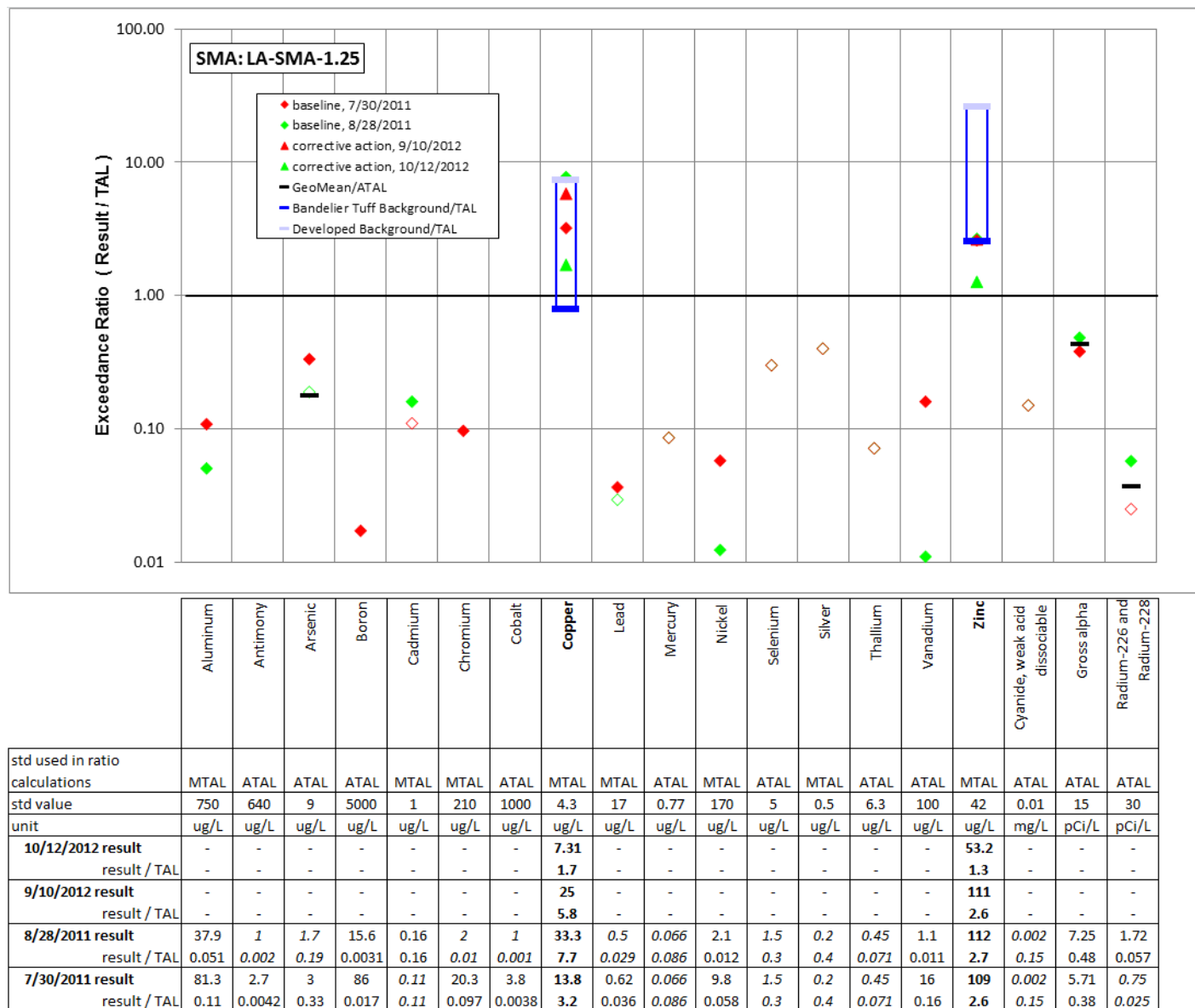
The Site associated with LA-SMA-1.25 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 23-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC C-43-001	Enhanced Control Monitoring	Corrective Action Initiated after 2 <sup>nd</sup> TAL exceedance	2 <sup>nd</sup> initiation on 11-15-2012



**Figure 23-1 LA-SMA-1.25 location map**



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

**Figure 23-2 Inorganic analytical results summary plot for LA-SMA-1.25**



## 24.0 LA-SMA-2.1: SWMU 01-001(f)

### 24.1 Site Descriptions

One historical industrial activity area is associated with L006, LA-SMA-2.1: Site 01-001(f).

SWMU 01-001(f) is the location of a former septic tank (structure 01-140) that was installed in 1945 and served HT and FP Buildings. The septic tank outfall discharged into Los Alamos Canyon. The outfall area is known as Hillside 140. HT Building was used to heat-treat and machine natural and enriched uranium. FP Building was a foundry for nonradioactive and nonferrous metals. The heat treatment and machining operations likely resulted in discharges of radioactive waste to the tank and outfall, and the machining operations were likely the source of the PCBs detected in the SWMU 01-001(f) outfall and drainage, although the use of PCBs was not documented in historical records.

The septic system ceased to be used in 1965 and the septic tank, drainlines, and surrounding soil were removed in 1975–1976. In 1995, soil with elevated concentrations of total uranium was removed from the upper and lower slopes of Hillside 140. Currently, the entire mesa-top area of SWMU 01-001(f) is developed, and the locations of the former drainlines are under the pavement and buildings of Ridge Park Village. The location of the former septic tank is partially covered by a building. The outfall location and the drainage into which it discharged are on undeveloped land owned by DOE.

Two IM soil removal actions were performed pursuant to the Consent Order to remediate PCB-contaminated sediment and tuff (i.e., a 2009–2010 IM and a 2010 supplemental IM). A total of 2880 yd<sup>3</sup> of soil and tuff was removed, and two sediment detention basins were constructed in Los Alamos Canyon below the SWMU 01-001(f) drainage. Influent and wetland discharge samples collected concurrently on July 12, 2013, show PCBs in the influent to be 42 times higher than in the wetland discharge.

The project map (Figure 24-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 24.2 Control Measures

The area is bordered on the east by a cement retaining wall, which contains any potential run-on to the SMA from Ridge Park Village. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 24-1).

**Table 24-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00601060009	Erosion Control Blanket			X		B
L00602040011	Established Vegetation		X	X		B
L00603030007	Log Berm		X		X	CB
L00603080002	Retaining Wall	X			X	CB
L00604010010	Earthen Channel/Swale	X		X		B
L00604060006	Rip Rap		X	X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls installation and certification are being planned for the end of 2014 or early in 2015 as part of corrective action.

### 24.3 Storm Water Monitoring

SWMU 01-001(f) is monitored within LA-SMA-2.1. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 24-2 and 24-3). Analytical results from this sample yielded three TAL exceedances:

- Copper concentration of 11.1 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 125 pCi/L (ATAL is 8.33 pCi/L), and
- PCB concentration of 21,100 ng/L (ATAL is 0.6 ng/L).

These exceedances were 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 discussion is organized by Site and analyte.

#### *SWMU 01-001(f):*

- Copper is not known to be associated with industrial materials historically managed at this Site, although it was possibly associated with nonferrous metals used in foundry operations. Copper was detected above the tuff BV in 2 of 37 shallow (i.e., less than 3 ft bgs) Consent Order samples at a maximum concentration 1.8 times the tuff BV. These results are from samples collected in 2008 and may not be representative of conditions following soil removal during the two IMs.
- PCBs are known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow IM and supplemental IM samples. Aroclor-1254 was detected in 90 of 98 shallow samples with a maximum concentration 35 times the residential SSL. Aroclor-1260 was detected in 55 of 98 shallow samples with a maximum concentration 8.7 times the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this 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 emitters. Americium-241 and plutonium-238 were not detected above BVs or FVs or were detected at depths where FVs do not apply in 37 shallow sediment and tuff samples. Plutonium-239/240 was detected above FVs or detected at depths where FVs do not apply in 5 of 37 shallow sediment and tuff samples with a maximum activity 3.3 times the sediment FV. Uranium-234 was detected above BVs in 18 of 37 shallow sediment and tuff samples at a maximum activity 9.5 times sediment BV. Uranium-235/236 was detected above BVs in 18 of 37 shallow sediment and tuff samples at a maximum activity 18 times sediment BV. Uranium-238 was detected above BV in 20 of 37 shallow sediment and tuff samples at a maximum activity 35 times sediment BV. These results are from samples collected in 2008 and may not be representative of conditions following soil removal during the two IMs.

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 24-2 and 24-3. 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 24-2 and 24-3.

Monitoring location LA-SMA-2.1 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape 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. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed urban landscape storm water run-on is 245 µg/L; the copper UTL for background storm water containing sediment derived from Bandelier Tuff is 2210 µg/L. The copper result from 2013 is between these 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 urban landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.
- PCBs—The PCB UTL from developed urban 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 result from 2013 is above these values.

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

#### 24.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-2.1 during the 2013 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 24-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30748	5-13-2013
Storm Rain Event	BMP-32785	6-18-2013
Storm Rain Event	BMP-33590	7-17-2013
Storm Rain Event	BMP-34573	8-14-2013
Storm Rain Event	BMP-35541	9-25-2013
Annual Erosion Evaluation	COMP-36687	11-21-2013
TAL Exceedance	COMP-37066	11-21-2013

No maintenance activities were conducted at LA-SMA-2.1 in 2013.

#### 24.5 Compliance Status

The Site associated with LA-SMA-2.1 is a High Priority Site. The High Priority Site deadline for the certification of corrective action is now 1 yr from the date of an observed TAL exceedance, which for LA-SMA-2.1 is October 28, 2014.

**Table 24-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-001(f)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 11-3-13



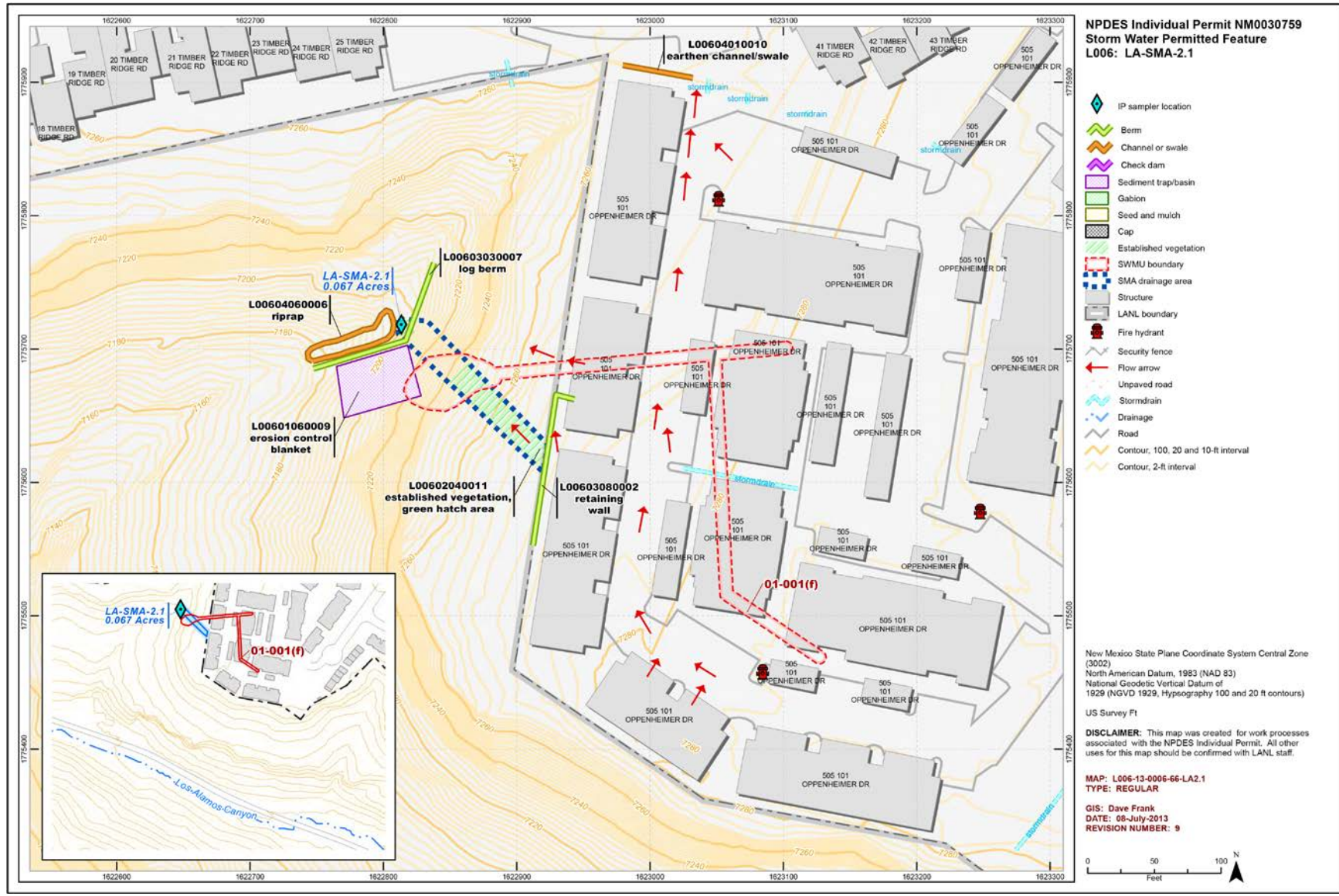
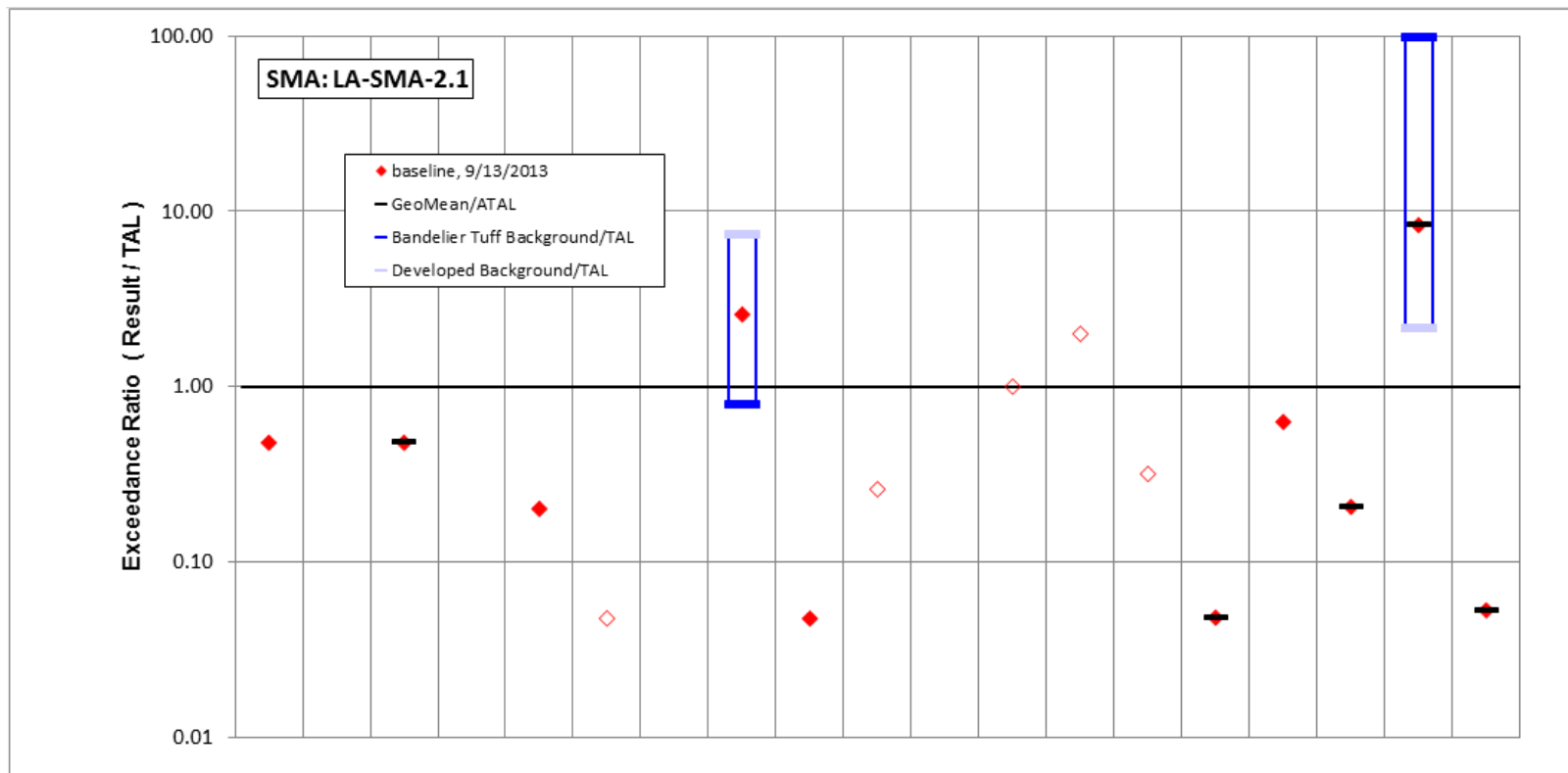


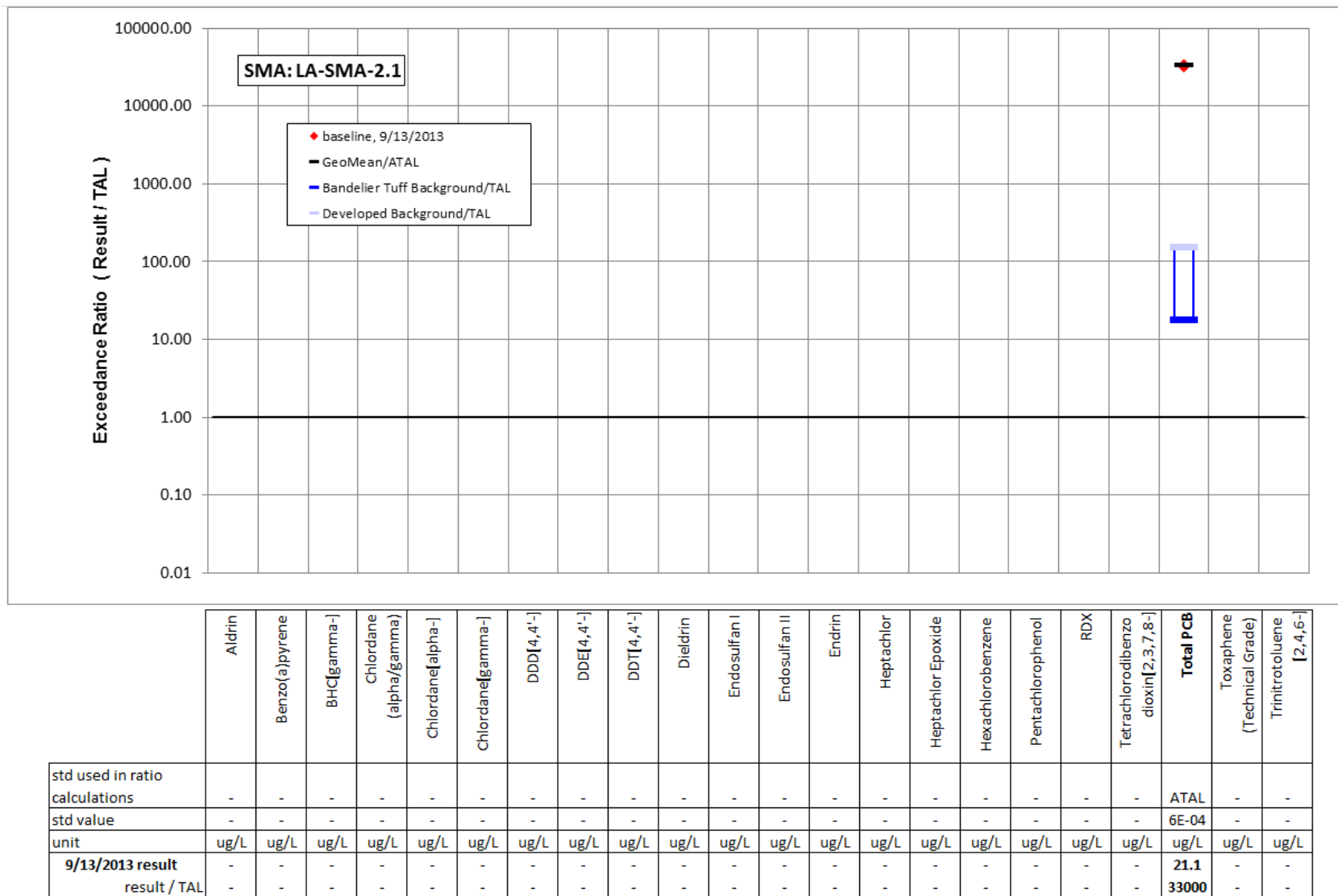
Figure 24-1 LA-SMA-2.1 location map



	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	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>9/13/2013 result</b>	359	3	4.31	45.5	0.201	<i>10</i>	5	<b>11.1</b>	0.808	0.2	1.43	5	<b>1</b>	2	4.81	26.4	0.0021	<b>125</b>	1.59
result / TAL	0.48	<i>0.005</i>	0.48	0.0091	0.2	<i>0.048</i>	<i>0.005</i>	<b>2.6</b>	0.048	0.26	0.0084	1	<b>2</b>	0.32	0.048	0.63	0.21	<b>8.3</b>	0.053

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

Figure 24-2 Inorganic analytical results summary plot for LA-SMA-2.1



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

Figure 24-3 Organic analytical results summary plot for LA-SMA-2.1

## 25.0 LA-SMA-2.3: SWMU 01-001(b)

### 25.1 Site Descriptions

One historical industrial activity area is associated with L007, LA-SMA-2.3: Site 01-001(b).

SWMU 01-001(b) is the former location of a septic tank (former structure 01-135), which served FP and M-1 Buildings through a single sanitary waste line connection. The septic tank was removed during the 1974–1976 radiological survey and D&D of TA-01. FP Building was constructed in November 1945 and was a foundry for nonradioactive and nonferrous metals. The building was determined to be free of radioactive contamination before D&D. M-1 Building was completed in June 1950 and originally was used to machine lithium and later to machine uranium-238. The building superstructure was determined to be free of contamination in 1964, but the floor drains were suspected to be radioactively contaminated from the uranium-238 machining conducted in M-1 Building.

Consent Order investigations are complete for SWMU 01-001(b); the Site meets residential risk levels. NMED issued a COC without controls for SWMU 01-001(b) in September 2010.

The project map (Figure 25-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 25.2 Control Measures

Grading and sloping is diverting run-on from all paved areas associated with parking and access to the condominiums. The concrete retaining wall is south of the condominiums and effectively controls run-on from these areas. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 25-1).

**Table 25-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00702040006	Established Vegetation		X	X		B
L00703060005	Straw Wattles	X			X	B
L00703060007	Straw Wattles		X		X	B
L00703080002	Retaining Wall	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 25.3 Storm Water Monitoring

SWMU 01-001(b) is monitored within LA-SMA-2.3. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 25-2). On September 10, 2010, NMED issued a COC for SWMU 01-001(b). This Site is now certified as corrective action complete and monitoring of storm water discharges has ceased at LA-SMA-2.3. No further sampling is required for LA-SMA-2.3 for the duration of the IP.



**25.4 Inspections and Maintenance**

RG055.5 recorded five storm events at LA-SMA-2.3 during the 2013 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 25-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30749	5-13-2013
Storm Rain Event	BMP-32780	6-18-2013
Storm Rain Event	BMP-33585	7-23-2013
Storm Rain Event	BMP-34568	8-14-2013
Storm Rain Event	BMP-35536	9-25-2013
Annual Erosion Evaluation	COMP-36688	11-5-2013

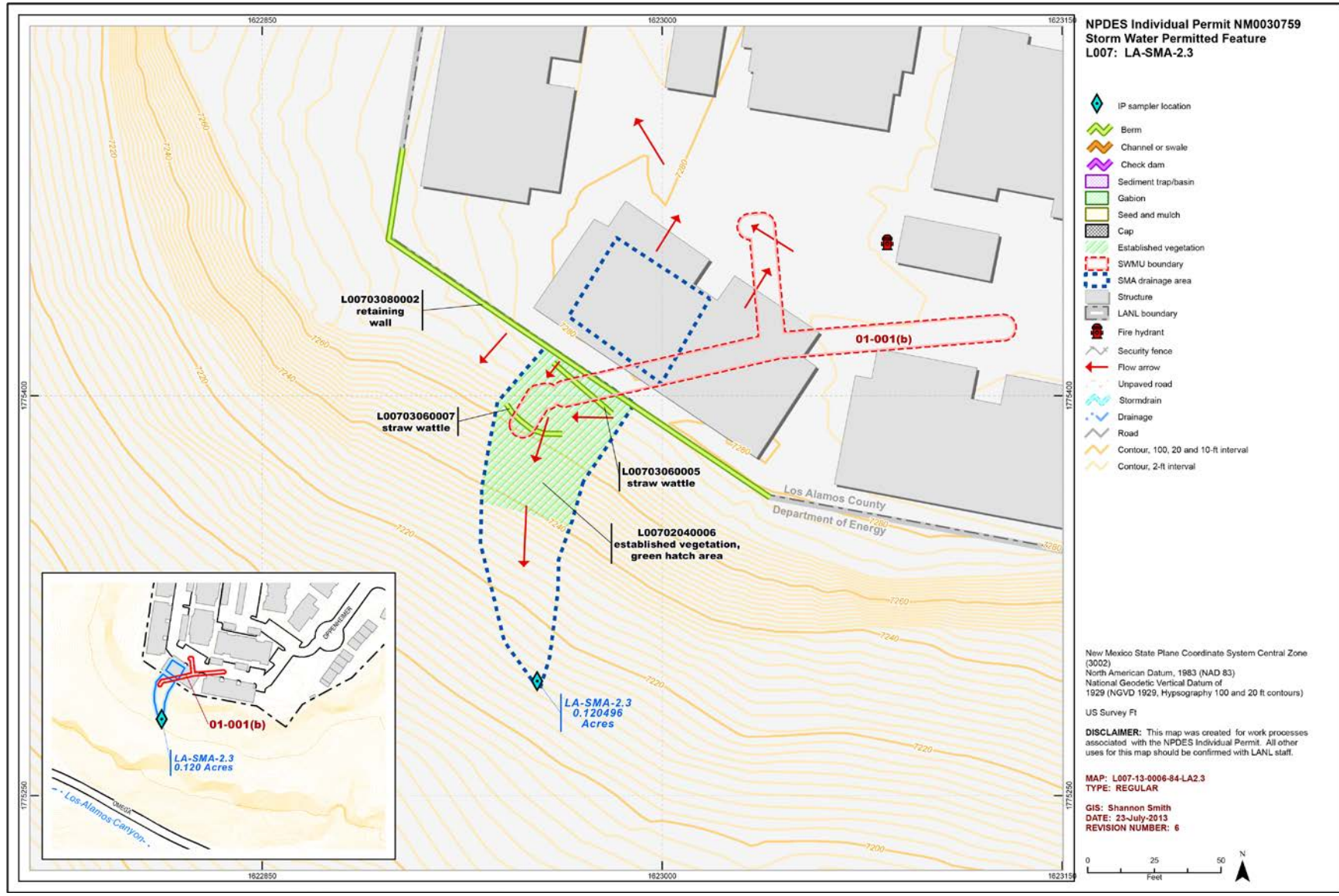
No maintenance activities were conducted at LA-SMA-2.3 in 2013.

**25.5 Compliance Status**

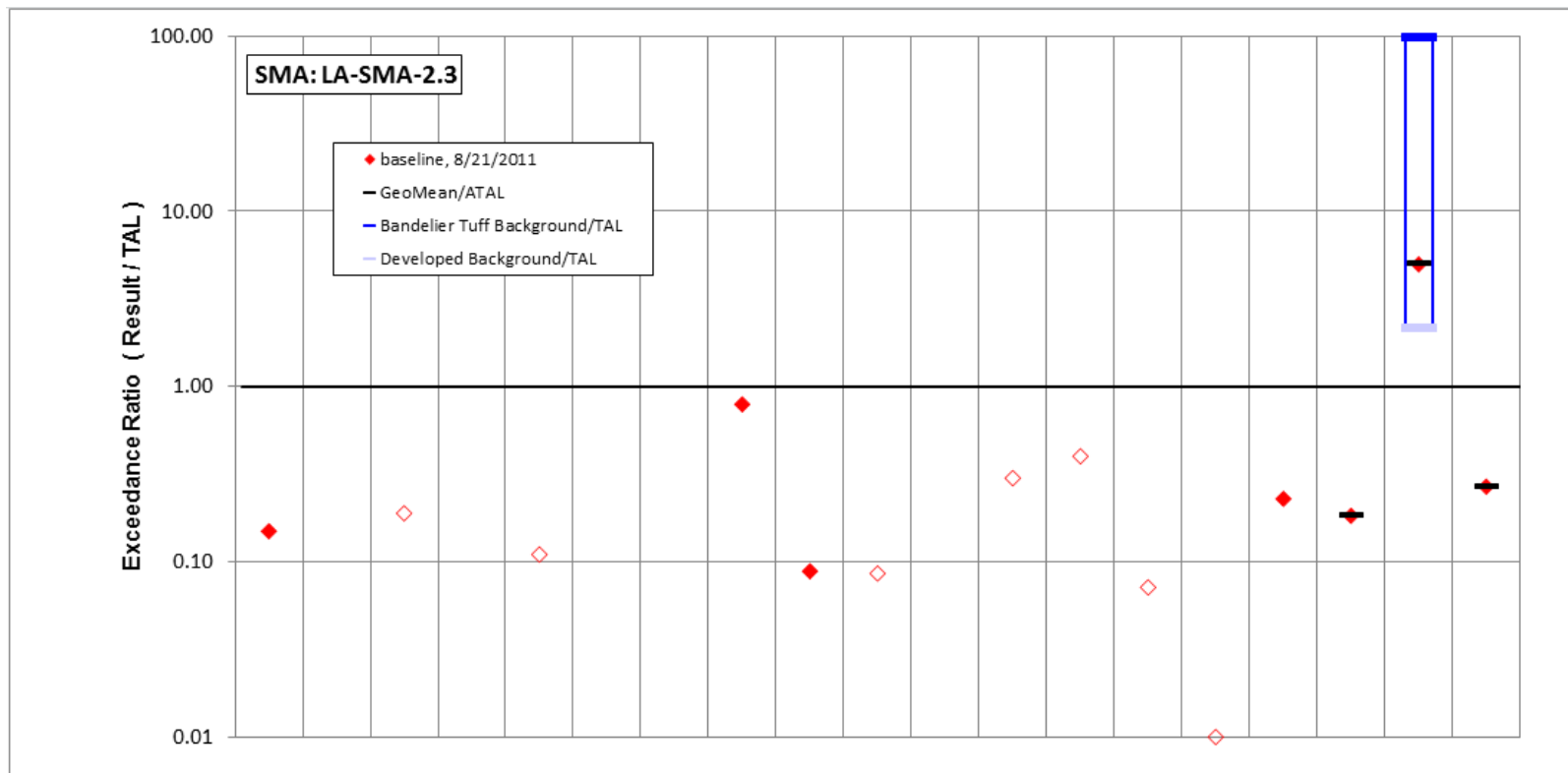
The Site associated with LA-SMA-2.3 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 25-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-001(b)	Corrective Action Complete	Corrective Action Complete	NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory"



**Figure 25-1 LA-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	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>8/21/2011 result</b>	112	1	1.7	17	0.11	2	1.4	3.4	1.5	0.066	1.4	1.5	0.2	0.45	1	9.6	0.0018	<b>74.7</b>	8.05
result / TAL	0.15	0.002	0.19	0.0034	0.11	0.01	0.0014	0.79	0.088	0.086	0.0082	0.3	0.4	0.071	0.01	0.23	0.18	5	0.27

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

Figure 25-2 Inorganic analytical results summary plot for LA-SMA-2.3

## **26.0 LA-SMA-3.1: SWMUs 01-001(e) and 01-003(a)**

### **26.1 Site Descriptions**

Two historical industrial activity areas are associated with L008, LA-SMA-3.1: Sites 01-001(e) and 01-003(a).

SWMU 01-001(e) is the location of former septic tank 139 (structure 01-139), its associated inlet and outlet drainlines, and outfall in former TA-01. The tank outfall discharged southeast of the buildings at the head of Bailey’s Bridge Canyon. Septic tank 139 was constructed in 1944 of reinforced concrete and measured 3 × 36 × 5 ft deep and served the D-5 Sigma vault, I Building, and Delta Building. The tank was decommissioned and left in place in 1965. However, the tank was not found during the 1974–1976 radiological sampling of TA-01, nor was it found when the area was developed for residential use. The D-5 Sigma vault was used to store plutonium-239 and uranium-235. Radiological soil sampling (1974–1976) near the former D-5 Sigma vault showed minimal radiologic contamination, and no additional soil was removed. I Building was used between 1947 and 1958 to store and machine beryllium. Delta Building was used as a meeting place and as a laboratory in which fission-product tracers were used. Currently, the septic tank location is on private property under Oppenheimer Drive, residential buildings and adjacent yards, driveways, and sidewalks.

Consent Order investigations are complete for SWMU 01-001(e). NMED issued a COC with controls in September 2010.

SWMU 01-003(a), also known as Bailey’s Bridge landfill, was a surface disposal area located at the head of Bailey’s Bridge Canyon, a tributary to Los Alamos Canyon. The area was used between 1959 and 1978 to dispose of debris from the demolition of former TA-01 structures. Debris included broken-up concrete walls and flooring from the former Sigma Building, the D-5 vault, HT, Warehouse 19, and the sheet metal shop. Only debris with activity less than 2500 cpm of surface alpha contamination was disposed of in this landfill. Upon completion of TA-01 demolition activities, the remaining debris was covered with 4 ft of earthen fill. Additional fill was deposited over the landfill when the area was developed for residential housing in the 1980s; Bailey’s Bridge no longer exists. The mesa-top portion of the SWMU is under pavement and a series of townhouses. The area downslope of the landfill is undeveloped DOE land.

Consent Order sampling and remediation activities were implemented in 2008–2009 to remove soil with PCBs and lead exceeding residential SSLs in the downslope portion of the Site. Based on the confirmation sampling data, additional removal and stabilization activities and confirmation sampling will be implemented at SWMU 01-003(a) in 2014/2015 to reduce concentrations of PCBs and lead to below residential SSLs. SWMU 01-003(a) will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 01-003(a) will be eligible for a COC upon approval of the Phase II report by NMED.

The project map (Figure 26-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **26.2 Control Measures**

The only potential run-on source is from a small rock lined channel on the eastern side of the SMA that does not appear to flow. The rock channel drains from area lawns. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 26-1).



**Table 26-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00802040007	Established Vegetation		X	X		B
L00803060008	Straw Wattles		X		X	B
L00804040004	Culvert	X		X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 26.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-3.1. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 26.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-3.1 during the 2013 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 26-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30750	5-14-2013
Storm Rain Event	BMP-32781	6-18-2013
Storm Rain Event	BMP-33586	7-23-2013
Storm Rain Event	BMP-34569	8-14-2013
Storm Rain Event	BMP-35537	9-25-2013
Annual Erosion Evaluation	COMP-36689	11-5-2013

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

**Table 26-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-32143	Install new straw wattle(s) above sampler location.	5/22/2013	8 days (s)	Maintenance conducted in timely manner.

### 26.5 Compliance Status

The Sites associated with LA-SMA-3.1 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is now 1 yr from the date of any observed TAL exceedance.

**Table 26-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-001(e)	Baseline Monitoring Extended	Baseline Monitoring Extended	NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory"
SWMU 01-003(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

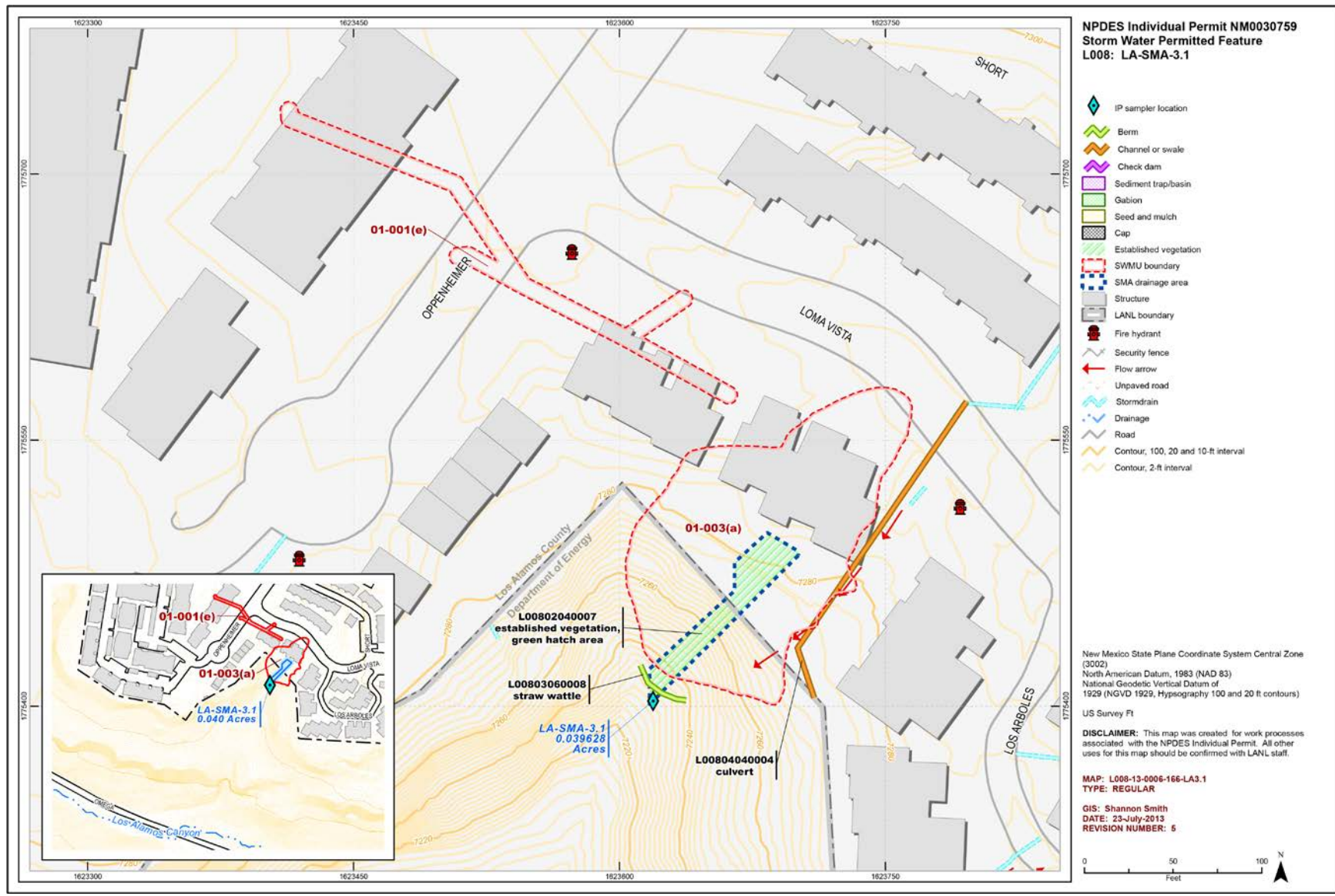


Figure 26-1 LA-SMA-3.1 location map

## **27.0 LA-SMA-3.9: SWMUs 01-001(g) and 01-006(a)**

### **27.1 Site Descriptions**

Two historical industrial activity areas are associated with L009, LA-SMA-3.9: Sites 01-001(g) and 01-006(a).

SWMU 01-001(g) is the location of former septic tank 141 (structure 01-141), its associated inlet and outlet drainlines, and outfall in former TA-01. The tank measured 3 × 6 × 5 ft deep and was installed in 1943. The tank was located south of Building X (01-79) near the edge of Los Alamos Canyon and served Building X, where radioactive targets were tested. The tank received sanitary waste from Building X through one sanitary waste line. The outfall discharged over the rim of the canyon. The septic tank, outlet line, and about 151 ft of the inlet line were removed in 1975. At that time, structure 01-141, its surrounding soil, and the sludge in the structure tested free of radioactive contamination. Currently, the location of the former inlet pipeline is on private property under a condominium building, and the outfall location is on undeveloped land owned by DOE.

Consent Order sampling and remediation activities were implemented on the hillside below the former septic tank outfall on DOE property in 2008–2009 to remove soil with plutonium-239/240 exceeding the residential SAL. Based on the confirmation sampling data, additional removal and stabilization activities and confirmation sampling will be implemented at SWMU 01-001(g) in 2014–2015. SWMU 01-001(g) will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 01-001(g) will be eligible for a COC upon approval of the Phase II report by NMED.

SWMU 01-006(a) is the former drainline and outfall that served a cooling tower (former structure 01-80) at former TA-01. The drainline and outfall were located on the east side of the cooling tower and south of Building X (01-79) near the north rim of Los Alamos Canyon. Currently, the location of the former pipeline is under a building of the privately owned Los Arboles condominiums. Although no documentation was found on the removal of the drainline, it was likely removed during the construction of the residential building. The drainline was not encountered during the 2008–2009 Consent Order investigation activities.

Phase I and II Consent Order investigations are complete for SWMU 01-006(a). All detected constituents are below residential SSLs and SALs. SWMU 01-006(a) is expected to be eligible for a COC after submittal and approval of the Phase II investigation report.

The project map (Figure 27-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **27.2 Control Measures**

The culvert northwest of the Permitted Feature prevents run-on to the SMA from the road north of the condominiums. There is no run-on from lawns and no impact from the road and related paved areas. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 27-1).



**Table 27-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L00902040005	Established Vegetation		X	X		B
L00903060004	Straw Wattles		X		X	B
L00904040002	Culvert	X		X		CB

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

### 27.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-3.9. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 27.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-3.9 during the 2013 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 27-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30751	5-14-2013
Storm Rain Event	BMP-32782	6-18-2013
Storm Rain Event	BMP-33587	7-23-2013
Storm Rain Event	BMP-34570	8-14-2013
Storm Rain Event	BMP-35538	9-25-2013
Annual Erosion Evaluation	COMP-36690	11-5-2013

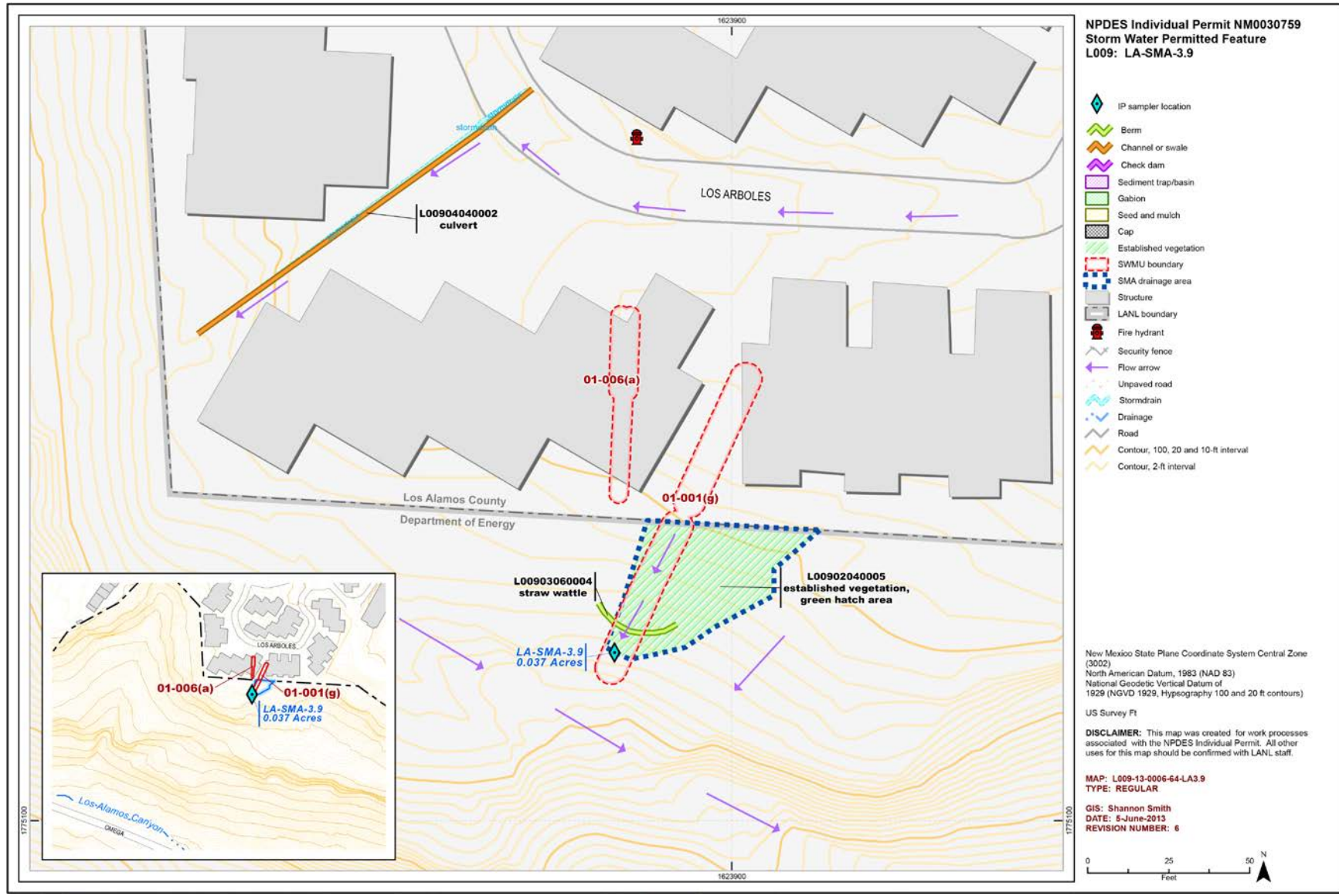
No maintenance activities were conducted at LA-SMA-3.9 in 2013.

### 27.5 Compliance Status

The Sites associated with LA-SMA-3.9 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 27-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-001(g)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 01-006(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



**Figure 27-1 LA-SMA-3.9 location map**

## 28.0 LA-SMA-4.1: SWMU 01-006(b) and AOC 01-003(b)

### 28.1 Site Descriptions

Two historical industrial activity areas are associated with L010, LA-SMA-4.1: Sites 01-003(b) and 01-006(b).

SWMU 01-006(b) consists of the TA-01 former D Building (01-6) drainline and outfall that discharged to Los Alamos Canyon. Before its removal, D Building was used primarily to process plutonium. The types and quantities of liquids handled by the drainline are not known. During the 1974–1976 excavation of the D Building area, all drainlines were removed along with the areas of elevated radioactivity.

AOC 01-003(b) is described in the 1990 SWMU report as a surface disposal area for construction debris reported to be below the north rim of Los Alamos Canyon, approximately 450 ft east of Bailey Bridge Canyon. Site visits performed to locate the disposal area identified a few pieces of metal debris, but there was no evidence of a surface disposal area.

The project map (Figure 28-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 28.2 Control Measures

Run-on contributions associated with the southwest corner of the parking area at Los Alamos Inn are present at this SMA. Additional run-on to the SMA may originate from a storm culvert located behind the eastern side of the condominiums. This run-on contribution is controlled but not diverted. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 28-1).



**Table 28-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01002040010	Established Vegetation		X	X		B
L01004060004	Rip Rap	X		X		CB
L01004060005	Rip Rap	X		X		CB
L01006010009	Rock Check Dam		X		X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 28.3 Storm Water Monitoring

AOC 01-003(b) and SWMU 01-006(b) are monitored within LA-SMA-4.1. Following the installation of baseline control measures, two baseline storm water samples were collected on August 19, 2011, and September 4, 2011 (Figures 28-2 and 28-3). Analytical results from these samples yielded three TAL exceedances:

- Copper concentrations of 5.3 µg/L and 6.7 µg/L (MTAL is 4.3 µg/L),
- Gross-alpha activity of 111 pCi/L (ATAL is 15 pCi/L), and
- PCB concentrations of 8 ng/L and 60 ng/L (ATAL is 0.6 ng/L).

These exceedances were 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 discussion is organized by Site and analyte.

#### *AOC 01-003(b):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the 7 shallow (i.e., less than 3 ft bgs) Consent Order soil, sediment, and tuff samples.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Consent Order samples were not analyzed for PCBs because they were not identified as potential contaminants at this Site.
- 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 uranium and plutonium isotopes, which are alpha emitters. Plutonium-238 and plutonium-239/240 were detected above soil and sediment BVs and sediment FVs, or detected where FVs are not applicable, in shallow Consent Order soil, sediment, and/or tuff samples. Plutonium-238 was detected in 1 of 8 shallow samples at an activity of 0.168 pCi/g in tuff; there is no FV for plutonium-238 in tuff. Plutonium-239/240 was detected in 6 of 8 shallow samples at a maximum activity 31 times the sediment FV. Americium and plutonium isotopes are not included in the definition of adjusted gross-alpha radioactivity.

#### *SWMU 01-006(b):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the tuff BV in shallow (i.e., less than 3 ft bgs) Consent Order soil, sediment, and tuff samples. Copper was detected in 1 of 8 shallow Consent Order samples at a concentration equal to the tuff BV.
- PCBs are not known to be associated with industrial materials historically managed at the Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in 2 to 5 shallow samples below the EQLs.
- Alpha-emitting radionuclides, specifically americium-241 and isotopes of plutonium, are known to be associated with industrial materials historically managed at the Site. However, americium and plutonium isotopes are excluded from the definition of adjusted gross-alpha radioactivity. No other 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 for americium-241 and uranium and plutonium isotopes, which are alpha emitters. Americium-241 was detected in 6 of 8 shallow samples with a maximum activity 1180 times the soil FV. Plutonium-239/240 was detected in 8 of 8 shallow samples at a maximum activity 19,074 times the sediment FV.

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 28-2 and 29-3. 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 28-2 and 28-3.

Monitoring location LA-SMA-4.1 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. PCBs are associated with building materials including paint, caulking, asphalt, solvents, transformers, and cutting oils. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—The copper UTL from developed urban landscape storm water run-on is 32.3 µg/L; copper UTL for background storm water containing sediment derived from Bandelier Tuff is 3.43 µg/L. The copper results from 2011 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 urban landscape is 32.5 pCi/L. The 2011 gross-alpha result is between these two values.
- PCBs—The PCB UTL from developed urban landscape storm water run-on is 98 ng/L; PCB UTL for background storm water containing sediment derived from Bandelier Tuff is 11.7 ng/L. One of the PCB results from 2011 is between these two values and the other is less than both of them.

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

### 28.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-4.1 during the 2013 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 28-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30752	4-2-2013
Storm Rain Event	BMP-32783	6-18-2013
Storm Rain Event	BMP-33588	7-23-2013
Storm Rain Event	BMP-34571	8-14-2013
Storm Rain Event	BMP-35539	9-25-2013
Annual Erosion Evaluation	COMP-36691	12-5-2013

No maintenance activities were conducted at LA-SMA-4.1 in 2013.

**28.5 Compliance Status**

The Sites associated with LA-SMA-4.1 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 28-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 01-003(b)	Corrective Action Initiated	Corrective Action Initiated	Initiated 11-08-2011
SWMU 01-006(b)	Corrective Action Initiated	Corrective Action Initiated	Initiated 11-08-2011

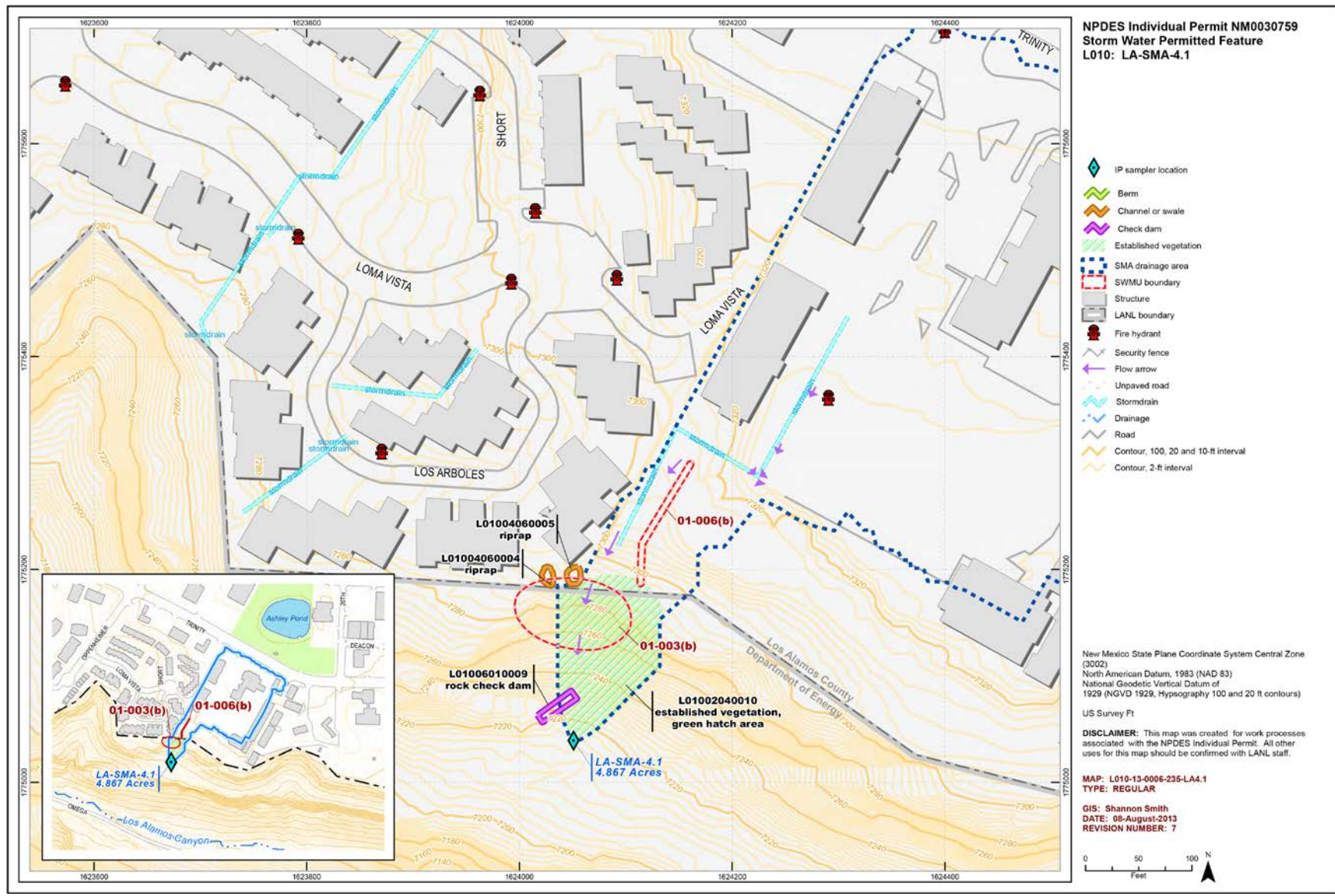
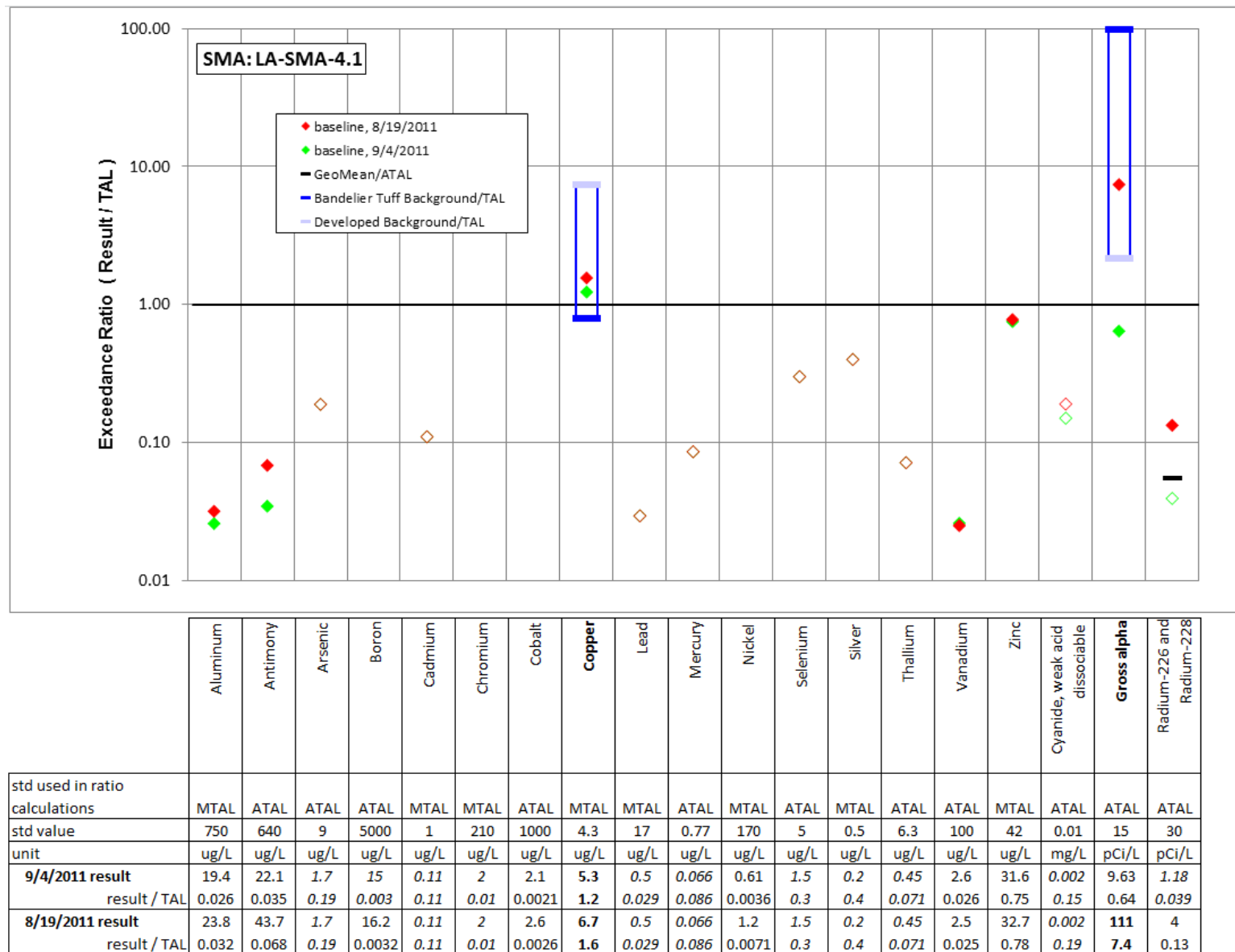


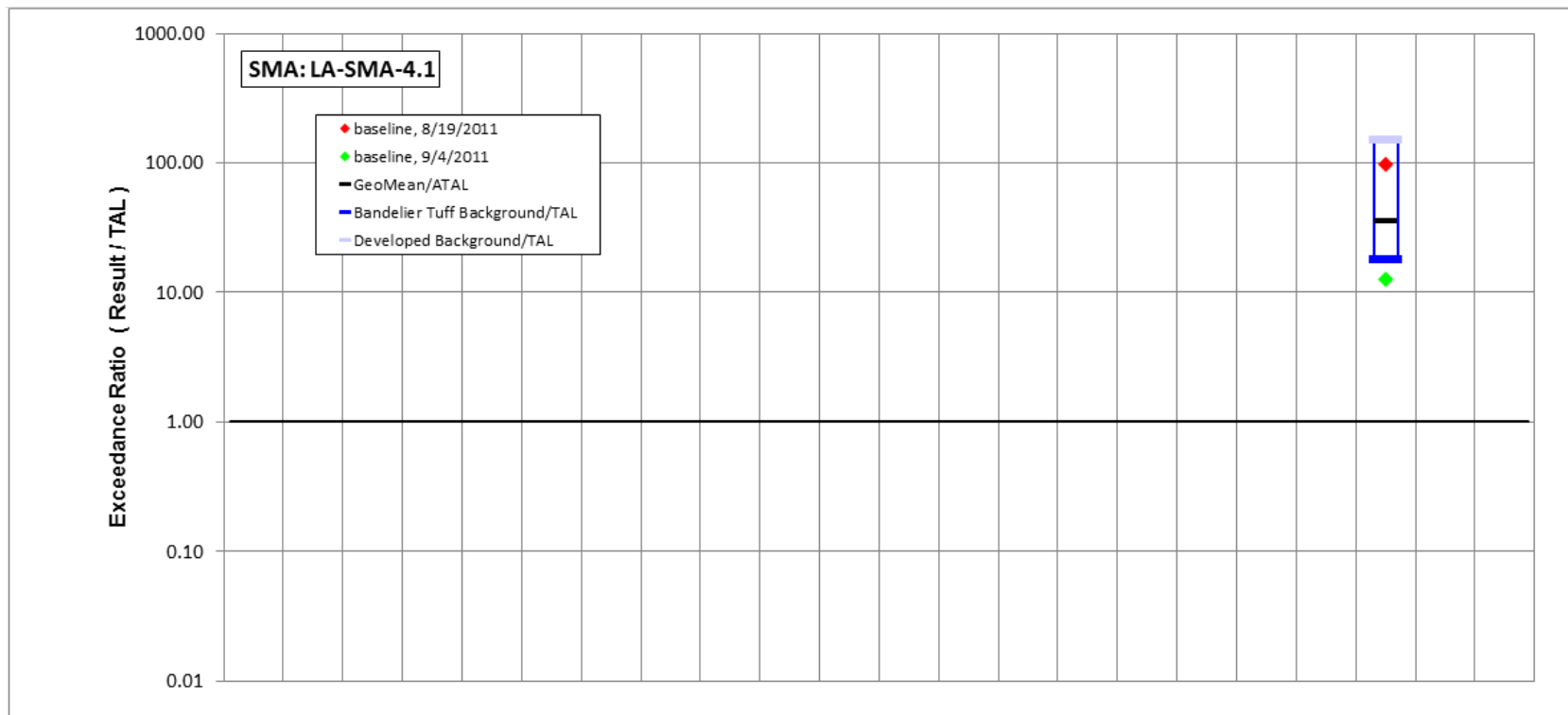
Figure 28-1 LA-SMA-4.1 location map



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

Figure 28-2 Inorganic analytical results summary plot for LA-SMA-4.1





	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-]	<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>9/4/2011 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.008</b>	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>13</b>	-	-
<b>8/19/2011 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.063</b>	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>98</b>	-	-

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

Figure 28-3 Organic analytical results summary plot for LA-SMA-4.1

## **29.0 LA-SMA-4.2: SWMUs 01-001(c), 01-006(c), and 01-006(d)**

### **29.1 Site Descriptions**

Three historical industrial activity areas are associated with L011, LA-SMA-4.2: Sites 01-001(c), 01-006(c), and 01-006(d).

SWMU 01-001(c) is the location of former septic tank 137 (structure 01-137), its associated inlet and outlet drainlines, and outfall in former TA-01. The septic tank was installed in 1945 and served D-2 Building, which operated as a laundry for radioactively contaminated clothing and recyclable equipment. It was converted to an electronics shop after laundry operations were relocated to TA-21. Septic tank 01-137 was identified as a potential source of plutonium contamination in the runoff area below the septic tank outfall pipe. Septic tank 01-137 and its outfall pipe were subsequently removed and disposed of at MDA G at TA-54. Low levels of radiological activity were detected in the sidewalls of the septic tank excavation. Soil was removed from the excavation until gross-alpha activity levels were below 25 pCi/g. Clean soil was used to backfill the excavation.

Decision-level data for SWMU 01-001(c) determined that the nature and extent for all chemicals detected were defined. All detected chemicals were below residential SSLs. Based on human health and ecological risk-screening assessments, no additional investigation or remediation activities are required at SWMU 01-001(c). NMED issued a COC with controls in September 2010.

SWMU 01-006(c) consists of the former drainlines and outfall that served Building D-2 (former building 01-8). The SWMU 01-006(c) drainlines exited the southwest side of the building and discharged directly onto Hillside 137. Building D-2 was the laundry facility for radioactively contaminated clothing and recyclable equipment for all of TA-01 from 1943 to 1945. The laundry facility was moved to TA-21 in 1945. During the 1974–1976 radiological survey of former TA-01, contaminated soil was excavated in the areas of former Buildings D and D-2. Two drainlines at the southwest end of the building were encountered during the excavation activities and were removed; the excavated areas were backfilled with clean fill.

Decision-level data from a 2009 investigation indicate detected contaminant concentrations are below residential SSLs and/or SALs. Additional sampling is proposed at SWMU 01-006(c).

SWMU 01-006(d) is the former drainline and outfall that served Building D-3 and discharged to Los Alamos Canyon at the former TA-01. The outfall is located on Hillside 137 in the same area as the former SWMU 01-006(c) drainline. Activities conducted at Building D-3 included counting radioactive filter papers from Building H-1. During the D&D of Buildings D and D-2, all drainlines were removed along with areas of elevated radioactivity. Because the main portion of the drainline from Building D-3 was located in close proximity to Building D-2, this drainline was likely removed during the excavation of contaminated soils beneath and around Buildings D and D-2. Clean soil was used to backfill the excavations. Currently, the area is undeveloped and privately owned. Clean soil was used to backfill the excavation. All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. NMED issued a COC with controls in September 2010.

The project map (Figure 29-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## 29.2 Control Measures

There is no evidence of concentrated flow and minimal evidence of run-on at this Permitted Feature. Water bars are installed along the unpaved access road to control any potential run-on to the SMA. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 29-1).

**Table 29-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01102040008	Established Vegetation		X	X		B
L01104050003	Water Bar	X		X		CB
L01104050004	Water Bar	X		X		CB
L01104050006	Water Bar	X		X		CB
L01104050007	Water Bar	X		X		CB
L01106010002	Rock Check Dam		X		X	CB
L01106010005	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

## 29.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-4.2. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

## 29.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-4.2 during the 2013 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 29-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30753	4-2-2013
Storm Rain Event	BMP-32784	6-18-2013
Storm Rain Event	BMP-33589	7-18-2013
Storm Rain Event	BMP-34572	8-14-2013
Storm Rain Event	BMP-35540	9-25-2013
Annual Erosion Evaluation	COMP-36692	12-5-2013

No maintenance activities were conducted at LA-SMA-4.2 in 2013.

### 29.5 Compliance Status

The Sites associated with LA-SMA-4.2 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 29-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-001(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory"
SWMU 01-006(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 01-006(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory"



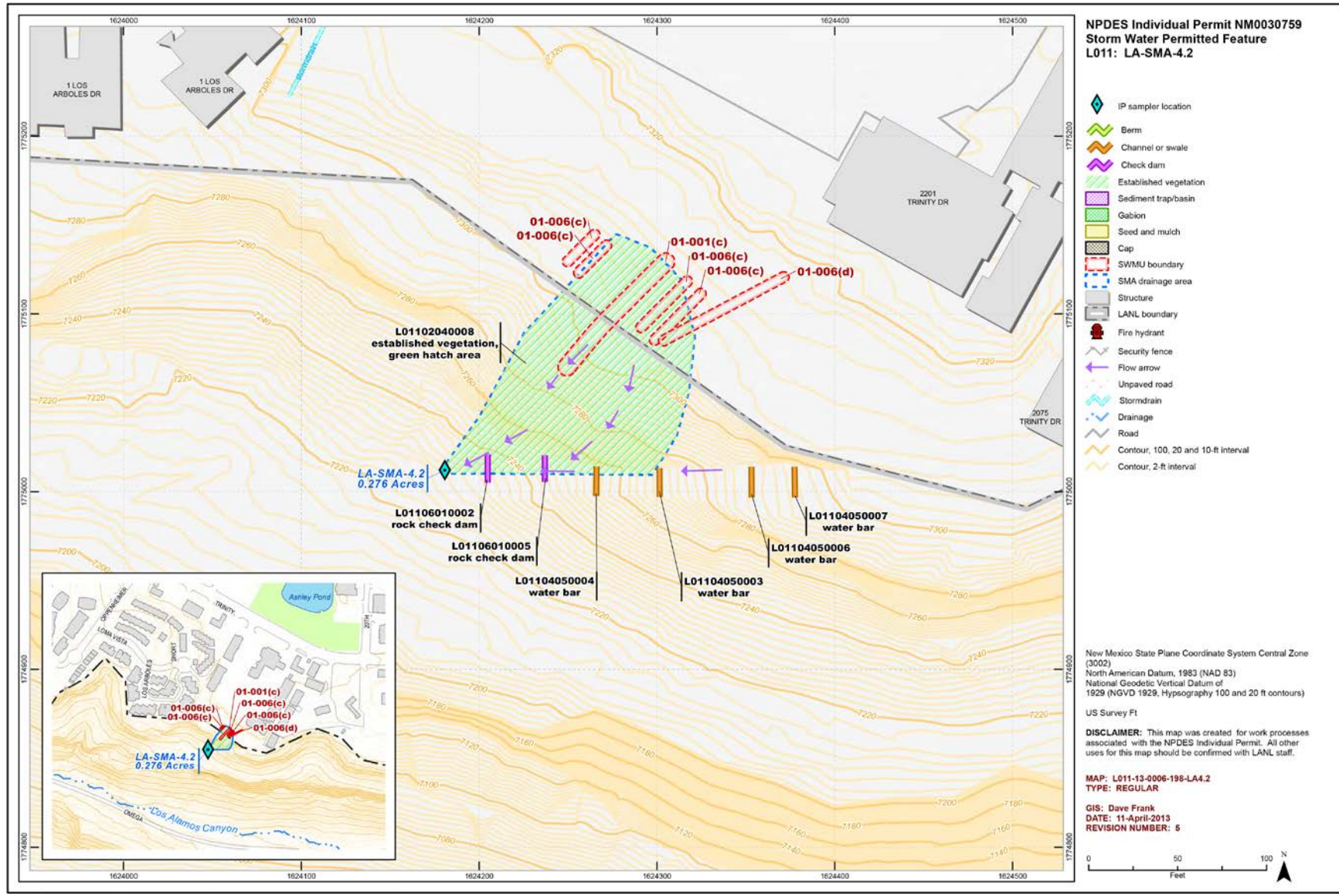


Figure 29-1 LA-SMA-4.2 location map

## **30.0 LA-SMA-5.01: SWMUs 01-001(d) and 01-006(h)**

### **30.1 Site Descriptions**

Two historical industrial activity areas are associated with L012, LA-SMA-5.01: Sites 01-001(d) and 01-006(h).

SWMU 01-001(d) is the former location of septic tank 138 (structure 01-138), its associated inlet and outlet drainlines, and outfall in former TA-01. The septic was constructed of reinforced concrete, measured 3 × 6 × 5 ft deep, and was located southeast of Building Y (former structure 01-81). The septic tank was installed in 1943 and served Buildings K (former structure 01-40), V (former structure 01-70), and Y. Building K was a chemical stock room that contained a mercury still. Building V housed the original TA-01 uranium and beryllium machine shop. Dry-grinding of boron was also performed in Building V. Building Y housed a physics laboratory that handled tritium, uranium-238, and polonium-210. The buildings were connected to septic tank 138 by a sanitary waste line. The outfall was located east of Building Y and discharged over the rim of Los Alamos Canyon. This outfall area is known as Hillside 138. The septic tank was abandoned in place in 1956 and was removed in 1975 or 1976. Currently, the location of the former pipelines and former septic tank is privately owned and commercially developed with buildings and an asphalt parking lot. The outfall is located on undeveloped land owned by DOE. SWMU 01-001(d) overlaps the footprint of SWMU 01-006(h); the two Sites share the same hillside area. Sampling and remediation activities were implemented at the Site in 2008–2009 to remove soil with mercury exceeding the residential SSL and plutonium-239/240 exceeding the residential SAL.

A total of 48 samples were collected from 23 locations and analyzed for TAL metals, VOCs, SVOCs, and radionuclides at SWMUs 01-001(d) and 01-006(h).

Concentrations of plutonium-239/240 exceeded the residential SAL at three locations. Mercury concentrations also exceed the residential SSL at two locations. Additional sampling and soil removals are planned for SWMU 01-001(d) in 2014/2015. Soil removals will be performed to reduce concentrations to below the residential levels.

SWMU 01-006(h) consists of the former storm water-drainage system that served the northwest side of former Building R and the east side of former Building Y with former TA-01. Building R housed model, glass, carpentry, and plumbing shops. Building Y housed a physics laboratory that handled tritium, uranium-238, and polonium-210. The outfall for this drainage system was located 25 ft south of Building Y on the north rim of Los Alamos Canyon, immediately west of Hillside 138. Currently, the entire drainage system area is located beneath privately owned commercial buildings.

Consent Order sampling and remediation activities will be implemented in 2014/2015 on the hillside below the former storm drain outfall on DOE property in 2014 to remove soil with mercury and plutonium-239/240 exceeding the residential SSL and SAL, respectively. SWMU 01-006(h) will then be recommended for corrective action complete in the future Phase II Upper Los Alamos Canyon Aggregate Area investigation report. SWMU 01-006(h) will be eligible for a COC upon approval of the Phase II report by NMED.

The project map (Figure 30-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 30.2 Control Measures

Paved areas and roof top drainage in the headwaters of this SMA provide a source for significant run-on contribution. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 30-1).

**Table 30-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01202040012	Established Vegetation		X	X		B
L01203010004	Earthen Berm		X		X	CB
L01203010007	Earthen Berm	X			X	CB
L01203060011	Straw Wattles	X			X	B
L01203120010	Rock Berm	X			X	CB
L01204050008	Water Bar	X		X		CB
L01204050009	Water Bar	X		X		CB
L01204060006	Rip Rap		X	X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 30.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.01. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 30.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-5.01 during the 2013 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 30-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30754	4-2-2013
Storm Rain Event	BMP-32787	6-18-2013
Storm Rain Event	BMP-33592	7-18-2013
Storm Rain Event	BMP-34575	8-14-2013
Storm Rain Event	BMP-35543	9-25-2013
Annual Erosion Evaluation	COMP-36693	12-5-2013

No maintenance activities were conducted at LA-SMA-5.01 in 2013.

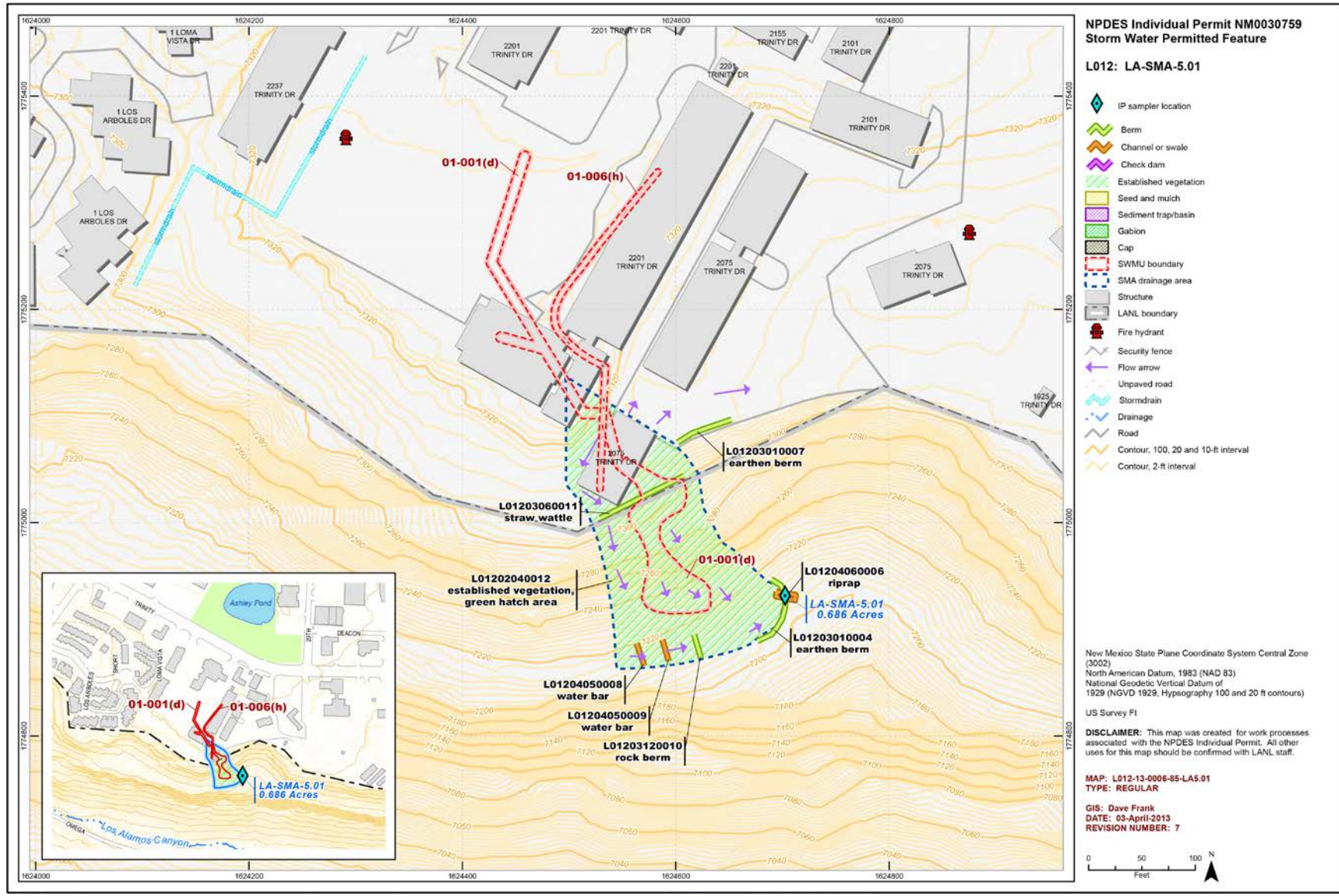
### 30.5 Compliance Status

The Sites associated with LA-SMA-5.01 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is now 1 yr from the date of any observed TAL exceedance.

**Table 30-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-001(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 01-006(h)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment





**Figure 30-1 LA-SMA-5.01 location map**

## 31.0 LA-SMA-5.02: SWMU 01-003(e)

### 31.1 Site Descriptions

One historical industrial activity area is associated with L012A, LA-SMA-5.02: Site 01-003(e).

SWMU 01-003(e) was a surface disposal area on the mesa top and partly on the Los Alamos Canyon hillside where demolition debris from former TA-01 was placed in the 1950s. Surface debris on the hillside of SWMU 01-003(e) consisted primarily of concrete construction debris but also included utility boxes, piping, and other miscellaneous debris. Review of historical aerial photographs from the 1950s and 1960s indicates that when the buildings in the eastern portion of former TA-01 underwent D&D in the 1950s, debris from the 1940s era buildings was placed at the head of the canyon, and some of the debris was pushed down the hillside. Review of historical aerial photographs from the mid-1970s shows that additional fill was placed over the top of the mesa-top portion of the debris during the development of the former Los Alamos Inn, adjacent professional buildings, and associated parking lots. The mesa-top portion of SWMU 01-003(e) is currently paved with asphalt and the professional buildings remain in place.

Consent Order investigations are complete for SWMU 01-003(e); the Site meets residential risk levels. NMED issued a COC with controls (storm water) for SWMU 01-003(e) in September 2010.

The project map (Figure 31-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 31.2 Control Measures

Paved areas in the headwaters of this SMA provide a source for significant run-on contribution. The storm drain located on the south side of the parking area contributes run-on to the SMA from the impervious areas in the northern portion of the Permitted Feature. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 31-1).

**Table 31-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L012A02040012	Established Vegetation		X	X		B
L012A03010002	Earthen Berm	X			X	CB
L012A03060016	Straw Wattles		X		X	B
L012A03060017	Straw Wattles		X		X	B
L012A03060018	Straw Wattles		X		X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 31.3 Storm Water Monitoring

SWMU 01-003(e) is monitored within LA-SMA-5.02. Following the installation of baseline control measures, a baseline storm water sample was collected on August 3, 2011, and August 19, 2011

(Figures 31-2 and 31-3). On September 10, 2010, NMED issued a COC for SWMU 01-003(e). This Site is now certified as corrective action complete, and monitoring of storm water discharges has ceased at LA-SMA-5.02. No further sampling is required for LA-SMA-5.02 for the remainder of the IP.

### 31.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-5.02 during the 2013 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 31-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30755	4-2-2013
Storm Rain Event	BMP-32788	6-18-2013
Storm Rain Event	BMP-33593	7-23-2013
Storm Rain Event	BMP-34576	8-14-2013
Storm Rain Event	BMP-35544	9-25-2013
Annual Erosion Evaluation	COMP-36694	12-5-2013

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

**Table 31-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-34080	Install new straw wattle above existing wattles -L012A03060005, -L012A03060006, and -L012A03060011. Wattles will be retired when work is complete.	8/7/2013	15 day (s)	Maintenance conducted in timely manner.
BMP-36959	Install new straw wattles directly upgradient of existing wattles -L012A03060013. Wattles will be retired when work is complete.	11/5/2013	41 day (s)	Maintenance conducted as soon as practicable.
BMP-36960	Install new straw wattles directly upgradient of existing wattles -L012A03060014. Wattles will be retired when work is complete.	11/5/2013	41 day (s)	Maintenance conducted as soon as practicable.
BMP-36961	Install new straw wattles directly upgradient of existing wattles -L012A03060015. Wattles will be retired when work is complete.	11/6/2013	42 day (s)	Maintenance conducted as soon as practicable.

### 31.5 Compliance Status

The Site associated with LA-SMA-5.02 is a High Priority Site. Corrective action at this SMA was certified within 3 yr of the effective date of the IP (i.e., November 2013).

**Table 31-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-003(e)	Corrective Action Complete	Corrective Action Complete	NMED, September 10, 2010, "Certificates of Completion Upper Los Alamos Canyon Aggregate Area Los Alamos National Laboratory"



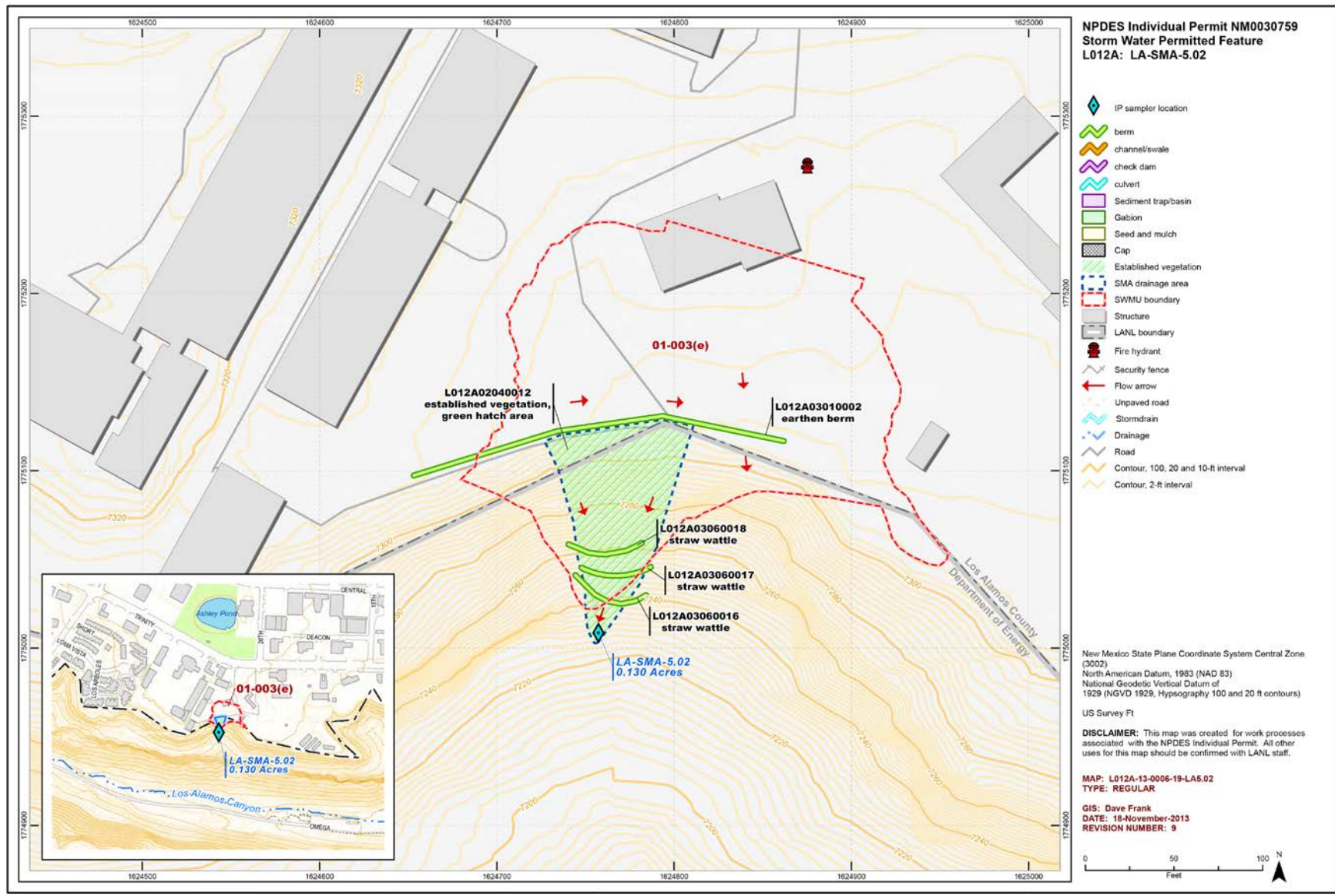
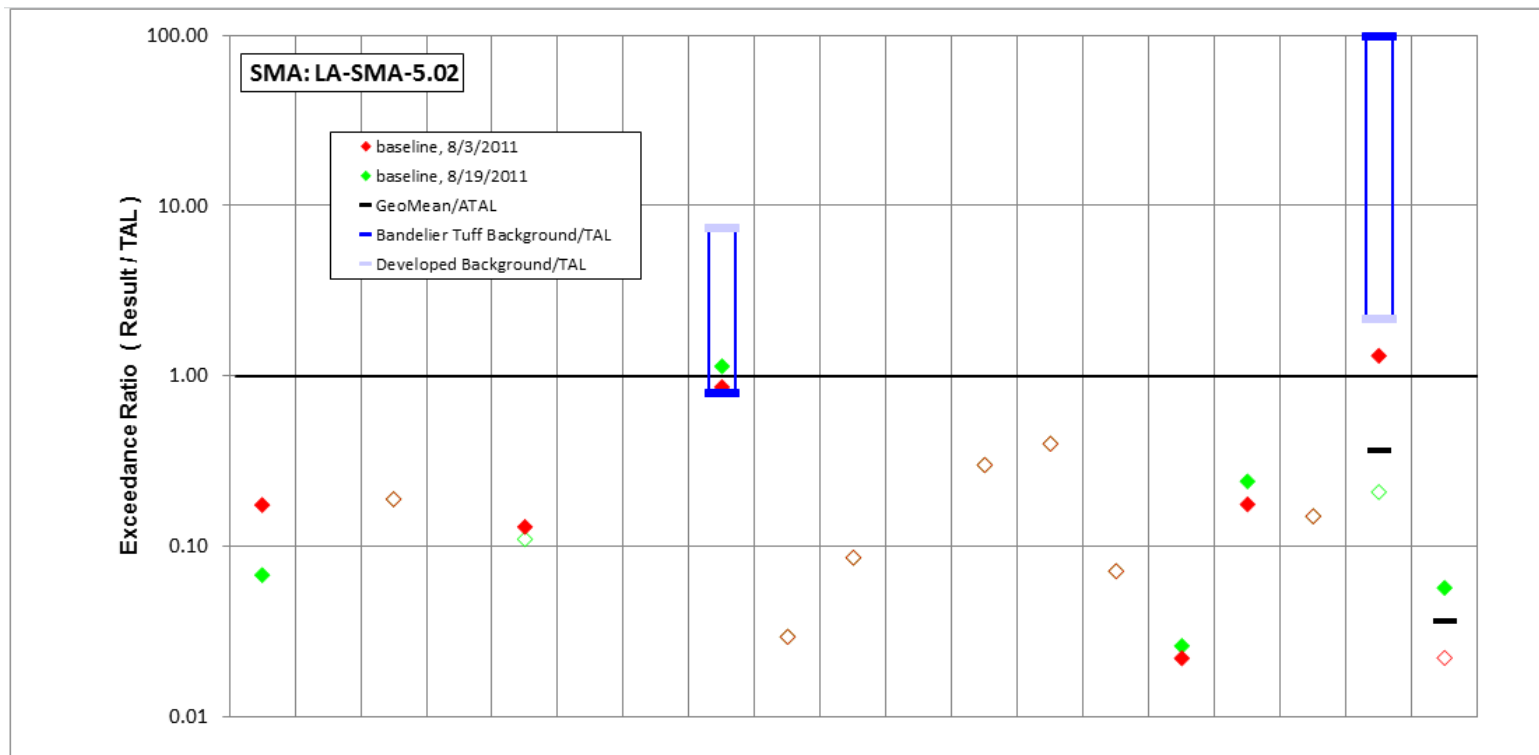


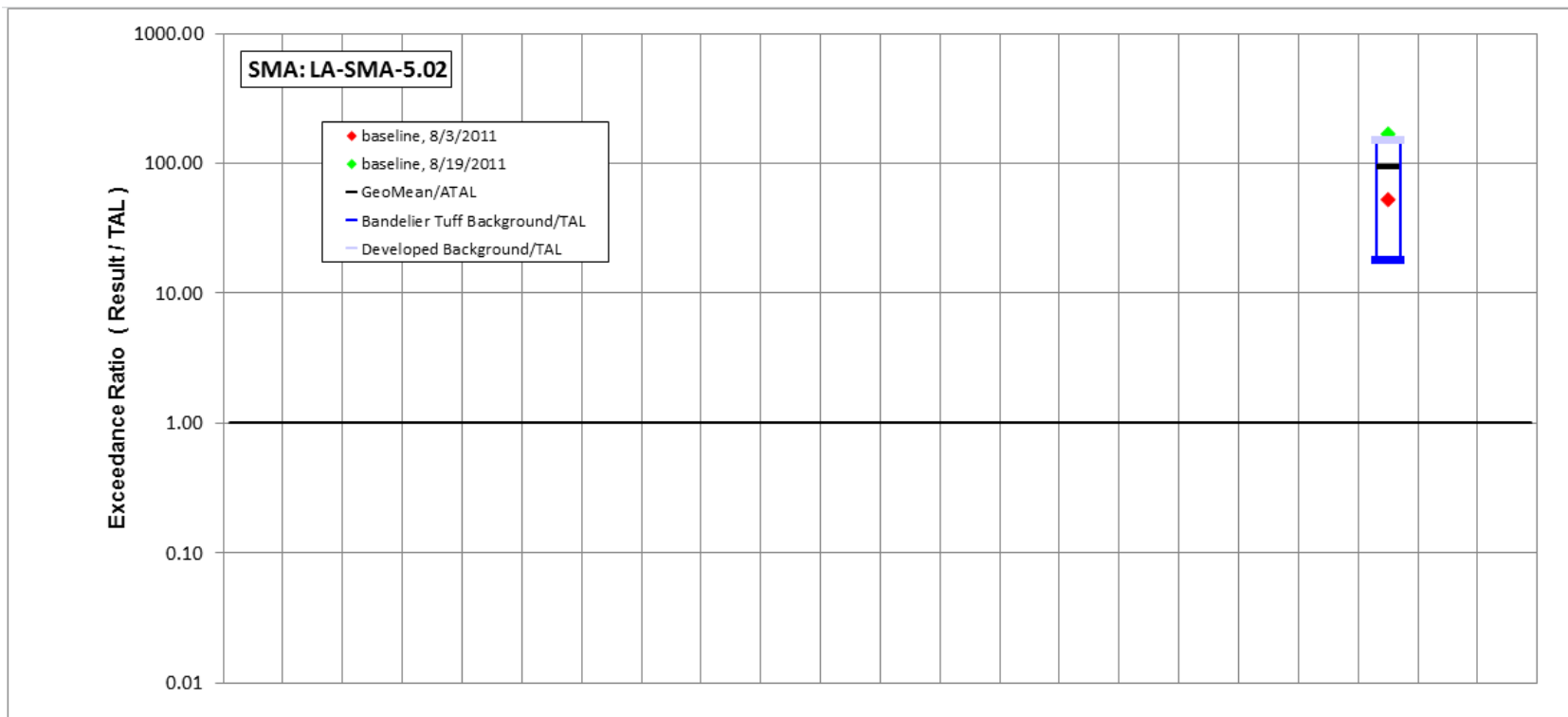
Figure 31-1 LA-SMA-5.02 location map



	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>8/19/2011 result</b>	50.8	<i>1</i>	1.7	29.6	0.11	2	2.6	<b>4.9</b>	0.5	<i>0.066</i>	1.3	1.5	0.2	0.45	2.6	10.1	0.002	3.12	1.71
result / TAL	0.068	<i>0.002</i>	0.19	0.0059	0.11	0.01	0.0026	<b>1.1</b>	0.029	<i>0.086</i>	0.0076	0.3	0.4	0.071	0.026	0.24	0.15	0.21	0.057
<b>8/3/2011 result</b>	131	<i>1</i>	1.7	15.3	0.13	2	1.3	3.7	0.5	<i>0.066</i>	1	1.5	0.2	0.45	2.2	7.4	0.002	<b>19.7</b>	0.663
result / TAL	0.17	<i>0.002</i>	0.19	0.0031	0.13	0.01	0.0013	0.86	0.029	<i>0.086</i>	0.0059	0.3	0.4	0.071	0.022	0.18	0.15	<b>1.3</b>	0.022

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

Figure 31-2 Inorganic analytical results summary plot for LA-SMA-5.02



	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-]	<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>8/19/2011 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.108</b>	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>170</b>	-	-
<b>8/3/2011 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.034</b>	-	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>53</b>	-	-

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

**Figure 31-3 Organic analytical results summary plot for LA-SMA-5.02**

## 32.0 LA-SMA-5.2: SWMU 01-003(d)

### 32.1 Site Descriptions

One historical industrial activity area is associated with L013, LA-SMA-5.2: Site 01-003(d).

SWMU 01-003(d), also known as Can Dump Site, was a surface disposal area used to dispose of empty solvent and paint cans during the operations of the Zia Company (paint, carpentry, furniture repair, and sign shops and warehouses). No radioactive materials were handled in these warehouses because they were located outside the TA-01 security fence. Disposal operations likely ceased during the mid- to late 1950s, when the majority of TA-01 buildings were demolished. All cans and debris were removed from the Site during a 1995 VCA. SWMU 01-003(d) is located on an undeveloped hillside of Los Alamos Canyon, just south of the current Century Link building. Currently, the Site is located on undeveloped DOE land. Sampling data from the 2010 Phase II investigation showed antimony detected above the residential SSL. Therefore, soil removal and additional sampling will be implemented at SWMU 01-003(d) in 2014/2015.

The project map (Figure 32-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 32.2 Control Measures

The paved area, owned by Los Alamos County, to the north of the Permitted Feature is sloped to the east, diverting run-on away from the SMA to a natural channel that discharges into Los Alamos Canyon. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 32-1).

**Table 32-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01302040005	Established Vegetation		X	X		B
L01306020006	Log Check Dam		X		X	B
L01306020007	Log Check Dam		X		X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 32.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.2. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

The LA-SMA-5.2 monitoring station was relocated. The new location of the sampler is positioned to provide a more representative sample of storm water discharge from the SMA. Sampler coordinates and SMA drainage area are updated in Attachment 4.



### 32.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-5.2 during the 2013 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 32-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30756	5-16-2013
Storm Rain Event	BMP-32786	6-18-2013
Storm Rain Event	BMP-33591	7-17-2013
Storm Rain Event	BMP-34574	8-12-2013
Storm Rain Event	BMP-35542	9-25-2013
Annual Erosion Evaluation	COMP-36695	11-15-2013

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

**Table 32-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-32169	Install 2 log check dams to the west of existing controls.	5/29/2013	13 day (s)	Maintenance conducted in timely manner.
BMP-33875	Modify log check dam L01306020006 by adding more logs as necessary.	7-31-2013	14 day(s)	Maintenance conducted in timely manner.

### 32.5 Compliance Status

The Site associated with LA-SMA-5.2 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 32-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 01-003(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

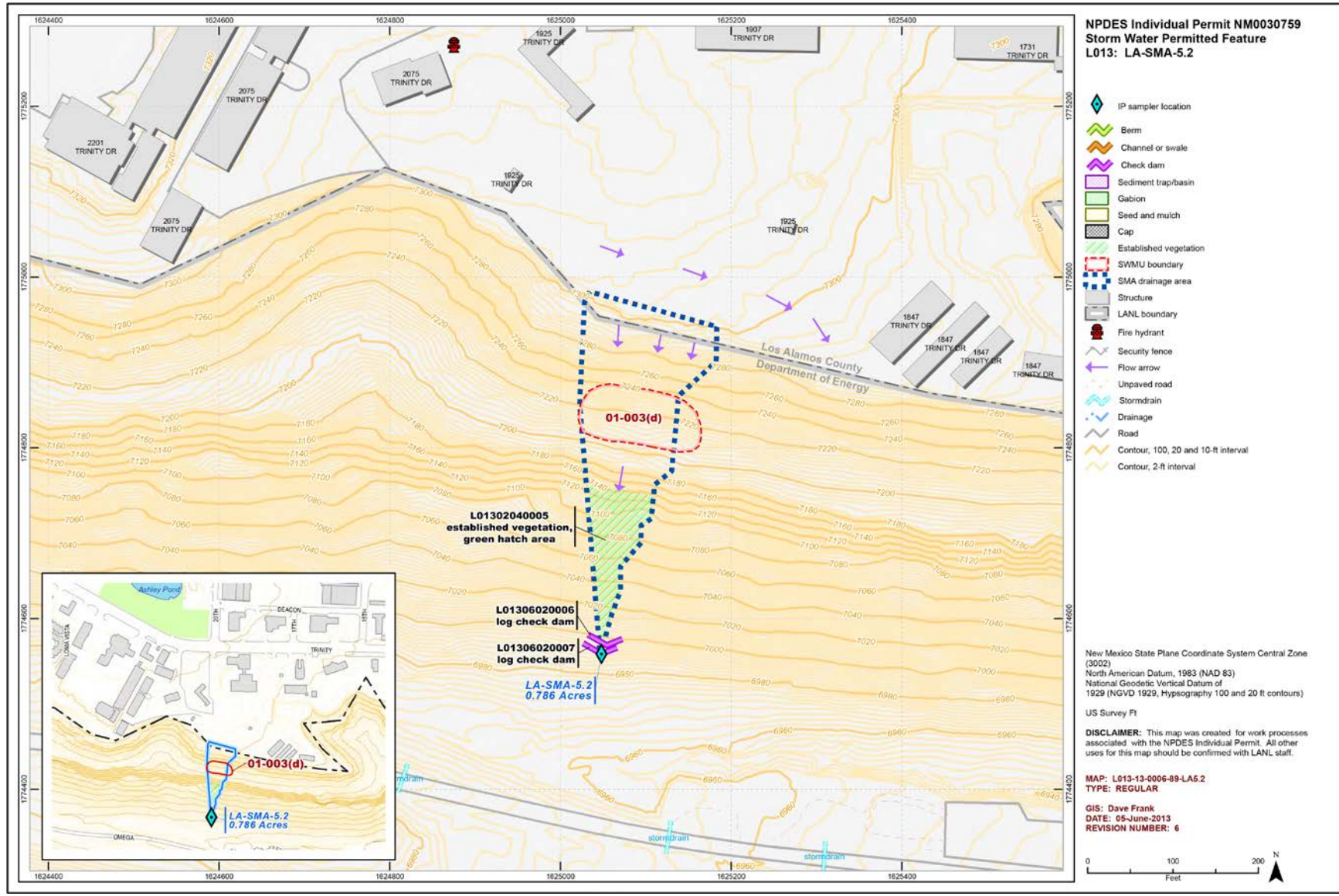


Figure 32-1 LA-SMA-5.2 location map

### 33.0 LA-SMA-5.31: SWMU 41-002(c)

#### 33.1 Site Descriptions

One historical industrial activity area is associated with L015, LA-SMA-5.31: Site 41-002(c).

SWMU 41-002(c) is a sludge drying bed and is one component of an inactive small sanitary sewage treatment plant at TA-41. The plant received sewage from TA-02 from the mid-1970s to 1987. After 1987, wastes were pumped to TA-03 for treatment until 1992, after which they were pumped to TA-46. The TA-41 treatment plant was retained as a standby unit in case the lift pump failed.

Consent Order investigations for SWMU 41-002(c) are delayed because building 41-4 is an active facility. Therefore, no sampling is expected to be done at SWMU 41-002(c) until building 41-4 undergoes D&D. However, RFI screening-level data are available for the Site.

The project map (Figure 33-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

#### 33.2 Control Measures

Run-on flows onto the Permitted Feature via a natural channel discharging from paved areas on the mesa top above the Site. A rock check dam diverts this run-on source around the managed area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 33-1).

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

**Table 33-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01501010015	Seed and Wood Mulch			X		B
L01503010012	Earthen Berm	X			X	B
L01503120010	Rock Berm	X			X	EC
L01503120011	Rock Berm		X		X	EC
L01504040014	Culvert			X		B
L01504060013	Rip Rap	X		X		B

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

#### 33.3 Storm Water Monitoring

SWMU 41-002(c) is monitored within LA-SMA-5.31. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 33-2). Analytical results from this sample yielded two TAL exceedances:

- Copper concentration of 5.5 µg/L (MTAL is 4.3 µg/L), and
- Gross-alpha activity of 86 pCi/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

*SWMU 41-002(c):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Shallow RFI samples collected at the SWMU 41-002(c) were not analyzed for copper because it 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. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for plutonium and uranium isotopes, which are alpha-emitting radionuclides, and for total uranium, which contains alpha-emitting radionuclides. Any alpha-emitting radionuclides associated with the Site would be exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

The SMA receives runoff from undeveloped areas and the sludge drying bed. The concentration of copper detected in the SMA sample is slightly greater than the UTL for runoff from undeveloped areas. The concentration of gross-alpha radioactivity detected in the SMA sample is less than the UTL for runoff from undeveloped areas.

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

### 33.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.31 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 33-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30757	5-16-2013
Storm Rain Event	BMP-33560	7-23-2013
Storm Rain Event	BMP-35724	9-25-2013
Annual Erosion Evaluation	COMP-36696	11-21-2013

No maintenance activities were conducted at LA-SMA-5.31 in 2013.

### 33.5 Compliance Status

The Site associated with LA-SMA-5.31 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 33-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 41-002(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	Initiated 07-27-2012



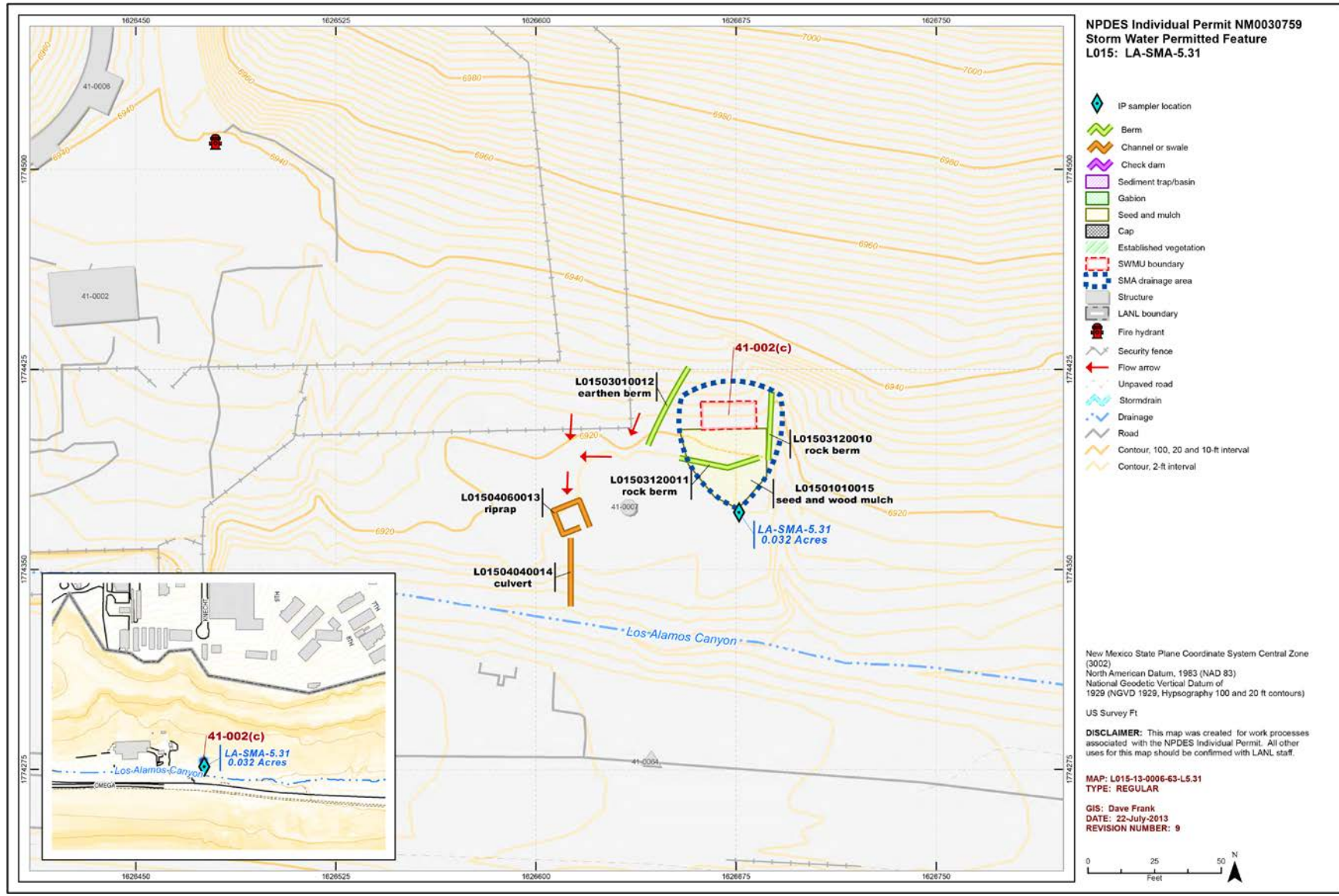
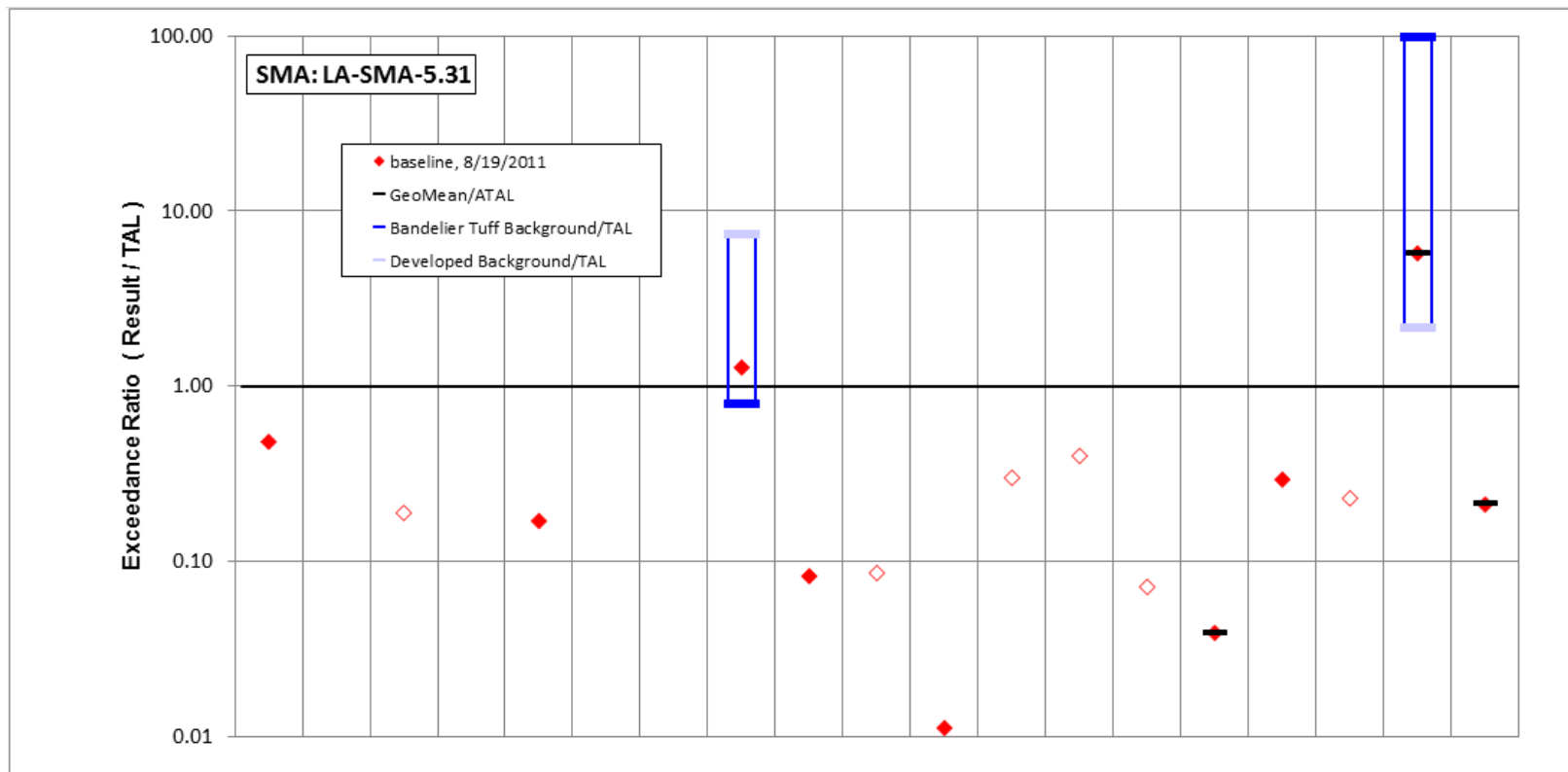


Figure 33-1 LA-SMA-5.31 location map



	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>8/19/2011 result</b>	361	1	1.7	32	0.17	2	2.7	5.5	1.4	<i>0.066</i>	1.9	1.5	0.2	0.45	3.9	12.3	0.002	<b>86</b>	6.33
result / TAL	0.48	0.002	0.19	0.0064	0.17	0.01	0.0027	<b>1.3</b>	0.082	0.086	0.011	0.3	0.4	0.071	0.039	0.29	0.23	<b>5.7</b>	0.21

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

Figure 33-2 Inorganic analytical results summary plot for LA-SMA-5.31

## 34.0 LA-SMA-5.33: AOC 32-004

### 34.1 Site Descriptions

One historical industrial activity area is associated with L016, LA-SMA-5.33: Site 32-004.

AOC 32-004 consists of a former drainline and outfall that served former building 32-03 and discharged to Los Alamos Canyon. Building 32-03 was an office building and contained a vault room where a radioactive source was stored. The drainline at AOC 32-004 led directly to an outfall at the edge of the mesa without passing through a septic tank. Building 32-03 was removed when TA-32 was decommissioned in 1954. During the 1996 Phase II RFI and VCA conducted at AOC 32-004, the 37.5-ft section of the drainline located on Los Alamos County property was removed. Because the drainline was found not to be contaminated, the portion of the drainline located on DOE property was left in place and grouted at both ends.

Consent Order investigations are complete for AOC 32-004; the Site meets industrial and construction worker risk levels. NMED issued a COC with controls for AOC 32-004 in December 2012.

The project map (Figure 34-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 34.2 Control Measures

The historical industrial activity area is an existing drainline and the majority of Site is belowgrade. Wattles have been placed north of the area to reduce run-on from the mesa above. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 34-1).

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

**Table 34-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01602040014	Established Vegetation		X	X		B
L01603010009	Earthen Berm	X			X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 34.3 Storm Water Monitoring

AOC 32-004 is monitored within LA-SMA-5.33. Following the installation of baseline control measures, a baseline storm water sample was collected on August 21, 2011 (Figure 34-2). On December 28, 2012, NMED issued a COC for SWMU 01-003(e). This Site is now certified as corrective action complete, and

monitoring of storm water discharges has ceased at LA-SMA-5.33. No further sampling is required for LA-SMA-5.33 for the remaining period of the IP.

### 34.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.33 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 34-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30758	5-14-2013
Storm Rain Event	BMP-33561	7-23-2013
Storm Rain Event	BMP-35725	9-25-2013
Annual Erosion Evaluation	COMP-36697	12-6-2013

No maintenance activities were conducted at LA-SMA-5.33 in 2013.

### 34.5 Compliance Status

The Site associated with LA-SMA-5.33 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 34-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 32-004	Corrective Action Complete	Corrective Action Complete	NMED, December 28, 2012, "Certificates of Completion Two Solid Waste Management Units and One Area of Concern in the Upper Los Alamos Canyon Aggregate Area"



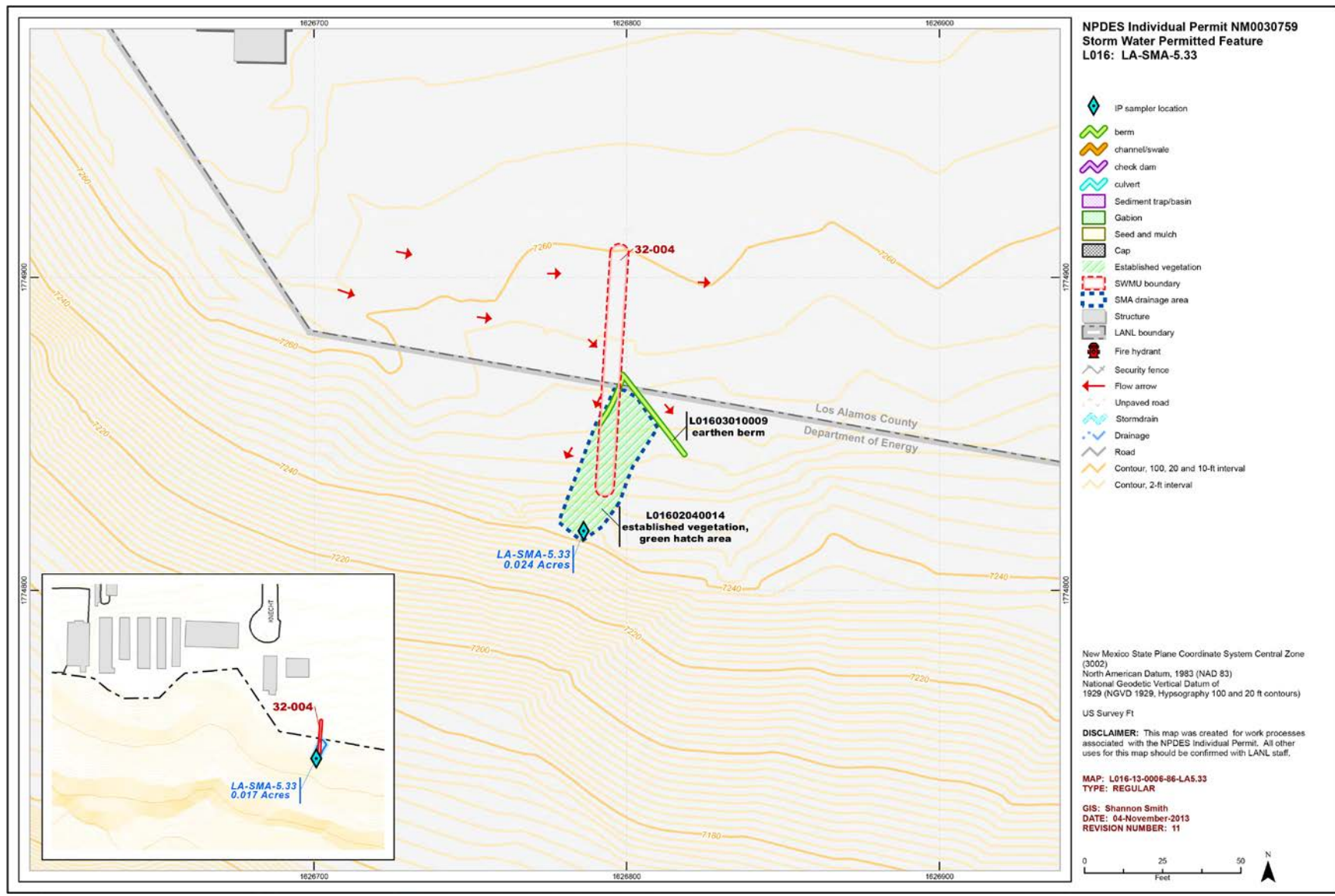
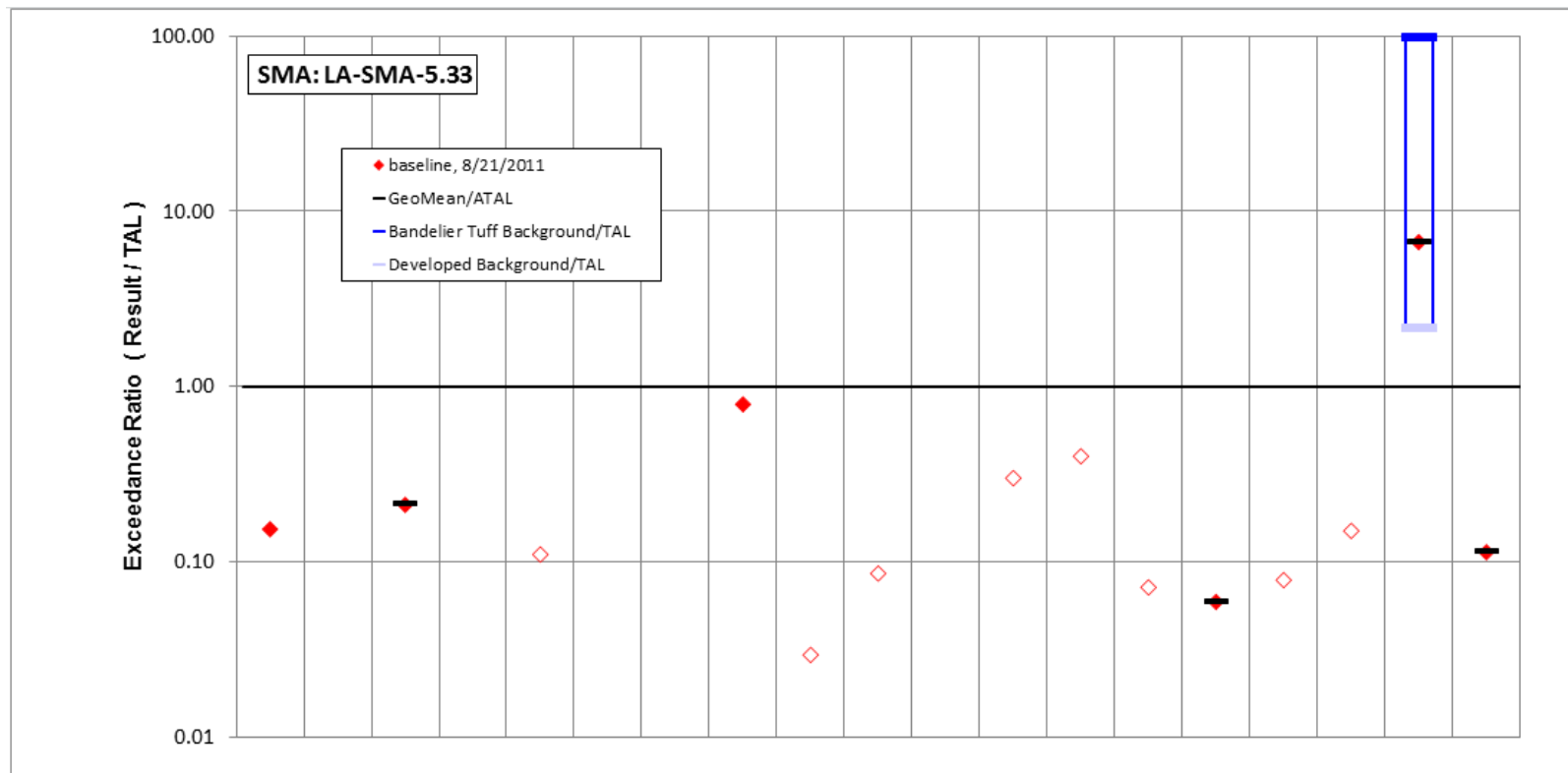


Figure 34-1 LA-SMA-5.33 location map



	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>8/21/2011 result</b>	115	1	1.9	21.8	0.11	2	2.2	3.4	0.5	0.066	1.2	1.5	0.2	0.45	5.9	3.3	0.002	<b>100</b>	3.4
result / TAL	0.15	0.002	0.21	0.0044	0.11	0.01	0.0022	0.79	0.029	0.086	0.0071	0.3	0.4	0.071	0.059	0.079	0.15	<b>6.7</b>	0.11

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

Figure 34-2 Inorganic analytical results summary plot for LA-SMA-5.33

## 35.0 LA-SMA-5.35: AOC C-41-004

### 35.1 Site Descriptions

One historical industrial activity area is associated with L014, LA-SMA-5.35: Site C-41-004.

AOC C-41-004 is the active storm drain system surrounding laboratory building 41-4. The drain system has seven storm drainage catch basins/manholes (structures 41-22 through 41-28). Although there are no indications of historical or current contaminant releases to the system, operational tritium releases from the emission stacks located between buildings 41-4 and 41-30 (office building) may have introduced surface (beta) contamination into the storm drain system.

Consent Order investigations for AOC C-41-004 are delayed because building 41-4 is an active facility. Therefore, no sampling is expected to be done at AOC C-41-004 until building 41-4 undergoes D&D. However, RFI screening-level data are available for the Site.

The project map (Figure 35-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 35.2 Control Measures

An asphalt swale and curbing route storm water from the mesa top to a discharge point east of the SMA. Inlet protection serves to reduce sediment loading at the drop inlets to the storm drain system. Riprap serves as outlet protection for storm water discharge from the storm drain system. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 35-1).

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

**Table 35-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01408030010	Concrete/Asphalt Cap	X		X		EC
L01408030014	Concrete/Asphalt Cap		X	X		EC
L01408040011	Metal Cap	X		X		EC
L01408040012	Metal Cap	X		X		EC
L01408040013	Metal Cap	X		X		EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 35.3 Storm Water Monitoring

AOC C-41-004 is monitored within LA-SMA-5.35. Following the installation of baseline control measures, a baseline storm water sample was collected on August 4, 2011, and September 7, 2011 (Figure 35-2). Analytical results from these samples yielded two TAL exceedances:

- Copper concentration of 5.9 µg/L (MTAL is 4.3 µg/L), and
- Gross-alpha activity of 874 pCi/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

#### *AOC C-41-004:*

- Copper is not known to be associated with industrial materials historically managed at the Site. The single shallow RFI samples collected at the AOC C-41-004 was not analyzed for copper because it 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. The single RFI sample was not analyzed for gross-alpha radioactivity but was analyzed for plutonium isotopes, which are alpha-emitting radionuclides, and for total uranium, which contains alpha-emitting radionuclides. Any alpha-emitting radionuclides associated with the Site would be exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

The SMA receives runoff from undeveloped areas and from developed areas including the Los Alamos townsite and TA-41. The concentration of copper detected in the SMA sample is slightly greater than the UTL for runoff from undeveloped areas and well below the UTL for runoff from developed areas. The concentration of gross-alpha radioactivity detected in the SMA sample is less than the UTL for runoff from undeveloped areas and above the UTL for runoff from developed areas.

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

### 35.4 Inspections and Maintenance

RG055.5 recorded five storm events at LA-SMA-5.35 during the 2013 season. This rain event triggered four post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 35-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30759	5-16-2013
Storm Rain Event	BMP-32774	6-18-2013
Storm Rain Event	BMP-33579	7-23-2013
Storm Rain Event	BMP-34562	8-12-2013
Storm Rain Event	BMP-35530	9-25-2013
Annual Erosion Evaluation	COMP-36698	11-15-2013



No maintenance activities were conducted at LA-SMA-5.35 in 2013.

### 35.5 Compliance Status

The Site associated with LA-SMA-5.35 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 35-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC C-41-004	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	Initiated 11-27-2012

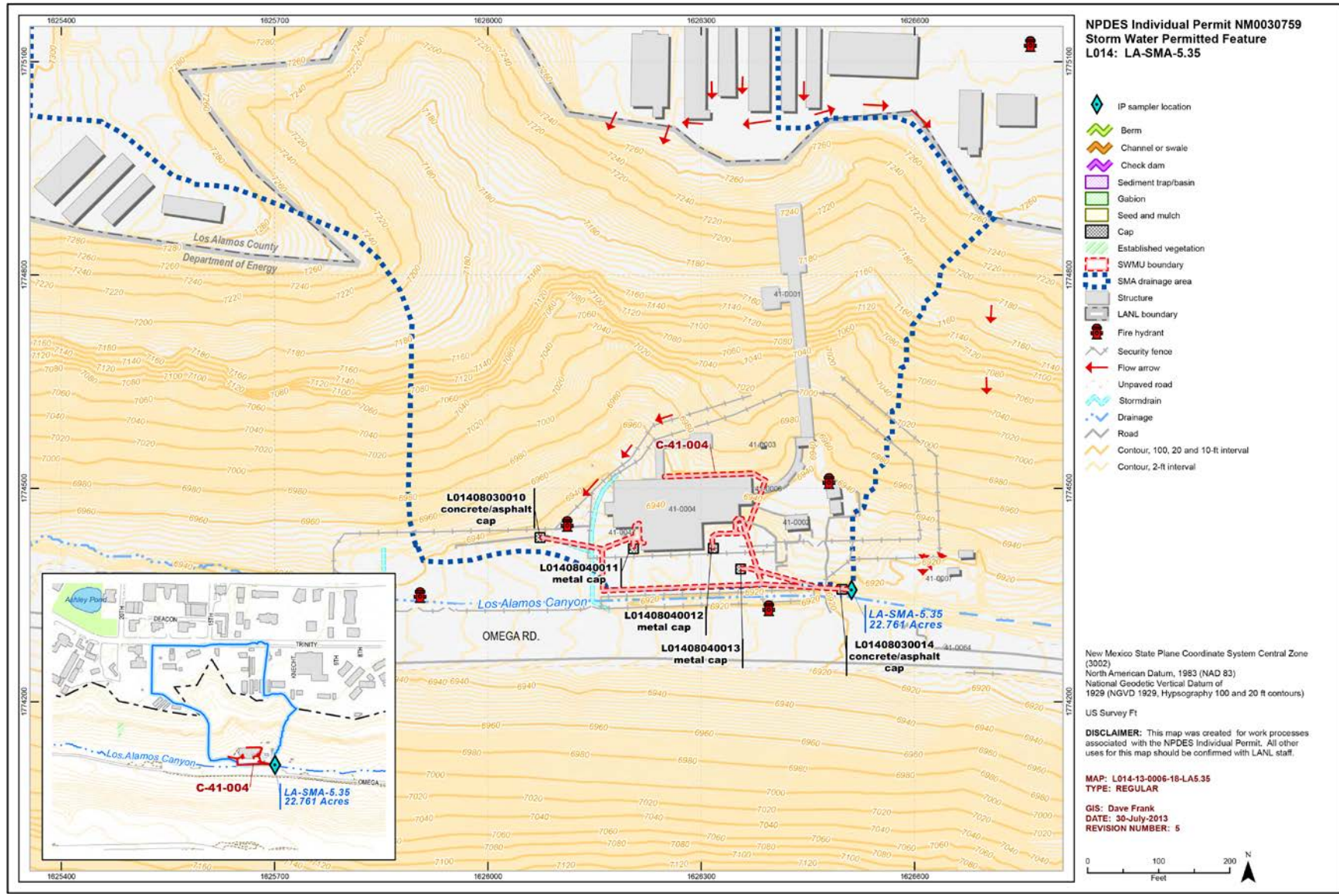
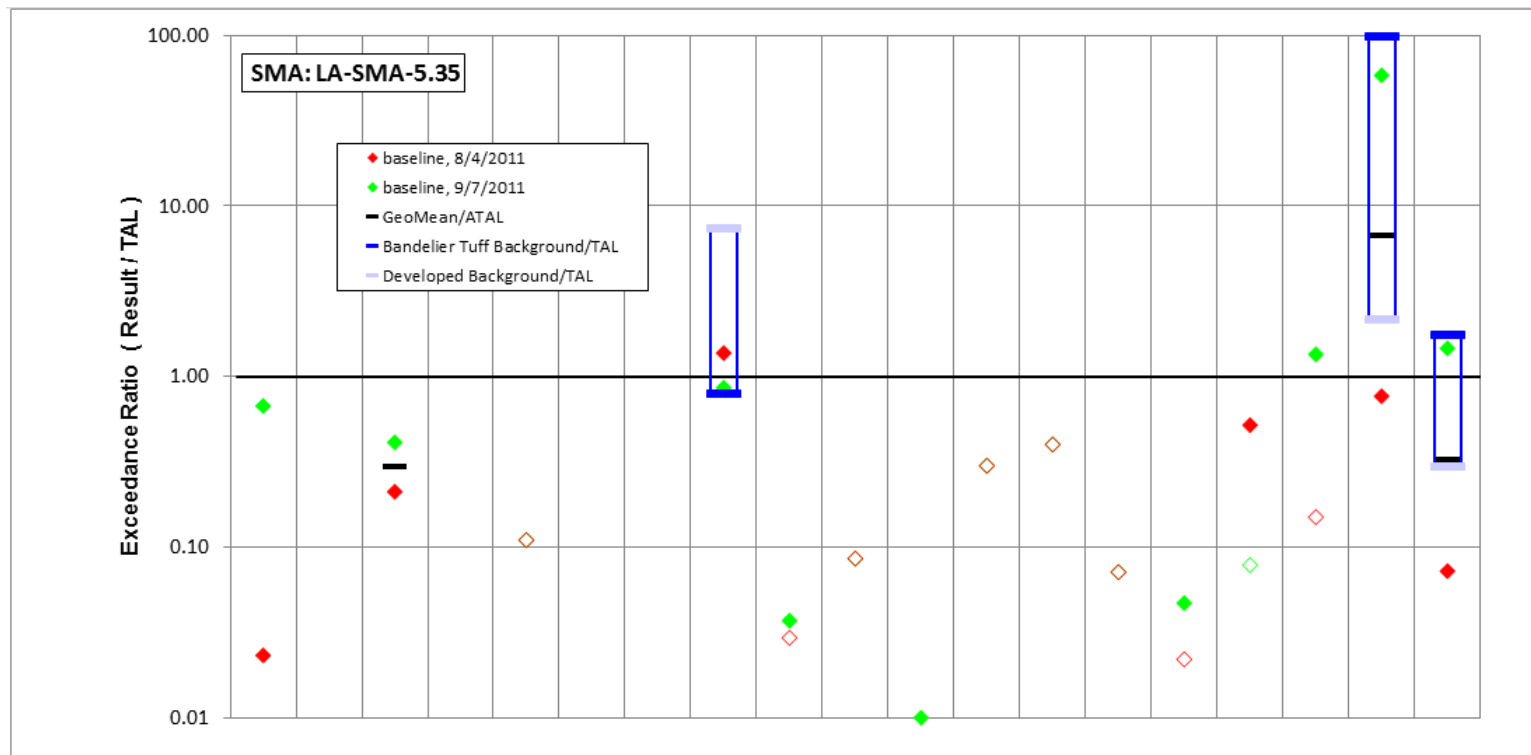


Figure 35-1 LA-SMA-5.35 location map



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	<b>Copper</b>	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>9/7/2011 result</b>	504	1	3.7	22.9	0.11	2	3.5	3.7	0.63	<i>0.066</i>	1.7	1.5	0.2	0.45	4.7	3.3	<b>0.0135</b>	<b>874</b>	<b>43.9</b>
result / TAL	0.67	0.002	0.41	0.0046	0.11	0.01	0.0035	0.86	0.037	<i>0.086</i>	0.01	0.3	0.4	0.071	0.047	0.079	<b>1.3</b>	<b>58</b>	<b>1.5</b>
<b>8/4/2011 result</b>	17.4	1	1.9	15	0.11	2	1	5.9	0.5	<i>0.066</i>	0.64	1.5	0.2	0.45	2.2	21.8	0.002	11.5	2.17
result / TAL	0.023	0.002	0.21	0.003	0.11	0.01	0.001	<b>1.4</b>	0.029	<i>0.086</i>	0.0038	0.3	0.4	0.071	0.022	0.52	0.15	0.77	0.072

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

Figure 35-2 Inorganic analytical results summary plot for LA-SMA-5.35

## **36.0 LA-SMA-5.361: SWMU 32-002(b1), 32-002(b2)**

### **36.1 Site Descriptions**

Two historical industrial activity areas are associated with L017, LA-SMA-5.361: Site 32-002(b1), 32-002(b2).

SWMU 32-002(b1) is part of a former septic system that served former buildings 32-01 and 32-02. SWMU 32-002(b1) is the portion of the former septic system that is located on property currently owned by the Los Alamos School Board. The remainder of the septic system is located on property owned by DOE and is designated as SMWU 32-002(b2). Former SWMU 32-002(b) was split into two new SWMUs [32-002(b1) and 32-002(b2)] in December 2012 to expedite completion of corrective actions on the portion of the Site owned by the Los Alamos School Board. The septic system was installed directly northwest and slightly upgradient of the SWMU 32-002(a) septic tank, near the edge of Los Alamos Canyon. This system was installed when the SWMU 32-002(a) septic system could no longer meet the usage requirement of the laboratory (building 32-01) and consisted of a reinforced concrete tank (former structure 32-08) with an outlet drainline that discharged to an outfall at the edge of Los Alamos Canyon. The influent line from the SWMU 32-002(a) septic system was diverted to the former SWMU 32-002(b) septic system, which also received effluent from former building 32-02, the medical research annex. The outfall was located at the edge of Los Alamos Canyon, approximately 15 ft southwest of the SWMU 32-002(a) outfall. The septic tank was removed in 1988, and the influent drainline was removed in 1996. Research activities in former building 32-01 involved radionuclides and potentially inorganic and organic chemicals. Because no industrial waste line served former TA-32, it is possible that chemical and radioactive wastes may have been disposed of in sinks and drains connected to the SWMU 32-002(b1) septic system.

Consent Order investigations are complete for SWMU 32-002(b1); the Site meets industrial risk levels. NMED issued a COC with controls for new SWMU 32-002(b1) in December 2012.

SWMU 32-002(b2) is part of a former septic system that served former buildings 32-01 and 32-02. SWMU 32-002(b2) is the portion of the former septic system that is located on property owned by the DOE. The remainder of the septic system is located on property owned by the Los Alamos School Board and is designated as SMWU 32-002(b1). Former SWMU 32-002(b) was split into two new SWMUs [32-002(b1) and 32-002(b2)] in December 2012 to expedite completion of corrective actions on the portion of the Site owned by the Los Alamos School Board. The septic system was installed directly northwest and slightly upgradient of the SWMU 32-002(a) septic tank, near the edge of Los Alamos Canyon. This system was installed when the SWMU 32-002(a) septic system could no longer meet the usage requirement of the laboratory (building 32-01) and consisted of a reinforced concrete tank (former structure 32-08) with an outlet drainline that discharged to an outfall at the edge of Los Alamos Canyon. The influent line from the SWMU 32-002(a) septic system was diverted to the former SWMU 32-002(b) septic system, which also received effluent from former building 32-02, the medical research annex. The outfall was located at the edge of Los Alamos Canyon, approximately 15 ft southwest of the SWMU 32-002(a) outfall. The septic tank was removed in 1988, and the influent drainline was removed in 1996. Research activities in former building 32-01 involved radionuclides and potentially inorganic and organic chemicals. Because no industrial waste line served former TA-32, it is possible that chemical and radioactive wastes may have been disposed of in sinks and drains connected to the SWMU 32-002(b2) septic system.

Phase I and II Consent Order investigations are complete for SWMU 32-002(b2). Mercury was detected at concentrations above residential SSLs at numerous sampling locations on the bench below the former



septic tank outfall in Los Alamos Canyon and on DOE Property. Approximately 60 yd<sup>3</sup> of mercury-contaminated soil will be removed from the SWMU 32-002(b2) bench in 2014/2015; results will be reported in the Phase II investigation report for Upper Los Alamos Canyon Aggregate Area.

The project map (Figure 36-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 36.2 Control Measures

Run-on enters the SMA from areas north of the Permitted Feature via a natural channel flowing southeast through the area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 36-1).

**Table 36-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01702040010	Established Vegetation		X	X		B
L01703010002	Earthen Berm	X			X	CB
L01706010009	Rock Check Dam		X		X	B

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

### 36.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.361. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 36.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.361 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 36-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30760	4-17-2013
Storm Rain Event	BMP-33552	7-23-2013
Storm Rain Event	BMP-35716	9-20-2013
Annual Erosion Evaluation	COMP-36699	12-6-2013

No maintenance activities were conducted at LA-SMA-5.361 in 2013.

**36.5 Compliance Status**

The Site associated with LA-SMA-5.361 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 36-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 32-002(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

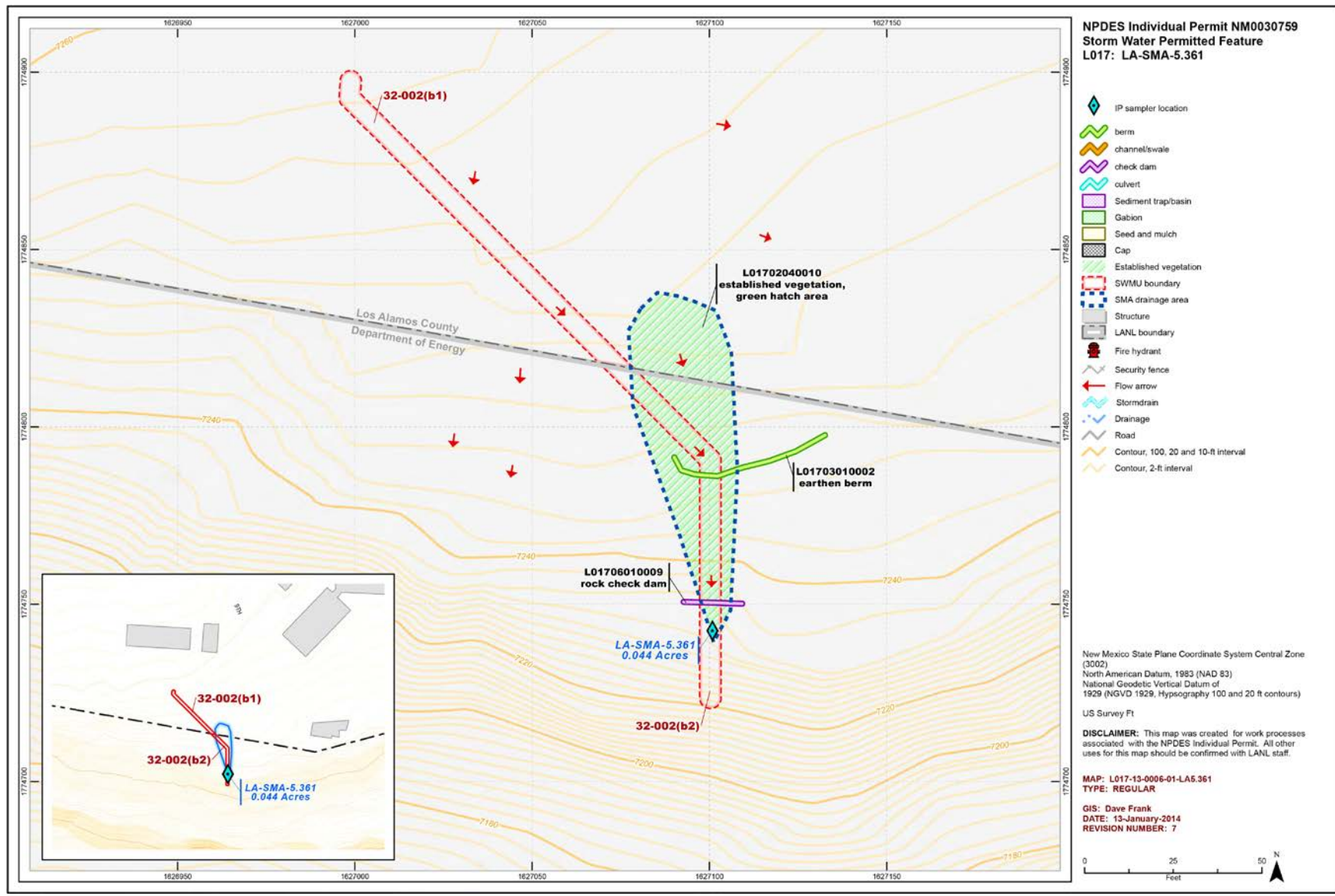


Figure 36-1 LA-SMA-5.361 location map

## 37.0 LA-SMA-5.362: AOC 32-003

### 37.1 Site Descriptions

One historical industrial activity area is associated with L017A, LA-SMA-5.362: Site 32-003.

AOC 32-003 is the location of a former transformer station (structure 32-10), which consisted of three transformers on a wooden platform suspended on poles approximately 20 ft off the ground. AOC 32-003 was discovered northwest of the SWMU 32-002(b) septic tank and directly south of former building 32-01 during the 1993 Phase I RFI at former TA-32. PCB-contaminated soil was removed from AOC 32-003 during the 1996 VCA and 2010 Phase II Consent Order investigation and confirmation samples were collected during the 2010 Phase II investigation.

Consent Order investigations are complete for AOC 32-003; the Site meets residential risk levels. NMED issued a COC without controls for AOC 32-003 in December 2012.

The project map (Figure 37-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 37.2 Control Measures

Run-on enters the SMA from areas north of the Permitted Feature via a natural channel flowing southeast through the area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 37-1).

**Table 37-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L017A02040010	Established Vegetation		X	X		B
L017A03010005	Earthen Berm		X		X	CB
L017A06010006	Rock Check Dam		X		X	CB
L017A06030002	Juniper Bales	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 37.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.362. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 37.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.362 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.



**Table 37-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30761	4-17-2013
Storm Rain Event	BMP-33553	7-23-2013
Storm Rain Event	BMP-35717	9-20-2013
Annual Erosion Evaluation	COMP-36700	12-6-2013

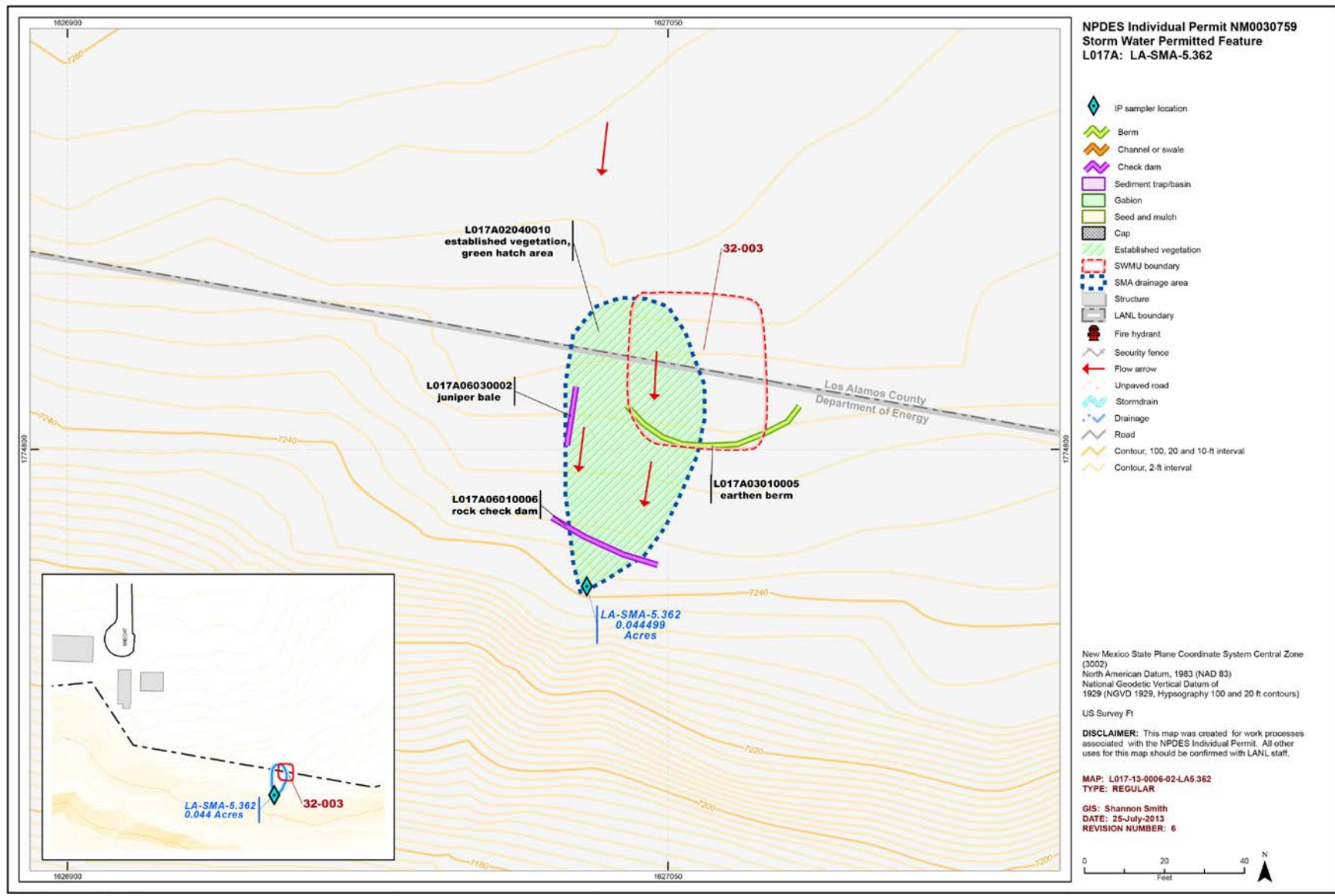
No maintenance activities were conducted at LA-SMA-5.362 in 2013.

**37.5 Compliance Status**

The Site associated with LA-SMA-5.362 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 37-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 32-003	Baseline Monitoring Extended	Baseline Monitoring Extended	NMED, December 20, 2012, "Certificate of Completion One Area of Concern in the Upper Los Alamos Canyon Aggregate Area"



**Figure 37-1 LA-SMA-5.362 location map**

**38.0 LA-SMA-5.51: SWMUs 02-005, 02-006(b), 02-008(a), and 02-009(b) and AOCs 02-003(a), 02-003(e), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), 02-011(c), and 02-011(d)**

**38.1 Site Descriptions**

Fourteen historical industrial activity areas are associated with L018, LA-SMA-5.51: Sites 02-003(a), 02-003(e), 02-004(a), 02-005, 02-006(b), 02-006(c), 02-006(d), 02-006(e), 02-008(a), 02-009(b), 02-011(a), 02-011(b), 02-011(c), and 02-011(d).

SWMU 02-005 consists of an area of soil potentially affected by the airborne drift of potassium dichromate used to inhibit corrosion in the OWR cooling tower (former structure 02-049) located at TA-02. The cooling tower was installed and became operational in 1957. It was constructed with aluminum heat exchangers that were prone to corrosion. Potassium dichromate was added to the circulating water to inhibit corrosion of the heat exchangers. In 1975, stainless-steel heat exchangers were installed to eliminate the use of potassium dichromate. The cooling tower operated until the OWR was shut down in 1993. In 1995, all liquid was drained from the system. In 2000, the cooling tower structure and associated equipment were removed and disposed of at TA-54. In 2003, the remaining buried pipes and drains were removed.

SWMU 02-006(b) is a former acid waste line located at TA-02. The waste line carried effluent from several laboratory rooms in the center of the OWR building (former building 02-001) south to a discharge point into Los Alamos Creek. The waste line was installed during the initial construction of building 02-001 in 1946 (engineering drawing C-1703) and was reportedly taken out of service in the 1960. According to the Omega West decommissioning report, all lines and connections associated with SWMU 02-006(b) were removed and disposed of in 2003.

SWMU 02-008(a) is a former NPDES-permitted outfall (EPA 03A020) located at TA-02. The outfall discharged cooling water from the OWR cooling tower (former structure 02-049). The cooling tower became operational in 1957. Use of potassium dichromate to control corrosion of aluminum heat exchangers began in 1959. The aluminum heat exchangers were replaced by stainless steel ones in 1975, thus eliminating the use of potassium dichromate. In 1993, the shutdown of the OWR placed the cooling tower on standby status, and in 1995, all liquid waste was drained from the system. In 2000, the cooling tower structure and associated equipment were decommissioned and removed. In 2003, the remaining buried pipes and drains were removed and disposed of. The outfall (EPA 03A020) was removed from the Laboratory's NPDES Permit in July 1999.

SWMU 02-009(b) is an area of radioactive soil contamination located north of the former stack-gas valve house (former structure 02-019) and the east bridge at TA-02. This area was used for truck staging during D&D of the WBR. A survey of the area at the time of D&D identified detectable beta/gamma activity. A small amount of soil was removed from the Site and disposed of as part of the D&D activities.

AOC 02-003(a) encompasses the soil contamination associated with the former WBR's stack-gas valve house (former structure 02-019) and associated stainless-steel gaseous effluent vent lines (former lines 117 and 118) located at TA-02. The WBR is part of Site 03-004(a).

AOC 02-003(e) encompasses the soil contamination associated with the former WBR's 800-L stainless-steel holding tank (structure 02-62). The WBR is part of Site 03-004(a).

AOC 02-004(a) is the former OWR facility (former building 02-001), which consisted of the OWR, the OWR fuel-handling area, the OWR cooling-liquid recirculating piping, the OWR gaseous effluent vent

line, the OWR material storage area, and the WBR. Before the OWR was constructed, former building 02-001 was used to house a 25-kW fast-neutron research reactor, Clementine, located in the western third of the building. The Clementine reactor was self-contained and operated from 1946 to 1953. Clementine was the precursor to the OWR and was dismantled in 1954.

The OWR was an 8-mW water-cooled tank-type research reactor fueled by enriched solid uranium. It was put online in 1956 and operated until it was put on standby status in 1993. The reactor remained inactive until it was decommissioned, removed, and disposed of in 2003. The OWR operated with a cooling-liquid recirculating system that consisted of a series of closed-loop pipes in a 100-ft-long corridor that extended from the OWR west to the reactor facility equipment building [former building 02-044, AOC 02-004(f)]. The water was routed through pumps, filters, and chillers in the reactor facility equipment building and back to the reactor. The cooling tower (former structure 02-049) was added in 1959 to supplement the building 02-044 chillers in this closed system. The recirculating system was active from 1956 to 1993, when it was put on standby status after a cooling system water leak was discovered.

Off-gas from the OWR was routed through the gaseous effluent vent line to a connection into line 119 on the east side of TA-02, where the effluent continued up to the mesa-top stack [former structure 02-009, SWMU 02-006(a)]. The gaseous effluent vent line teed off from the piping corridor between the OWR and OWR equipment building (former building 02-044).

The OWR fuel-handling area consisted of a fuel pit and a closed recirculating system that serviced only the fuel pit. It was located next to the OWR in the central portion of the building and was used for temporary storage of fuel rods before they were recycled.

Operation of the OWR included the temporary storage of material (isotope columns, through-put port metal sleeves, etc.) that became activated during contact in the reactor neutron flux field. The material was stored in a structure next to the guard quarters (former building 02-004), located south of the reactor, to await final disposition. The material storage structure was removed in 2000.

The WBR was the name used for a series of three small research reactors, LOPO, HYPO, and SUPO, located in the eastern third of former building 02-001. The reactors were each progressively stronger in power output, each consisted generally of a 1-ft-diameter sphere filled with liquid fuel, and each was surrounded with neutron-reflecting blocks sitting on a graphite base. The LOPO reactor became functional in May 1944. The LOPO was dismantled, removed, and disposed of in September 1944. The HYPO reactor became operational in December 1944 and was later upgraded to SUPO, which became operational in 1951. The SUPO was decommissioned, removed, and disposed of in 1990.

The reactors were surrounded by a 15- × 15- × 11-ft concrete biological shield and underlain by a shallow sand pit and a utility trench that were used to collect liquids and gases from the reactor and transport them to support structures on the east side of former building 02-001. The gases were managed through the WBR gaseous effluent vent line system. Some radionuclides may have been deposited on the ground surface as gaseous effluent drifted from this system, and condensate from the gaseous effluent may have leaked from portions of the vent line system. These releases are addressed as AOCs 02-003(a–d). Cesium-137 contamination was found in the OWR building (former building 02-001) near the sand pit and the utility trench during SUPO decommissioning activities and removed.

AOC 02-006(c) is a former sanitary waste line located at TA-02. The waste line extended from the office area restrooms in the OWR building (former building 02-001) to a septic tank (former structure 02-043, SWMU 02-007). The 1990 SWMU report incorrectly describes AOCs 02-006(c) and 02-006(d). This report



describes AOC 02-006(c) as the drainline that served the chemical room and several laboratories in the building and AOC 02-006(d) is described as the drainline that served the OWR building (02-001) reactor control room air conditioner, sink, backflow preventer valve, and drinking water fountain. The 1990 SWMU report states that both AOCs discharged to Los Alamos Creek. Engineering drawings C-1750 and C-1703 and the 2003 D&D records demonstrate that a single drainline served the laboratories and the control room air conditioner, sink, backflow preventer valve, and drinking water fountain was connected to a septic tank (former structure 02-043, SWMU 02-007) rather than discharging to Los Alamos Creek.

AOC 02-006(c) is a former sanitary waste line located at TA-02. The waste line extended from the office area restrooms in the OWR building (former building 02-001) to a septic tank (former structure 02-043, SWMU 02-007). The 1990 SWMU report incorrectly describes AOCs 02-006(c) and 02-006(d). This report describes AOC 02-006(c) as the drainline that served the chemical room and several laboratories in the building and AOC 02-006(d) is described as the drainline that served the OWR building (02-001) reactor control room air conditioner, sink, backflow preventer valve, and drinking water fountain. The 1990 SWMU report states that both AOCs discharged to Los Alamos Creek. Engineering drawings C-1750 and C-1703 and the 2003 D&D records demonstrate that a single drainline served the laboratories and the control room air conditioner, sink, backflow preventer valve, and drinking water fountain was connected to a septic tank (former structure 02-043, SWMU 02-007) rather than discharging to Los Alamos Creek.

AOC 02-006(e) is a former sump (former structure 02-026) and associated drainline located at TA-02. The sump and drainline received effluent from the OWR building (former building 02-001) reactor room. The sump and drainline were connected to floor drains in the main reactor room and became operational in 1944. The sump outfall overflow discharged directly to Los Alamos Creek. In 1990, a second collection sump (former structure 02-082) was connected to the AOC 02-006(e) drainline and is shown on engineering drawing C-45924. According to the Middle Los Alamos Canyon Aggregate Area historical investigation report and investigation work plan, a drainline from the sump 02-082 was connected directly to the AOC 02-004(e) acid pit (former structure 02-053); however, engineering drawings do not show a drainline connecting the two structures. Sumps 02-026 and 02-082 and the drainline remained in place until they were removed and disposed of during D&D activities in 2003.

AOC 02-011(a) consists of the following 11 drain segments and associated outfalls across TA-02. These individual segments drain either directly or indirectly to Los Alamos Creek.

- An approximately 50-ft-long concrete storm drain (also described as a concrete flume), located northwest of the OWR building that drained into a drop inlet/catch basin (former structure 02-36), as shown on engineering drawing R-5102, sheet 2 of 2. There is no information indicating the drain handled anything but storm water.
- A 24-in.-diameter, 8-ft-long underground CMP between former catch basins 02-036 and 02-027, as shown on engineering drawing R-5102, sheet 2 of 2. There is no information that the drain handled anything but storm water.
- An 85-ft-long concrete storm drain (e.g., concrete flume) located northwest of the OWR building (former building 02-001) that drained into former catch basin 02-027, as shown on engineering drawing R-5102, sheet 2 of 2. The drain was reportedly used periodically for discharge of water from the fuel transfer pit.
- A 15-in.-diameter, 15-ft-long concrete storm drain west of the OWR building that drained into former catch basin 02-028, as shown on engineering drawing R-5102, sheet 2 of 2. There is no information that the drain handled anything but storm water.

- A 24-in.-diameter, 30-ft-long concrete storm drain between former catch basins 02-027 and 02-028, as shown on engineering drawing R-5102, sheet 2 of 2. This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.
- A 30-in.-diameter, 75-ft-long CMP between a catch basin (former structure 02-028) and Los Alamos Creek, as shown on engineering drawing R-5102, sheet 2 of 2. This drain may have handled the fuel transfer pit water from the concrete flume, with associated contaminated aluminum shards.
- A 6-in.-diameter, 18-ft-long pipe between the OWR building and the salvage basin (former structure 02-026) and Los Alamos Creek. AOC 02-011(a)(vii) is a duplicate of AOC 02-006(e), as noted in the 1990 SWMU report.
- An 18-in.-diameter, 75-ft-long CMP between the OWR building catch basin (unnumbered former structure within former building 02-001) and Los Alamos Creek, as shown on engineering drawing C-1699. There is no information verifying this drain handled anything but storm water runoff.
- A 3-in.-diameter, 75-ft-long pipe between the OWR building and the outfall to Los Alamos Creek. Wastewater system design memoranda indicate that floor drains from the eastern side of the WBR area drained to this outfall before 1990.
- A 12-in.-diameter, 30-ft long storm drain northeast of the OWR building that discharged to Los Alamos Creek through a series of concrete ditches and a CMP along the east side of the OWR building, as shown on engineering drawing C-1718. The total length of the drain and ditches to Los Alamos Creek is approximately 130 ft. The drains and concrete ditches remained in place until they were removed during D&D activities in 2003. There is no information verifying this drain handled anything but storm water.
- A 4-in.-diameter, 95-ft-long pipe between the OWR building and Los Alamos Creek. AOC 02-011(a)(xi) is a duplicate of the OWR acid waste line [SWMU 02-006(b)].

The drains in AOC 02-011(a) date from approximately the time of construction of the reactor building in 1944. Drains from operational areas of the facility may have received storm water until the 2003 D&D of the OWR facility, although the OWR was inactive from 1993 to 2003. Several of the drains were removed in either the 2000 or 2003 D&D activities, but five of the drains, or some portion of them, remained in place.

AOC 02-011(b) consists of two former drains and associated potential soil contamination affiliated with former building 02-19, the stack-gas valve house. One drain was a 9-ft-long × 15-in.-diameter CMP between former building 02-19 and a former drainage basin (former structure 02-35), and the second drain was a 9 ft long × 24-in.-diameter CMP from former structure 02-35 that drained outside the east fence. Potential contaminants at the drains would have come from operations of the Clementine reactor (no associated SWMUs or AOCs) and from the former WBR. The drains were removed, but the year they were removed is not known.

AOC 02-011(c) is a former storm drain at TA-02 associated with the OWR equipment building [former building 02-044, AOC 02-004(f)]. The OWR equipment building operated from 1954 to 1993. The drainline was a 4-in.-diameter VCP that was approximately 12 ft long and drained to the surface west of the west fence. The drainline, which was installed in 1954, was removed and disposed of in 2003.

AOC 02-011(d) is a former NPDES-permitted outfall that discharged effluent from the reactor facility equipment building [former building 02-44, AOC 02-004(f)]. Discharges consisted of primary cooling water from an ion-exchange system. Primary cooling water was circulated in the ion-exchange system to remove contaminants. Periodically flushing municipal water through the system would regenerate the ion-exchangers. Before 1963, effluent discharged directly to Los Alamos Creek. From 1963 to 1968, the effluent was held in three 1200-gal. storage tanks [AOCs 02-004(b–d)] until short-lived radionuclides decayed or were diluted to a safe level before it was discharged to the creek. After 1968, the effluent transferred to the three 1200-gal. tanks was transported to the TA-50 RLWTF treatment. From 1957 to 1963, periodic sampling of the groundwater and creek water from monitoring points below the Site showed no detectable increase in activity levels. AOC 02-011(d) was removed from the NPDES-permit effective July 11, 1995. The outfall location was incorrectly identified in the RFI work plan as discharging from AOC 02-011(c), west of former building 02-44. The correct location is south of former building 02-44.

The project map (Figure 38-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 38.2 Control Measures

Potential run-on may enter this Permitted Feature via the dirt access road or from the slope above, to the north. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 38-1).

**Table 38-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01802040009	Established Vegetation		X	X		B
L01803010006	Earthen Berm	X			X	CB
L01803010007	Earthen Berm		X		X	CB
L01803010008	Earthen Berm		X		X	CB
L01807010003	Gabions		X	X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

Enhanced controls installation and certification are being planned for the end of 2014 as part of corrective action.

### 38.3 Storm Water Monitoring

SWMUs 02-005, 02-006(b), 02-008(a), and 02-009(b) and AOCs 02-003(a), 02-003(e), 02-004(a), 02-006(c), 02-006(d), 02-006(e), 02-011(a), 02-011(b), 02-011(c), and 02-011(d) are monitored within LA-SMA-5.51. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figures 38-2 and 38-3). Analytical results from this sample yielded three TAL exceedances:

- Mercury concentration of 2.39 µg/L (ATAL is 0.77 µg/L),
- Gross-alpha activities of 92.3 pCi/L (ATAL is 15 pCi/L).
- PCB concentration of 59 ng/L (ATAL is 0.6 ng/L).

These exceedances were 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 discussion is organized by Site and analyte.

#### *SWMU 02-005:*

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above the soil and sediment BVs in shallow samples collected during the 2007 and 2010 Consent Order investigations. Mercury was detected above the BVs in 1 of 40 shallow samples with a maximum concentration 22 times BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1242, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1242 was detected in 1 of 35 shallow samples at 0.3% of the residential SSL. Aroclor-1254 was detected in 11 of 35 shallow samples at a maximum concentration 18% of the residential SSL. Aroclor-1260 was detected in 28 of 35 shallow samples with a maximum concentration 1.9 times the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this 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 emitters. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

#### *SWMU 02-006(b):*

- Mercury may have been associated with industrial materials historically managed at this Site. It was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post-Cerro Grande fire investigation. Mercury was detected above BVs in 19 of 19 shallow samples with a maximum concentration 60 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order and post-Cerro Grande fire samples. Aroclor-1254 was detected in 1 of 19 shallow samples at a maximum concentration 4% of the residential SSL. Aroclor-1260 was detected in 17 of 19 shallow samples with a maximum concentration 45% of the residential SSL.



- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site.
- Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, uranium-234, and uranium-238 were not detected above BVs or FVs or were detected where FVs do not apply in 19 shallow soil and sediment samples. Plutonium-239/240 was detected above FV in 2 of 19 shallow samples at a maximum activity 31 times the sediment FV. Uranium-235/235 was detected in 1 of 19 shallow samples at 1.4 times the sediment BV.

*SWMU 02-008(a):*

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above soil and sediment BVs in 6 shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 5 shallow samples at a maximum concentration 17% of the residential SSL. Aroclor-1260 was detected in 4 of 5 shallow samples with a maximum concentration 11% of the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in 6 shallow soil and sediment samples. Plutonium-239/240 was detected above FVs in 6 of 6 shallow soil and sediment samples at a maximum activity 28 times the sediment FV.

*SWMU 02-009(b):*

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above soil and sediment BVs in 6 of 16 shallow samples with a maximum concentration 13 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 5 of 16 shallow samples at a maximum concentration 2% of the residential SSL. Aroclor-1260 was detected in 12 of 16 shallow samples with a maximum concentration 6% of the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this 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 emitters. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*AOC 02-003(a):*

- Mercury is not known to be associated with industrial materials historically managed at this Site. It was detected above the soil BV in shallow (i.e., less than 3 ft bgs) soil and sediment samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above the BV in 5 of 9 shallow samples with a maximum concentration 4.1 times the soil BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 7 shallow samples and Aroclor-1260 was detected in 4 of 7 shallow samples with maximum concentrations 1.6% and 33% of the residential SSL, respectively.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in shallow soil and sediment samples. Plutonium-239/240 was detected above the soil FV in 2 of 8 shallow samples with a maximum activity 4.7 times the soil FV.

*AOC 02-003(e):*

- Mercury is not known to be associated with industrial materials historically managed at this Site. It was detected above the soil BV in shallow (i.e., less than 3 ft bgs) soil and sediment samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above the BV in 5 of 9 shallow samples with a maximum concentration 4.1 times the soil BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 7 shallow samples and Aroclor-1260 was detected in 4 of 7 shallow samples with maximum concentrations 1.6% and 33% of the residential SSL, respectively.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in shallow soil and sediment samples. Plutonium-239/240 was detected above the soil FV in 2 of 8 shallow samples with a maximum activity 4.7 times the soil FV.

*AOC 02-004(a):*

- Mercury may have been associated with industrial materials historically managed at this Site. Mercury was detected above the soil BV in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above the BV in 30 of 32 shallow samples with a maximum concentration 82 times the soil BV.

- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 6 of 29 shallow samples, and Aroclor-1260 was detected in 9 of 29 shallow samples with maximum concentrations 59% of and 1.1 times the residential SSL, respectively.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this 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 emitters. Americium-241 and uranium isotopes were not detected above BVs or FVs or detected where FVs do not apply in 32 shallow Consent Order soil and sediment samples. Plutonium-239/240 was detected above the soil FV in 5 of 32 shallow samples with a maximum activity 16 times the soil FV.

*AOC 02-006(c):*

- Mercury is not known to be associated with industrial materials historically managed at this Site. Mercury was detected above the soil BV in shallow samples collected during the 2007 Consent Order investigation. Mercury was detected above BV in 7 of 7 shallow samples with a maximum concentration 14 times the BV.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1254 was detected in 3 of 7 shallow samples at a maximum concentration 11% of the residential SSL. Aroclor-1260 was detected in 7 of 7 shallow samples with a maximum concentration 8% of the residential SSL.
- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this 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 emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs or FVs or were detected where FVs do not apply in 7 shallow soil samples. Plutonium-239/240 was detected above FV in 1 of 7 shallow samples at a maximum activity 2.1 times the soil FV.

*AOC 02-006(d):* AOC 02-006(d) is a duplicate of AOC 02-006(c). Potential contaminants associated with AOC 02-006(c) and the results of previous sampling are described above.

*AOC 02-006(e):*

- Mercury may have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above BVs in 14 of 14 shallow samples with a maximum concentration 43 times BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow Consent Order and post–Cerro Grande fire samples. Aroclor-1254 was detected in 6 of 13 shallow samples at a maximum concentration 1.2 times the residential SSL. Aroclor-1260 was detected in 10 of 13 shallow samples with a maximum concentration 6% of the residential SSL.

- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post–Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241, plutonium-238, and uranium isotopes were not detected above BVs, FVs or were detected where FVs do not apply in 14 shallow soil samples. Plutonium-239/240 was detected above FVs in 4 of 14 shallow soil and sediment samples at a maximum activity 14 times the sediment FV.

*AOC 02-011(a):*

- Mercury may have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above soil and sediment BVs in 29 of 41 shallow samples with a maximum concentration 66 times the BVs.
- PCBs are likely associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow samples from the 2007 and 2010 Consent Order investigations. Aroclor-1248 was detected in 1 of 53 shallow samples at 9% of the residential SSL. Aroclor-1254 was detected in 29 of 53 shallow samples at a maximum concentration 21% of the residential SSL. Aroclor-1260 was detected in 49 of 53 shallow samples with a maximum concentration 13 times the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*AOC 02-011(b):*

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was detected above soil and sediment BVs in shallow samples collected during the 2007 Consent Order investigation and 2000 post–Cerro Grande fire investigation. Mercury was detected above BV in 3 of 7 shallow samples with a maximum concentration 4.6 times the BVs.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in shallow samples from the 2007 Consent Order investigation. Aroclor-1254 was detected in 6 of 6 shallow samples at a maximum concentration 14% of the residential SSL. Aroclor-1260 was detected in 5 of 6 shallow samples with a maximum concentration 10% of the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.



*AOC 02-011(c):*

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above the soil BV in a shallow sample collected during the 2007 Consent Order investigation.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in a shallow sample from the 2007 Consent Order investigation. Aroclor-1254 and Aroclor-1260 were both detected at 5% of residential SSLs.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. Americium-241 and plutonium and uranium isotopes were not detected above BVs, FVs, or were detected where FVs do not apply in a shallow soil sample.

*AOC 02-011(d):*

- Mercury is not known to have been associated with industrial materials historically managed at this Site. Mercury was not detected above soil and sediment BVs in 4 shallow samples collected during the 2007 Consent Order and 2000 post–Cerro Grande fire investigations.
- PCBs are not known to be associated with industrial materials historically managed at this Site. Two PCB mixtures (Aroclor-1254 and Aroclor-1260) were detected in 2 of 2 shallow samples from the 2007 Consent Order investigation. Aroclor-1254 and Aroclor-1260 were both detected at maximum concentrations 11% and 4% of residential SSLs, respectively.
- Alpha-emitting radionuclides may have been associated with industrial materials historically managed at this Site. Consent Order, RFI, and post–Cerro Grande fire investigation samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

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 38-2 and 38-3. 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 38-2 and 38-3.

Monitoring location LA-SMA-5.51 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 mercury 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.

- Mercury—The mercury UTL from undisturbed Bandelier Tuff and from developed urban landscape storm water run-on was not calculated because the number of detected values was not sufficient to permit calculation of the UTL value in the baseline metals background study. Therefore, no comparison to background mercury levels 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, and the gross-alpha background storm water UTL for storm water run-on from a developed urban landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.
- PCBs—The PCB UTL from developed urban 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 result from 2013 is between these two values.

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

### 38.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.51 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 38-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30896	4-11-2013
Storm Rain Event	BMP-33548	7-23-2013
Storm Rain Event	BMP-35712	9-25-2013
Annual Erosion Evaluation	COMP-36835	11-19-2013
TAL Exceedance	COMP-35293	9-17-2013

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

**Table 38-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-31605	Remove all rebar from any existing wattles. Restaking is not necessary as existing wattles are no longer active control measures	4-30-2013	19 day(s)	Maintenance conducted in timely manner.

### 38.5 Compliance Status

The Sites associated with LA-SMA-5.51 are High Priority Sites. The High Priority Site deadline for the certification of corrective action is now 1 yr from the date of an observed TAL exceedance, which for LA-SMA-5.51 is August 21, 2014.

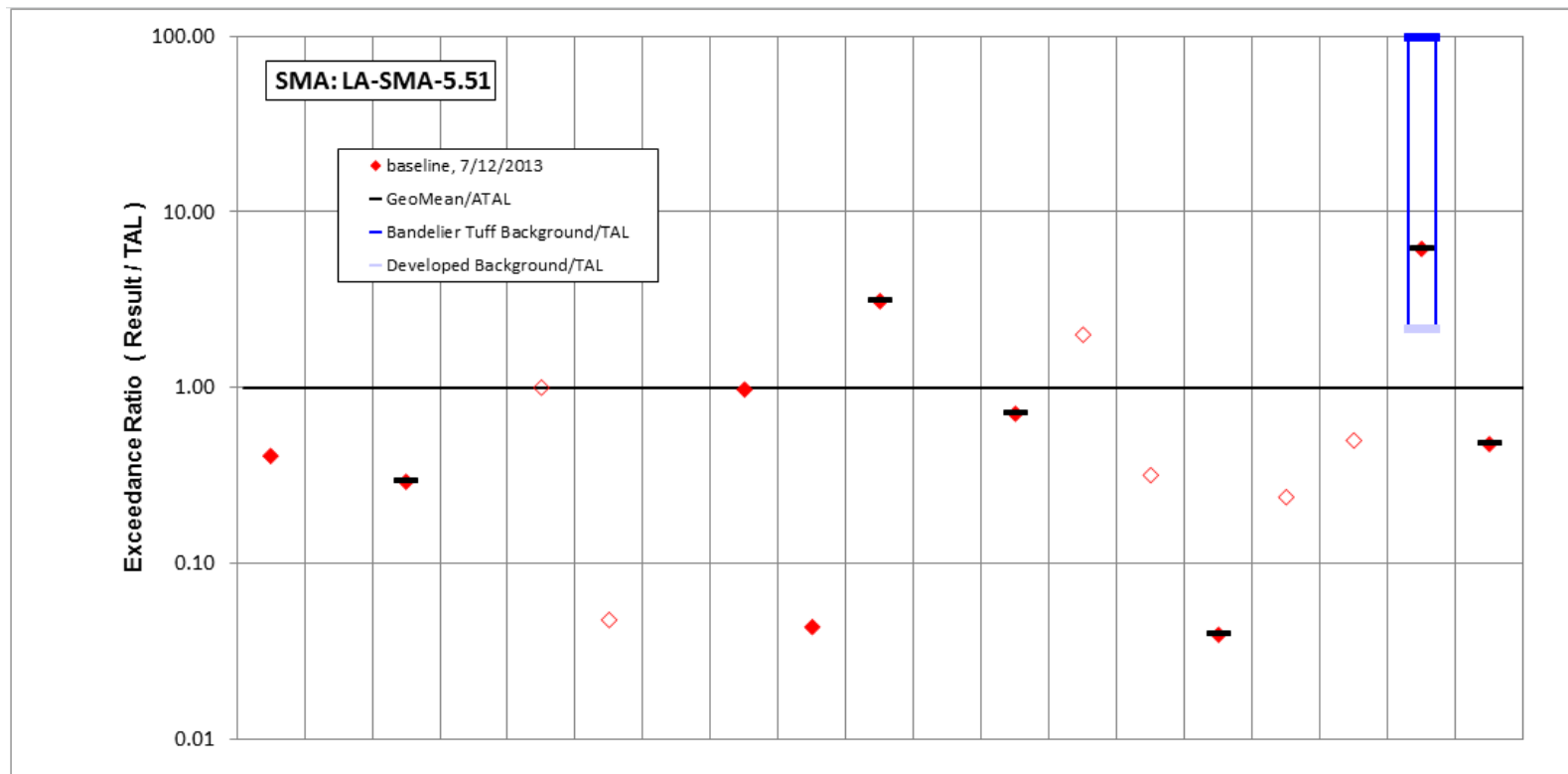
**Table 38-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 02-003(a)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-003(e)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-004(a)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
SWMU 02-005	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
SWMU 02-006(b)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-006(c)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-006(d)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-006(e)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
SWMU 02-008(a)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
SWMU 02-009(b)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-011(a)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-011(b)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-011(c)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13
AOC 02-011(d)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-21-13





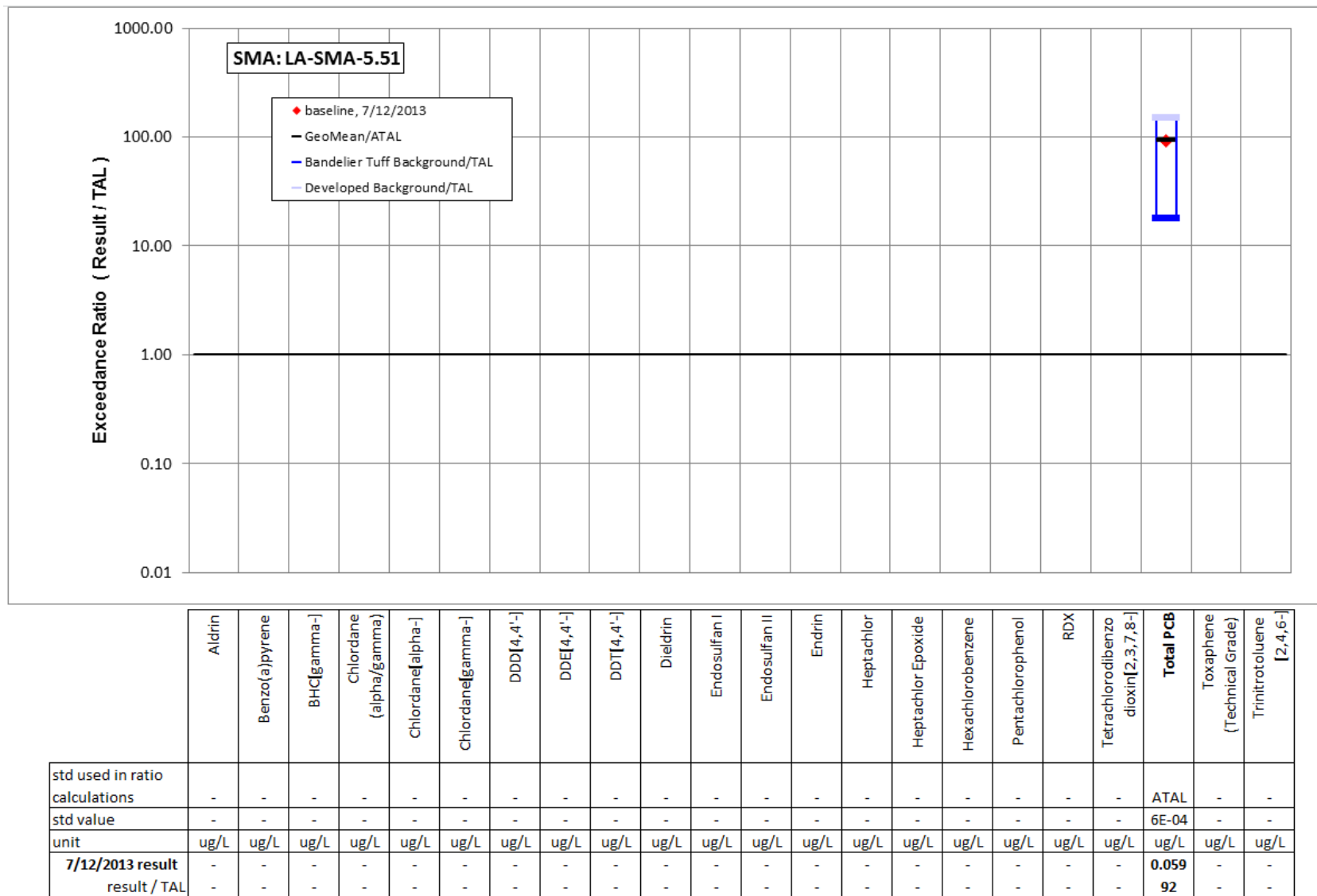




	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	<b>Mercury</b>	Nickel	Selenium	<b>Silver</b>	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	<b>Gross alpha</b>	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	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>7/12/2013 result</b>	306	3	2.62	27.1	1	10	1.02	4.19	0.738	<b>2.39</b>	1.43	3.55	<b>1</b>	2	3.92	10	<i>0.005</i>	<b>92.3</b>	14.3
result / TAL	0.41	<i>0.005</i>	0.29	0.0054	1	<i>0.048</i>	0.001	0.97	0.043	<b>3.1</b>	0.0084	0.71	<b>2</b>	0.32	0.039	0.24	0.5	<b>6.2</b>	0.48

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

Figure 38-2 Inorganic analytical results summary plot for LA-SMA-5.51



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

Figure 38-3 Organic analytical results summary plot for LA-SMA-5.51

## **39.0 LA-SMA-5.52: SWMU 02-007 and AOCs 02-003(b) and 02-008(c)**

### **39.1 Site Descriptions**

Three historical industrial activity areas are associated with L018A, LA-SMA-5.52: Sites 02-003(b), 02-007, and 02-008(c).

SWMU 02-007 consists of a former septic system that was located at (structure 02-043) TA-02. The septic tank was constructed of reinforced concrete and measured 13 ft long × 8 ft wide × 6 ft deep. The septic tank received effluent from laboratory sink drains in the OWR facility (former building 02-001). The septic tank was installed in 1944. In 1947, the chemical waste shack (former building 02-003, AOC 02-010) was connected to the septic system and remained connected until the chemical waste shack was decommissioned in 1971. Overflow from the tank discharged to Los Alamos Creek through a 6-in.-diameter VCP. However, the exact location of the outfall discharge is not known. The septic tank, overflow outfall, and surrounding soils were removed and disposed of in 1986. All remaining components of TA-02 were removed during D&D activities in 2003.

Consent Order investigations are complete at SWMU 02-007; the Site meets residential risk levels. SWMU 02-007 was recommended for corrective action complete in the Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area. SWMU 02-007 will be eligible for a COC upon approval of the report by NMED.

AOC 02-003(b) consists of a former condensate trap (structure 02-048) and a portion of an associated stainless-steel line (line 119) located at TA-02. The condensate trap was a concrete manhole superstructure with a small-diameter standpipe. The trap was located at the lowest point of line 119 between the stack-gas valve house [structure 02-019, AOC 02-003(a)] and the delay tanks [structure 02-131, AOC 02-003(c)]. Line 119 consisted of an approximately 78-ft-long east-west trending pipe section that ran from the stack-gas valve house (structure 02-019) to the condensate trap and a 205-ft-long north-south trending section that ran from the condensate trap to the delay tanks. Line 119 continued southward from the delay tanks, and that portion of the line is addressed as AOC 02-003(d). The condensate trap and the portion of line 119 between the valve house and the delay tanks were used until 1974 and remained inactive until they were removed and disposed of during D&D activities performed in 1985.

Consent Order investigations are complete for AOC 02-003(b); the Site meets residential risk levels. AOC 02-003(b) was recommended for corrective action complete in the Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area. AOC 02-003(b) will be eligible for a COC upon approval of the report by NMED.

AOC 02-008(c) consists of two former outfalls and associated drainlines at TA-02. In 1985, the easternmost drainpipe was installed to discharge groundwater seepage from the OWR building 02-001 basement sump to Los Alamos Creek. In 1988, this drainpipe was plugged, left in place, and replaced with drainpipe that was installed approximately 100 ft west of the original drainpipe location. The second drainpipe also discharged groundwater seepage from the OWR basement sump to Los Alamos Creek. Both drainpipes were removed and disposed of during D&D activities in 2003.

Consent Order investigations are complete for AOC 02-008(c); the Site meets residential risk levels. AOC 02-008(c) was recommended for corrective action complete in the Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area. AOC 02-008(c) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 39-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 39.2 Control Measures

Potential run-on may enter this Permitted Feature via the dirt access road or from the slope above, to the north. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 39-1).

**Table 39-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L018A01010006	Seed and Wood Mulch			X		CB
L018A02040007	Established Vegetation		X	X		B
L018A03010003	Earthen Berm	X			X	CB
L018A03010004	Earthen Berm		X		X	CB
L018A04060005	Rip Rap	X		X		CB
L018A06010002	Rock Check Dam	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 39.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.52. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 39.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.52 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 39-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30897	4-11-2013
Storm Rain Event	BMP-33549	7-23-2013
Storm Rain Event	BMP-35713	9-25-2013
Annual Erosion Evaluation	COMP-36836	11-14-2013



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

**Table 39-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-33772	Remove rebar. Replace with wooden stakes as necessary.	7-23-2013	103 day(s)	Maintenance conducted as soon as practicable.

**39.5 Compliance Status**

The Sites associated with LA-SMA-5.52 are High Priority Sites. The High Priority Site deadline for the certification of corrective action at this SMA is now 1 yr from the date of any observed TAL exceedance.

**Table 39-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 02-003(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 02-007	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
AOC 02-008(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

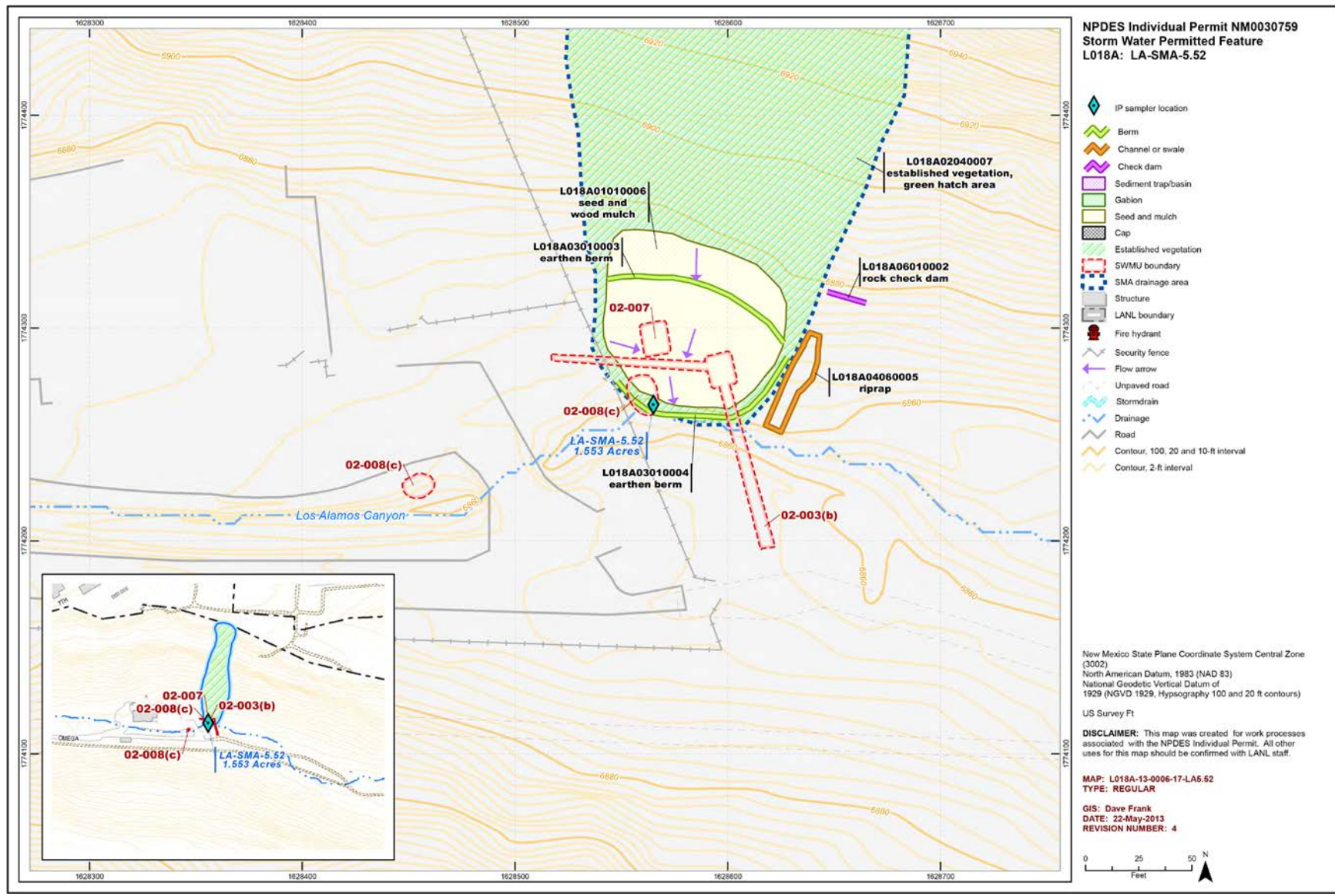


Figure 39-1 LA-SMA-5.52 location map

## 40.0 LA-SMA-5.53: SWMU 02-009(a)

### 40.1 Site Descriptions

One historical industrial activity area is associated with L018B, LA-SMA-5.53: Site 02-009(a).

SWMU 02-009(a) is an area of potential radioactive soil contamination at TA-02 identified during a survey conducted during the 1985 D&D of the WBR. A survey of the area at the time of the D&D identified above-background levels of radioactivity directly south of former building 02-050. A small amount of soil was removed from the Site as part of the 1985 D&D activities. During the post-Cerro Grande fire recovery work performed in 2000, approximately 58 yd<sup>3</sup> of radioactively contaminated soil was removed from SWMU 02-009(a).

Consent Order investigations are complete for SWMU 02-009(a); the Site meets residential risk levels. SWMU 02-009(a) was recommended for corrective action complete in the Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area. SWMU 02-009(a) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 40-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 40.2 Control Measures

Potential run-on may enter this Permitted Feature via the unpaved access road or from the slope above, to the south. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 40-1).

**Table 40-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L018B01010003	Seed and Wood Mulch			X		CB
L018B02040007	Established Vegetation		X	X		B
L018B03010002	Earthen Berm		X		X	CB
L018B03060004	Straw Wattles	X			X	CB
L018B03060008	Straw Wattles	X			X	B
L018B03060009	Straw Wattles	X			X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 40.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-5.53. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

#### 40.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.53 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 40-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30898	4-11-2013
Storm Rain Event	BMP-33550	7-23-2013
Storm Rain Event	BMP-35714	9-25-2013
Annual Erosion Evaluation	COMP-36837	11-14-2013

**Table 40-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-31604	Remove rebar from all wattles -0004, -0005, and -0006 replace with wooden stakes.	4-30-2013	19 day(s)	Maintenance conducted in timely manner.
BMP-36962	Install new straw wattles directly upgradient of existing wattles - L0018B03060005. Wattles will be retired when work is complete.	11/5/2013	41 day (s)	Maintenance conducted as soon as practicable.
BMP-36963	Install new straw wattles directly upgradient of existing wattles - L0018B03060006. Wattles will be retired when work is complete.	11/5/2013	41 day (s)	Maintenance conducted as soon as practicable.

#### 40.5 Compliance Status

The Site associated with LA-SMA-5.53 is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is now 1 yr from the date of any observed TAL exceedance.

**Table 40-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 02-009(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



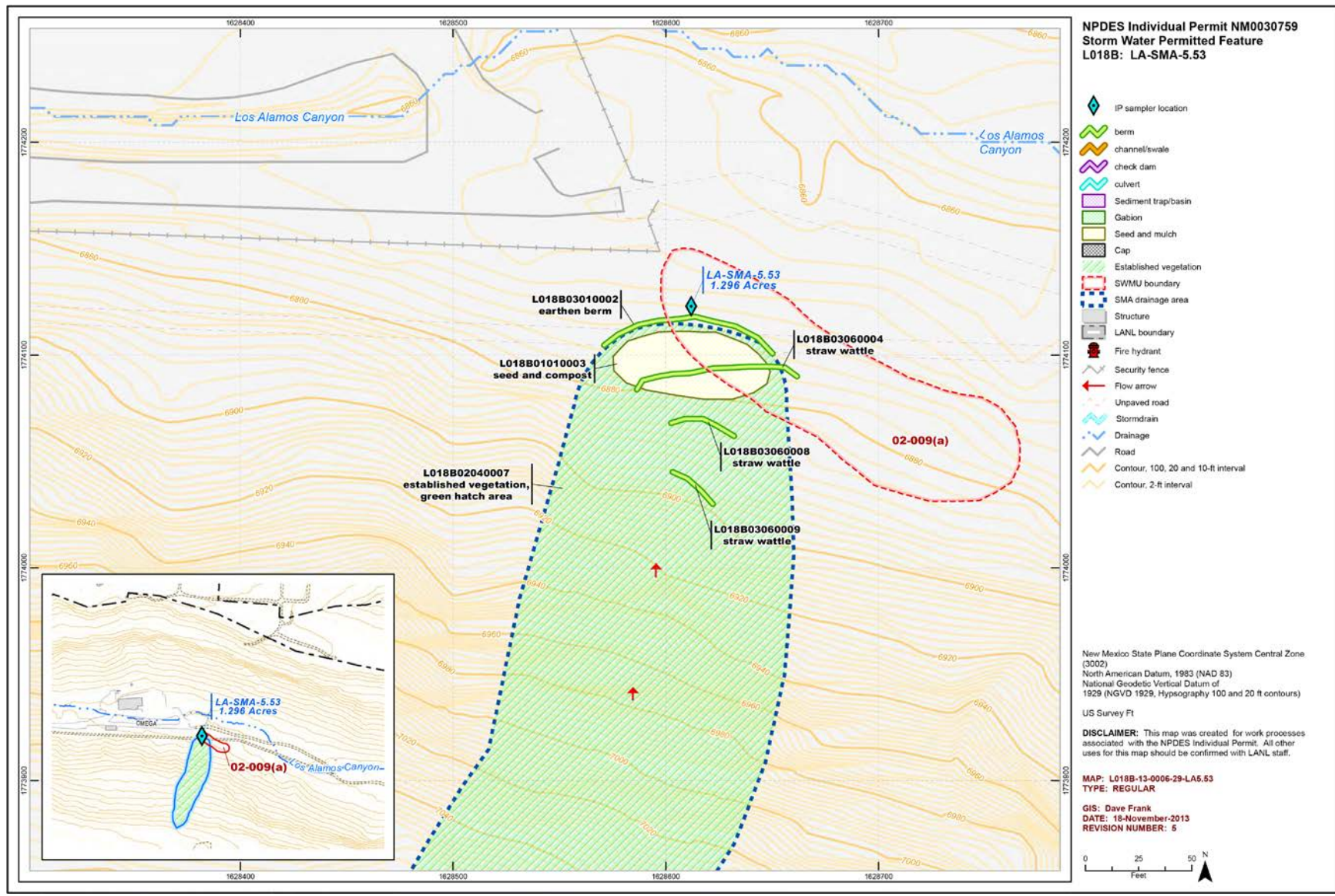


Figure 40-1 LA-SMA-5.53 location map

**41.0 LA-SMA-5.54: SWMU 02-009(c)**

**41.1 Site Descriptions**

One historical industrial activity area is associated with L018C, LA-SMA-5.54: Site 02-009(c).

SWMU 02-009(c) is a leach field and an area of alpha-, beta-, and gamma-emitting radioactively contaminated soil south of the condensate trap [former structure 02-048, AOC 02-003(b)]. Radioactive soil contamination was identified at SWMU 02-009(c) during 1985–1986 D&D activities associated with the condensate trap. Two sections of contaminated 6-in.-diameter VCP, one 34 ft long and one 20 ft long and lying parallel to the septic tank overflow pipe, were uncovered during D&D activities at the condensate trap. The pipes were approximately 5 ft below and to either side of the septic tank overflow pipe. The purpose of the pipes is not known. The pipes were present at depths of 3–8 ft bgs. All structures (septic tank and pipes) and adjacent soil down to the saturated zone were removed and disposed of during the 1985–1986 D&D. The area was backfilled with clean tuff. A post–Cerro Grande fire survey in 2000 identified elevated radiation levels at one location at SWMU 02-009(c). Soil was excavated and removed, and the area was backfilled with clean soil and reseeded.

Phase I and Phase II Consent Order investigations are complete for this Site. Extent is defined and the risk assessment results show acceptable human health risk and dose under current and future land use. The Site is not eligible for a COC, however, because an ecological risk assessment has not been performed. The ecological risk assessment will be performed for the entire TA-02 core area and requires investigation and remediation of AOC 02-011(a) to be completed first.

The project map (Figure 41-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

**41.2 Control Measures**

Potential run-on may enter this Permitted Feature from the undeveloped slope south of the SMA. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 41-1).

**Table 41-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L018C02040004	Established Vegetation		X	X		B
L018C03010002	Earthen Berm	X			X	CB
L018C03060005	Straw Wattles	X			X	B
L018C03060009	Straw Wattles		X		X	B
L018C03060010	Straw Wattles	X			X	B

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

Enhanced controls installation and certification are being planned for the end of 2014 as part of corrective action.

### 41.3 Storm Water Monitoring

SWMU 02-009(c) is monitored within LA-SMA-5.54. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figures 41-2 and 41-3). Analytical results from this sample yielded two TAL exceedances:

- Gross-alpha activities of 356 pCi/L (ATAL is 15 pCi/L), and
- PCB concentration of 60 ng/L (ATAL is 0.6 ng/L).

These exceedances were 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 discussion is organized by Site and analyte.

*SWMU 02-009(c):*

- PCBs are not known to be associated with industrial materials historically managed at this Site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow (i.e., less than 3 ft bgs) Consent Order samples. Aroclor-1248 was detected in one sample at 0.2% of the residential SSL. Aroclor-1254 was detected in 13 of 19 shallow samples with a maximum concentration 13% of the residential SSL. Aroclor-1260 was detected in 16 of 19 shallow samples with a maximum concentration 7% of the residential SSL.
- Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at this Site. Consent Order and post-Cerro Grande fire samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are alpha emitters. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

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 41-2 and 41-3. 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 41-2 and 41-3.

Monitoring location LA-SMA-5.54 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—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed urban landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these values.
- PCBs—The PCB UTL from developed urban 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 result from 2013 is between these values.

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

#### 41.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.54 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 41-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30899	4-11-2013
Storm Rain Event	BMP-33551	7-19-2013
Storm Rain Event	BMP-35715	9-25-2013
Annual Erosion Evaluation	COMP-36838	11-22-2013
TAL Exceedance	COMP-37067	11-22-2013

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

**Table 41-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-31501	Install 2-4 wattles as runoff controls for 02-009(c). Install 2-4 wattles as run-on controls for 02-009(c).	4/30/2013	19 day (s)	Maintenance conducted in timely manner.
BMP-31503	Install wattle on west end of berm L018C03010002 to extend berm. Repair damaged areas of matting on berm L018C03010002.	5-1-2013	30 day(s)	Maintenance conducted in timely manner.
BMP-36964	Install new straw wattles directly upgradient of existing wattles -L0018C03060006. Wattles will be retired when work is complete.	11/5/2013	41 day (s)	Maintenance conducted as soon as practicable.
BMP-36965	Install new straw wattles directly upgradient of existing wattles -L0018C03060008. Wattles will be retired when work is complete.	11/5/2013	41 day (s)	Maintenance conducted as soon as practicable.

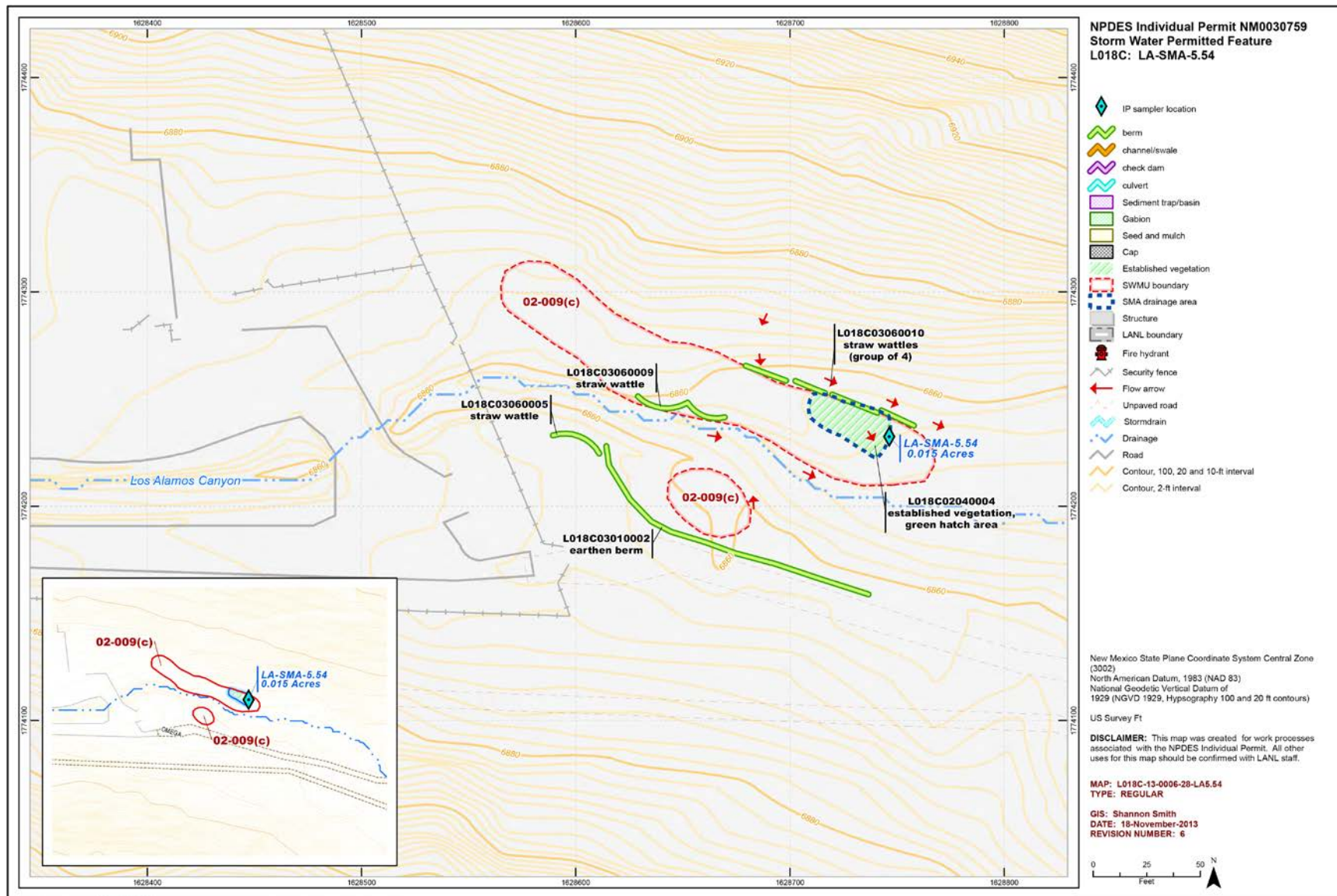
#### 41.5 Compliance Status

The Site associated with LA-SMA-5.54 is a High Priority Site. The High Priority Site deadline for the certification of corrective action is now 1 yr from the date of an observed TAL exceedance, which for LA-SMA-5.54 is October 28, 2014.

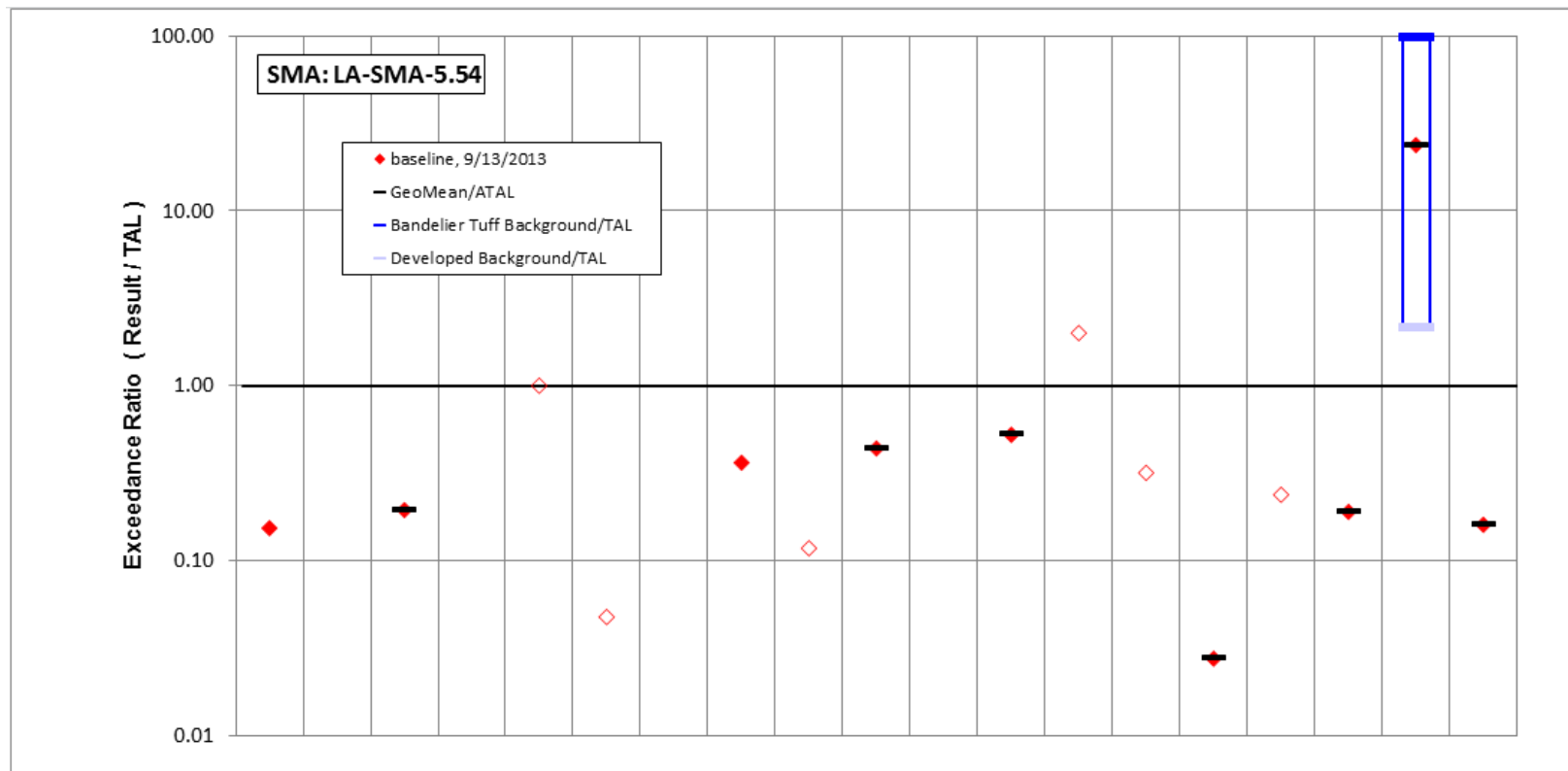
**Table 41-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 02-009(c)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 11-3-13





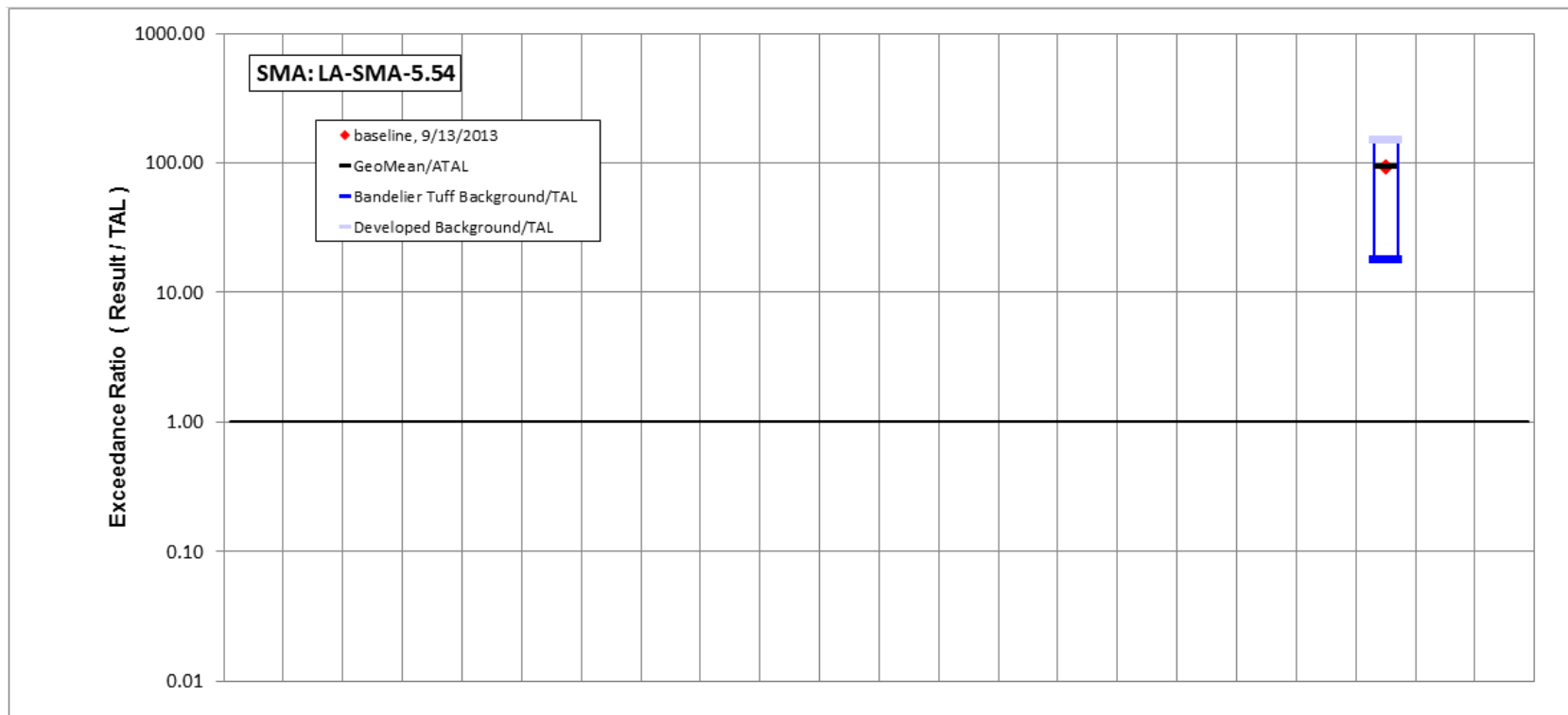
**Figure 41-1 LA-SMA-5.54 location map**



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	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	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>9/13/2013 result</b>	115	3	1.75	16.7	1	10	5	1.56	2	0.337	1.07	2.62	<b>1</b>	2	2.75	10	0.0019	356	4.81
result / TAL	0.15	<i>0.005</i>	0.19	0.0033	1	<i>0.048</i>	<i>0.005</i>	0.36	0.12	0.44	0.0063	0.52	<b>2</b>	0.32	0.028	0.24	0.19	<b>24</b>	0.16

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

Figure 41-2 Inorganic analytical results summary plot for LA-SMA-5.54



	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>9/13/2013 result</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>0.06</b>	-	-
<b>result / TAL</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>93</b>	-	-

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

Figure 41-3 Organic analytical results summary plot for LA-SMA-5.54

## **42.0 LA-SMA-5.91: SWMUs 21-021, 21-023(c), and 21-027(d) and AOC 21-009**

### **42.1 Site Descriptions**

Four historical industrial activity areas are associated with L019, LA-SMA-5.91: Sites 21-009, 21-021, 21-023(c), and 21-027(d).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-023(c) is a former septic system and associated outfall located immediately west of former MDA V. The septic system consisted of a concrete tank (structure 21-62) that measured 3.5 ft wide × 7 ft long × 5.8 ft deep and a 4-in. VCP drainline. The septic system was intended only for sanitary waste and served a waste treatment laboratory (building 21-33) from 1948 to 1965. Sewage was pumped from the sump in building 21-33 through the septic tank and was discharged approximately 30 ft from the canyon edge above BV Canyon, a tributary to Los Alamos Canyon. It is not known what volume of wastewater was handled by the septic system or if any releases occurred, other than intentional releases to the outfall. The septic tank was removed in 1965.

Consent Order investigations are complete for SWMU 21-023(c); the Site meets residential risk levels. NMED issued a COC with controls (storm water) for SWMU 21-023(c) in June 2011.

SWMU 21-027(d) consists of the former drainline and outfall for the secondary containment that was around a former aboveground diesel fuel tank (AOC C-21-028). The concrete secondary containment structure was built around the tank in 1948 to contain any potential releases from the tank. A sump was constructed in the center of the south side of the containment, and a drainline was installed in the drainage ditch from the tank containment. The first segment of the drainline (approximately 5 ft) from the sump to a gate valve just outside the containment wall was a 4-in. steel pipe. At the gate valve, the drainline changed to a VCP. When the wastewater treatment laboratory (former structure 21-33, AOC 21-009) was built, the drainage ditch was rerouted around the building and south toward the rim of DP Mesa. The new containment drainline was then installed below ground surface. The outfall for the drainline began near the mesa edge and continued down the hillside toward BV Canyon. The fuel tank and concrete containment were removed in 1960, and the drainline was removed in March 1965. There was no record or evidence of a release from the fuel tank or containment area.

Consent Order investigation are complete for SWMU 21-027(d); the Site meets residential risk levels. SWMU 21-027(d) will be recommended for a COC without controls in 2014.

AOC 21-009 is a former waste treatment laboratory (building 21-33) that was built in 1948 and operated until 1965. It was a wooden-frame single floor structure, built on concrete pillars and measuring 16 × 48 ft. Building components and laboratory furniture were contaminated with plutonium dust. Perchloric acid was used and may have contaminated the exhaust hoods. Wastewater from the laboratory was discharged to septic tank 21-33, which discharged to an outfall at the rim of Los Alamos Canyon. The



tank was removed during demolition of building 21-33 in 1965; however, the drainline from the laboratory to the septic tank may remain in place. The outfall and tank associated with this waste line were designated as SWMU 21-023(c).

Consent Order investigations are complete for AOC 21-009; the Site meets residential risk levels. AOC 21-009 will be recommended for corrective action complete in Revision 2 of the Phase II investigation report for DP Site Aggregate Area to be submitted to NMED in late 2014 or early 2015. AOC 21-009 will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 42-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## 42.2 Control Measures

Potential run-on to this Permitted Feature originates from the paved access road south of MDA B as well as from large paved areas north and east of the SMA. Berms along the southern portion of SWMUs 21-018(a) and 21-013(b) also control runoff. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 42-1).

Enhanced controls were installed and certified on July 8, 2013, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/construction-certifications.php>

**Table 42-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L01902040010	Established Vegetation		X	X		B
L01905020015	Sediment Basin	X			X	EC
L01906020013	Log Check Dam		X		X	EC
L01906020014	Log Check Dam		X		X	EC

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

## 42.3 Storm Water Monitoring

AOC 21-009 and SWMUs 21-021, 21-023(c), and 21-027(d) are monitored within LA-SMA-5.91. Following the installation of baseline control measures, a baseline storm water sample was collected on September 7, 2011 (Figure 42-2). Analytical results from this sample yielded one TAL exceedance:

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

Following the installation of enhanced control measures at LA-SMA-5.91, a corrective action storm water sample was collected on September 12, 2013 (Figure 42-2). Analytical results from this corrective action monitoring sample yielded one TAL exceedance:

- Gross-alpha activities of 15.7 pCi/L (ATAL is 15 pCi/L).

This exceedance was 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 discussion is organized by Site and analyte.

*AOC 21-009:*

- Alpha-emitting radionuclides are not known to be associated 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. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*SWMU 21-021:*

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*SWMU 21-023(c):*

- Alpha-emitting radionuclides are not known to be associated industrial materials historically managed at the Site. 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. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*SWMU 21-027(d):*

- Alpha-emitting radionuclides are not known to be associated 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. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

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 42-2. 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 42-2.

Monitoring location LA-SMA-5.91 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape 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 urban landscape is 32.5 pCi/L. The 2011 gross-alpha result is between these two values, while the 2013 result is below both values.

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

#### 42.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.91 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 42-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30762	5-14-2013
Storm Rain Event	BMP-33569	7-17-2013
Storm Rain Event	BMP-35733	9-23-2013
Annual Erosion Evaluation	COMP-36701	11-21-2013
TAL Exceedance	COMP-37089	11-21-2013

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

**Table 42-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-36461	Repair log check dam L01906020013.	11-21-2013	59 day(s)	Maintenance conducted as soon as practicable.

#### 42.5 Compliance Status

The Sites associated with LA-SMA-5.91 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 42-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 21-009	Corrective Action Initiated	Enhanced Control Corrective Action Monitoring	Corrective Action Certified 7-8-13
SWMU 21-021	Corrective Action Initiated	Enhanced Control Corrective Action Monitoring	Corrective Action Certified 7-8-13
SWMU 21-023(c)	Corrective Action Initiated	Corrective Action Complete	NMED, June 3, 2011, "Certificates of Completion Material Disposal Area V, Technical Area 21 Los Alamos National Laboratory"
SWMU 21-027(d)	Corrective Action Initiated	Enhanced Control Corrective Action Monitoring	Corrective Action Certified 7-8-13



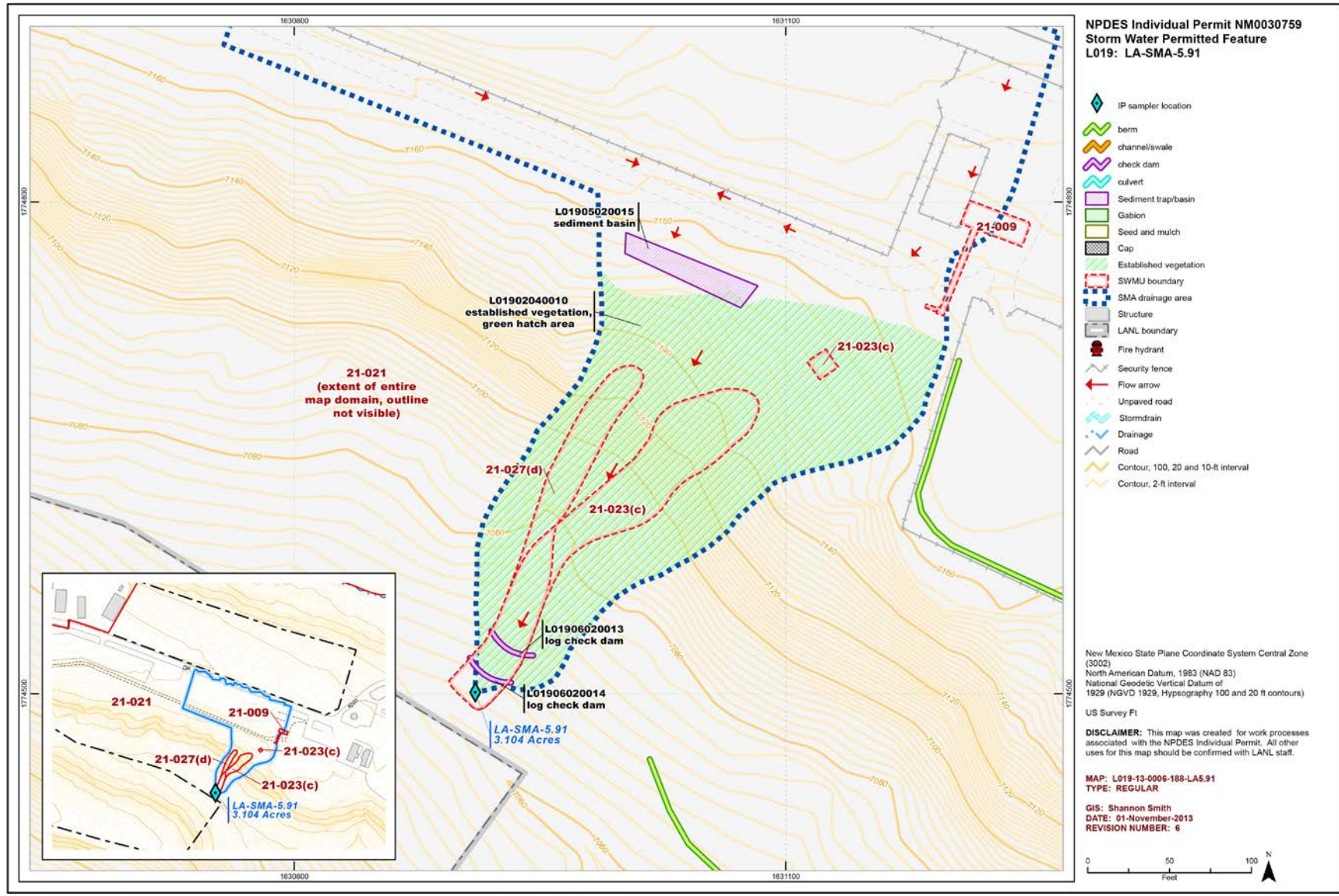
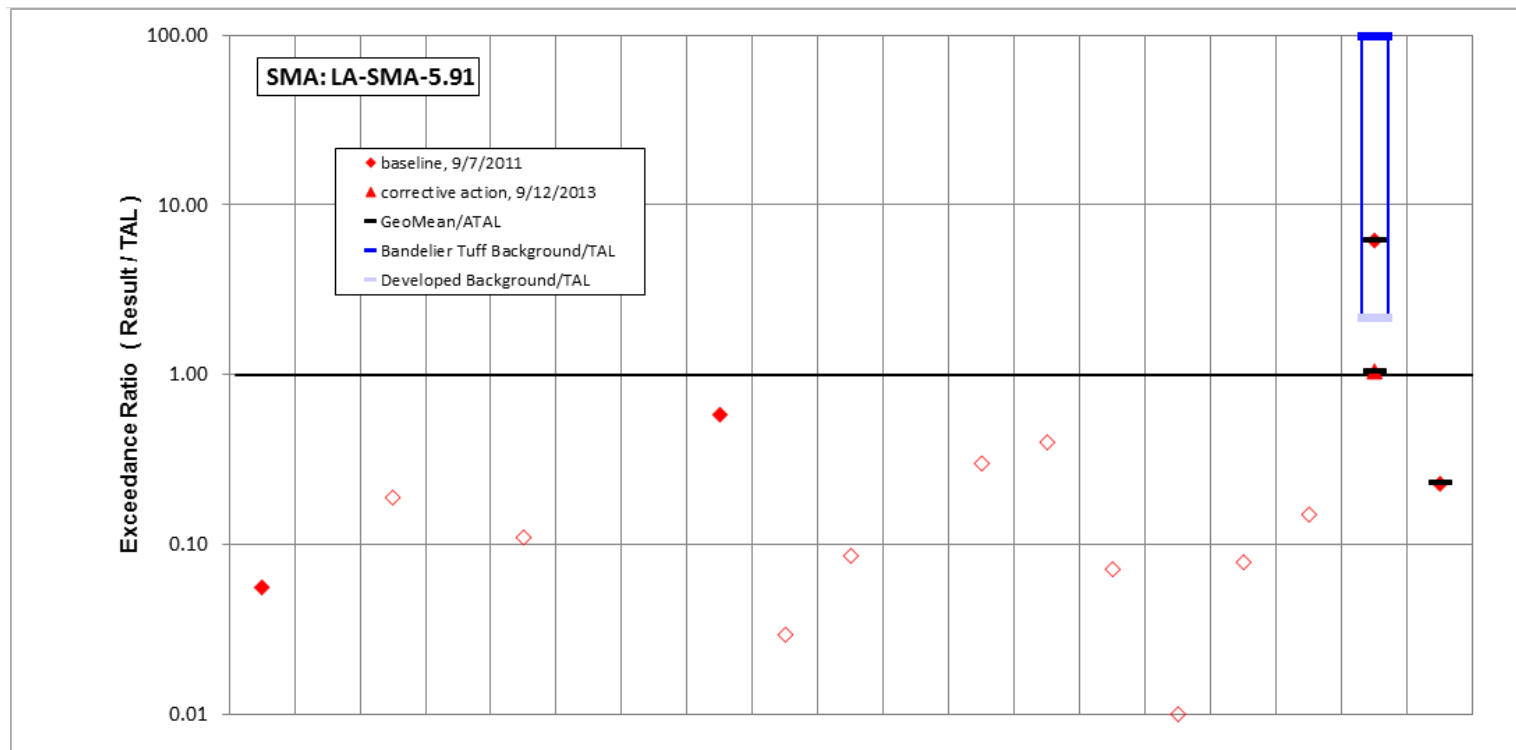


Figure 42-1 LA-SMA-5.91 location map



	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
9/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>15.7</b>	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>1</b>	-
9/7/2011 result	41.9	<i>1</i>	<i>1.7</i>	27.1	<i>0.11</i>	<i>2</i>	2.9	2.5	0.5	<i>0.066</i>	1.3	1.5	0.2	0.45	1	3.3	0.002	92.6	6.83
result / TAL	0.056	0.002	0.19	0.0054	0.11	0.01	0.0029	0.58	0.029	0.086	0.0076	0.3	0.4	0.071	0.01	0.079	0.15	6.2	0.23

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

Figure 42-2 Inorganic analytical results summary plot for LA-SMA-5.91

## **43.0 LA-SMA-5.92: SWMUs 21-013(b), 21-018(a), and 21-021 and AOC 21-013(g)**

### **43.1 Site Descriptions**

Four historical industrial activity areas are associated with L019A, LA-SMA-5.92: Sites 21-013(b), 21-013(g), 21-018(a), and 21-021.

SWMU 21-013(b) is the former location of a surface disposal area on the southern edge of DP Mesa, southwest of former MDA V in TA-21. This area contained concrete building debris from the 1965 demolition of a waste treatment laboratory (former building 21-33). A radiological contamination survey of the building interior before demolition showed that various surfaces were contaminated with plutonium dust. It is not known if other materials were disposed of at SWMU 21-013(b). All debris was removed and the entire site was regraded in 2005. NMED issued a COC with controls under the Consent Order for the Site in June 2011.

SWMU 21-018(a), former MDA V, consisted of three interconnected liquid waste absorption beds on approximately 1 acre immediately south of the former DP laundry facility [SWMU 21-018(b), former building 21-20]. The cobble- and gravel-filled absorption beds with dimensions of 25 ft wide × 220 ft long × 5 ft to 6 ft deep were constructed to receive RLW from the former laundry facility and were designed to enhance liquid infiltration into the tuff. The average discharge rate to MDA V was 6000 to 8000 gal. per day. Discharged wastewater flowed into pit 1, which overflowed into pit 2 and then into pit 3. Historical evidence shows the beds were underdesigned for the volume of wastewater discharged, resulting in overflows into adjacent drainages and into BV Canyon, a tributary of Los Alamos Canyon. The absorption beds were used continuously from 1945 to 1961 and remained on standby status until September 1963, when they were permanently removed from service. A soil cover was placed over the Site to repair erosion damage in 1985.

All absorption bed material, associated piping, and contaminated soil/tuff were removed and the Site fully characterized between 2005 and 2007. Risk-assessment results showed no potential unacceptable risk to residential and ecological receptors; no further investigation is required. NMED issued a COC with controls under the Consent Order for the Site in June 2011.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

AOC 21-013(g) the former location of a surface disposal area south of MDA V in TA-21 on the south-facing slope leading into BV Canyon. The Site consisted of miscellaneous building debris, the origin of which is not known. All debris was removed 2005. NMED issued a COC with controls under the Consent Order for the Site in June 2011.

The project map (Figure 43-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 43.2 Control Measures

Potential run-on to this Permitted Feature originates from the base course access road south of MDA B traversing the area, as well as from large paved areas north of the SMA. Berms along the southern portion of SWMUs 21-018(a) and 21-013(b) also control runoff. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 43-1).

**Table 43-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L019A02040007	Established Vegetation		X	X		B
L019A03010005	Earthen Berm	X	X		X	CB
L019A03030003	Log Berm		X		X	CB
L019A05020006	Sediment Basin		X		X	CB

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

### 43.3 Storm Water Monitoring

SWMUs 21-013(b), 21-018(a), and 21-021 and AOC 21-013(g) are monitored within LA-SMA-5.92. Following the installation of baseline control measures, a baseline storm water sample was collected on July 12, 2013 (Figure 43-2). Analytical results from this sample yielded three TAL exceedances:

- Copper concentrations of 8.32 µg/L (MTAL is 4.3 µg/L),
- Mercury concentration of 2.89 µg/L (MTAL is 0.77 µg/L), and
- Gross-alpha activities of 264 pCi/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

*SWMU 21-013(b):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was detected above the BV in 1 of 101 shallow (i.e., less than 3 ft bgs) soil samples collected during the 1994 RFI and 2004–2005 Phase I Consent Order investigation at a concentration 1.4 times the soil BV.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was detected above the BVs in 12 of 101 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs, and 2005–2006 Phase I Consent Order investigation at a maximum concentration 4.3 times the soil BV.
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Americium and plutonium and uranium isotopes are excluded from the definition of adjusted gross-alpha radioactivity. Shallow soil and tuff samples collected during the 1994 RFI and 2004–2005 Phase I Consent Order investigation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are all alpha emitters.



*SWMU 21-018(a):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the 6 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFI, 2005–2006 Phase I Consent Order investigation, and remediation, and 2007 supplemental investigation and remediation.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury was detected above the BV in 1 of 6 shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs, 2005–2006 Phase I Consent Order investigation and remediation, and 2007 supplemental investigation and remediation at a concentration 1.5 times the soil BV (0.1 mg/kg versus 0.15 mg/kg).
- Alpha-emitting radionuclides are known to have been associated with industrial materials historically managed at this Site. Shallow soil and tuff samples collected during the 1992, 1994, and 1996 RFIs and 2005–2007 Phase I Consent Order investigation and remediation were not analyzed for gross-alpha radioactivity but were analyzed for americium-241 and plutonium and uranium isotopes, which are all alpha emitters. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

*AOC 21-013(g):*

- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BV in any of the 12 shallow soil and sediment samples collected during the 1994 RFI and the 2004–2005 Phase I Consent Order investigation.
- Mercury is not known to be associated with industrial materials historically managed at the Site. Mercury were not detected above BVs in any of the 12 shallow soil and sediment samples collected during the 1994 RFI and the 2004–2005 Phase I Consent Order investigation.
- Alpha-emitting radionuclides are not known to have been associated with industrial materials historically managed at this Site. Shallow soil and tuff samples collected during the 1994 RFI and 2004–2005 Phase I Consent Order investigation 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 americium-241 and plutonium, thorium, and uranium isotopes, which are all alpha emitters. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

The SMA receives runoff primarily from SWMUs 21-013(b) and 21-013(g), which were remediated in 2005. The area is currently undeveloped. 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 43-2. 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 43-2.

Monitoring location LA-SMA-5.92 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 urban 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.
- **Mercury**—The mercury UTL from undisturbed Bandelier Tuff and from developed urban landscape storm water run-on was not calculated because the number of detected values was not sufficient to calculate the UTL value in the baseline metals background study. Therefore, no comparison to background mercury levels 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, and the gross-alpha background storm water UTL for storm water run-on from a developed urban landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.

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

#### 43.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-5.92 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 43-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30763	5-14-2013
Storm Rain Event	BMP-33570	7-17-2013
Storm Rain Event	BMP-35734	9-23-2013
Annual Erosion Evaluation	COMP-36702	11-7-2013
TAL Exceedance	COMP-35294	11-21-2013

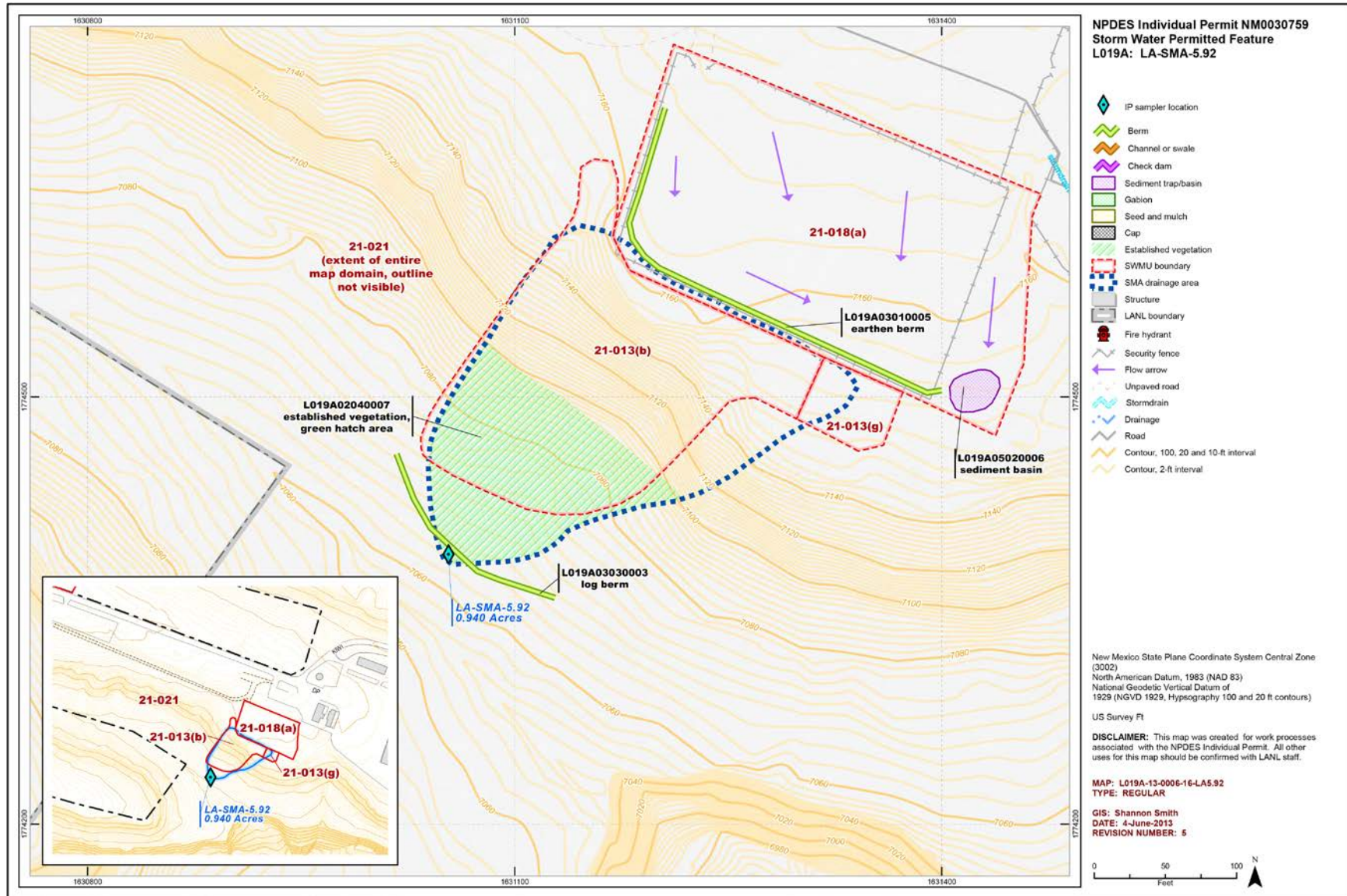
No maintenance activities were conducted at LA-SMA-5.92 in 2013.

#### 43.5 Compliance Status

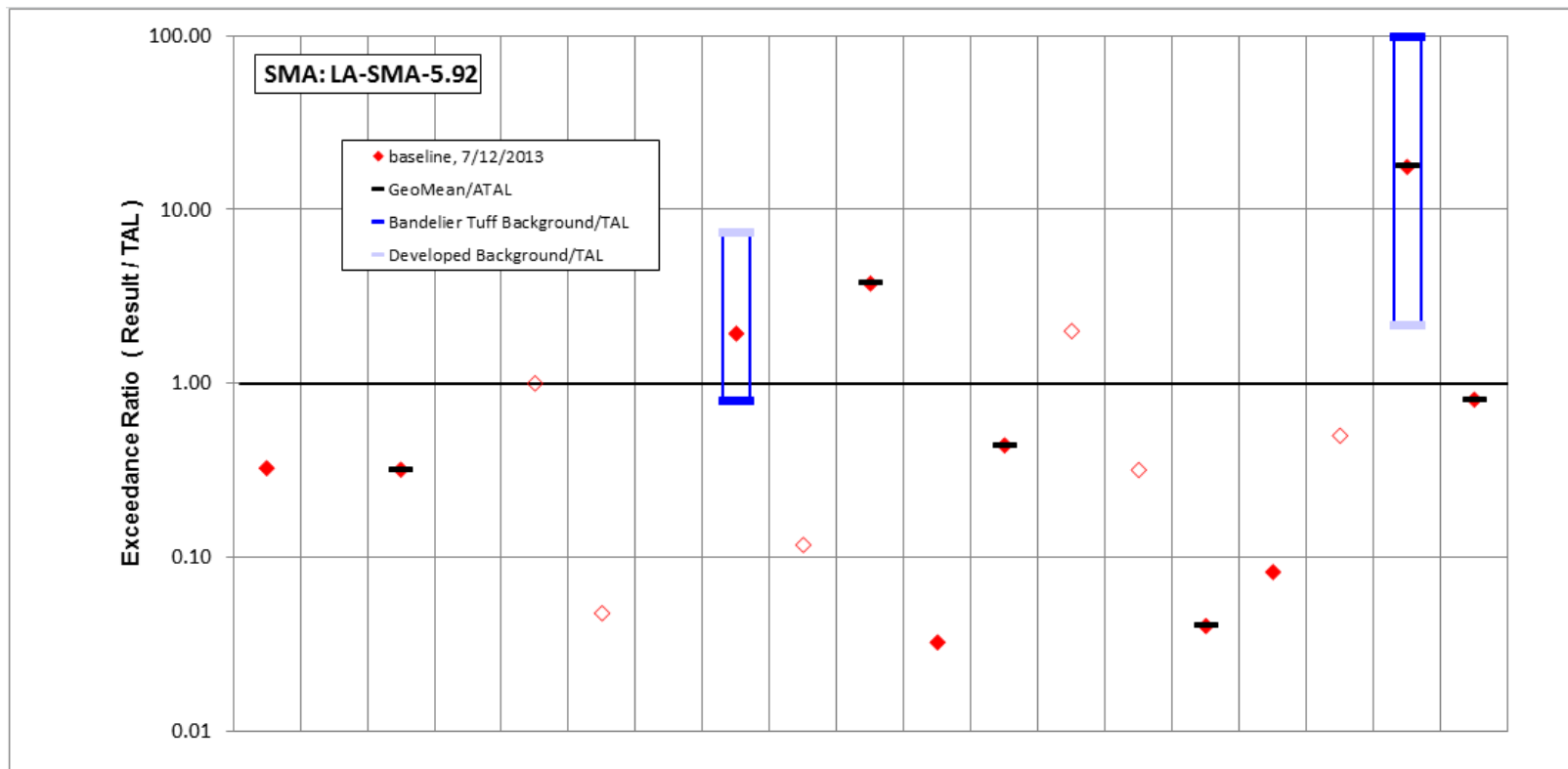
The Sites associated with LA-SMA-5.92 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 43-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-013(b)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-27-13
AOC 21-013(g)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-27-13
SWMU 21-018(a)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-27-13
SWMU 21-021	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 8-27-13



**Figure 43-1 LA-SMA-5.92 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	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>7/12/2013 result</b>	244	1.75	2.87	32.9	<i>1</i>	<i>10</i>	7.42	<b>8.32</b>	2	<b>2.89</b>	5.5	2.2	<b>1</b>	2	4.02	3.45	0.005	<b>264</b>	24.2
result / TAL	0.33	0.0027	0.32	0.0066	<i>1</i>	<i>0.048</i>	0.0074	<b>1.9</b>	0.12	<b>3.8</b>	0.032	0.44	<b>2</b>	0.32	0.04	0.082	0.5	<b>18</b>	0.81

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

Figure 43-2 Inorganic analytical results summary plot for LA-SMA-5.92



## 44.0 LA-SMA-6.25: SWMUs 21-021, 21-024(d), and 21-027(c)

### 44.1 Site Descriptions

Three historical industrial activity areas are associated with L020, LA-SMA-6.25: Sites 21-021, 21-024(d), and 21-027(c).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(d) consists of a former location septic system that served building 21-01. The septic system was constructed in 1945 at the same time building 21-01 was built. The septic system consisted of a reinforced concrete septic tank (structure 21-106) that measured 17.5 × 9.5 × 8.83 ft deep, with 6-in.-diameter VCP inlet and outlet drainlines. The outfall discharged to the surface on the south rim of DP Mesa above Los Alamos Canyon. The septic system was decommissioned in the early 1960s. In 1995, the septic tank was filled with gravel, and the inlet and outlet lines were grouted with concrete and left in place. The septic tank and all remaining inlet and outlet drainlines were removed in 2007.

The Phase II investigation at SWMU 21-024(d) determined the detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs, with the exception of arsenic, which was just above the residential SSL but below the industrial SSL. However, the vertical extent of americium-241, SVOCs, and tritium were not defined. Therefore, additional sampling is proposed for SWMU 21-024(d).

SWMU 21-027(c) consists of a former drainline and outfall that discharged 50 ft inside the south TA-21 perimeter fence to a broad, gently sloping area on the south rim of DP mesa toward Los Alamos Canyon. Building 21-6 was constructed in 1945 as a cafeteria and machine shop. A 4-in. VCP drainline exited the southeast corner of the building and discharged sanitary wastewater to the SWMU 21-027(c) outfall. Building 21-6 was removed in 1966; however, the drainline was left in place. The entire drainline was removed in 2007.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-027(c) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. SWMU 21-027(c) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 44-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

#### 44.2 Control Measures

The asphalt berm at the northern end of the Site is directing run-on from the paved area away from the Sites. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 44-1).

**Table 44-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02002040007	Established Vegetation		X	X		B
L02003040002	Asphalt Berm	X			X	CB
L02003060009	Straw Wattles		X		X	B
L02003060010	Straw Wattles		X		X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

#### 44.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.25. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

#### 44.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-6.25 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 44-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30764	4-17-2013
Storm Rain Event	BMP-33562	7-19-2013
Storm Rain Event	BMP-35726	9-23-2013
Annual Erosion Evaluation	COMP-36703	11-21-2013

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

**Table 44-3 Maintenance during 2013**

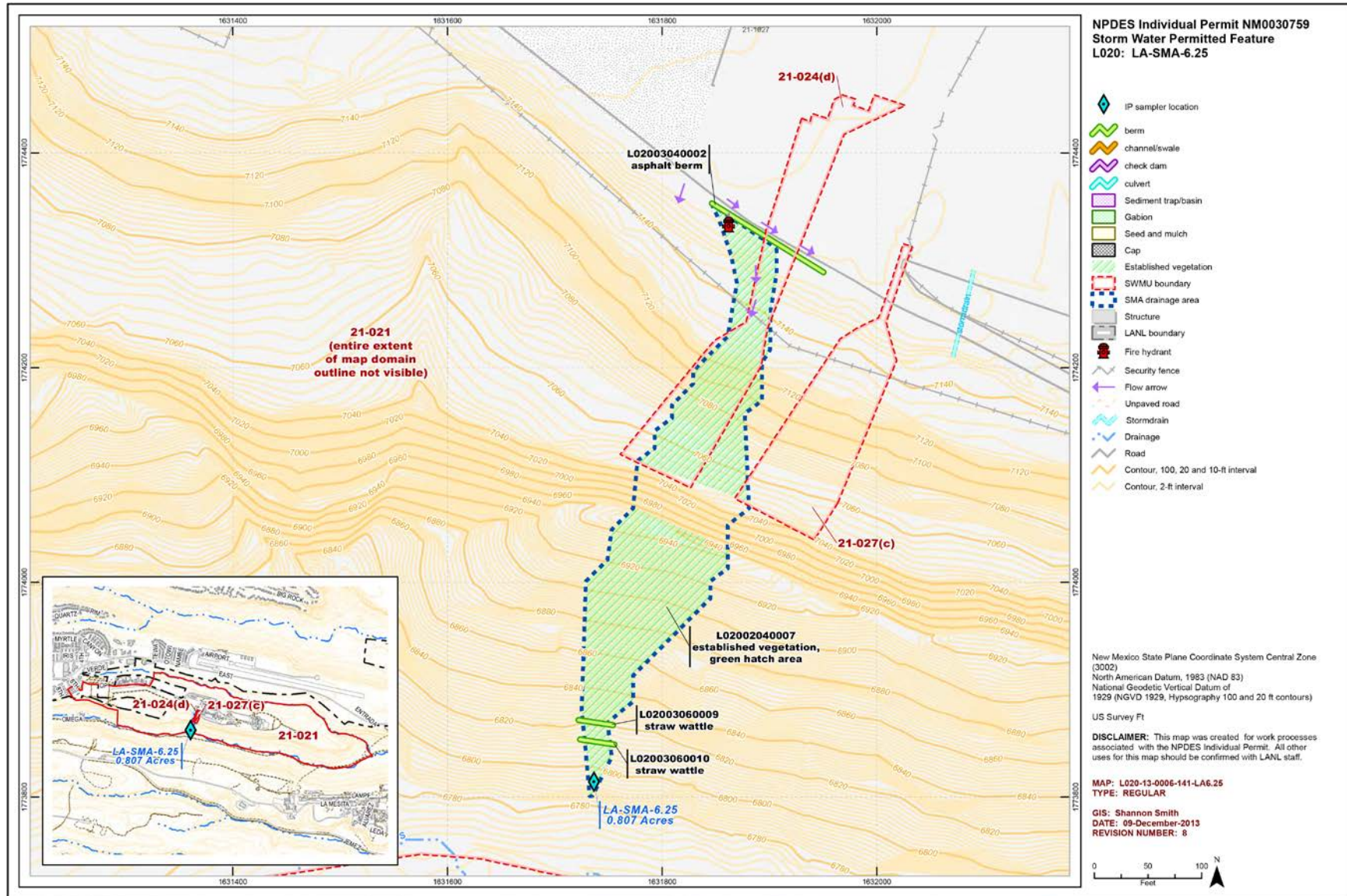
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-33562	Straw wattle -L02003060006 was found silted in at inspection. A new wattle was installed to replace it.	7/19/2013	0 day (s)	Maintenance conducted in timely manner.
BMP-36453	Install at least 2 new lines of straw wattles upgradient of existing wattle - L02003060008. Wattles will be retired when work is complete.	11/15/2013	53 day (s)	Maintenance conducted as soon as practicable.

**44.5 Compliance Status**

The Sites associated with LA-SMA-6.25 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 44-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-024(d)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-027(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



**Figure 44-1 LA-SMA-6.25 location map**



## 45.0 LA-SMA-6.27: SWMUs 21-021 and 21-027(c)

### 45.1 Site Descriptions

Two historical industrial activity areas are associated with L021, LA-SMA-6.27: Sites 21-021 and 21-027(c).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-027(c) consists of a former drainline and outfall that discharged 50 ft inside the south TA-21 perimeter fence to a broad, gently sloping area on the south rim of DP mesa toward Los Alamos Canyon. Building 21-6 was constructed in 1945 as a cafeteria and machine shop. A 4-in. VCP drainline exited the southeast corner of the building and discharged sanitary wastewater to the SWMU 21-027(c) outfall. Building 21-6 was removed in 1966; however, the drainline was left in place. The entire drainline was removed in 2007.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-027(c) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. SWMU 21-027(c) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 45-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 45.2 Control Measures

The run-on from paved areas to the north is managed with controls that serve to reduce the sediment and velocity of contributions from these areas. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 45-1).

**Table 45-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02102040011	Established Vegetation		X	X		B
L02103040001	Asphalt Berm	X			X	CB
L02103060012	Straw Wattles		X		X	B
L02103060013	Straw Wattles		X		X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 45.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.27. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 45.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-6.27 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 45-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30765	4-17-2013
Storm Rain Event	BMP-33563	7-22-2013
Storm Rain Event	BMP-35727	9-23-2013
Annual Erosion Evaluation	COMP-36704	11-21-2013

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

**Table 45-3 Maintenance during 2013**

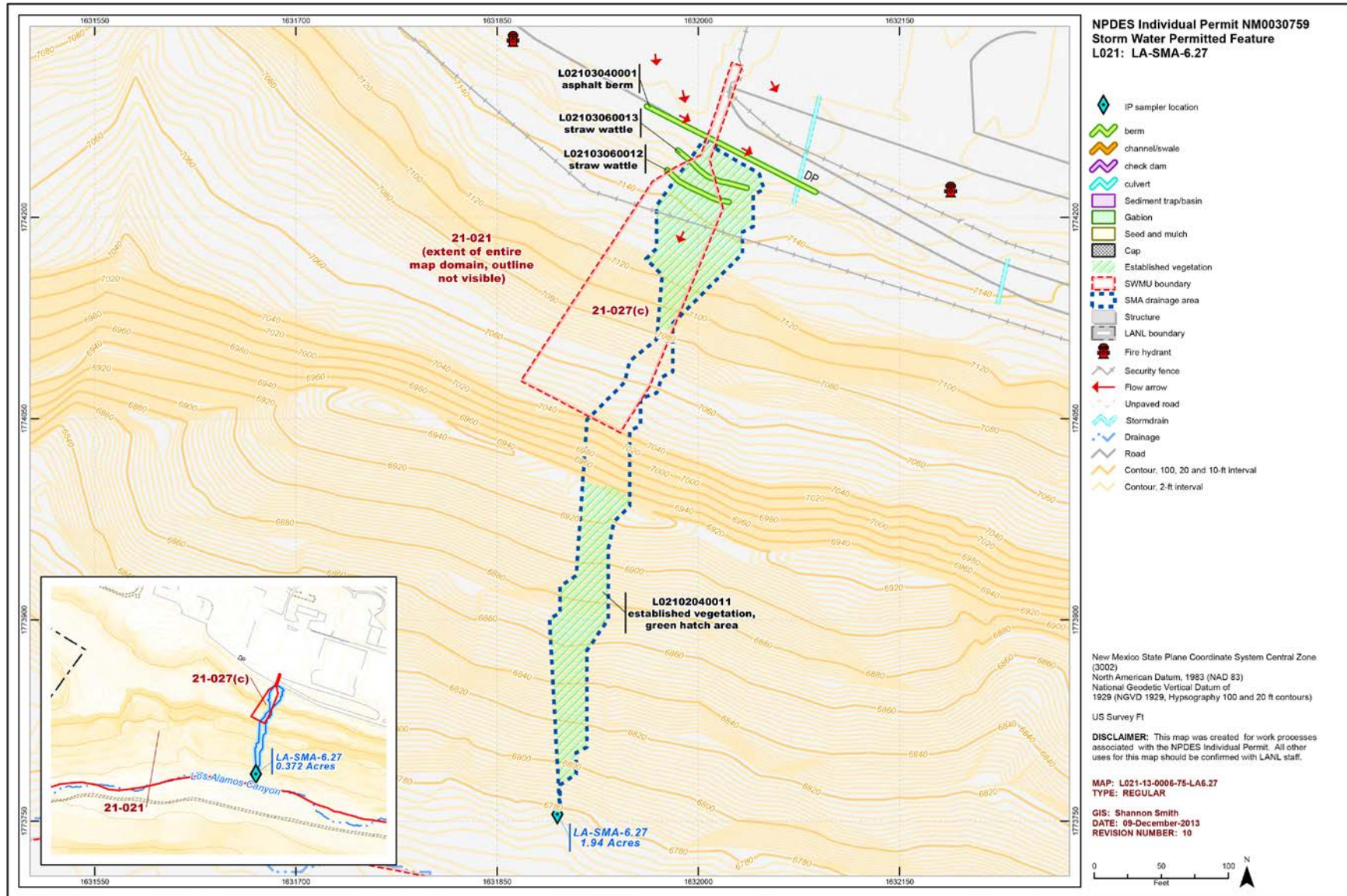
Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-36455	Install new straw wattles directly upgradient of existing wattles - L02103060009. Wattles will be retired when work is complete.	11/15/2013	53 day (s)	Maintenance conducted as soon as practicable.
BMP-36458	Install new straw wattles directly upgradient of existing wattles - L02103060010. Wattles will be retired when work is complete.	11/15/2013	53 day (s)	Maintenance conducted as soon as practicable.

### 45.5 Compliance Status

The Sites associated with LA-SMA-6.27 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 45-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-027(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



**Figure 45-1 LA-SMA-6.27 location map**

## 46.0 LA-SMA-6.3: SWMU 21-006(b)

### 46.1 Site Descriptions

One historical industrial activity area is associated with L022, LA-SMA-6.3: Site 21-006(b).

SWMU 21-006(b) was a seepage pit (former structure 21-202), drainline, and outfall installed in 1945 during the construction of building 21-2. Waste from the extraction process that was part of the original TA-21 plutonium purification process was discharged to a 3-in. cast-iron drainline that exited the southeast side of building 21-2 and extended 160 ft to the south to the seepage pit. A 2-in. cast-iron outlet line exited the sump and extended approximately 100 ft to the south to an outfall approximately 8 ft above the surface of a bench below the mesa top. It is not known when the seepage pit ceased to be used. The seepage pit consisted of a brick manhole placed within a trench. The seepage pit and piping were removed during the 2006–2007 DP Site Aggregate Area investigation. The section of the drainline that lies beneath the road was left in place because the road is active and continues to service DP East. SWMU 21-006(b) along with SWMUs 21-006(a), 21-006(c), and 21-006(d) comprise Consolidated Unit 21-006(c)-99.

SWMU 21-006(b) was investigated along with SWMUs 21-006(a), 21-006(c), and 21-006(d) as part of Consolidated Unit 21-006(c)-99. Samples were collected from 2007 to 2010 and analyzed for TAL metals, perchlorate, nitrate, cyanide, SVOCs, VOCs, pH, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and strontium-90.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-006(b) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. SWMU 21-006(b) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 46-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 46.2 Control Measures

An asphalt berm located on the southern edge of DP Road controls run-on from the paved areas in the headwaters of this SMA. Because of the development in the headwaters of the Permitted Feature, run-on controls are crucial to the successful management of storm water at this site. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 46-1).

**Table 46-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02202040009	Established Vegetation		X	X		B
L02203040005	Asphalt Berm	X			X	CB
L02206010001	Rock Check Dam		X		X	CB
L02206010004	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.



### 46.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.3. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 46.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-6.3 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 46-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30766	4-17-2013
Storm Rain Event	BMP-33564	7-22-2013
Storm Rain Event	BMP-35728	9-23-2013
Annual Erosion Evaluation	COMP-36705	11-21-2013

No maintenance activities were conducted at LA-SMA-6.3 in 2013.

### 46.5 Compliance Status

The Site associated with LA-SMA-6.3 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 46-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-006(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



LA-SMA-6.3, Rock Check Dam, L02206010004 (photo ID 8655-1)

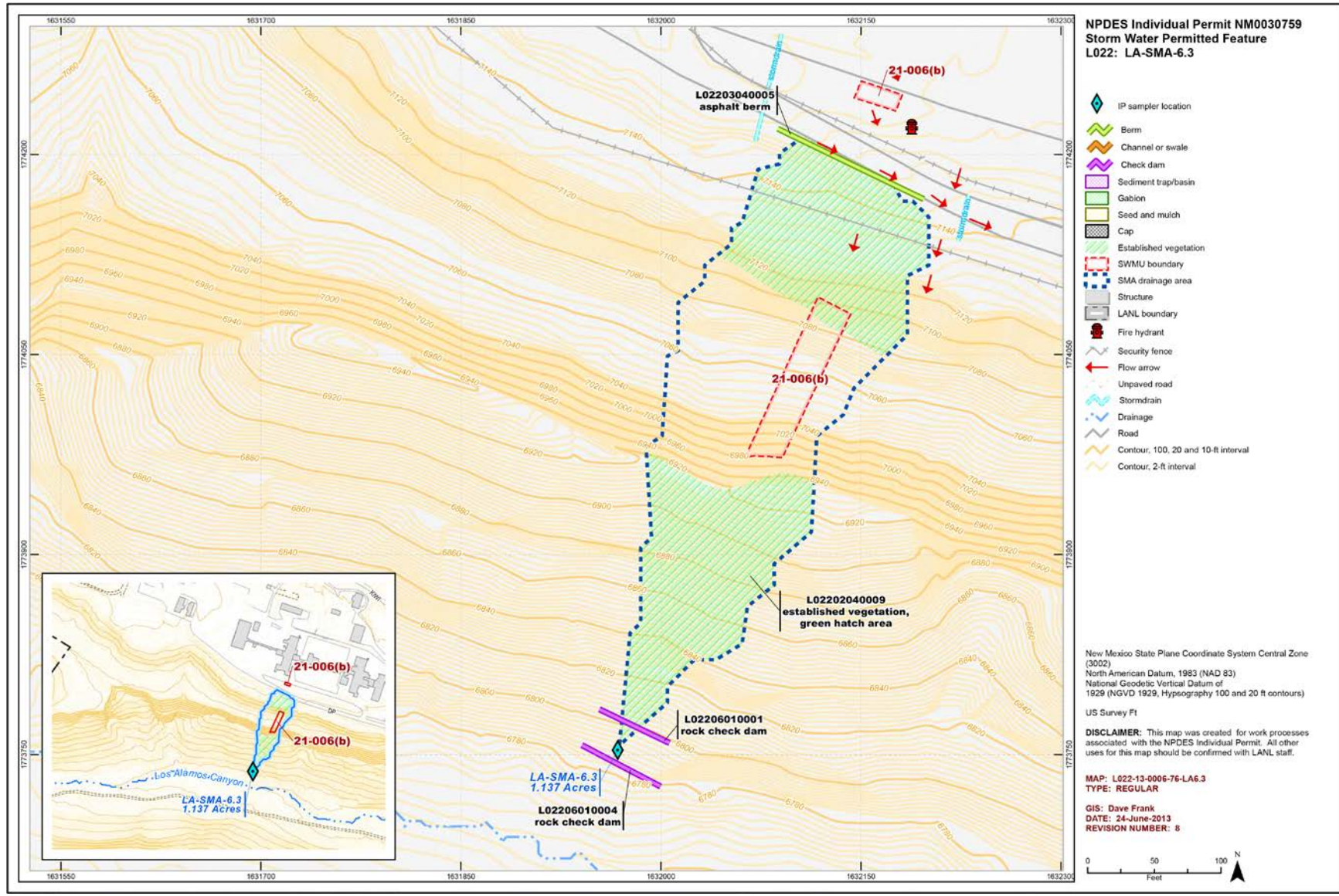


Figure 46-1 LA-SMA-6.3 location map



## 47.0 LA-SMA-6.31: SWMU 21-027(a)

### 47.1 Site Descriptions

One historical industrial activity area is associated with L022A, LA-SMA-6.31: Site 21-027(a).

SWMU 21-027(a) consists of former drainlines that received effluent from floor drains in building 21-3, a surface-drainage system, and a former outfall at the south of DP Canyon that discharged to Los Alamos Canyon. Building 21-3 was constructed in 1945 as part of original DP West plutonium facilities. A 4-in. VCP ran beneath a paved area south of building 21-3 for approximately 30 ft and emptied into a storm drain. A 12-in.-diameter culvert ran from the storm drain underground for approximately 50 ft, emptying onto the ground at a ponding area on the southwest corner of the footprint of a former cooling tower (structure 21-143, AOC C-21-027). From the cooling tower footprint, runoff flowed in an unlined ditch to a 24-in.-diameter CMP culvert that carried runoff beneath the south TA-21 perimeter road to the mesa edge. The CMP extended approximately 3 ft over the mesa edge into Los Alamos Canyon. In 1994 and 1995, building 21-3, including all building drains and the drainlines beneath the building, and the cooling tower were removed during TA-21 D&D activities. The 4-in.-diameter pipe beneath the paved area was left in place as was the storm drain, which collected runoff from nearby parking lots. During the 2007 DP Site Aggregate Area investigation, remaining drainlines were removed along with the top foot of soil at the former ponding area. The section of drainline beneath the TA-21 perimeter road was left in place because the road is active and continues to service DP East.

Decision-level data for SWMU 21-027(a) indicate the presence of elevated concentrations of dioxins/furans at levels above the industrial SSLs and concentrations of dioxins/furans and isotopic plutonium above the construction worker and residential SSLs and SALs. Additional sampling and remediation will be conducted at SWMU 21-027(a) during the DP Aggregate Area Phase III investigation.

The project map (Figure 47-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 47.2 Control Measures

Run-on and runoff controls are in place. The SMA is stabilized and run-on to the area is conveyed to the mesa edge via a rock-lined channel. The asphalt berm diverts flow to the east of the Permitted Feature. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 47-1).

**Table 47-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L022A02040008	Established Vegetation		X	X		B
L022A03040002	Asphalt Berm	X			X	CB
L022A06010005	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

**47.3 Storm Water Monitoring**

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.31. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

**47.4 Inspections and Maintenance**

RG038 recorded two storm events at LA-SMA-6.31 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 47-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30767	4-17-2013
Storm Rain Event	BMP-33568	7-22-2013
Storm Rain Event	BMP-35732	9-23-2013
Annual Erosion Evaluation	COMP-36706	11-21-2013

No maintenance activities were conducted at LA-SMA-6.31 in 2013.

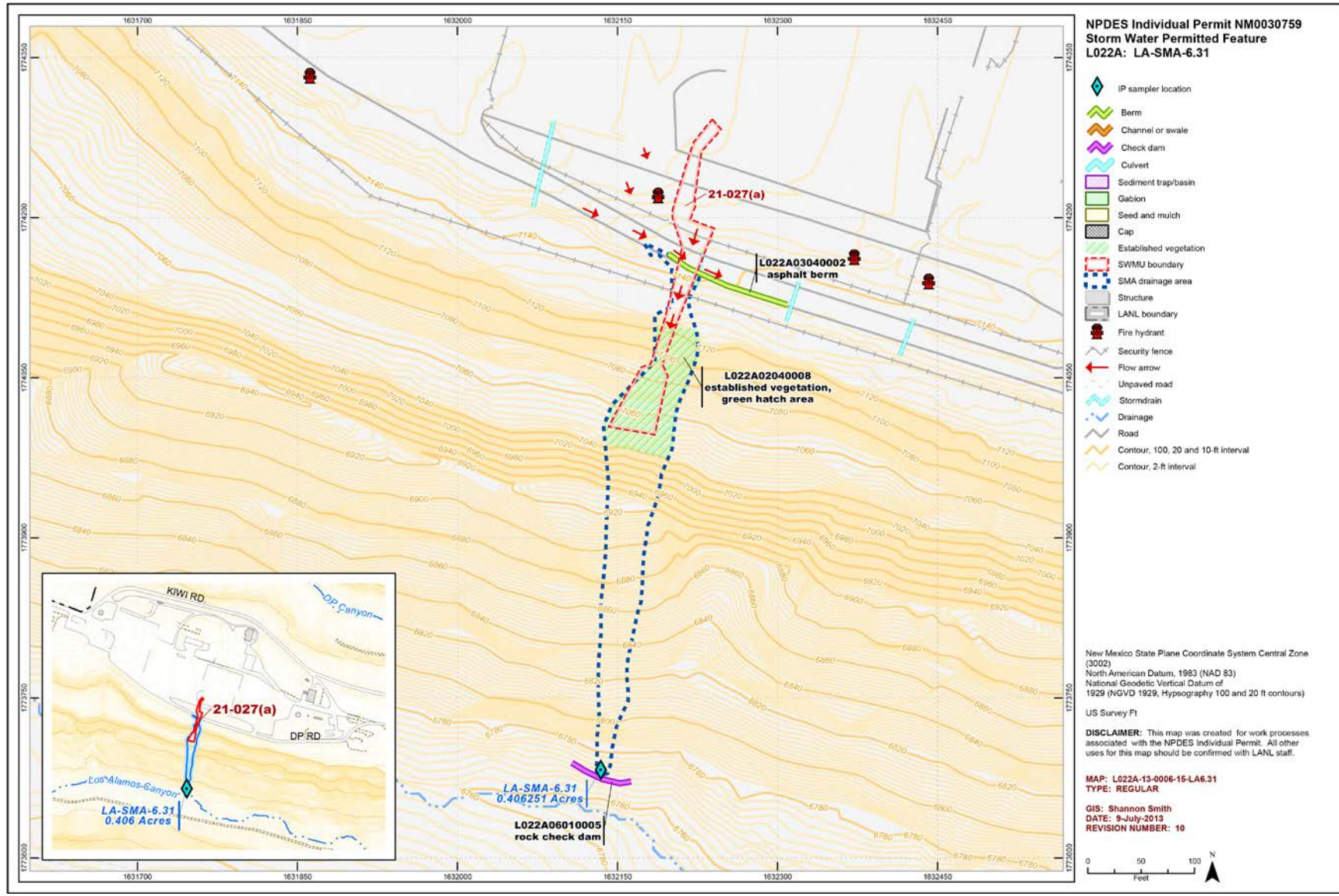
**47.5 Compliance Status**

The Site associated with LA-SMA-6.31 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 47-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-027(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment





## 48.0 LA-SMA-6.32: SWMU 21-021

### 48.1 Site Descriptions

One historical industrial activity area is associated with L023, LA-SMA-6.32: Site 21-021.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 48-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 48.2 Control Measures

DP Road, located near the northern boundary of the Permitted Feature, is crowned to the north away from the mesa edge. A berm along the southern edge of DP Road is managing potential run-on to the site. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 48-1).

**Table 48-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02302040006	Established Vegetation		X	X		B
L02303040002	Asphalt Berm	X			X	CB
L02303060003	Straw Wattles		X		X	CB
L02303060005	Straw Wattles		X		X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 48.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.32. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

**48.4 Inspections and Maintenance**

RG038 recorded two storm events at LA-SMA-6.32 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 48-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30768	4-17-2013
Storm Rain Event	BMP-33565	7-17-2013
Storm Rain Event	BMP-35729	9-23-2013
Annual Erosion Evaluation	COMP-36707	11-7-2013

No maintenance activities were conducted at LA-SMA-6.32 in 2013.

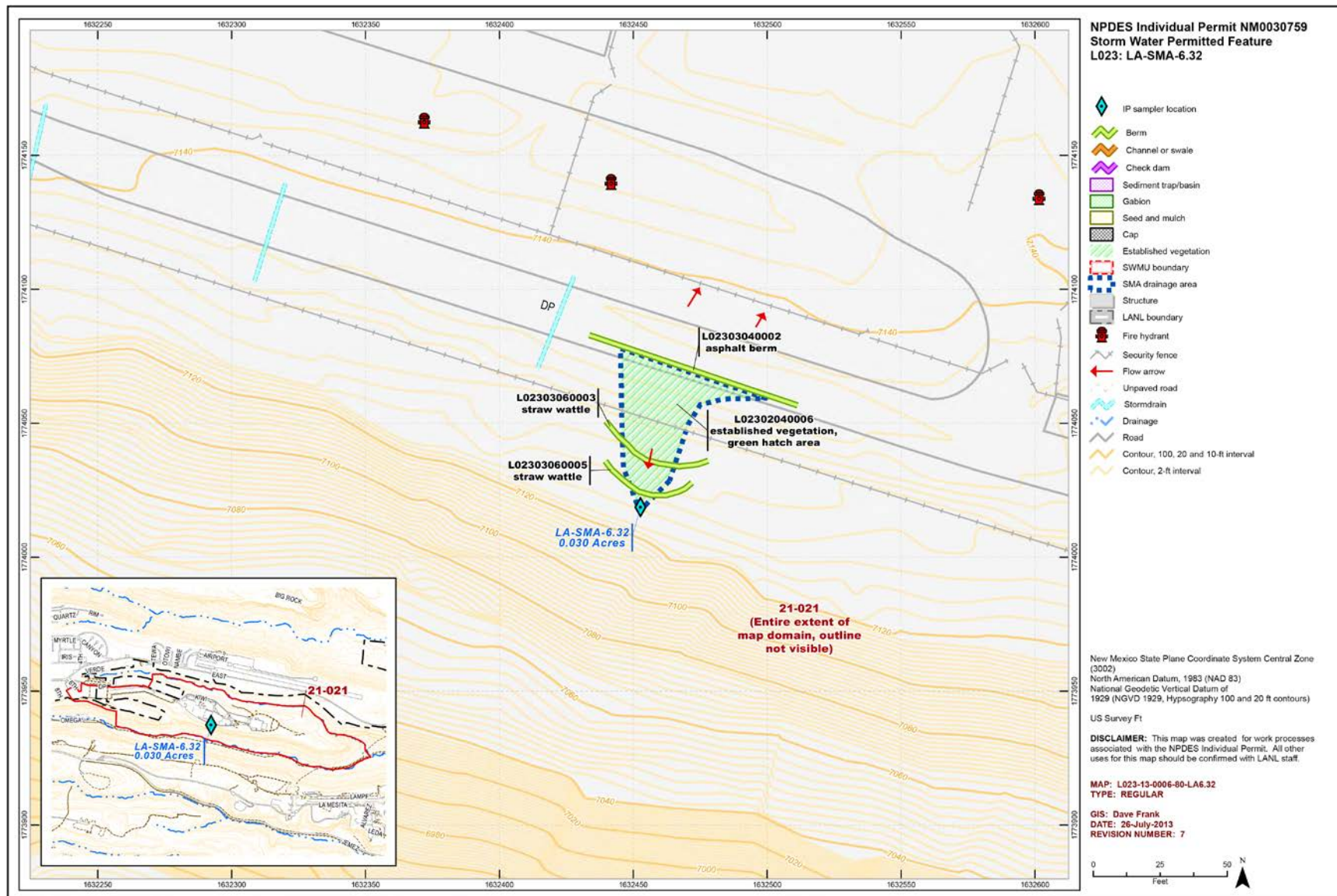
**48.5 Compliance Status**

The Sites associated with LA-SMA-6.32 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 48-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment





**Figure 48-1 LA-SMA-6.32 location map**



## 49.0 LA-SMA-6.34: SWMUs 21-021 and 21-022(h)

### 49.1 Site Descriptions

Two historical industrial activity areas are associated with L024, LA-SMA-6.34: Sites 21-021 and 21-022(h).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-022(h) is the former location of a sump (structure 21-202), outlet drainline, and a formerly permitted outfall located at TA-21. Structure 21-202 was constructed in 1962 from 36-in. CMP. The sump received industrial wastewater and discharges from basement floor drains and roof drains in the plutonium fuel service building (21-150). The outlet drainline from the sump consisted of a 24-in.-diameter pipe that discharged to Los Alamos Canyon. As of May 1991, the outfall discharged only treated cooling water. Quantitative information about effluent discharged through structure 21-202 is not available. The SWMU sump (structure 21-202) and associated piping were removed in 2007. The section of the drainline that lies beneath the road was left in place because the road is active and continues to service DP East.

Decision-level data for SWMU 21-022(h) indicate the nature and extent of chemicals and radionuclides have been defined and elevated concentrations of benzo(a)pyrene, lead, and plutonium-239 are present at the outfall area. Benzo(a)pyrene is present at concentrations above the industrial scenario, and lead and plutonium-239 are present at concentrations above the construction worker and residential scenarios. Safety personnel concluded the outfall area cannot be excavated safely with mechanical equipment. SWMU 21-022(h) was recommended to have no additional investigations or excavations performed because of the cliff-side hazards of the outfall area as well as the remote location. NMED has not yet approved or commented on the recommendation.

The project map (Figure 49-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 49.2 Control Measures

Berms located on the northern and southern sides of DP Road effectively control run-on from the impervious areas north of the Permitted Feature. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 49-1).

**Table 49-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02402040006	Established Vegetation		X	X		B
L02403040003	Asphalt Berm	X			X	CB
L02406010005	Rock Check Dam		X		X	CB

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

### 49.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.34. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 49.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-6.34 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 49-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30769	4-17-2013
Storm Rain Event	BMP-33566	7-22-2013
Storm Rain Event	BMP-35730	9-23-2013
Annual Erosion Evaluation	COMP-36708	11-13-2013

No maintenance activities were conducted at LA-SMA-6.34 in 2013.

### 49.5 Compliance Status

The Sites associated with LA-SMA-6.34 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 49-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-022(h)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

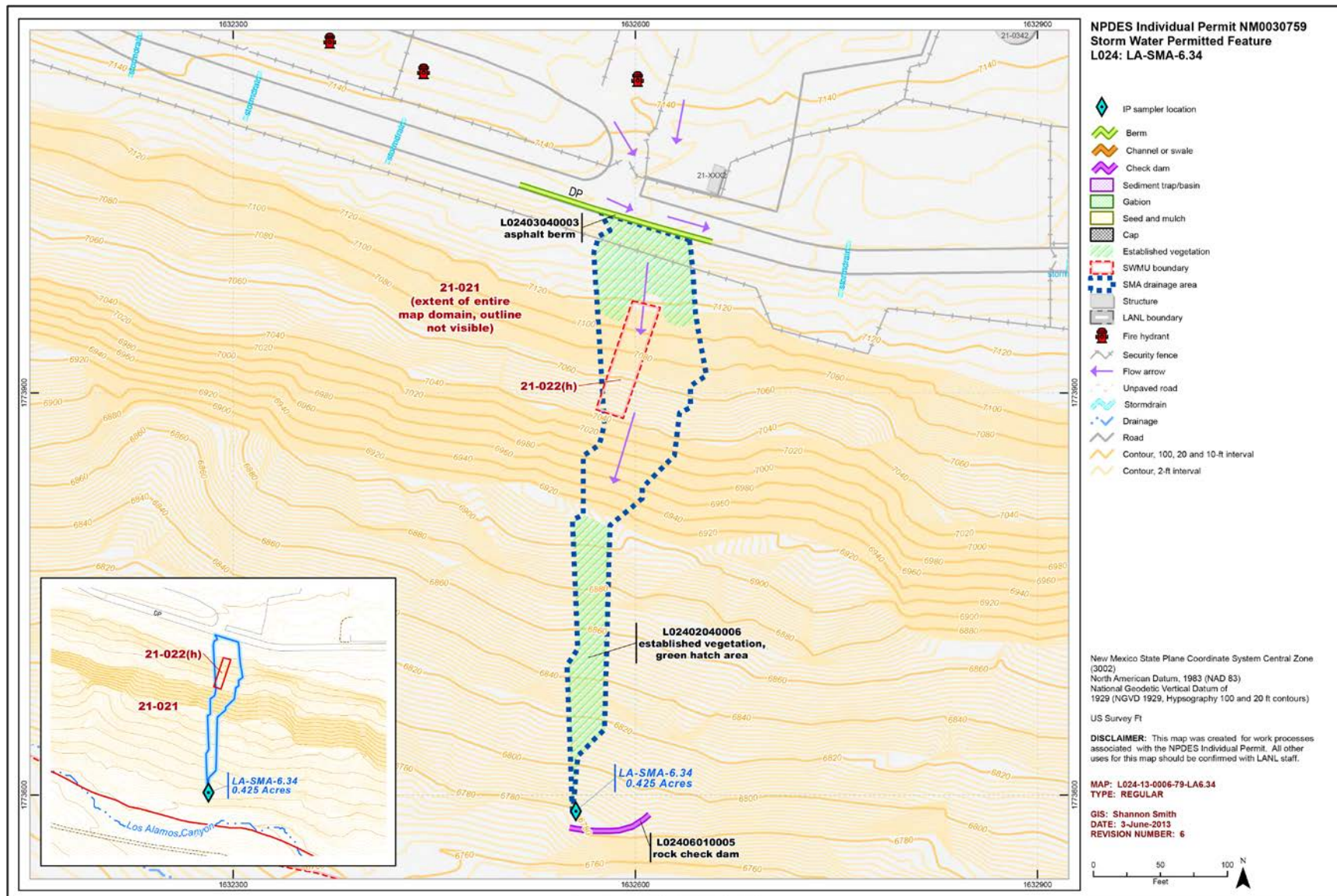


Figure 49-1 LA-SMA-6.34 location map

## **50.0 LA-SMA-6.36: SWMUs 21-021 and 21-024(a)**

### **50.1 Site Descriptions**

Two historical industrial activity areas are associated with L025, LA-SMA-6.36: Sites 21-021 and 21-024(a).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(a) consists of a former septic system that served the old steam plant (building 21-009) at TA-21. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank (structure 21-53) that measured 9 × 5.75 × 7.25 ft deep, a 6-in.-diameter VCP inlet line, and a 4- or 6-in.-diameter VCP outlet line. The outfall discharged to the surface on the south rim of DP Mesa above Los Alamos Canyon. The septic system was decommissioned in 1966. The septic tank and inlet and outlet drainlines were removed in 2007. The section of the drainline that lies beneath the road was left in place because the road is active and continues to service DP East.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-024(a) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area, submitted to NMED in 2010. SWMU 21-024(a) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 50-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **50.2 Control Measures**

The Permitted Feature is flat with minimal run-on, which is effectively controlled by the vegetative buffer south of DP Road. The curb south of the building 21-0356 is diverting run-on to a culvert and away from the monitored area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 50-1).



**Table 50-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02502040010	Established Vegetation		X	X		B
L02503010008	Earthen Berm		X		X	CB
L02503010009	Earthen Berm	X			X	CB
L02503090004	Curbing	X			X	CB

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

### 50.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.36. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 50.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-6.36 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 50-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30770	4-17-2013
Storm Rain Event	BMP-33567	7-22-2013
Storm Rain Event	BMP-35731	9-23-2013
Annual Erosion Evaluation	COMP-36709	11-13-2013

No maintenance activities were conducted at LA-SMA-6.36 in 2013.

### 50.5 Compliance Status

The Sites associated with LA-SMA-6.36 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 50-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-024(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

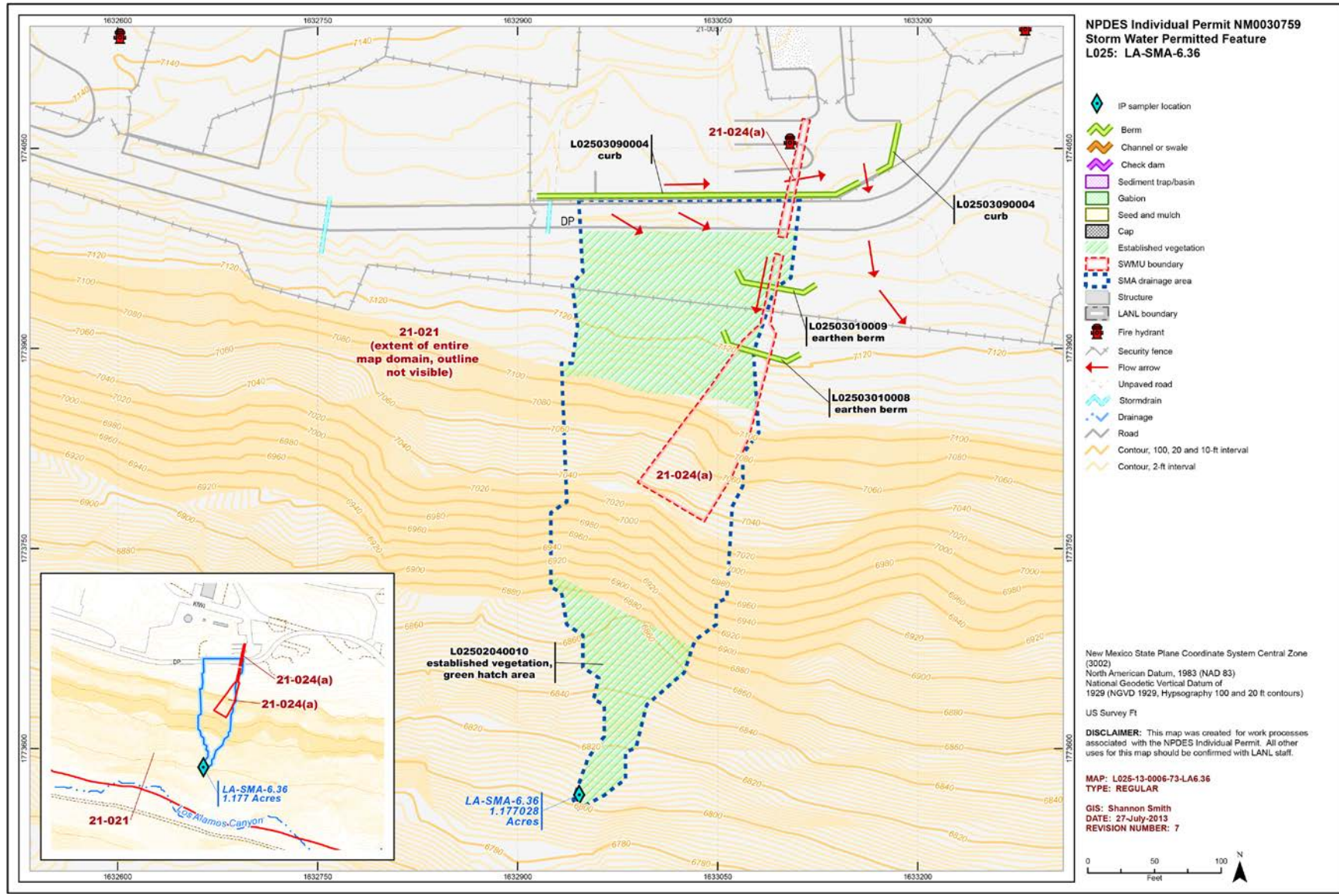


Figure 50-1 LA-SMA-6.36 location map

## **51.0 LA-SMA-6.38: SWMUs 21-021 and 21-024(c)**

### **51.1 Site Descriptions**

Two historical industrial activity areas are associated with L026, LA-SMA-6.38: Sites 21-021 and 21-024(c).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(c) consists of a former septic system that served buildings 21-54 and 21-61 at TA-21. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank (structure 21-56) that measured 4 ft long × 8 ft wide × approximately 5 ft deep with 4-in.-diameter VCP inlet and outlet drainlines. The outfall discharged to the surface on the south rim of DP Mesa above Los Alamos Canyon. The septic system was decommissioned in 1966. The septic tank and inlet and outlet drainlines were removed in 2006 along with PCB-contaminated soil and tuff. Additional PCB-contaminated soil and tuff were removed in 2009.

Results from the Phase I investigation of 21-024(c) determined PCB concentrations were above the TSCA cleanup level of 1 mg/kg and remediation effort were performed in 2009. A total of 142 preexcavation samples, and 368 postexcavation samples were collected and analyzed for PCBs. The Site has been remediated to less than or equal to 1 mg/kg total PCBs. Phase II investigations of SWMU 21-024(c) were combined with Consolidated Unit 21-003-99. The nature and extent of contamination have not been defined, and additional sampling is proposed at 21-024(c).

The project map (Figure 51-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **51.2 Control Measures**

Run-on enters this Permitted Feature from a graveled storage area above the SMA. Run-on flows through sparse vegetation, then over the edge of the mesa. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 51-1).

**Table 51-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02602040011	Established Vegetation		X	X		B
L02603060004	Straw Wattles		X		X	CB
L02603060009	Straw Wattles	X			X	B
L02603060010	Straw Wattles	X			X	B
L02604060006	Rip Rap	X		X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 51.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.38. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 51.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-6.38 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 51-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30771	4-17-2013
Storm Rain Event	BMP-33571	7-22-2013
Storm Rain Event	BMP-35735	9-23-2013
Annual Erosion Evaluation	COMP-36710	11-8-2013

No maintenance activities were conducted at LA-SMA-6.38 in 2013.

### 51.5 Compliance Status

The Sites associated with LA-SMA-6.38 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 51-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-024(c)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment





## 52.0 LA-SMA-6.395: SWMUs 21-021 and 21-024(j)

### 52.1 Site Descriptions

Two historical industrial activity areas are associated with L027, LA-SMA-6.395: Sites 21-021, and 21-024(j).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(j) consists of a septic system that routed sanitary sewage from building 21-155, a warehouse/laboratory through a septic tank (structure 21-94) to the surface on the south rim of DP Mesa above Los Alamos Canyon. Building 21-155 housed the TSTA facility. The septic system was constructed in 1961 and consisted of a reinforced concrete septic tank that measured 5 × 3 × 6 ft deep with 4-in.-diameter VCP inlet and outlet drainlines. The septic tank was located off the southwest corner of building 21-155 near the south edge of the perimeter road. The septic system was decommissioned in 1966; the septic tank was filled with dirt and left in place. The septic tank and inlet and outlet drainlines were removed in 2007. SWMU 21-024(j) was recommended for a COC without controls.

Consent Order investigations are complete for SWMU 21-024(j). The Site meets recreational risk levels. SWMU 21-024(j) was recommended for corrective action complete without controls in October 2010. The Site will be recommended for a COC without controls in 2014.

The project map (Figure 52-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 52.2 Control Measures

Run-on controls are in place to direct run-on from DP Mesa road to the channel east and away from the monitored area. There is no sign of concentrated runoff. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 52-1).

**Table 52-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02702040008	Established Vegetation		X	X		B
L02703010004	Earthen Berm		X		X	CB
L02703010005	Earthen Berm	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 52.3 Storm Water Monitoring

SWMUs 21-021 and 21-024(j) are monitored within LA-SMA-6.395. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 52-2). Analytical results from this sample yielded one TAL exceedance:

- Gross-alpha activities of 300 pCi/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

#### *SWMU 21-021:*

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

#### *SWMU 21-024(j):*

- 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. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

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 52-2. 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 52-2.

Monitoring location LA-SMA-6.395 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—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed urban landscape is 32.5 pCi/L. The 2013 gross-alpha result is between these two values.

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

#### 52.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-6.395 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 52-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30772	4-17-2013
Storm Rain Event	BMP-33573	7-22-2013
Storm Rain Event	BMP-35737	9-23-2013
Annual Erosion Evaluation	COMP-36711	11-21-2013
TAL Exceedance	COMP-36882	11-21-2013

No maintenance activities were conducted at LA-SMA-6.395 in 2013.

#### 52.5 Compliance Status

The Sites associated with LA-SMA-6.395 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 52-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-25-13
SWMU 21-024(j)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-25-13



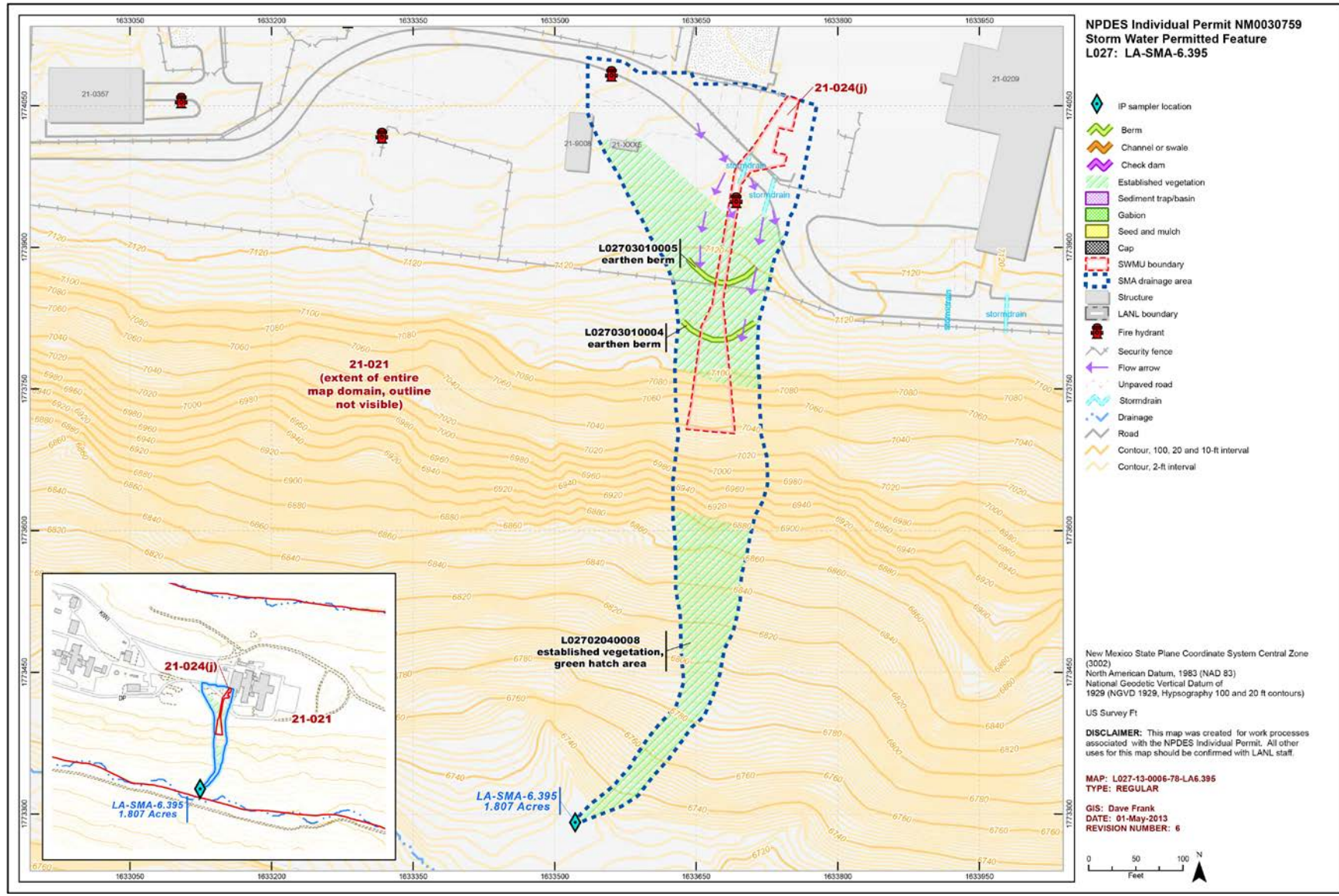
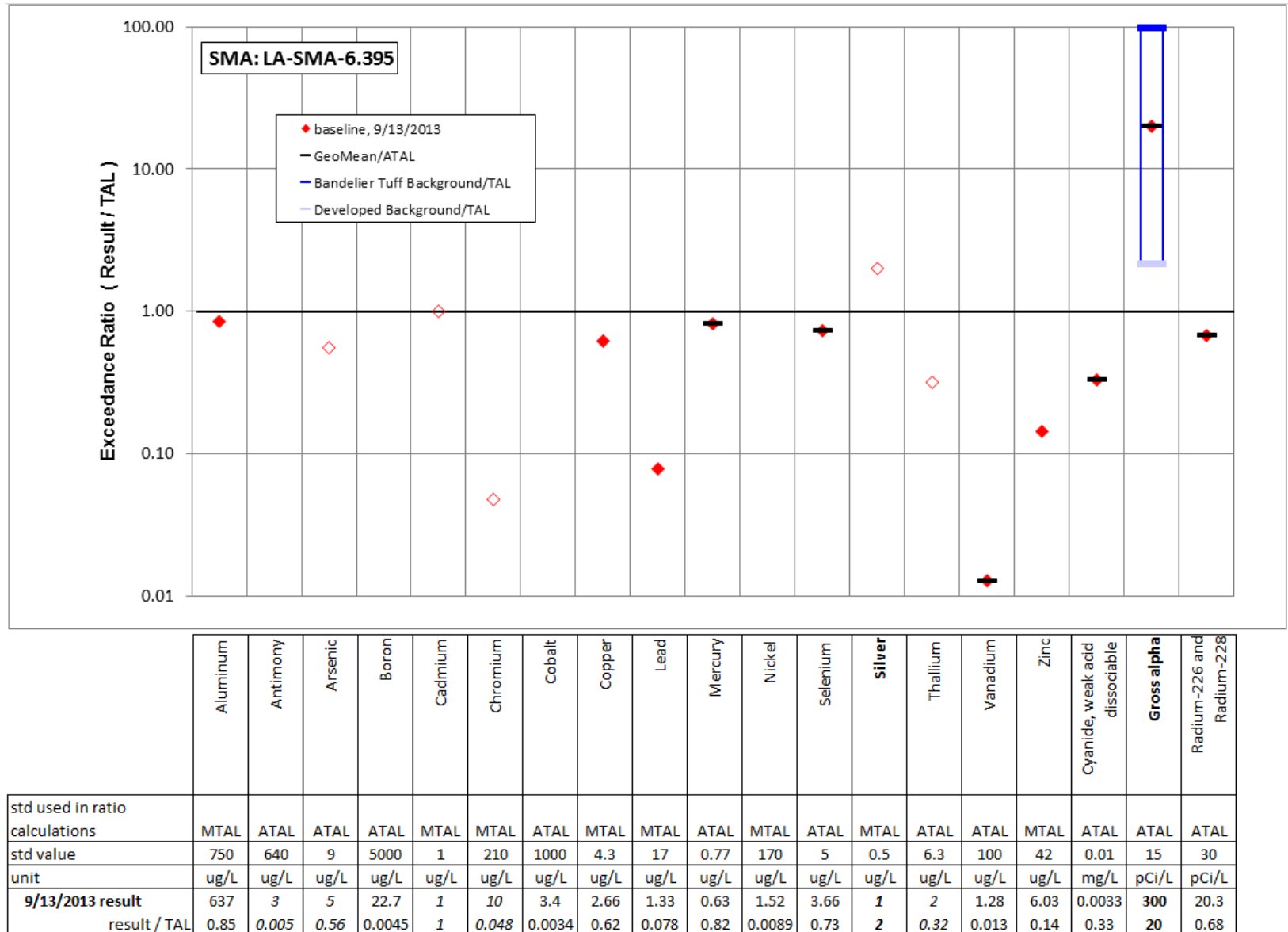


Figure 52-1 LA-SMA-6.395 location map



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

**Figure 52-2 Inorganic analytical results summary plot for LA-SMA-6.395**

## 53.0 LA-SMA-6.5: SWMUs 21-021 and 21-024(i)

### 53.1 Site Descriptions

Two historical industrial activity areas are associated with L028, LA-SMA-6.5: Sites 21-021 and 21-024(i).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(i) consists of a former septic system that served polonium-processing laboratory, structure 21-152, and high-temperature chemistry building, structure 21-209. The septic tank also received blowdown from former cooling towers 21-166 and 21-167. The septic system was constructed in 1945 and consisted of a reinforced concrete septic tank that measured 6- × 10- × 8-ft deep, with 6-in.-diameter VCP inlet and outlet drainlines. The outfall discharged approximately 30 ft from the southeastern edge of DP Mesa above Los Alamos Canyon. Portions of the inlet line, the septic tank, the outlet line, and contaminated soil and tuff at the outfall were removed in 2001 as part of an IA. The remaining portion of the inlet line was removed in 2007.

All detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. SWMU 21-024(i) was recommended for corrective action complete in the Phase II investigation report for DP Site Aggregate Area submitted to NMED. SWMU 21-024(i) will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 53-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 53.2 Control Measures

This Permitted Feature has potential run-on from a paved parking lot north of the area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 53-1).

**Table 53-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02802040008	Established Vegetation		X	X		B
L02803010004	Earthen Berm	X			X	CB
L02803010006	Earthen Berm	X			X	CB
L02806010002	Rock Check Dam		X		X	CB

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

### 53.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-6.5. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 53.4 Inspections and Maintenance

RG038 recorded two storm events at LA-SMA-6.5 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 53-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30773	4-17-2013
Storm Rain Event	BMP-33572	7-22-2013
Storm Rain Event	BMP-35736	9-23-2013
Annual Erosion Evaluation	COMP-36712	11-8-2013

No maintenance activities were conducted at LA-SMA-6.5 in 2013.

### 53.5 Compliance Status

The Site associated with LA-SMA-6.5, SWMU 21-024(i), is a High Priority Site. The High Priority Site deadline for the certification of corrective action at this SMA is now 1 yr from the date of any observed TAL exceedance.

**Table 53-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-024(i)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



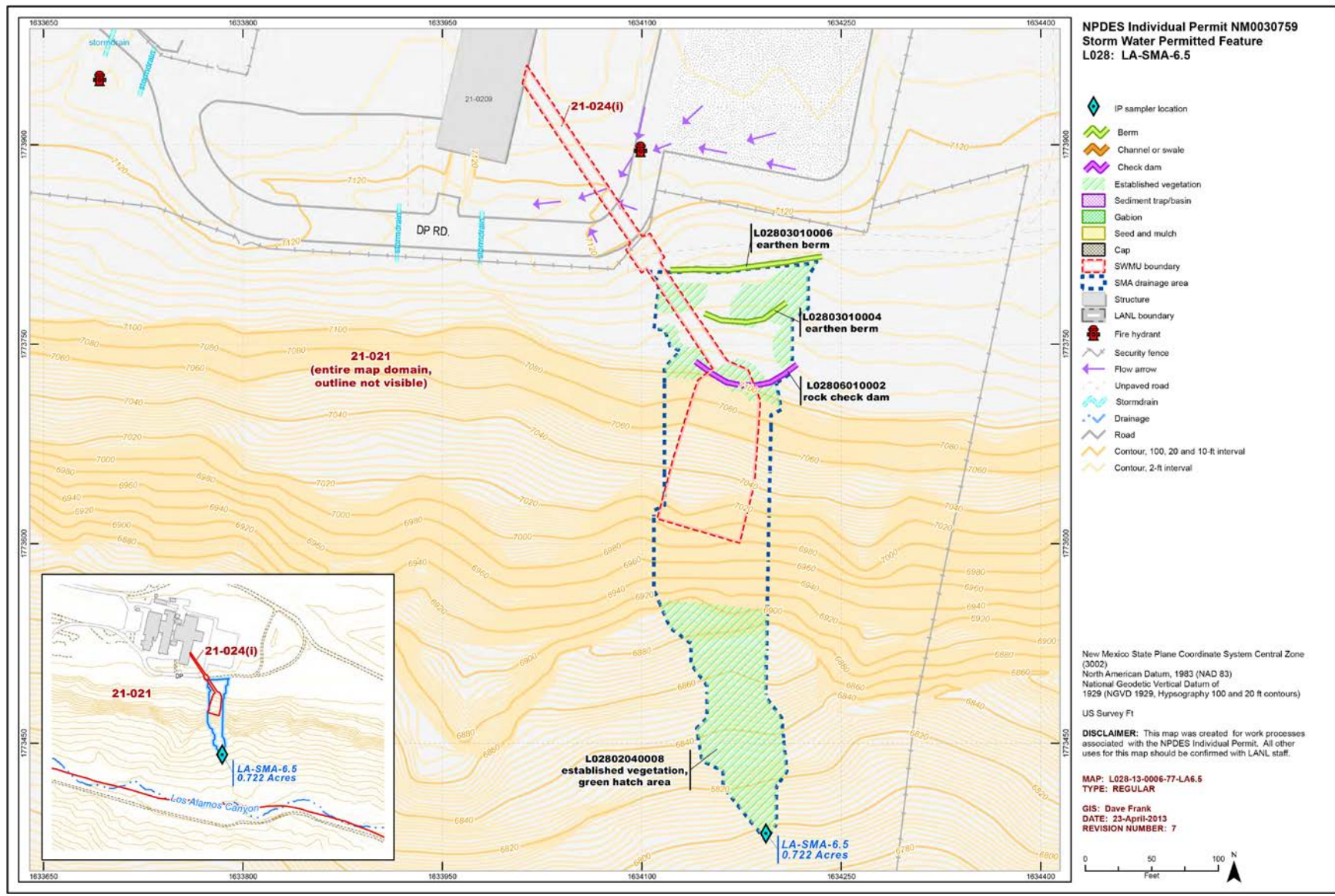


Figure 53-1 LA-SMA-6.5 location map

## 54.0 LA-SMA-9: SWMUs 26-001, 26-002(a), 26-002(b), and 26-003

### 54.1 Site Descriptions

Four historical industrial activity areas are associated with L029, LA-SMA-9: Sites 26-001, 26-002(a), 26-002(b), and 26-003.

SWMU 26-001 is a surface disposal area that contains debris from a five-room concrete storage vault (structure 26-1) and is located within TA-73 on the south-facing slope of Los Alamos Canyon. The vault was constructed in 1946 for storing radioactive materials; however, the type and quantity of radioactive materials is not known. The vault was later used for storing HE. The vault was decommissioned and dismantled in 1966. Before it was decommissioned, some components of the vault, including shelving, drainlines, the sump, and ductwork, were removed and disposed of at MDA C. The remaining structure was bulldozed onto the south-facing slope of Los Alamos Canyon. In the 1970s, most of the vault debris rested on the bench below the mesa top; however, some debris may have fallen as far as the canyon floor. The debris on the ledge was covered with approximately 3 ft of soil.

Decision-level data for SWMU 26-001 determined that the lateral and vertical extent of contamination have not been defined for antimony, chromium, nickel, and copper. Additional sampling is proposed for SWMU 26-001.

SWMU 26-002(a) is a former acid sump system located within TA-73 and situated on the south rim of Los Alamos Canyon. Installed in 1948, the sump system consisted of a 6-in. VCP floor drain that discharged to a collection sump located outside the concrete storage vault (structure 26-1). The sump discharged to an outfall [SWMU 26-002(b)] that drained to Los Alamos Canyon. The sump was decommissioned and removed in 1966.

Decision-level data for SWMU 26-002(a) determined the lateral and vertical extent of contamination have not been defined for antimony, chromium, nickel, and copper. Additional sampling is proposed for SWMU 26-002(a).



LA-SMA-9, Earthen Berm,  
L02903010014 (photo ID 12942-1)

SWMU 26-002(b) is a former drainline located within TA-73 and situated on the south rim of Los Alamos Canyon. The 4-in. VCP drainline served the equipment room of the former concrete storage vault (structure 26-1) and discharged directly to Los Alamos Canyon. The drainline was removed in 1966.

Decision-level data for SWMU 26-002(b) determined that the lateral and vertical extent of contamination have not been defined for antimony, chromium, nickel, and copper. Additional sampling is proposed for SWMU 26-002(b).

SWMU 26-003 is a sanitary septic system that served a restroom in the former concrete storage vault (structure 26-1) at former TA-26. Installed in 1948, the septic system consisted of 4-in. VCP drainline connected to a 250-gal. steel septic tank. The septic tank may have been removed at the same time as the sump [SWMU 26-002(a)]; however, there is no documentation verifying removal of the septic tank.

Decision-level data for SWMU 26-003 determined the lateral and vertical extent of contamination have not been defined for antimony, chromium, nickel, and copper. Additional sampling is proposed for SWMU 26-003.

The project map (Figure 54-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

## 54.2 Control Measures

Berms and vegetation are used to address some of the run-on to this Permitted Feature. Existing controls augment these BMPs to provide for longer term, more sustainable control of the run-on sources. Runoff discharged over the edge of the mesa into the canyon is minimized by the concrete retaining wall. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 54-1).

**Table 54-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L02902040015	Established Vegetation		X	X		B
L02903010012	Earthen Berm		X		X	CB
L02903010013	Earthen Berm		X		X	CB
L02903010014	Earthen Berm		X		X	CB
L02903080005	Retaining Wall	X			X	CB
L02904050009	Water Bar	X		X		CB
L02904050010	Water Bar	X		X		CB
L02904050011	Water Bar	X		X		CB

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

## 54.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-9. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

## 54.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at LA-SMA-9 during the 2013 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 54-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30774	5-14-2013
Storm Rain Event	BMP-34153	7-29-2013
Storm Rain Event	BMP-35516	9-24-2013
Storm Rain Event	BMP-37121	11-7-2013
Annual Erosion Evaluation	COMP-36713	11-7-2013

No maintenance activities were conducted at LA-SMA-9 in 2013.

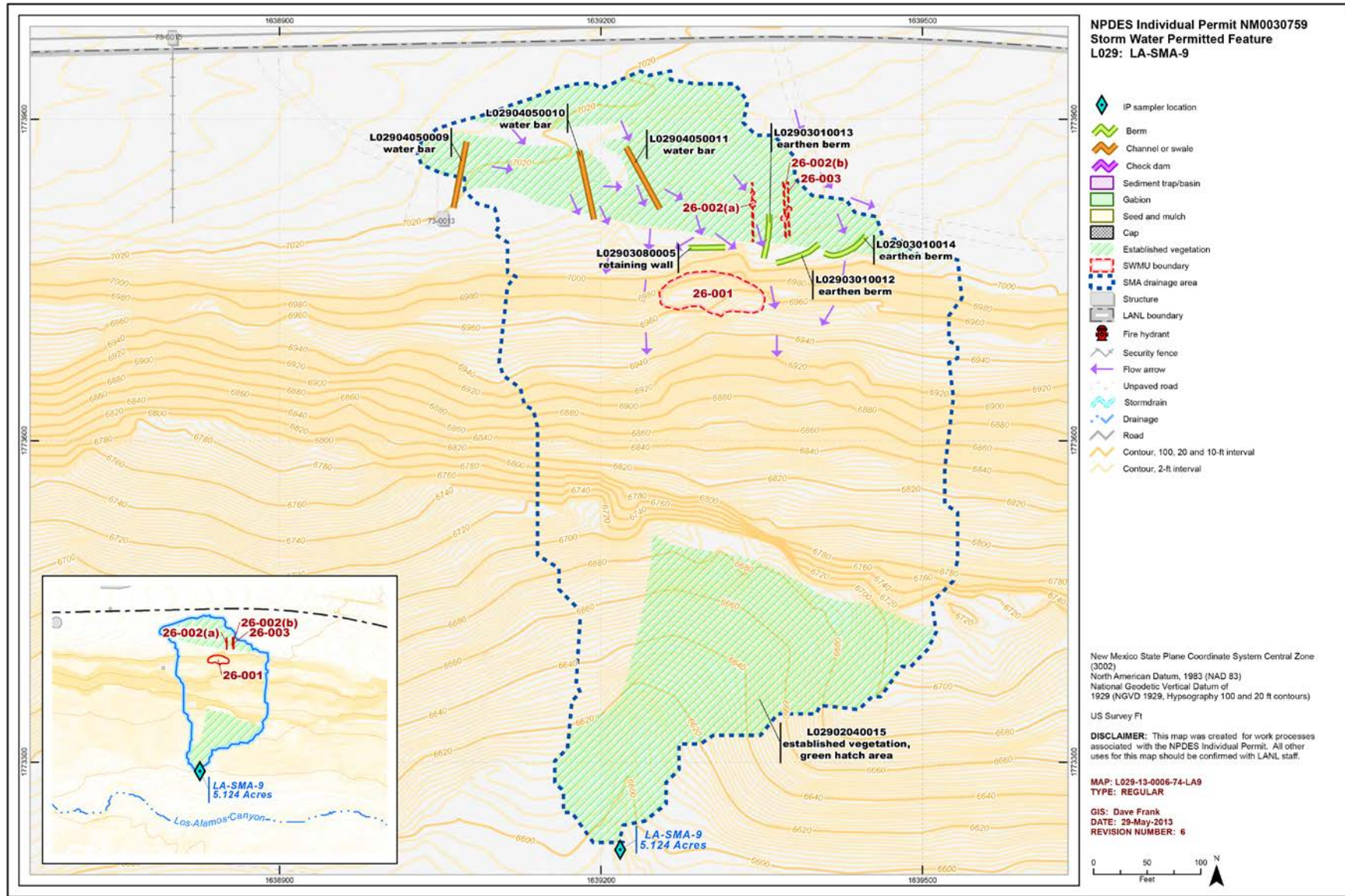
**54.5 Compliance Status**

The Sites associated with LA-SMA-9 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 54-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 26-001	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 26-002(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 26-002(b)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 26-003	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment





**Figure 54-1 LA-SMA-9 location map**

## 55.0 LA-SMA-10.11: SWMU 53-002(a)

### 55.1 Site Descriptions

One historical industrial activity area is associated with L030, LA-SMA-10.11: Site 53-002(a).

SWMU 53-002(a) consists of two inactive surface impoundments known as the NE and NW impoundments. These impoundments were constructed in 1969, and each measured 210 × 210 × 6 ft deep with a capacity of 1.6 million gal. The dikes comprising the sidewalls of the impoundments were constructed of compacted tuff lined with 4 to 6 in. of gunite. The bottom of each impoundment was lined with 4 in. of bentonite clay. These impoundments were originally constructed to contain all sanitary, industrial, and radioactive wastewater generated at TA-53 with no discharge. However, wastewater flows exceeded the evaporative capacity of the NE and NW impoundments, and it became necessary to discharge wastewater from the impoundments to an unlined drainage channel leading to Los Alamos Canyon. Discharges occurred on a batch basis through an NPDES-permitted outfall. The impoundments also had an emergency overflow that discharged to the south of the impoundments, near a tributary to Sandia Canyon. Beginning in 1989, all radioactive wastewaters from TA-53 were discharged to a third impoundment [SWMU 53-002(b)]. The NE and NW impoundments continued to receive all sanitary and industrial wastewaters until 1993, when the impoundments were taken out of service. The remaining wastewater in the impoundments was then allowed to evaporate.

The SWMU 53-002(a) surface impoundments were originally included as treatment, storage, and disposal units in the Laboratory's 1991 RCRA Part A permit application for mixed waste. The Laboratory had intended to close these units under RCRA interim status and submitted a closure plan to NMED in 1994. After 1994, the Laboratory conducted investigations to determine the source of hazardous materials detected in the impoundments. Based on these investigations and sample results, a determination was made that the contents of the impoundments were not hazardous waste. As a result, in 1997, NMED changed the status of the impoundments from treatment, storage, and disposal units to corrective action units. The sludge and liners were removed from the two SWMU 53-002(a) impoundments during an IA conducted in 2002.

Decision-level data for SWMU 53-002(a) indicate that nature and extent are defined, and all detected inorganic and organic chemical concentrations and radionuclide activities from Consent Order samples were below residential SSLs and SALs. NMED issued a COC with controls in September 2006.

The project map (Figure 55-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 55.2 Control Measures

There are no significant run-on sources at this SMA. Runoff is controlled with riprap at the former emergency overflow. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 55-1).

**Table 55-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L03004060003	Rip Rap		X	X		CB
L03004060009	Rip Rap		X	X		CB
L03006010001	Rock Check Dam		X		X	CB

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

### 55.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at LA-SMA-10.11. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 55.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at LA-SMA-10.11 during the 2013 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 55-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30746	4-26-2013
Storm Rain Event	BMP-34149	8-1-2013
Storm Rain Event	BMP-35512	9-24-2013
Storm Rain Event	BMP-37117	11-14-2013
Annual Erosion Evaluation	COMP-36685	11-14-2013

No maintenance activities were conducted at LA-SMA-10.11 in 2013.

### 55.5 Compliance Status

The Site associated with LA-SMA-10.11 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 55-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 53-002(a)	Baseline Monitoring Extended	Baseline Monitoring Extended	NMED, 2006, "Certificates of Completion for Solid Waste Management Units 53-002(a) and 53-002(b), Technical Area 53"



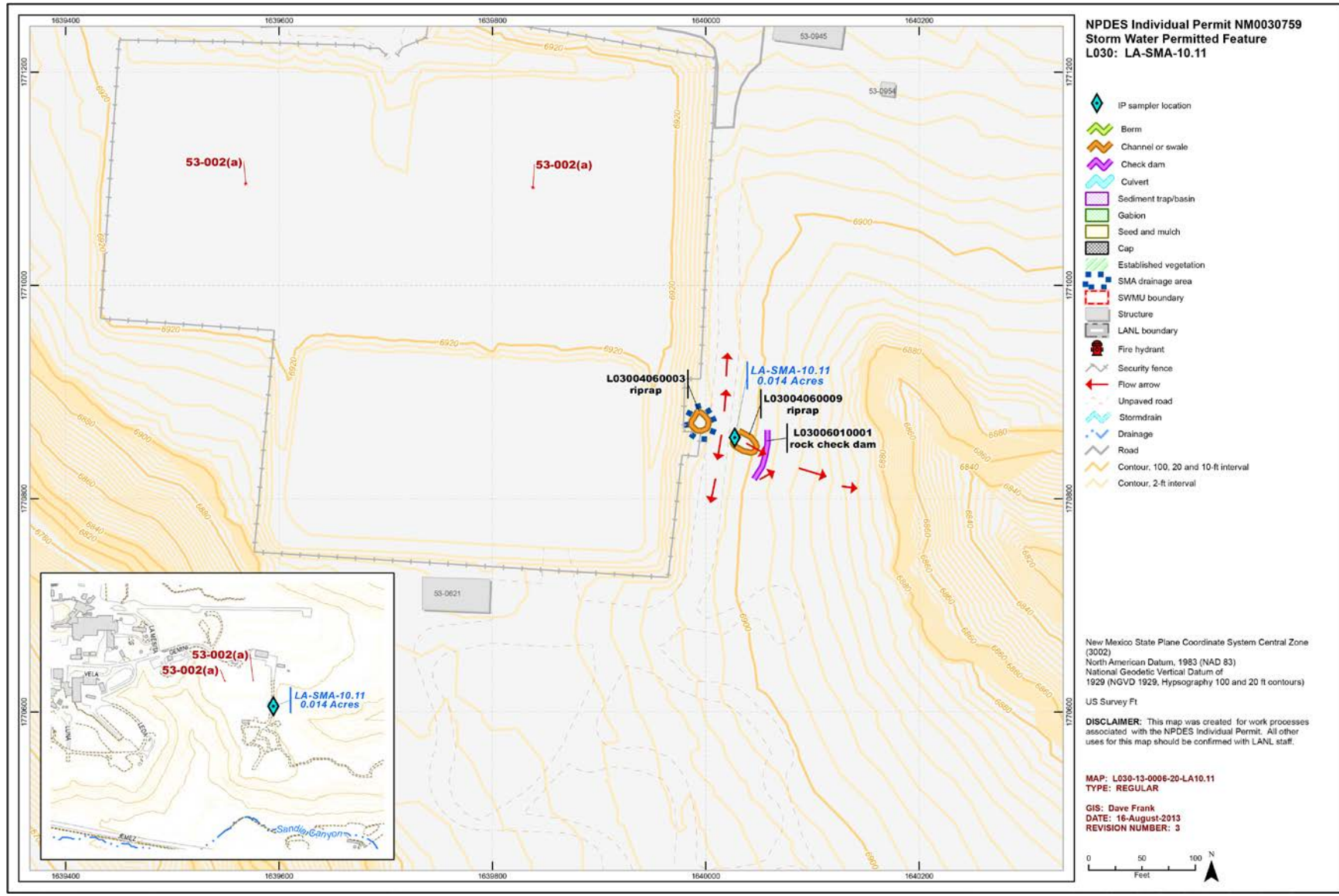


Figure 55-1 LA-SMA-10.11 location map



## 56.0 LA-SMA-10.12: AOC 53-008

### 56.1 Site Descriptions

One historical industrial activity area is associated with L030A, LA-SMA-10.12: Site 53-008.

AOC 53-008 is an approximate 3-acre unpaved open area (referred to as a “boneyard”) previously used to store used materials and equipment associated with historical experiments conducted at TA-53. Most of the storage area is vegetated with grasses, shrubs, and juniper trees, and several dirt trails also run through it. Materials shown to be present at the Site in 1989 photographs included vacuum pumps, metal ducting, concrete shielding blocks, empty overpack drums, and drums containing steel bearings. This Site was inspected in September 1993 and was found to contain shielding blocks (magnetite concrete and steel), concrete, steel, other metallic debris, and other miscellaneous items. No hazardous materials or chemicals were observed, with the exception of lead stored in a shed (structure 53-621) at the south end of the Site. The area was used for storage from approximately 1972 to 2009. By 2010, much of the material previously stored at the Site had been removed. The IP does not regulate storm water discharges associated with current conventional industrial activities at the Laboratory.

Phase I Consent Order sampling is complete for AOC 53-008. All detected inorganic and organic chemical concentrations and radionuclide activities were below residential SSLs, except for one detection of arsenic. AOC 53-008 will be recommended for corrective action complete in the supplemental investigation report for Lower Sandia Canyon Aggregate Area, to be submitted to NMED in 2015. AOC 53-008 will be eligible for a COC upon approval of the report by NMED.

The project map (Figure 56-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 56.2 Control Measures

Near the southern portion of the SMA, runoff from bare areas and the unpaved access road flows west to east and ultimately to a natural channel that discharges towards the receiving waters. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 56-1).

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

**Table 56-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
L030A02040032	Established Vegetation		X	X		B
L030A03010025	Earthen Berm		X		X	B
L030A03010026	Earthen Berm	X			X	EC
L030A03010027	Earthen Berm		X		X	EC
L030A03060028	Straw Wattles	X			X	EC
L030A03060029	Straw Wattles		X		X	EC
L030A03120005	Rock Berm	X			X	CB
L030A03120006	Rock Berm	X			X	CB
L030A03120009	Rock Berm		X		X	CB
L030A03120012	Rock Berm	X			X	CB
L030A03120015	Rock Berm		X		X	CB
L030A03120016	Rock Berm		X		X	CB
L030A03120017	Rock Berm	X			X	CB
L030A03120019	Rock Berm	X			X	CB
L030A03120020	Rock Berm		X		X	CB
L030A03120021	Rock Berm		X		X	CB
L030A03120030	Rock Berm		X		X	EC
L030A04060007	Rip Rap		X	X		CB
L030A06010001	Rock Check Dam	X			X	CB
L030A06010002	Rock Check Dam	X			X	CB
L030A06010003	Rock Check Dam		X		X	CB
L030A06010008	Rock Check Dam	X			X	CB
L030A06010011	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 56.3 Storm Water Monitoring

AOC 53-008 is monitored within LA-SMA-10.12. Following the installation of baseline control measures, a baseline storm water sample was collected on September 1, 2011 (Figure 56-2). Analytical results from this sample yielded one TAL exceedance:

- Gross-alpha activity of 23 pCi/L (ATAL is 15 pCi/L).

Following the installation of enhanced control measures at LA-SMA-10.12, a corrective action storm water sample was collected on September 12, 2013 (Figure 56-2). Analytical results from this corrective action monitoring sample yielded no TAL exceedances:

Corrective action has resulted in a decrease in gross-alpha activity detected in storm water samples collected at LA-SMA-10.12.

This exceedance was 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 discussion is organized by Site and analyte.

*AOC 53-008:*

- 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 plutonium and uranium isotopes, which are alpha-emitting radionuclides. Any alpha-emitting radionuclides associated with the Site would be exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance. In addition, the gross-alpha TAL exceedance is below the Bandelier Tuff and developed BVs.

Based on the Site history and Consent Order sampling results, this Site is an unlikely source of the TAL exceedance.

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 56-2. 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 56-2.

LA-SMA-10.12 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 undisturbed background locations on Bandelier Tuff were compared with gross-alpha ATAL exceedances. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Gross alpha—The undisturbed background UTL for gross alpha is 1490 pCi/L; the result from 2011 is less than this value and the result from 2013 did not exceed the ATAL.

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

#### **56.4 Inspections and Maintenance**

RG-TA-53 recorded six storm events at LA-SMA-10.12 during the 2013 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 56-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30747	4-26-2013
Storm Rain Event	BMP-34150	8-1-2013
Storm Rain Event	BMP-35513	9-24-2013
Storm Rain Event	BMP-37118	11-14-2013
Annual Erosion Evaluation	COMP-36686	11-14-2013

No maintenance activities were conducted at LA-SMA-10.12 in 2013.

**56.5 Compliance Status**

The Site associated with LA-SMA-10.12 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 56-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
AOC 53-008	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	Initiated 11-30-2012



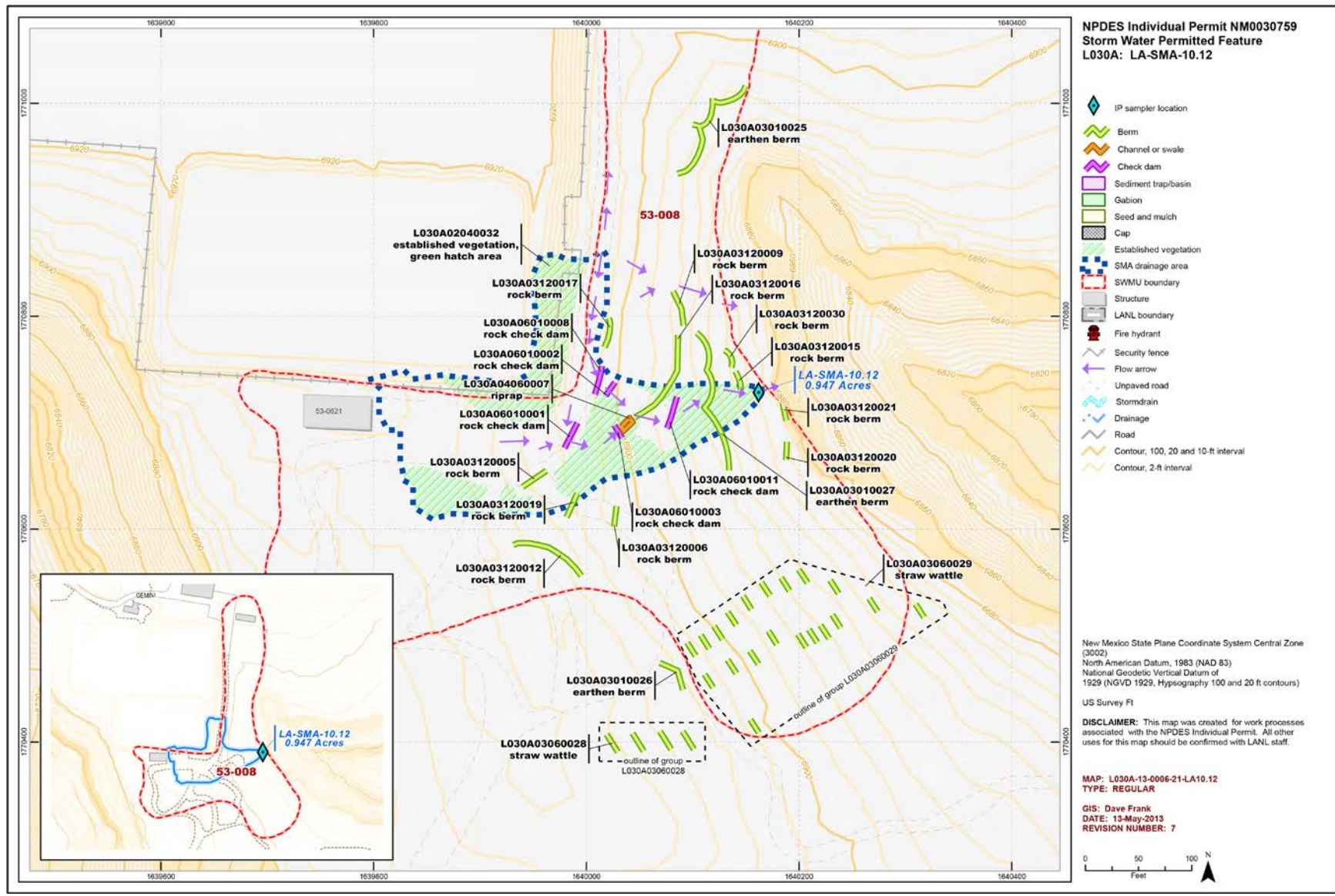
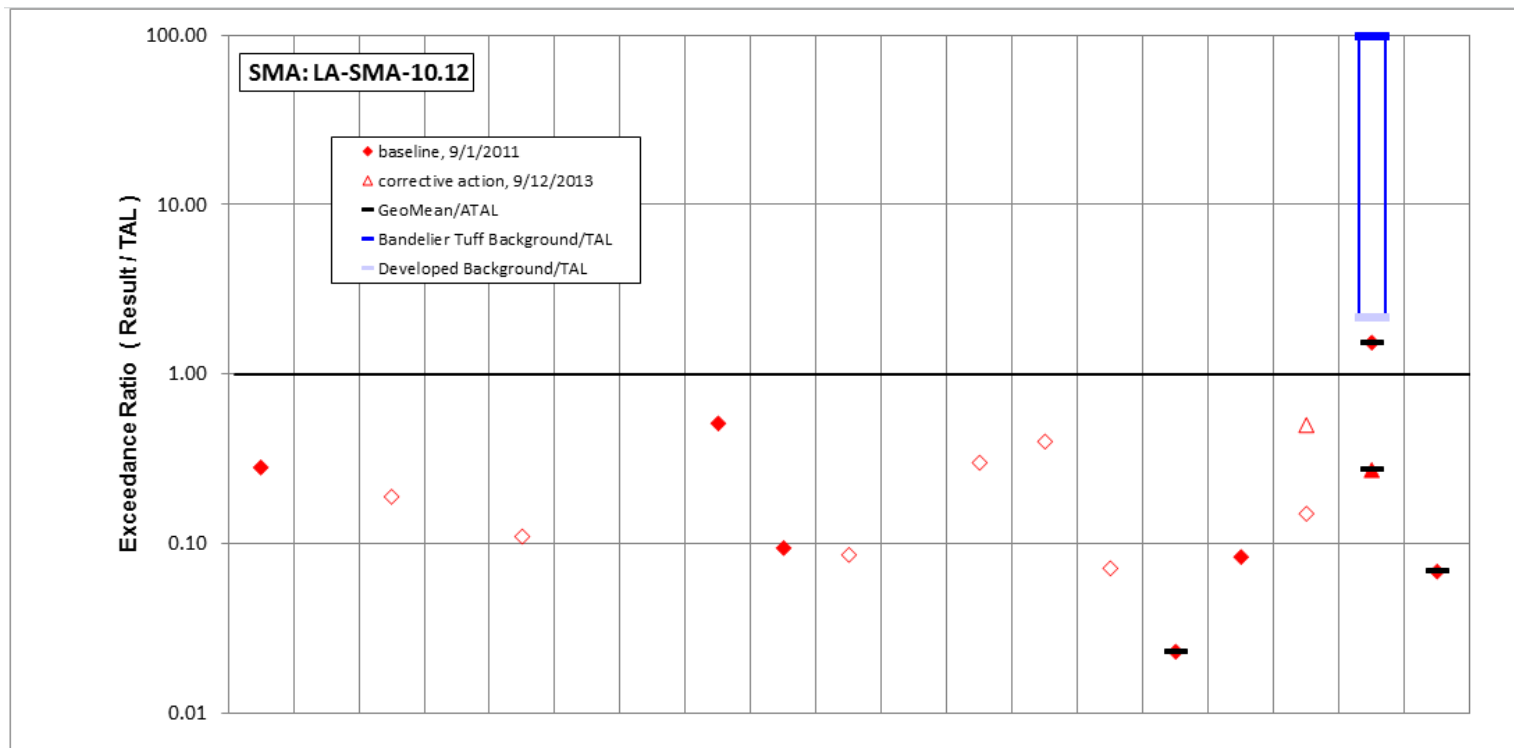


Figure 56-1 LA-SMA-10.12 location map



	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
9/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.005	4.07	-
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.27	-
<b>9/1/2011 result</b>	<b>211</b>	<b>1</b>	<b>1.7</b>	<b>32</b>	<b>0.11</b>	<b>2</b>	<b>4.7</b>	<b>2.2</b>	<b>1.6</b>	<b>0.066</b>	<b>1.3</b>	<b>1.5</b>	<b>0.2</b>	<b>0.45</b>	<b>2.3</b>	<b>3.5</b>	<b>0.002</b>	<b>23</b>	<b>2.05</b>
result / TAL	0.28	0.002	0.19	0.0064	0.11	0.01	0.0047	0.51	0.094	0.086	0.0076	0.3	0.4	0.071	0.023	0.083	0.15	1.5	0.068

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

Figure 56-2 Inorganic analytical results summary plot for LA-SMA-10.12

## 57.0 DP-SMA-0.3: SWMU 21-029

### 57.1 Site Descriptions

One historical industrial activity area is associated with D001, DP-SMA-0.3: Site 21-029.

SWMU 21-029, DP Tank Farm, is the former location at TA-21 of 15 storage tanks and 2 fill stations that contained various petroleum hydrocarbon products. DP Tank Farm was operational from 1946 to 1985 and is a 3.5-acre Site located between the eastern boundary of the Knights of Columbus property line and the western boundary of the Los Alamos County Fire and Training Station. DP Tank Farm was the primary fueling station supporting LASL operations until the late 1970s, when some of the fuel storage and distribution operations were moved to TA-03. Thirteen of the tanks were installed belowground, and 2 were installed aboveground. To contain any petroleum hydrocarbon release, an earthen berm was constructed on the northern perimeter of the Site sometime between 1974 and 1986. The berm was approximately 397 ft long × 4 ft high.

All storage tanks and structures (including piping, fill stations, and valve boxes) were decommissioned and removed in 1988. The excavation for each underground tank was backfilled with the soil that had covered the tanks. During decommissioning activities, one tank (structure-21-ATF-10) had a leaking gasket. The remaining tanks were reportedly in excellent condition, as documented by the 1980 corrosion inspections. Approximately 4 yd<sup>3</sup> of contaminated soil was removed from beneath the former location of structure-21-ATF-10. In addition, approximately 75 yd<sup>3</sup> of contaminated soil was removed from the former locations of the two fill stations. Clean fill was brought in to fill the depression caused by the removal of contaminated soil beneath structure-21-ATF-10. Clean soil from the soil berm was used to regrade the Site. Piping and concrete were disposed of at Los Alamos County landfill. Petroleum-contaminated soil excavated during decommissioning activities was removed. In addition, in 1996, 1720 yd<sup>3</sup> of petroleum-contaminated soil and tuff was excavated and removed from the former location of the East Fill Station. The excavation was backfilled, regraded, and reseeded.

SWMU 21-029 was investigated and remediated before the Consent Order went into effect on 2005 and was recommended for NFA. NMED approved the NFA recommendation in 2002, and no additional investigation was required under the Consent Order.

The project map (Figure 57-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 57.2 Control Measures

There are a number of run-on sources from adjacent areas to this SMA. Run-on from DP Road travels east along the access drive north of the southern fence boundary. Run-on from DP Road also enters the Site at the access point on the western portion of the SMA. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 57-1).

Enhanced controls were installed and certified on July 9, 2013, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 57-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00102040025	Established Vegetation		X	X		B
D00103010022	Earthen Berm	X			X	EC
D00103010023	Earthen Berm		X		X	EC
D00103020011	Base Course Berm		X		X	CB
D00103120013	Rock Berm		X		X	CB
D00103120020	Rock Berm	X			X	EC
D00103120021	Rock Berm		X		X	EC
D00106010008	Rock Check Dam		X		X	CB
D00106010009	Rock Check Dam		X		X	CB
D00106010016	Rock Check Dam	X			X	EC
D00106010017	Rock Check Dam	X			X	EC
D00106010018	Rock Check Dam		X		X	EC
D00106010019	Rock Check Dam		X		X	EC
D00106010024	Rock Check Dam	X			X	EC
D00107010001	Gabions		X		X	CB
D00107020006	Gabion Blanket	X		X		CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 57.3 Storm Water Monitoring

SWMU 21-029 is monitored within DP-SMA-0.3. Following the installation of baseline control measures, a baseline storm water sample was collected on August 19, 2011 (Figure 57-2). Analytical results from this sample yielded two TAL exceedances:

- Gross-alpha activity of 65.5 pCi/L (ATAL is 15 pCi/L), and
- Radium-226 and radium-228 activity of 68.3 pCi/L (ATAL is 30 pCi/L).

Following the installation of enhanced control measures at DP-SMA-0.3, a corrective action storm water samples were collected on July 12, 2013 and September 13, 2013 (Figure 57-2). Analytical results from these corrective action monitoring samples yielded one TAL exceedance:

- Gross-alpha activities of 87.8 pCi/L and 68.7 pCi/L (ATAL is 15 pCi/L).

Corrective action has resulted in a decrease in radium-226 and radium-228 activity detected in storm water samples collected at DP-SMA-0.3.

These exceedances were 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 discussion is organized by Site and analyte.



**SWMU 21-029:**

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at this Site. Shallow (i.e., less than 3 ft bgs) samples collected during the 1995 RFI, 1996 VCA, and 2000–2001 Phase II RFI were not analyzed for gross-alpha radioactivity or alpha-emitting radionuclides because these were not potential contaminants 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 Figure 57-2. 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 57-2.

Monitoring location DP-SMA-0.3 receives storm water run-on from developed environments, including paved parking lots, roads, and buildings, as well as landscape 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 urban landscape is 32.5 pCi/L. The 2011 and 2013 gross-alpha results are between these two values.

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

**57.4 Inspections and Maintenance**

RG038 recorded two storm events at DP-SMA-0.3 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 57-2 Control Measure Inspections during 2013**

<b>Inspection Type</b>	<b>Inspection Reference</b>	<b>Inspection Date</b>
Annual Erosion Evaluation	COMP-30734	4-17-2013
Storm Rain Event	BMP-33554	7-16-2013
Storm Rain Event	BMP-35718	9-25-2013
Annual Erosion Evaluation	COMP-36673	11-7-2013
TAL Exceedance	COMP-35292	9-25-2013

No maintenance activities were conducted at DP-SMA-0.3 in 2013.

**57.5 Compliance Status**

The Site associated with DP-SMA-0.3 is a Moderate Priority Site. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 57-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-029	Corrective Action Initiated	Enhanced Control Corrective Action Monitoring	LANL, July 9, 2013, "Certification of Installation of Enhanced Control Measures for Five Site Monitoring Areas (DP-SMA-0.3, LA-SMA-5.91, PJ-SMA-13.7, S-SMA-2, STRM-SMA-1.5)"

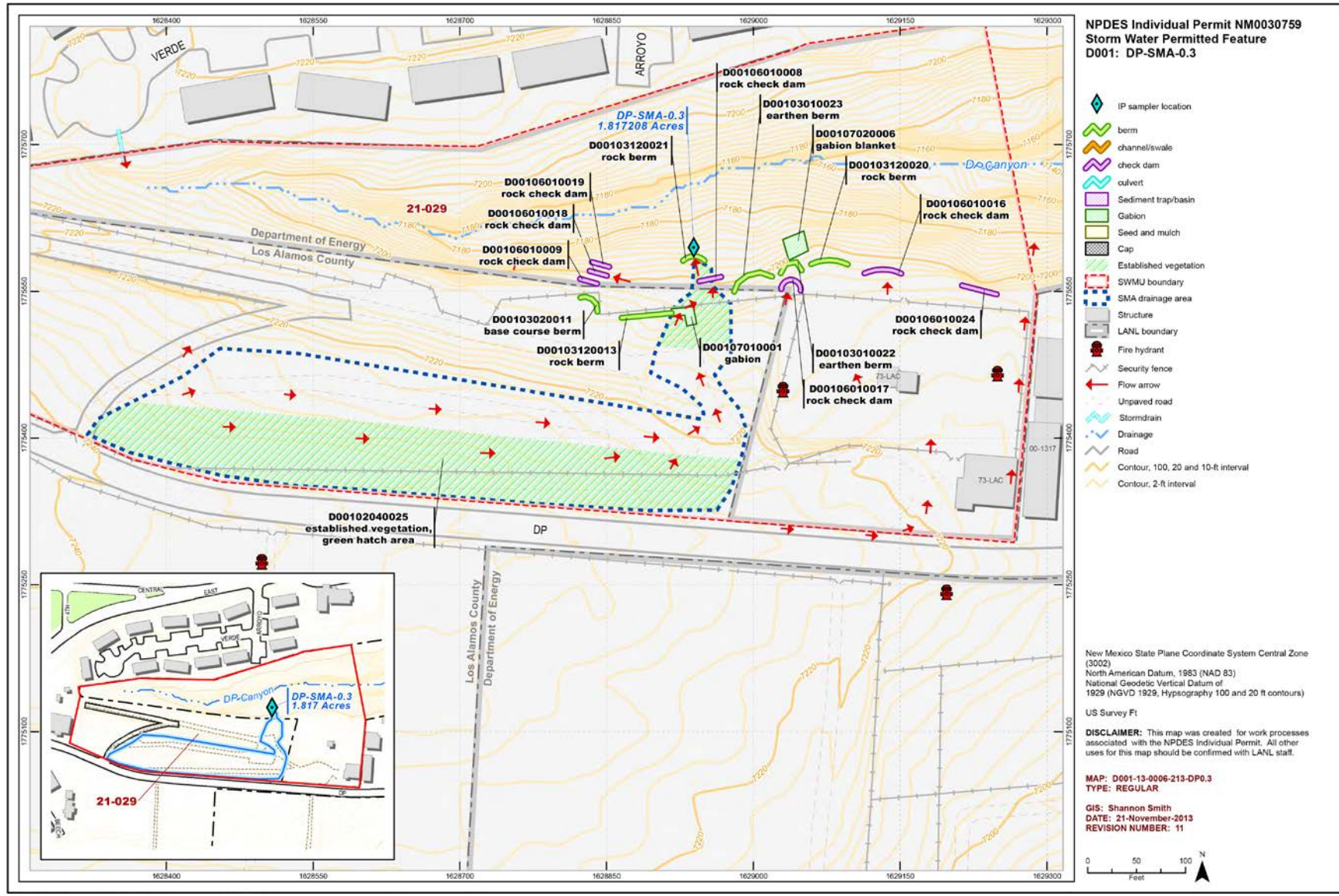
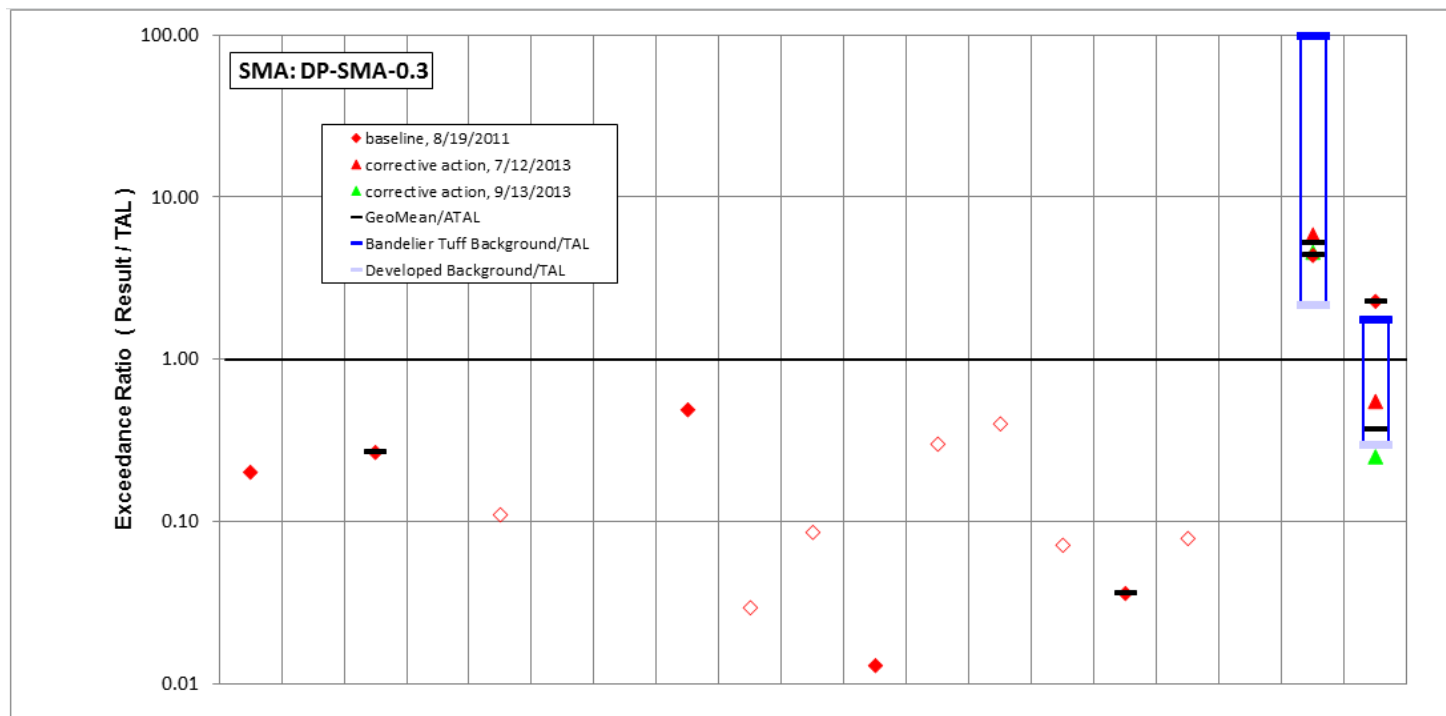


Figure 57-1 DP-SMA-0.3 location map



	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	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	-	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	-	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>68.7</b>	7.52
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>4.6</b>	0.25
7/12/2013 result	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>87.8</b>	16.5
result / TAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>5.9</b>	0.55
8/19/2011 result	151	<b>1</b>	2.4	30.7	<i>0.11</i>	2	2.7	2.1	0.5	<i>0.066</i>	2.2	1.5	0.2	<i>0.45</i>	3.6	3.3	-	65.5	68.3
result / TAL	0.2	<i>0.002</i>	0.27	0.0061	<i>0.11</i>	<i>0.01</i>	0.0027	0.49	<i>0.029</i>	<i>0.086</i>	0.013	0.3	0.4	<i>0.071</i>	0.036	<i>0.079</i>	-	<b>4.4</b>	<b>2.3</b>

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

Figure 57-2 Inorganic analytical results summary plot for DP-SMA-0.3



## 58.0 DP-SMA-0.4: SWMU 21-021

### 58.1 Site Descriptions

One historical industrial activity area is associated with D002, DP-SMA-0.4: Site 21-021.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 58-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 58.2 Control Measures

Storm water controls around this SMA divert water away from the monitored area. The paved area in the headwaters of the SMA is controlled with a vegetated swale. The area around the monitoring station is heavily vegetated, effectively mitigating runoff from the SMA. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 58-1).

**Table 58-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00202040009	Established Vegetation		X	X		B
D00203060005	Straw Wattles	X			X	CB
D00203060008	Straw Wattles		X		X	B
D00204040003	Culvert	X		X		CB
D00204060006	Rip Rap	X			X	CB
D00206030004	Juniper Bales	X			X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 58.3 Storm Water Monitoring

SWMU 21-021 is monitored within DP-SMA-0.4. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 58-2). Analytical results from this sample yielded two TAL exceedances:

- Aluminum concentration of 3540 µg/L (MTAL is 750 µg/L), and
- Copper concentrations of 10.7 µg/L (MTAL is 4.3 µg/L).

These exceedances were 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 discussion is organized by Site and analyte.

**SWMU 21-021:**

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the 3 shallow soil samples collected within the SMA boundary of DP-SMA-3 during the 1992 TA-21 RFI surface-wide soil investigation.
- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the 3 shallow soil samples collected within the SMA boundary of DP-SMA-3 during the 1992 TA-21 RFI surface-wide soil 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 Figure 58-2. 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 58-2.

Monitoring location DP-SMA-0.4 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 and copper are associated with building materials, parking lots, and automobiles as well as low concentrations in the Bandelier Tuff.

- Aluminum—The aluminum UTL from developed urban 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 greater than both of these values.
- Copper—The copper UTL from developed urban 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.

**58.4 Inspections and Maintenance**

RG038 recorded two storm events at DP-SMA-0.4 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 58-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30735	4-17-2013
Storm Rain Event	BMP-33555	7-16-2013
Storm Rain Event	BMP-35719	9-25-2013
Annual Erosion Evaluation	COMP-36674	11-21-2013
TAL Exceedance	COMP-37063	11-21-2013

No maintenance activities were conducted at DP-SMA-0.4 in 2013.

**58.5 Compliance Status**

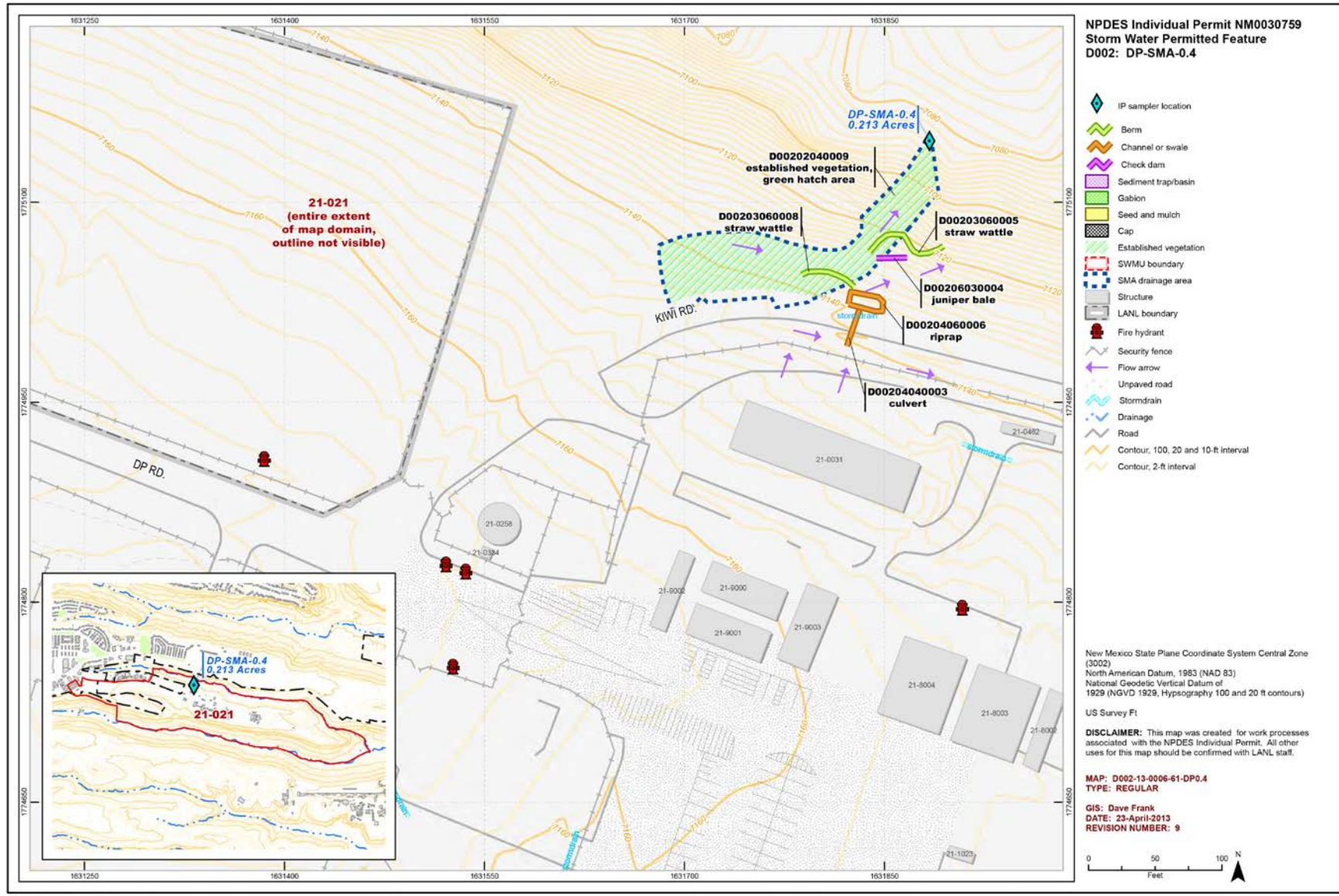
The Sites associated with DP-SMA-0.4 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 58-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-26-13

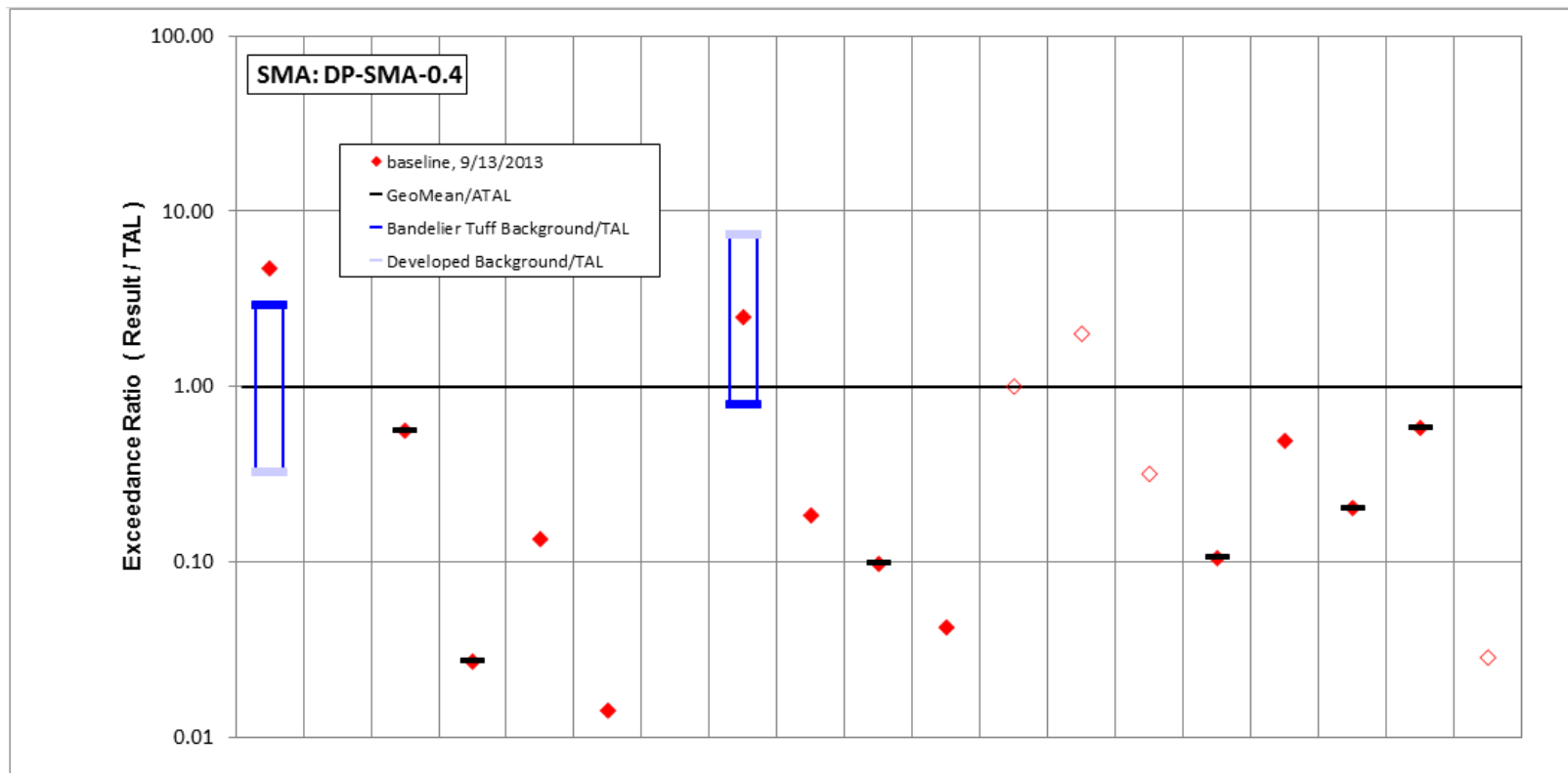






**Figure 58-1 DP-SMA-0.4 location map**





	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
9/13/2013 result	3540	2.53	5.04	135	0.135	2.98	1.55	<b>10.7</b>	3.13	0.075	7.19	5	<i>1</i>	2	10.5	20.6	0.002	8.71	<i>0.854</i>
result / TAL	<b>4.7</b>	0.004	0.56	0.027	0.14	0.014	0.0016	<b>2.5</b>	0.18	0.097	0.042	1	<i>2</i>	0.32	0.1	0.49	0.2	0.58	<i>0.028</i>

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

Figure 58-2 Inorganic analytical results summary plot for DP-SMA-0.4

## 59.0 DP-SMA-0.6: SWMUs 21-021 and 21-024(I)

### 59.1 Site Descriptions

Two historical industrial activity areas are associated with D003, DP-SMA-0.6: Sites 21-021 and 21-024(I). SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(I) is the location of a former outfall that received liquid waste from the floor drain of the building 21-21 mechanical room. The 3-in. cast-iron drainline ran north from the building 21-21 mechanical room to the outfall near the south rim of DP Canyon. From 1946 to 1974, building 21-21 housed a vault used to store uranium and plutonium. The building was decommissioned in 1974. During the 2007 DP Site Aggregate Area investigation, the drainline was removed, and contaminated soil and sediment were excavated from the outfall area to a depth of approximately 3 ft bgs.

The project map (Figure 59-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 59.2 Control Measures

Run-on to the Site is controlled by culverts and swales along the access road west of former building 21-021, a channel west of the Site, and curbed perimeter along the fence surrounding the foundation of the former building 21-021. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 59-1).

**Table 59-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00302040015	Established Vegetation		X	X		B
D00303010013	Earthen Berm		X		X	CB
D00303010014	Earthen Berm		X		X	CB
D00303020011	Base Course Berm	X			X	CB
D00304010004	Earthen Channel/Swale	X		X		CB
D00304040005	Culvert	X		X		CB
D00305020010	Sediment Basin		X		X	CB
D00308020012	Rock Cap			X		CB

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

### 59.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-0.6. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 59.4 Inspections and Maintenance

RG038 recorded two storm events at DP-SMA-0.6 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 59-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30736	4-17-2013
Storm Rain Event	BMP-33556	7-16-2013
Storm Rain Event	BMP-35720	9-25-2013
Annual Erosion Evaluation	COMP-36675	11-6-2013

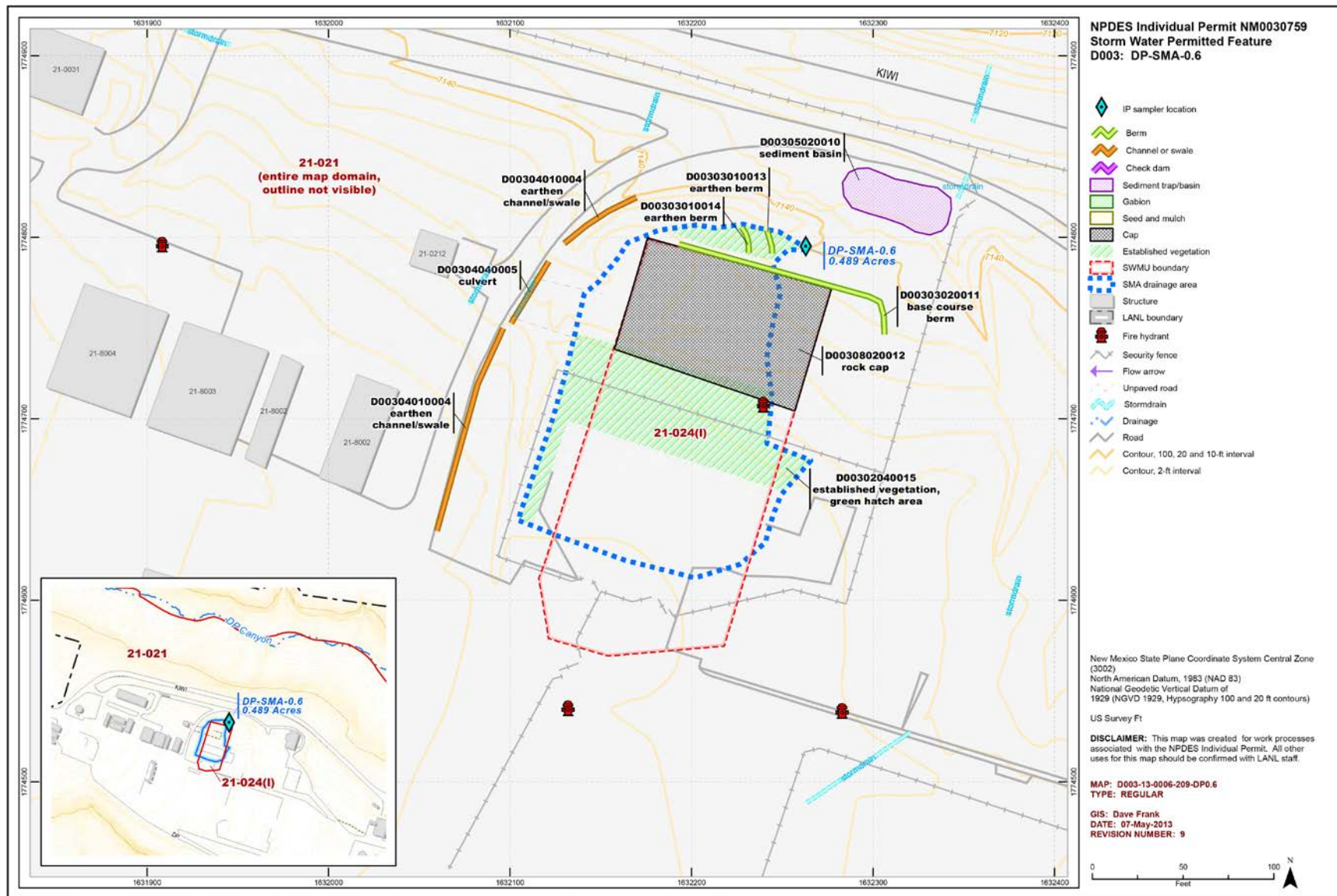
No maintenance activities were conducted at DP-SMA-0.6 in 2013.

### 59.5 Compliance Status

The Sites associated with DP-SMA-0.6 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 59-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-024(l)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



**Figure 59-1 DP-SMA-0.6 location map**



## **60.0 DP-SMA-1: SWMUs 21-011(k) and 21-021**

### **60.1 Site Descriptions**

Two historical industrial activity areas are associated with D004, DP-SMA-1: Sites 21-011(k), and 21-021. SWMU 21-011(k) consists of the former NPDES-permitted outfall for treated industrial wastewater from the former WWTPs (buildings 21-37 and 21-257) and the former drainline. The drainline carried treated wastewater from two holding tanks (structures 21-112 and 21-113) to an outfall on the north-facing slope of DP Canyon. Wastewater discharged to the outfall consisted of treated plutonium-extraction-process effluents and potentially contained a variety of radioactive and chemical constituents. The discharge point was the end of a 4-in. cast-iron pipe located approximately 55 ft north of the TA-21 perimeter road. A gently sloping rocky surface extends from the former outfall approximately 30 ft north to the canyon rim where there is a steep drop into DP Canyon. Discharges of treated industrial wastewater to the outfall were discontinued in July 1986. In January 2001, approximately 55 gal. of partially tritiated wastewater was unintentionally released from holding tank 21-113 through the SWMU 21-011(k) and infiltrated surface soils within 50 ft of the outfall. The drainline was plugged later in January 2001. In 1996, an IA was implemented on the hillside below SWMU 21-011(k) to remove radioactively contaminated soil and sediment and to install storm water control measures. During the 2002 and 2003 VCM conducted at the Site, the plugged outfall drainline was removed along with all radioactively contaminated soil, tuff, and sediment on the hillside and in the drainage below the former outfall until confirmation sampling results indicated no risk to recreational receptors. Excavated portions of the hillside were backfilled with clean fill, regraded, and reseeded and storm water controls were installed.

Investigation and remediation of SWMU 21-011(k) were complete before the Consent Order went into effect in 2005. The Site meets recreational risk levels and will be recommended for a COC with controls in 2014.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 60-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **60.2 Control Measures**

Run-on originates on the paved access road and to a lesser extent, on the unpaved access road. Run-on controls function primarily to divert storm water from these areas around the monitored area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 60-1).

**Table 60-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00402040015	Established Vegetation		X	X		B
D00403010002	Earthen Berm	X			X	CB
D00403010011	Earthen Berm		X		X	B
D00403020014	Base Course Berm	X			X	B
D00403060013	Straw Wattles	X			X	B
D00403120009	Rock Berm		X		X	CB
D00403120012	Rock Berm		X		X	B
D00404060004	Rip Rap	X		X		CB
D00406030006	Juniper Bales		X		X	CB
D00406030007	Juniper Bales		X		X	CB
D00406030008	Juniper Bales		X		X	CB

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

### 60.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-1. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 60.4 Inspections and Maintenance

RG038 recorded two storm events at DP-SMA-1 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 60-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30737	4-17-2013
Storm Rain Event	BMP-33557	7-16-2013
Storm Rain Event	BMP-35721	9-25-2013
Annual Erosion Evaluation	COMP-36676	11-6-2013

No maintenance activities were conducted at DP-SMA-1 in 2013.

### 60.5 Compliance Status

The Sites associated with DP-SMA-1 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 60-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-011(k)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

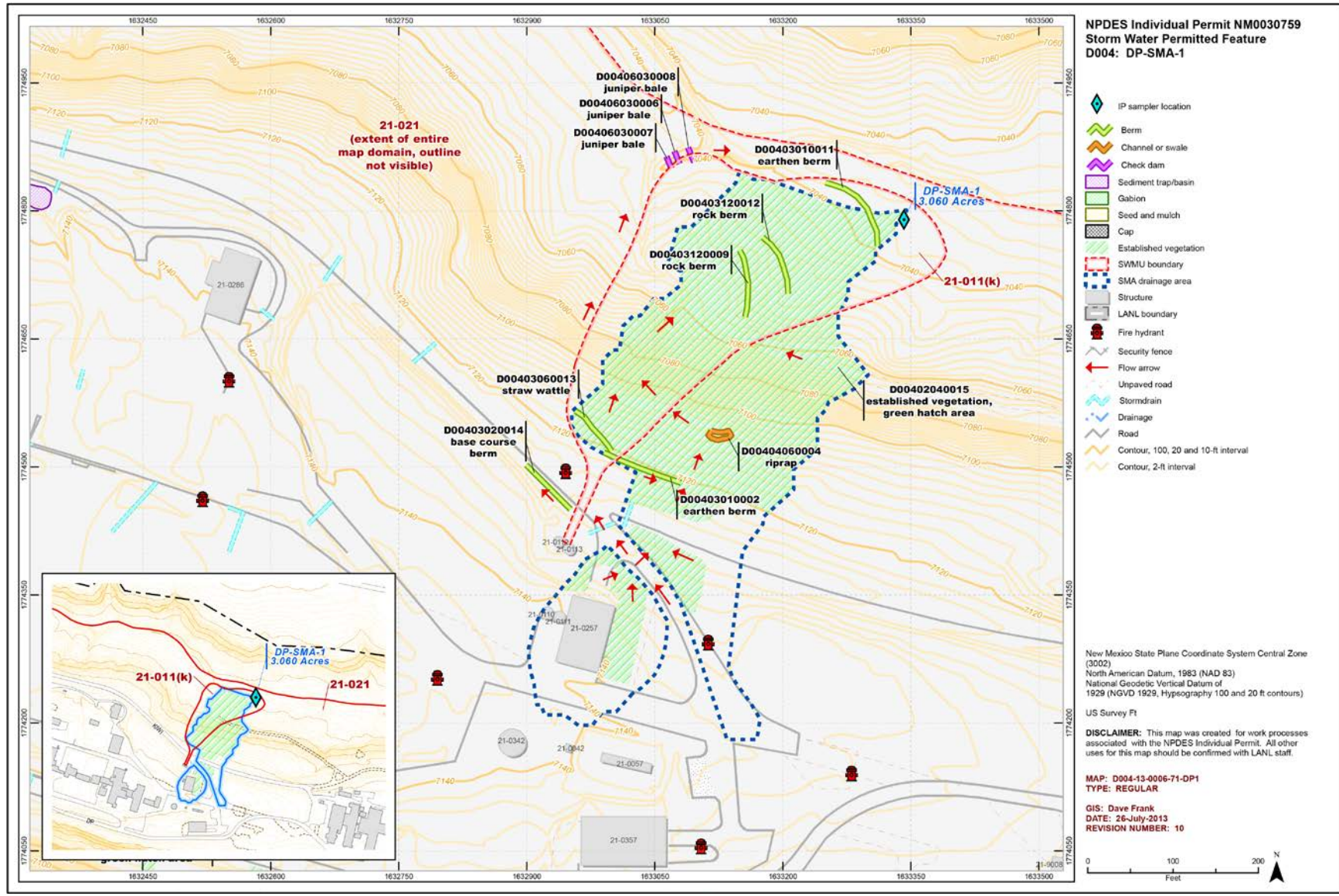


Figure 60-1 DP-SMA-1 location map



## **61.0 DP-SMA-2: SWMUs 21-021 and 21-024(h)**

### **61.1 Site Descriptions**

Two historical industrial activity areas are associated with D005, DP-SMA-2: Sites 21-021, and 21-024(h).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(h) consists of a septic system that routed sewage from building 21-151, an administrative building and shop, through a sump (structure 21-175) and then through a septic tank (structure 21-163) to the surface on the north rim of DP Mesa above DP Canyon. The septic system was constructed in 1945 at the same time building 21-151 was built. The septic system consisted of a reinforced concrete septic tank that measured 11.33 × 6.33 × 8.67 ft deep, with 6-in.-diameter VCP inlet and outlet drainlines. Building 21-151 was removed in the early 1960s, and building 21-152, a polonium-processing and high-temperature laboratory, was subsequently tied into the SWMU 21-024(h) septic tank in 1965. The septic system was decommissioned in 1966; the septic tank was filled with pea gravel and inlet and outlet lines were grouted with concrete and left in place in 1996. The septic tank and inlet and outlet drainlines were removed in 2007.

Consent Order investigations for SWMU 21-024(h) are complete. The Site meets residential risk levels and will be recommended for a COC with without controls in 2014.

The project map (Figure 61-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **61.2 Control Measures**

An unpaved road borders the southern portion of the SMA. Berms along the edge of the road are used to control run-on to the SMA. Check dams are in place to control runoff from this area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 61-1).

**Table 61-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00502040012	Established Vegetation		X	X		B
D00503010011	Earthen Berm		X		X	B
D00503020003	Base Course Berm	X			X	CB
D00506030007	Juniper Bales		X		X	CB
D00506030009	Juniper Bales		X		X	CB

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

### 61.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-2. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.

### 61.4 Inspections and Maintenance

RG038 recorded two storm events at DP-SMA-2 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 61-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30738	4-17-2013
Storm Rain Event	BMP-33558	7-16-2013
Storm Rain Event	BMP-35722	9-25-2013
Annual Erosion Evaluation	COMP-36677	11-6-2013

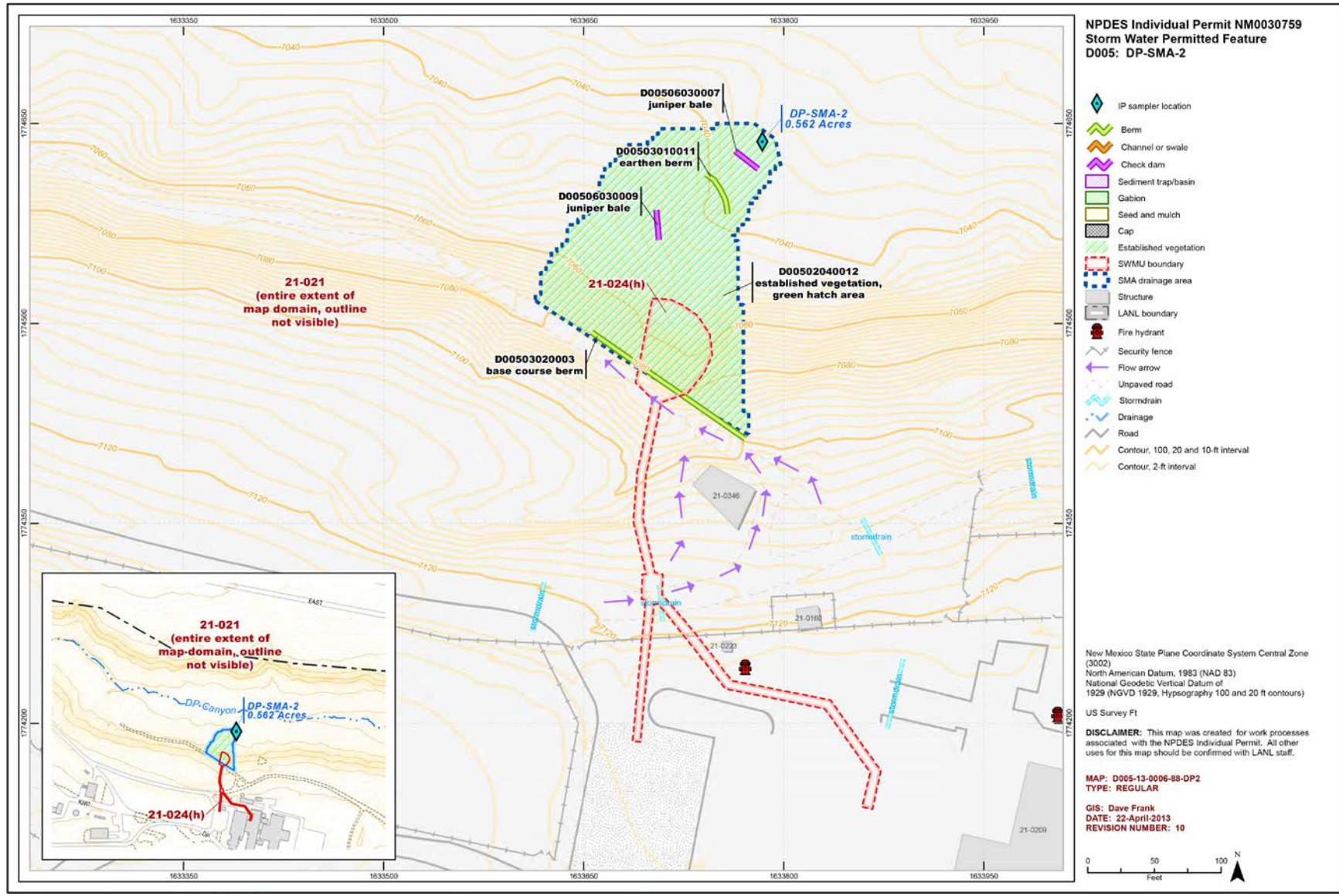
No maintenance activities were conducted at DP-SMA-2 in 2013.

### 61.5 Compliance Status

The Sites associated with DP-SMA-2 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 61-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment
SWMU 21-024(h)	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment



**Figure 61-1 DP-SMA-2 location map**

## **62.0 DP-SMA-2.35: SWMUs 21-021 and 21-024(n)**

### **62.1 Site Descriptions**

Two historical industrial activity areas are associated with D006, DP-SMA-2.35: Sites 21-021, and 21-024(n).

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

SWMU 21-024(n) originally consisted of a CMP that exited building 21-155 and an outfall on the north edge of DP Canyon. Building 21-155 was constructed in 1949 and housed a warehouse and laboratory. Three additional drainlines originating from building 21-155 (or next to building 21-155) that followed a parallel path to, and west of, the SWMU 21-024(n) drainline were found in engineering drawings and during site visits in the early 1990s and were subsequently added to SWMU 21-024(n). Each of the parallel drainlines discharged to the same hillside as the SWMU 21-024(n) outfall. Discharges from each drainline flowed downslope to a ditch on the south side of the TA-21 perimeter road. From the ditch, the path of the effluent flowed to one of two culverts (one to the east and one to the west) that crossed under the perimeter road and emptied onto the ground surface that sloped toward DP Canyon. All four drainlines were removed in 2007.

Decision-level data for SWMU 21-024(n) determined the lateral and vertical extent of plutonium-239 and uranium-238 were not defined. Additional sampling and remediation will be conducted at SWMU 21-024(n) during the DP Aggregate Area Phase III investigation.

The project map (Figure 62-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **62.2 Control Measures**

Run-on contributions from structures and paved areas have the potential to influence storm water discharges from this SMA. Baseline controls are installed to address run-on from building 21-0213 at the fence north of building 21-0213. Runoff controls below the gravel/paved pad south of the access road are installed to better manage runoff from this SMA. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 62-1).



**Table 62-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00602040007	Established Vegetation		X	X		B
D00603020002	Base Course Berm		X		X	CB
D00603060006	Straw Wattles	X			X	B
D00604060004	Rip Rap		X	X		CB

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

### 62.3 Storm Water Monitoring

SWMUs 21-021 and 21-024(n) are monitored within DP-SMA-2.35. Following the installation of baseline control measures, a baseline storm water sample was collected on September 13, 2013 (Figure 62-2). Analytical results from this sample yielded one TAL exceedance:

- Gross-alpha activities of 25 pCi/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

#### *SWMU 21-021:*

- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

#### *SWMU 21-024(n):*

- The only alpha-emitting radionuclides known to be associated with industrial materials historically managed at the Site are polonium and actinium. Shallow Consent Order soil and tuff samples collected at the Site were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, isotopic plutonium, and isotopic uranium, all of which are alpha emitters. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

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 62-2. 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 62-2.

Monitoring location DP-SMA-2.35 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—The gross-alpha UTL for background storm water containing sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water UTL for storm water run-on from a developed urban landscape is 32.5 pCi/L. The 2013 gross-alpha result is less than both of these values.

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

#### 62.4 Inspections and Maintenance

RG038 recorded two storm events at DP-SMA-2.35 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 62-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30739	4-17-2013
Storm Rain Event	BMP-33547	7-16-2013
Storm Rain Event	BMP-35711	9-25-2013
Annual Erosion Evaluation	COMP-36678	11-21-2013
TAL Exceedance	COMP-37064	11-21-2013

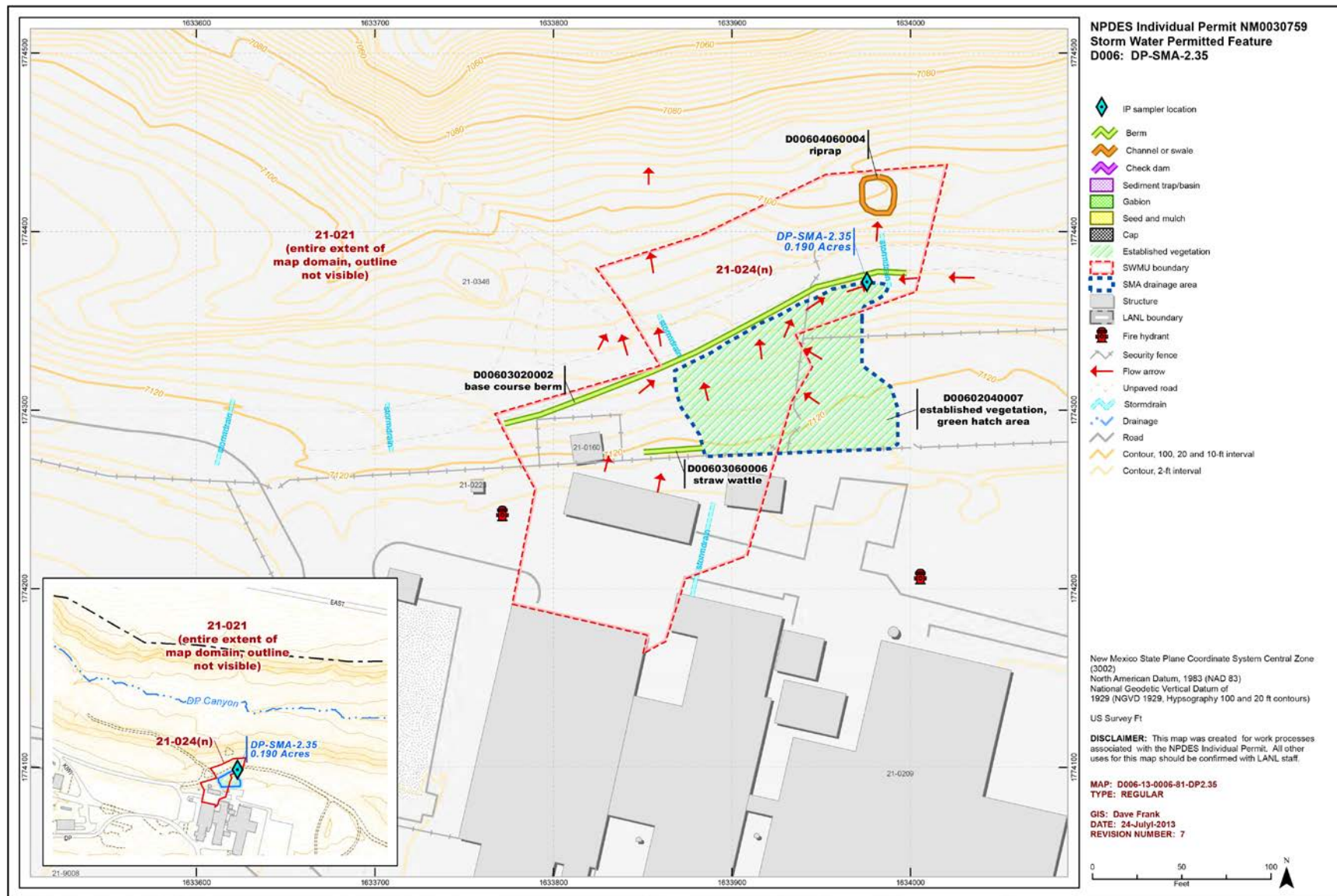
No maintenance activities were conducted at DP-SMA-2.35 in 2013.

#### 62.5 Compliance Status

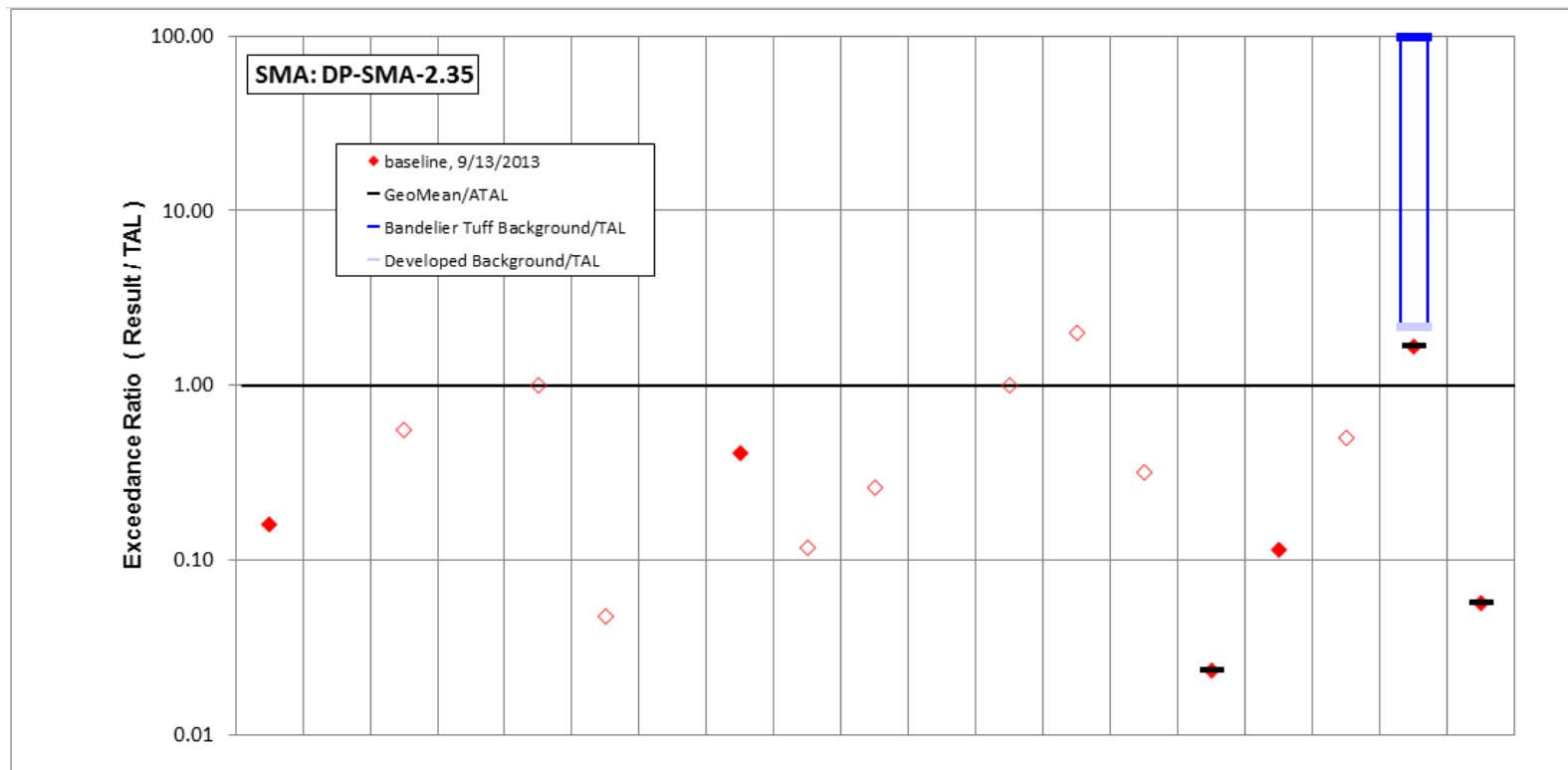
The Sites associated with DP-SMA-2.35 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 62-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13
SWMU 21-024(n)	Baseline Monitoring Extended	Corrective Action Initiated	Initiated 10-30-13



**Figure 62-1 DP-SMA-2.35 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
9/13/2013 result	120	3	5	15.7	1	10	5	1.76	2	0.2	0.791	5	1	2	2.33	4.81	0.005	25	1.7
result / TAL	0.16	0.005	0.56	0.0031	1	0.048	0.005	0.41	0.12	0.26	0.0047	1	2	0.32	0.023	0.11	0.5	1.7	0.057

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

Figure 62-2 Inorganic analytical results summary plot for DP-SMA-2.35



## **63.0 DP-SMA-3: SWMUs 21-013(c) and 21-021**

### **63.1 Site Descriptions**

Two historical industrial activity areas are associated with D007, DP-SMA-3: Sites 21-013(c), and 21-021.

SWMU 21-013(c) is the former location of a surface disposal area located at the eastern end of DP Mesa. The site consisted only of construction debris, including piles of fill, asphalt, and concrete, an excavated trench, an earthen berm that contained scattered concrete, asphalt, and metal debris, and four large concrete pylons. Other surface debris included glass, scrap metal, wood, cans, paper, and plastic. It is not known when the materials were disposed of at this site. During the 1995 VCA implemented at SWMU 21-013(c), all debris was removed.

Decision-level data presented for the Site in the Phase II DP Site Aggregate Area investigation report indicates the Site poses no risk to residential receptors. The Phase II DP Site Aggregate Area investigation report recommended SWMU 21-013(c) for a COC without controls.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 63-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### **63.2 Control Measures**

The area is elevated reducing the impact from run-on from surrounding areas. The Site is partially vegetated, and there is no significant runoff at this Permitted Feature. Existing controls are in place to reduce the sediment loading and velocity of storm water discharge from this area. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 63-1).

Enhanced controls were installed and certified on September 20, 2012, as part of corrective action. Photographs of the enhanced controls are available at <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/construction-certifications.php>.

**Table 63-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00702040023	Established Vegetation		X	X		B
D00703010016	Earthen Berm		X		X	EC
D00703010017	Earthen Berm		X		X	EC
D00703010018	Earthen Berm		X		X	EC
D00703010019	Earthen Berm		X		X	EC
D00703010020	Earthen Berm		X		X	EC
D00703010021	Earthen Berm		X		X	EC
D00703010022	Earthen Berm		X		X	EC
D00703120015	Rock Berm		X		X	CB
D00706010008	Rock Check Dam		X		X	CB
D00706010009	Rock Check Dam		X		X	CB
D00706010010	Rock Check Dam		X		X	CB
D00706010011	Rock Check Dam		X		X	CB
D00706010012	Rock Check Dam		X		X	CB

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 63.3 Storm Water Monitoring

SWMUs 21-013(c) and 21-021 are monitored within DP-SMA-3. Following the installation of baseline control measures, a baseline storm water sample was collected on July 29, 2011 (Figure 63-2). Analytical results from this sample yielded three TAL exceedances:

- Aluminum concentration of 1870 µg/L (MTAL is 750 µg/L),
- Copper concentration of 5.5 µg/L (MTAL is 4.3 µg/L), and
- Gross-alpha activity of 174 pCi/L (ATAL is 15 pCi/L).

These exceedances were 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 discussion is organized by Site and analyte.

*SWMU 21-013(c):*

- Aluminum is not known to have been associated with industrial materials historically managed at the Site. Aluminum was detected above BVs in 3 of 48 shallow Consent Order soil and tuff samples at a maximum concentration 1.3 times the tuff BV.
- Copper is not known to have been associated with industrial materials historically managed at the Site. Copper was detected above BVs in 8 of 48 shallow Consent Order samples at a maximum concentration 3 times the tuff BV.

- Alpha-emitting radionuclides are not known to be associated with industrial materials historically managed at the Site. Shallow Consent Order soil and tuff samples collected at the Site were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, isotopic plutonium, and isotopic uranium, which are all alpha-emitting radionuclides. These radionuclides are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

**SWMU 21-021:**

- Aluminum is not known to be associated with industrial materials historically managed at the Site. Aluminum was not detected above BVs in any of the three shallow soil samples collected within the SMA boundary of DP-SMA-3 during the 1992 TA-21 RFI surface-wide soil investigation.
- Copper is not known to be associated with industrial materials historically managed at the Site. Copper was not detected above BVs in any of the three shallow soil samples collected within the SMA boundary of DP-SMA-3 during the 1992 TA-21 RFI surface-wide soil investigation.
- Alpha-emitting radionuclides are known to be associated with the stack emissions historically associated with this Site, although stack emissions would not be considered management of industrial materials. RFI samples were not analyzed for gross-alpha radioactivity but were analyzed for americium-241, plutonium, thorium, and uranium isotopes, which are alpha-emitting radionuclides, and total uranium, which has alpha-emitting isotopes. Any alpha-emitting radionuclides associated with the Site are exempt from regulation under the CWA. Although these radionuclides may be associated with the gross-alpha radioactivity detected in the IP sample, they are excluded from the definition of adjusted gross-alpha radioactivity and would not be the source of the TAL exceedance.

These results, along with the lack of aluminum and copper detections in RFI samples, are consistent with the Site not being the source of the TAL exceedances for aluminum, copper, 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 63-2. 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 63-2.

Potential influence of background material on storm water TAL exceedances include the following: monitoring location DP-SMA-3 receives storm water run-on from developed environments, including



DP-SMA-3, Rock Berm, D00703120015 (photo ID 23657-9)

paved parking lots, roads, and buildings, as well as landscape containing sediment derived from Bandelier Tuff. Metals including copper and 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 urban 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 2011 is between these two values.
- Copper—The copper UTL from developed urban 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 2011 is 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 urban 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.

### 63.4 Inspections and Maintenance

RG038 recorded two storm events at DP-SMA-3 during the 2013 season. These rain events triggered two post-storm inspections. Post-storm inspections and all other inspection activity conducted at the SMA are summarized below.

**Table 63-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30740	4-17-2013
Storm Rain Event	BMP-33559	7-16-2013
Storm Rain Event	BMP-35723	9-25-2013
Annual Erosion Evaluation	COMP-36679	11-6-2013

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

**Table 63-3 Maintenance during 2013**

Maintenance Reference	Maintenance Conducted	Maintenance Date	Response Time	Response Discussion
BMP-36578	Check berm D00703010020 elevations. Determine spillway maintenance needs.	11-21-2013	57 day(s)	Maintenance conducted as soon as practicable.
BMP-36579	Repair earthen berm D00703010016. Only hand tools needed.	11-5-2013	41 day(s)	Maintenance conducted as soon as practicable.



### 63.5 Compliance Status

The Sites associated with DP-SMA-3 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 63-4 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-013(c)	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	Initiated 08-30-2012
SWMU 21-021	Enhanced Control Corrective Action Monitoring	Enhanced Control Corrective Action Monitoring	Initiated 08-30-2012

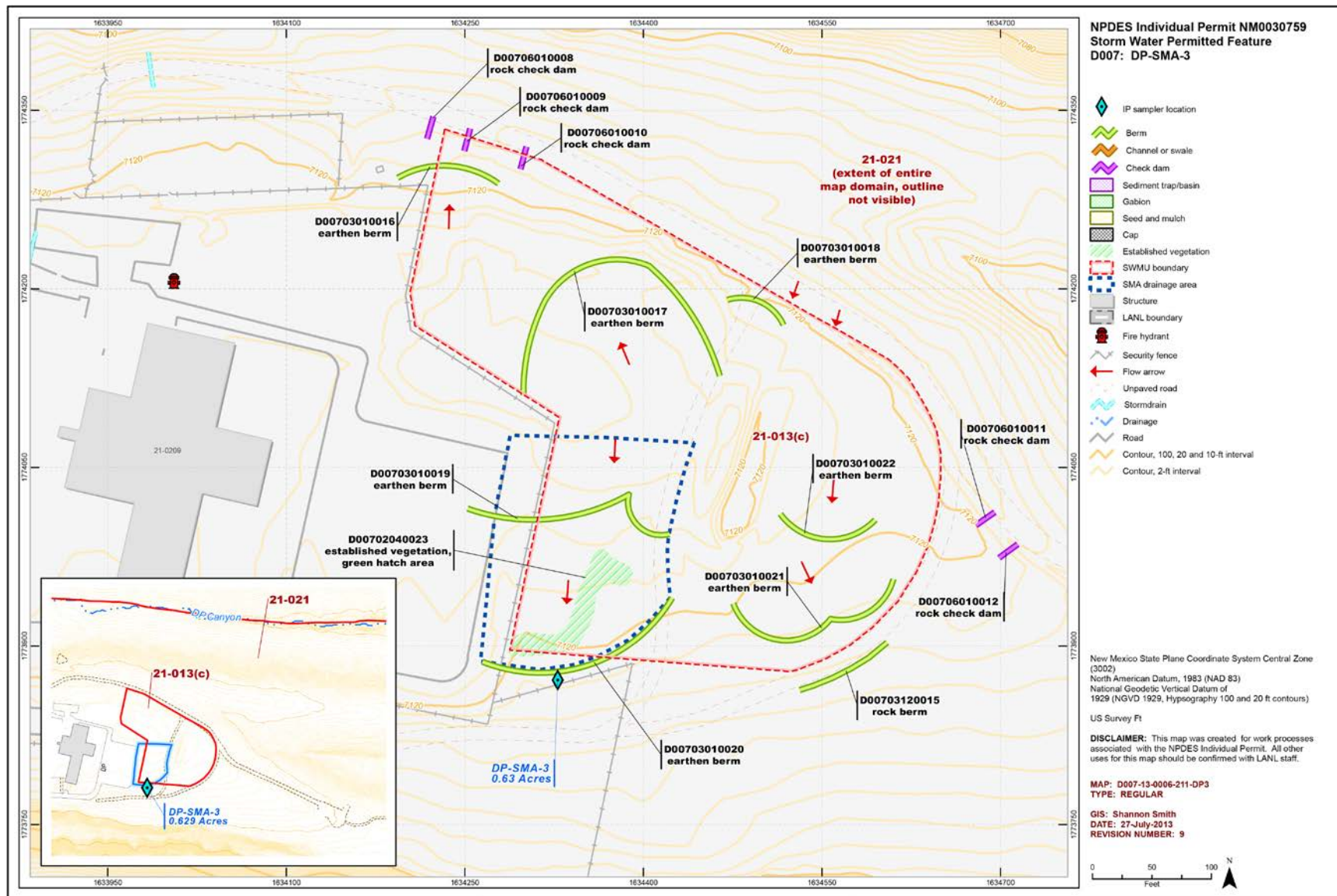
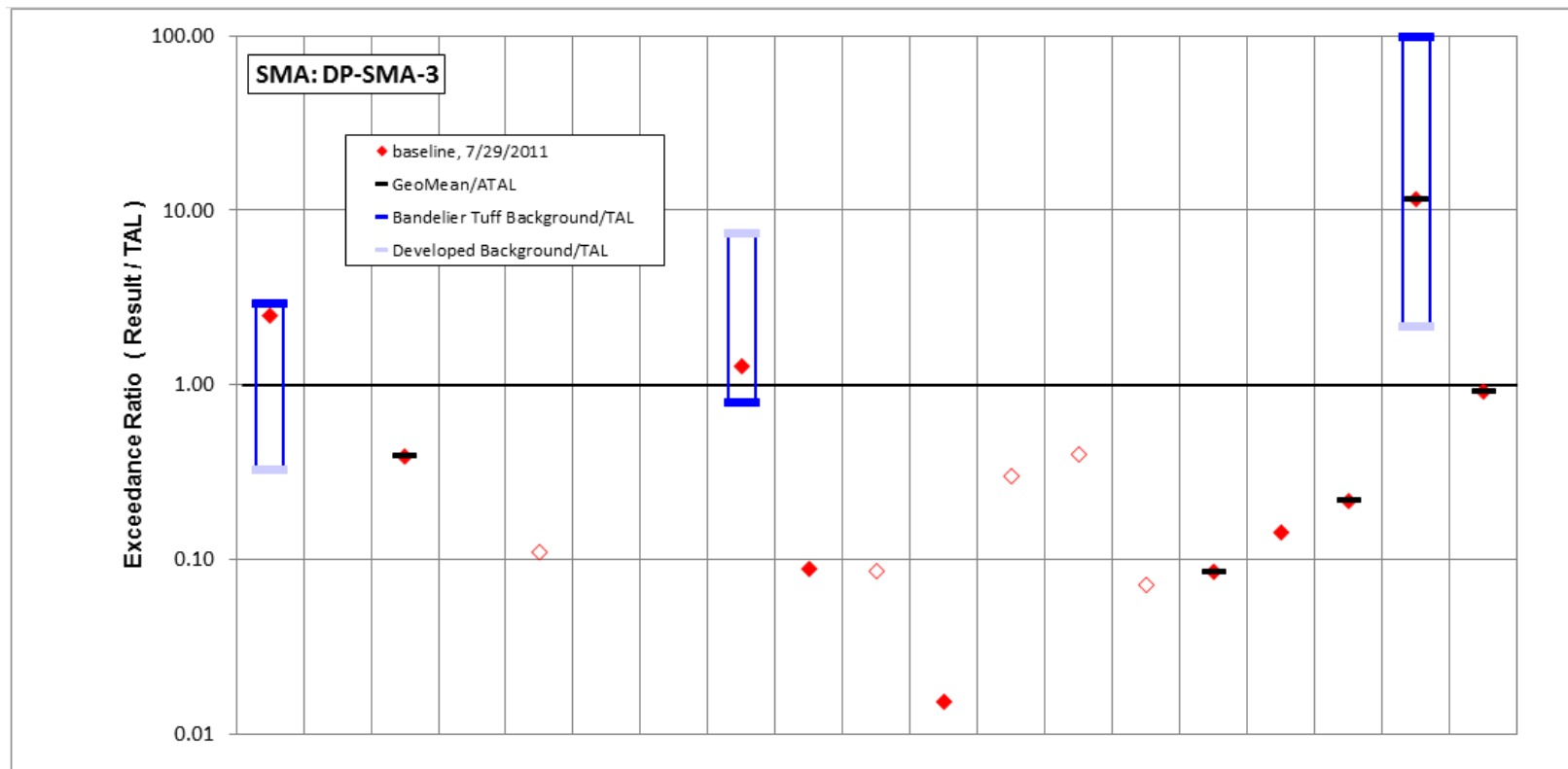


Figure 63-1 DP-SMA-3 location map



	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	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>7/29/2011 result</b>	<b>1870</b>	<i>1</i>	3.5	24.9	<i>0.11</i>	2	2.7	<b>5.5</b>	1.5	<i>0.066</i>	2.6	1.5	0.2	0.45	8.5	6	0.0022	<b>174</b>	27.5
result / TAL	<b>2.5</b>	<i>0.002</i>	0.39	0.005	<i>0.11</i>	<i>0.01</i>	0.0027	<b>1.3</b>	0.088	<i>0.086</i>	0.015	0.3	0.4	<i>0.071</i>	0.085	0.14	0.22	<b>12</b>	0.92

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

**Figure 63-2 Inorganic analytical results summary plot for DP-SMA-3**

## 64.0 DP-SMA-4: SWMU 21-021

### 64.1 Site Descriptions

One historical industrial activity area is associated with D008, DP-SMA-4: Site 21-021.

SWMU 21-021 consists of surface soil contamination resulting from emissions from stacks throughout TA-21. The estimated area of soil contamination is approximately 300,000 m<sup>2</sup> and overlaps all of TA-21, a developed industrial area. Radionuclides were known to have been released from stacks throughout TA-21. There is no documentation of nonradioactive chemical releases associated with historical TA-21 stack emissions.

During the 1992 RFI, 155 shallow soil samples were collected from locations on a 40- × 40-m grid across TA-21. NMED approved the DP Site Aggregate Area investigation work plan, which indicated the investigation of SWMU 21-021 was complete and no additional investigations were required. Because SWMU 21-021 overlies all other SWMUs and AOCs within TA-21, a request for a COC is not expected to be made until investigation of all other TA-21 Sites is complete.

The project map (Figure 64-1) is located at the end of this SMA update. Any future map updates will be posted on the IP website: <http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php>.

### 64.2 Control Measures

Run-on from the unpaved access road follows a natural drainage channel west of the SMA and does not impact the monitoring area. Vegetation is thick and storm water flow is largely overland. All active control measures are listed in the following table, and their locations are shown on the project map (Figure 64-1).

**Table 64-1 Active Control Measures**

Control ID	Control Name	Purpose of Control				Control Status
		Run-On	Runoff	Erosion	Sediment	
D00801010002	Seed and Wood Mulch			X		CB
D00802040009	Established Vegetation		X	X		B
D00803010006	Earthen Berm	X			X	CB
D00803010007	Earthen Berm		X		X	CB
D00806010008	Rock Check Dam	X			X	B

CB: Certified baseline control measure.

B: Additional baseline control measure.

EC: Enhanced control measure.

### 64.3 Storm Water Monitoring

Through calendar year 2013, storm water flow has not been sufficient for full-volume sample collection at DP-SMA-4. Initial confirmation sampling will continue until one confirmation sample is collected from this SMA.



#### 64.4 Inspections and Maintenance

RG-TA-53 recorded six storm events at DP-SMA-4 during the 2013 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 64-2 Control Measure Inspections during 2013**

Inspection Type	Inspection Reference	Inspection Date
Annual Erosion Evaluation	COMP-30741	4-17-2013
Storm Rain Event	BMP-34152	7-29-2013
Storm Rain Event	BMP-35515	9-25-2013
Storm Rain Event	BMP-37120	11-6-2013
Annual Erosion Evaluation	COMP-36680	11-6-2013

No maintenance activities were conducted at DP-SMA-4 in 2013.

#### 64.5 Compliance Status

The Sites associated with DP-SMA-4 are Moderate Priority Sites. Corrective action is to be certified complete within 5 yr of the effective date of the IP (i.e., November 2015).

**Table 64-3 Compliance Status during 2013**

Site	Compliance Status on Jan 1, 2013	Compliance Status on Dec 31, 2013	Comments
SWMU 21-021	Baseline Monitoring Extended	Baseline Monitoring Extended	No Comment

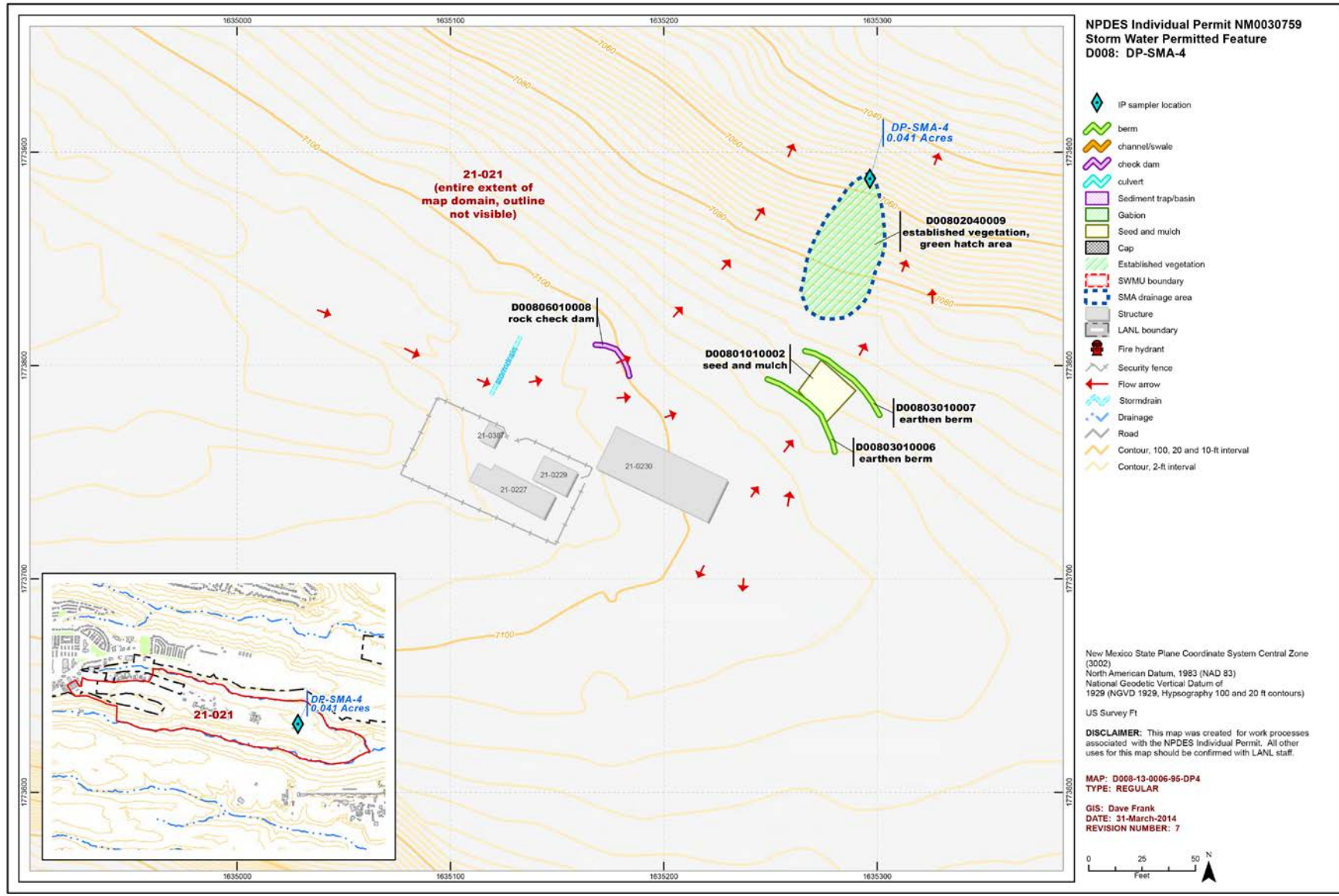


Figure 64-1 DP-SMA-4 location map

## Attachment 1 Amendments

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.575	5/24/2013	LA-SMA-5.01	New Control - Routine/Replacement - Control ID: L01202040012	T	CCN - 31217
V1.576	5/24/2013	LA-SMA-5.01	Map Revision - (R7)	T	CCN - 31217
V1.577	5/24/2013	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A02010001	T	CCN - 31221
V1.578	5/24/2013	LA-SMA-5.02	New Control - Routine/Replacement - Control ID: L012A02040012	T	CCN - 31221
V1.579	5/24/2013	LA-SMA-5.02	Map Revision - (R7)	T	CCN - 31221
V1.580	5/24/2013	LA-SMA-4.1	Retire Control - Damaged and/or Replaced - Control ID: L01002010002	T	CCN - 31222
V1.581	5/24/2013	LA-SMA-4.1	New Control - Routine/Replacement - Control ID: L01002040010	T	CCN - 31222
V1.582	5/24/2013	LA-SMA-4.1	Map Revision - (R6)	T	CCN - 31222
V1.583	5/24/2013	LA-SMA-4.2	Retire Control - Damaged and/or Replaced - Control ID: L01102010001	T	CCN - 31223
V1.584	5/24/2013	LA-SMA-4.2	New Control - Routine/Replacement - Control ID: L01102040008	T	CCN - 31223
V1.585	5/24/2013	LA-SMA-4.2	Map Revision - (R5)	T	CCN - 31223
V1.586	5/24/2013	LA-SMA-5.51	Retire Control - Damaged and/or Replaced - Control ID: L01802010002	T	CCN - 31509
V1.587	5/24/2013	LA-SMA-5.51	Retire Control - Damaged and/or Replaced - Control ID: L01802020005	T	CCN - 31509
V1.588	5/24/2013	LA-SMA-5.51	New Control - Routine/Replacement - Control ID: L01802040009	T	CCN - 31509
V1.589	5/24/2013	LA-SMA-5.51	Map Revision - (R3)	T	CCN - 31509
V1.590	7/29/2013	LA-SMA-6.32	Retire Control - Damaged and/or Replaced - Control ID: L02302010001	T	CCN - 31512
V1.591	7/29/2013	LA-SMA-6.32	New Control - Routine/Replacement - Control ID: L02302040006	T	CCN - 31512
V1.592	7/29/2013	LA-SMA-6.32	Map Revision - (R7)	T	CCN - 31512
V1.593	7/29/2013	DP-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: D00402010003	T	CCN - 31516
V1.594	7/29/2013	DP-SMA-1	New Control - Routine/Replacement - Control ID: D00402040015	T	CCN - 31516
V1.595	7/29/2013	DP-SMA-1	Map Revision - (R10)	T	CCN - 31516

**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.596	7/29/2013	DP-SMA-3	Retire Control - Damaged and/or Replaced - Control ID: D00702010001	T	CCN - 31518
V1.597	7/29/2013	DP-SMA-3	New Control - Routine/Replacement - Control ID: D00702040023	T	CCN - 31518
V1.598	7/29/2013	DP-SMA-3	Map Revision - (R9)	T	CCN - 31518
V1.599	7/29/2013	LA-SMA-6.36	Retire Control - Damaged and/or Replaced - Control ID: L02502010002	T	CCN - 31519
V1.600	7/29/2013	LA-SMA-6.36	New Control - Routine/Replacement - Control ID: L02502040010	T	CCN - 31519
V1.601	7/29/2013	LA-SMA-6.36	Map Revision - (R7)	T	CCN - 31519
V1.602	7/29/2013	LA-SMA-6.27	Retire Control - Damaged and/or Replaced - Control ID: L02102010004	T	CCN - 31520
V1.603	7/29/2013	LA-SMA-6.27	New Control - Routine/Replacement - Control ID: L02102040011	T	CCN - 31520
V1.604	7/29/2013	LA-SMA-6.27	Map Revision - (R9)	T	CCN - 31520
V1.605	5/24/2013	DP-SMA-2.35	Retire Control - Damaged and/or Replaced - Control ID: D00602010001	T	CCN - 31522
V1.606	5/24/2013	DP-SMA-2.35	New Control - Routine/Replacement - Control ID: D00602040007	T	CCN - 31522
V1.607	5/24/2013	DP-SMA-2.35	Map Revision - (R6)	T	CCN - 31522
V1.608	5/24/2013	DP-SMA-2	Retire Control - Damaged and/or Replaced - Control ID: D00502010001	T	CCN - 31523
V1.609	5/24/2013	DP-SMA-2	Retire Control - Damaged and/or Replaced - Control ID: D00502020002	T	CCN - 31523
V1.610	5/24/2013	DP-SMA-2	New Control - Routine/Replacement - Control ID: D00502040012	T	CCN - 31523
V1.611	5/24/2013	DP-SMA-2	Map Revision - (R10)	T	CCN - 31523
V1.612	5/24/2013	DP-SMA-0.4	Retire Control - Damaged and/or Replaced - Control ID: D00202010001	T	CCN - 31521
V1.613	5/24/2013	DP-SMA-0.4	New Control - Routine/Replacement - Control ID: D00202040009	T	CCN - 31521
V1.614	5/24/2013	DP-SMA-0.4	SMA Boundary Modification	T	CCN - 31521
V1.615	5/24/2013	DP-SMA-0.4	Map Revision - (R9)	T	CCN - 31521
V1.616	5/24/2013	DP-SMA-4	Retire Control - Damaged and/or Replaced - Control ID: D00802020004	T	CCN - 31514
V1.617	5/24/2013	DP-SMA-4	Retire Control - Damaged and/or Replaced - Control ID: D00802010001	T	CCN - 31514
V1.618	5/24/2013	DP-SMA-4	New Control - Routine/Replacement - Control ID: D00802040009	T	CCN - 31514
V1.619	5/24/2013	DP-SMA-4	Map Revision - (R6)	T	CCN - 31514



**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.620	5/24/2013	LA-SMA-6.5	Retire Control - Damaged and/or Replaced - Control ID: L02802010001	T	CCN - 31517
V1.621	5/24/2013	LA-SMA-6.5	Retire Control - Damaged and/or Replaced - Control ID: L02801010007	T	CCN - 31517
V1.622	5/24/2013	LA-SMA-6.5	New Control - Routine/Replacement - Control ID: L02802040008	T	CCN - 31517
V1.623	5/24/2013	LA-SMA-6.5	Map Revision - (R7)	T	CCN - 31517
V1.624	5/24/2013	LA-SMA-5.53	Retire Control - Damaged and/or Replaced - Control ID: L018B02020001	T	CCN - 31511
V1.625	5/24/2013	LA-SMA-5.53	New Control - Routine/Replacement - Control ID: L018B02040007	T	CCN - 31511
V1.626	5/24/2013	LA-SMA-5.53	SMA Boundary Modification	T	CCN - 31511
V1.627	5/24/2013	LA-SMA-5.53	Map Revision - (R4)	T	CCN - 31511
V1.628	5/24/2013	LA-SMA-6.395	Retire Control - Damaged and/or Replaced - Control ID: L02702010001	T	CCN - 31515
V1.629	5/24/2013	LA-SMA-6.395	New Control - Routine/Replacement - Control ID: L02702040008	T	CCN - 31515
V1.630	5/24/2013	LA-SMA-6.395	Map Revision - (R6)	T	CCN - 31515
V1.631	5/24/2013	B-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: B00202010001	T	CCN - 31826
V1.632	5/24/2013	B-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: B00202020002	T	CCN - 31826
V1.633	5/24/2013	B-SMA-1	New Control - Routine/Replacement - Control ID: B00202040008	T	CCN - 31826
V1.634	5/24/2013	B-SMA-1	Map Revision - (R5)	T	CCN - 31826
V1.635	6/18/2013	LA-SMA-6.25	Retire Control - Damaged and/or Replaced - Control ID: L02002010003	T	CCN - 31634
V1.636	6/18/2013	LA-SMA-6.25	New Control - Routine/Replacement - Control ID: L02002040007	T	CCN - 31634
V1.637	6/18/2013	LA-SMA-6.25	Map Revision - (R6)	T	CCN - 31634
V1.638	5/24/2013	DP-SMA-0.6	New Control - Routine/Replacement - Control ID: D00302040015	T	CCN - 31843
V1.639	5/24/2013	DP-SMA-0.6	Map Revision - (R9)	T	CCN - 31843
V1.640	6/4/2013	LA-SMA-6.34	Retire Control - Damaged and/or Replaced - Control ID: L02402010001	T	CCN - 31848
V1.641	6/4/2013	LA-SMA-6.34	New Control - Routine/Replacement - Control ID: L02402040006	T	CCN - 31848
V1.642	6/4/2013	LA-SMA-6.34	Map Revision - (R6)	T	CCN - 31848
V1.643	7/29/2013	LA-SMA-6.38	Retire Control - Damaged and/or Replaced - Control ID: L02602010001	T	CCN - 31849

**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.644	7/29/2013	LA-SMA-6.38	New Control - Routine/Replacement - Control ID: L02602040011	T	CCN - 31849
V1.645	7/29/2013	LA-SMA-6.38	Map Revision - (R9)	T	CCN - 31849
V1.646	8/7/2013	LA-SMA-5.362	Retire Control - Damaged and/or Replaced - Control ID: L017A02010001	T	CCN - 31846
V1.647	8/7/2013	LA-SMA-5.362	Retire Control - Lifecycle Expired - Control ID: L017A01010007	T	CCN - 31846
V1.648	8/7/2013	LA-SMA-5.362	Retire Control - Lifecycle Expired - Control ID: L017A03010008	T	CCN - 31846
V1.649	8/7/2013	LA-SMA-5.362	Retire Control - Lifecycle Expired - Control ID: L017A03120009	T	CCN - 31846
V1.650	8/7/2013	LA-SMA-5.362	New Control - Augment Existing - Control ID: L017A03010011	T	CCN - 31846
V1.651	8/7/2013	LA-SMA-5.362	New Control - Routine/Replacement - Control ID: L017A02040010	T	CCN - 31846
V1.652	8/7/2013	LA-SMA-5.362	Retire Control - Damaged and/or Replaced - Control ID: L017A03010011	T	CCN - 31846
V1.653	8/7/2013	LA-SMA-5.362	Map Revision - (R6)	T	CCN - 31846
V1.654	8/12/2013	LA-SMA-6.31	Retire Control - Damaged and/or Replaced - Control ID: L022A02010001	T	CCN - 31847
V1.655	8/12/2013	LA-SMA-6.31	Retire Control - Lifecycle Expired - Control ID: L022A03060007	T	CCN - 31847
V1.656	8/12/2013	LA-SMA-6.31	Retire Control - Lifecycle Expired - Control ID: L022A04030003	T	CCN - 31847
V1.657	8/12/2013	LA-SMA-6.31	New Control - Routine/Replacement - Control ID: L022A02040008	T	CCN - 31847
V1.658	8/12/2013	LA-SMA-6.31	Map Revision - (R10)	T	CCN - 31847
V1.659	5/24/2013	ACID-SMA-2	Retire Control - Damaged and/or Replaced - Control ID: P00202020006	T	CCN - 31984
V1.660	5/24/2013	ACID-SMA-2	New Control - Routine/Replacement - Control ID: P00202040018	T	CCN - 31984
V1.661	5/24/2013	ACID-SMA-2	Map Revision - (R7)	T	CCN - 31984
V1.662	6/18/2013	ACID-SMA-2.01	Retire Control - Damaged and/or Replaced - Control ID: P002A02010001	T	CCN - 31985
V1.663	6/18/2013	ACID-SMA-2.01	New Control - Routine/Replacement - Control ID: P002A02040007	T	CCN - 31985
V1.664	6/18/2013	ACID-SMA-2.01	Map Revision - (R5)	T	CCN - 31985
V1.665	8/16/2013	ACID-SMA-2.1	Retire Control - Damaged and/or Replaced - Control ID: P00302010001	T	CCN - 31986
V1.666	8/16/2013	ACID-SMA-2.1	Retire Control - Damaged and/or Replaced - Control ID: P00302020014	T	CCN - 31986
V1.667	8/16/2013	ACID-SMA-2.1	Map Revision - (R7)	T	CCN - 31986

**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.668	8/7/2013	LA-SMA-0.85	Retire Control - Damaged and/or Replaced - Control ID: L00102010003	T	CCN - 32023
V1.669	8/7/2013	LA-SMA-0.85	Retire Control - Damaged and/or Replaced - Control ID: L00102030007	T	CCN - 32023
V1.670	8/7/2013	LA-SMA-0.85	New Control - Routine/Replacement - Control ID: L00102040009	T	CCN - 32023
V1.671	8/7/2013	LA-SMA-0.85	Map Revision - (R7)	T	CCN - 32023
V1.672	8/12/2013	LA-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: L00302010003	T	CCN - 32024
V1.673	8/12/2013	LA-SMA-1	New Control - Routine/Replacement - Control ID: L00302040025	T	CCN - 32024
V1.674	8/12/2013	LA-SMA-1	Map Revision - (R10)	T	CCN - 32024
V1.675	5/24/2013	LA-SMA-10.12	Retire Control - Damaged and/or Replaced - Control ID: L030A02010031	T	CCN - 31844
V1.676	5/24/2013	LA-SMA-10.12	New Control - Routine/Replacement - Control ID: L030A02040032	T	CCN - 31844
V1.677	5/24/2013	LA-SMA-10.12	Map Revision - (R7)	T	CCN - 31844
V1.678	6/18/2013	P-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: P00502010001	T	CCN - 32060
V1.679	6/18/2013	P-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: P00502030014	T	CCN - 32030
V1.680	6/18/2013	P-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: P00502030015	T	CCN - 32060
V1.681	6/18/2013	P-SMA-1	New Control - Routine/Replacement - Control ID: P00502040040	T	CCN - 32060
V1.682	6/18/2013	P-SMA-1	Map Revision - (R8)	T	CCN - 32060
V1.683	7/19/2013	P-SMA-2	Retire Control - Damaged and/or Replaced - Control ID: P00602010007	T	CCN - 32061
V1.684	7/19/2013	P-SMA-2	New Control - Routine/Replacement - Control ID: P00602040011	T	CCN - 32061
V1.685	7/19/2013	P-SMA-2	Map Revision - (R4)	T	CCN - 32061
V1.686	5/24/2013	P-SMA-2.15	Retire Control - Damaged and/or Replaced - Control ID: P00702010001	T	CCN - 32062
V1.687	5/24/2013	P-SMA-2.15	Retire Control - Damaged and/or Replaced - Control ID: P00702030002	T	CCN - 32062
V1.688	5/24/2013	P-SMA-2.15	New Control - Routine/Replacement - Control ID: P00702040007	T	CCN - 32062
V1.689	5/24/2013	P-SMA-2.15	Map Revision - (R5)	T	CCN - 32062
V1.690	6/4/2013	P-SMA-3.05	Retire Control - Damaged and/or Replaced - Control ID: P00902010001	T	CCN - 32063
V1.691	6/4/2013	P-SMA-3.05	New Control - Routine/Replacement - Control ID: P00902040012	T	CCN - 32063

**Attachment 1, Amendments (continued)**

<b>Amendment Number</b>	<b>Effective Date</b>	<b>SMA Number or Section Number</b>	<b>Description of Changes</b>	<b>Type of Change [Technical (T), Documentation (D), or Errata (E)]</b>	<b>Reference</b>
V1.692	6/4/2013	P-SMA-3.05	Map Revision - (R5)	T	CCN - 32063
V1.693	5/24/2013	P-SMA-2.2	Retire Control - Damaged and/or Replaced - Control ID: P00802010002	T	CCN - 32064
V1.694	5/24/2013	P-SMA-2.2	New Control - Routine/Replacement - Control ID: P00802040025	T	CCN - 32064
V1.695	5/24/2013	P-SMA-2.2	Retire Control - Lifecycle Expired - Control ID: P00803130015	T	CCN - 32064
V1.696	5/24/2013	P-SMA-2.2	Retire Control - Lifecycle Expired - Control ID: P00803130016	T	CCN - 32064
V1.697	5/24/2013	P-SMA-2.2	Map Revision - (R9)	T	CCN - 32064
V1.698	6/4/2013	P-SMA-0.3	Retire Control - Damaged and/or Replaced - Control ID: P00402010001	T	CCN - 32065
V1.699	6/4/2013	P-SMA-0.3	New Control - Routine/Replacement - Control ID: P00402040008	T	CCN - 32065
V1.700	6/4/2013	P-SMA-0.3	Retire Control - Lifecycle Expired - Control ID: P00403010007	T	CCN - 32065
V1.701	6/4/2013	P-SMA-0.3	Map Revision - (R8)	T	CCN - 32065
V1.702	7/19/2013	LA-SMA-2.1	Retire Control - Damaged and/or Replaced - Control ID: L00602020004	T	CCN - 32070
V1.703	7/19/2013	LA-SMA-2.1	New Control - Routine/Replacement - Control ID: L00602040011	T	CCN - 32070
V1.704	7/19/2013	LA-SMA-2.1	Map Revision - (R9)	T	CCN - 32070
V1.705	6/18/2013	B-SMA-0.5	Retire Control - Damaged and/or Replaced - Control ID: B00102010001	T	CCN - 32075
V1.706	6/18/2013	B-SMA-0.5	Retire Control - Damaged and/or Replaced - Control ID: B00102020002	T	CCN - 32075
V1.707	6/18/2013	B-SMA-0.5	New Control - Routine/Replacement - Control ID: B00102040012	T	CCN - 32075
V1.708	6/18/2013	B-SMA-0.5	Map Revision - (R8)	T	CCN - 32075
V1.709	5/29/2013	LA-SMA-9	Retire Control - Damaged and/or Replaced - Control ID: L02902010001	T	CCN - 32076
V1.710	5/29/2013	LA-SMA-9	New Control - Routine/Replacement - Control ID: L02902040015	T	CCN - 32076
V1.711	5/29/2013	LA-SMA-9	Map Revision - (R6)	T	CCN - 32076
V1.712	6/18/2013	R-SMA-2.5	Retire Control - Damaged and/or Replaced - Control ID: R00602010001	T	CCN - 32100
V1.713	6/18/2013	R-SMA-2.5	Retire Control - Damaged and/or Replaced - Control ID: R00602020002	T	CCN - 32100
V1.714	6/18/2013	R-SMA-2.5	New Control - Routine/Replacement - Control ID: R00602040007	T	CCN - 32100
V1.715	6/18/2013	R-SMA-2.5	Map Revision - (R5)	T	CCN - 32100



**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.716	6/18/2013	R-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: R00202010003	T	CCN - 32101
V1.717	6/18/2013	R-SMA-1	New Control - Routine/Replacement - Control ID: R00202040008	T	CCN - 32101
V1.718	6/18/2013	R-SMA-1	Map Revision - (R5)	T	CCN - 32101
V1.719	6/18/2013	R-SMA-1.95	Retire Control - Damaged and/or Replaced - Control ID: R00302010001	T	CCN - 32102
V1.720	6/18/2013	R-SMA-1.95	New Control - Routine/Replacement - Control ID: R00302040008	T	CCN - 32102
V1.721	6/18/2013	R-SMA-1.95	Map Revision - (R4)	T	CCN - 32102
V1.722	6/18/2013	R-SMA-2.05	Retire Control - Damaged and/or Replaced - Control ID: R00402020001	T	CCN - 32103
V1.723	6/18/2013	R-SMA-2.05	New Control - Routine/Replacement - Control ID: R00402040005	T	CCN - 32103
V1.724	6/18/2013	R-SMA-2.05	Map Revision - (R3)	T	CCN - 32103
V1.725	7/24/2013	LA-SMA-5.33	Retire Control - Damaged and/or Replaced - Control ID: L01602020004	T	CCN - 32077
V1.726	7/24/2013	LA-SMA-5.33	New Control - Routine/Replacement - Control ID: L01602040014	T	CCN - 32077
V1.727	7/24/2013	LA-SMA-5.33	Retire Control - Lifecycle Expired - Control ID: L01601040013	T	CCN - 32077
V1.728	7/24/2013	LA-SMA-5.33	Map Revision - (R10)	T	CCN - 32077
V1.729	7/24/2013	LA-SMA-5.33	New Control - Augment Existing - Control ID: L01603010015	T	CCN - 32077
V1.730	6/18/2013	LA-SMA-3.9	Retire Control - Damaged and/or Replaced - Control ID: L00902010001	T	CCN - 32118
V1.731	6/18/2013	LA-SMA-3.9	New Control - Routine/Replacement - Control ID: L00902040005	T	CCN - 32118
V1.732	6/18/2013	LA-SMA-3.9	Map Revision - (R6)	T	CCN - 32118
V1.733	6/18/2013	LA-SMA-0.9	Retire Control - Damaged and/or Replaced - Control ID: L00202010001	T	CCN - 32150
V1.734	6/18/2013	LA-SMA-0.9	New Control - Routine/Replacement - Control ID: L00202040020	T	CCN - 32150
V1.735	6/18/2013	LA-SMA-0.9	Retire Control - Lifecycle Expired - Control ID: L00201060019	T	CCN - 32150
V1.736	6/18/2013	LA-SMA-0.9	Map Revision - (R11)	T	CCN - 32150
V1.737	8/30/2013	LA-SMA-1.25	Retire Control - Damaged and/or Replaced - Control ID: L00502020005	T	CCN - 32026
V1.738	8/30/2013	LA-SMA-1.25	New Control - Routine/Replacement - Control ID: L00502040008	T	CCN - 32026
V1.739	8/30/2013	LA-SMA-1.25	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 32026

**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.740	8/30/2013	LA-SMA-1.25	Map Revision - (R7)	T	CCN - 32026
V1.741	5/24/2013	LA-SMA-5.54	Retire Control - Damaged and/or Replaced - Control ID: L018C02020001	T	CCN - 31508
V1.742	5/24/2013	LA-SMA-5.54	New Control - Routine/Replacement - Control ID: L018C02040004	T	CCN - 31508
V1.743	5/24/2013	LA-SMA-5.54	Retire Control - Lifecycle Expired - Control ID: L018C03060003	T	CCN - 31508
V1.744	5/24/2013	LA-SMA-5.54	SMA Boundary Modification	T	CCN - 31508
V1.745	5/24/2013	LA-SMA-5.54	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 31508
V1.746	5/24/2013	LA-SMA-5.54	New Control - Augment Existing - Control ID: L018C03060005	T	CCN - 31508
V1.747	5/24/2013	LA-SMA-5.54	New Control - Augment Existing - Control ID: L018C03060009	T	CCN - 31508
V1.748	5/24/2013	LA-SMA-5.54	New Control - Augment Existing - Control ID: L018C03060010	T	CCN - 31508
V1.749	5/24/2013	LA-SMA-5.54	Map Revision - (R4)	T	CCN - 31508
V1.750	8/7/2013	LA-SMA-5.31	Retire Control - Damaged and/or Replaced - Control ID: L01502010001	T	CCN - 32174
V1.751	8/7/2013	LA-SMA-5.31	New Control - Routine/Replacement - Control ID: L01501010015	T	CCN - 32174
V1.752	8/7/2013	LA-SMA-5.31	Map Revision - (R9)	T	CCN - 32174
V1.753	6/18/2013	LA-SMA-5.361	Retire Control - Damaged and/or Replaced - Control ID: L01702010001	T	CCN - 31845
V1.754	6/18/2013	LA-SMA-5.361	Retire Control - Damaged and/or Replaced - Control ID: L01701010008	T	CCN - 31845
V1.755	6/18/2013	LA-SMA-5.361	New Control - Routine/Replacement - Control ID: L01702040010	T	CCN - 31845
V1.756	6/18/2013	LA-SMA-5.361	New Control - Augment Existing - Control ID: L01703010011	T	CCN - 31845
V1.757	6/18/2013	LA-SMA-5.361	Site Boundary Modification	T	CCN - 31845
V1.758	6/18/2013	LA-SMA-5.361	Map Revision - (R6)	T	CCN - 31845
V1.759	5/24/2013	LA-SMA-5.52	Retire Control - Damaged and/or Replaced - Control ID: L018A02020001	T	CCN - 31510
V1.760	5/24/2013	LA-SMA-5.52	New Control - Routine/Replacement - Control ID: L018A02040007	T	CCN - 31510
V1.761	5/24/2013	LA-SMA-5.52	Map Revision - (R4)	T	CCN - 31510
V1.762	5/24/2013	LA-SMA-1.1	Retire Control - Damaged and/or Replaced - Control ID: L00402010001	T	CCN - 32025
V1.763	5/24/2013	LA-SMA-1.1	New Control - Routine/Replacement - Control ID: L00402040007	T	CCN - 32025

**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.764	5/24/2013	LA-SMA-1.1	Map Revision - (R6)	T	CCN - 32025
V1.765	7/24/2013	LA-SMA-3.1	Retire Control - Damaged and/or Replaced - Control ID: L00802020006	T	CCN - 32144
V1.766	7/24/2013	LA-SMA-3.1	Retire Control - Damaged and/or Replaced - Control ID: L00802010003	T	CCN - 32144
V1.767	7/24/2013	LA-SMA-3.1	Retire Control - Damaged and/or Replaced - Control ID: L00802030005	T	CCN - 32144
V1.768	7/24/2013	LA-SMA-3.1	New Control - Routine/Replacement - Control ID: L00802040007	T	CCN - 32144
V1.769	7/24/2013	LA-SMA-3.1	New Control - Augment Existing - Control ID: L00803060008	T	CCN - 32144
V1.770	7/24/2013	LA-SMA-3.1	Map Revision - (R5)	T	CCN - 32144
V1.771	7/24/2013	LA-SMA-2.3	Retire Control - Damaged and/or Replaced - Control ID: L00702010001	T	CCN - 32107
V1.772	7/24/2013	LA-SMA-2.3	New Control - Routine/Replacement - Control ID: L00702040006	T	CCN - 32107
V1.773	7/24/2013	LA-SMA-2.3	Retire Control - Lifecycle Expired - Control ID: L00703060004	T	CCN - 32107
V1.774	7/24/2013	LA-SMA-2.3	New Control - Augment Existing - Control ID: L00703060007	T	CCN - 32107
V1.775	7/24/2013	LA-SMA-2.3	Map Revision - (R6)	T	CCN - 32107
V1.776	7/31/2013	LA-SMA-5.35	Map Revision - (R5)	T	CCN - 32430
V1.777	6/18/2013	LA-SMA-5.2	Retire Control - Damaged and/or Replaced - Control ID: L01302010001	T	CCN - 32172
V1.778	6/18/2013	LA-SMA-5.2	New Control - Routine/Replacement - Control ID: L01302040005	T	CCN - 32172
V1.779	6/18/2013	LA-SMA-5.2	Retire Control - Lifecycle Expired - Control ID: L01306010003	T	CCN - 32172
V1.780	6/18/2013	LA-SMA-5.2	Retire Control - Lifecycle Expired - Control ID: L01306010004	T	CCN - 32172
V1.781	6/18/2013	LA-SMA-5.2	New Control - Augment Existing - Control ID: L01306020006	T	CCN - 32172
V1.782	6/18/2013	LA-SMA-5.2	New Control - Augment Existing - Control ID: L01306020007	T	CCN - 32172
V1.783	6/18/2013	LA-SMA-5.2	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 32172
V1.784	6/18/2013	LA-SMA-5.2	SMA Boundary Modification	T	CCN - 32172
V1.785	6/18/2013	LA-SMA-5.2	Map Revision - (R6)	T	CCN - 32172
V1.786	6/18/2013	LA-SMA-5.92	Retire Control - Damaged and/or Replaced - Control ID: L019A02010001	T	CCN - 32073
V1.787	6/18/2013	LA-SMA-5.92	New Control - Routine/Replacement - Control ID: L019A02040007	T	CCN - 32073

**Attachment 1, Amendments (continued)**

<b>Amendment Number</b>	<b>Effective Date</b>	<b>SMA Number or Section Number</b>	<b>Description of Changes</b>	<b>Type of Change [Technical (T), Documentation (D), or Errata (E)]</b>	<b>Reference</b>
V1.788	6/18/2013	LA-SMA-5.92	Map Revision - (R5)	T	CCN - 32073
V1.789	6/18/2013	LA-SMA-5.91	Retire Control - Damaged and/or Replaced - Control ID: L01902010006	T	CCN - 32074
V1.790	6/18/2013	LA-SMA-5.91	New Control - Routine/Replacement - Control ID: L01902040010	T	CCN - 32074
V1.791	6/18/2013	LA-SMA-5.91	Map Revision - (R5)	T	CCN - 32074
V1.792	6/18/2013	R-SMA-0.5	Retire Control - Damaged and/or Replaced - Control ID: R00102010001	T	CCN - 32099
V1.793	6/18/2013	R-SMA-0.5	Retire Control - Damaged and/or Replaced - Control ID: R00102020002	T	CCN - 32099
V1.794	6/18/2013	R-SMA-0.5	New Control - Routine/Replacement - Control ID: R00102040025	T	CCN - 32099
V1.795	6/18/2013	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00101010014	T	CCN - 32099
V1.796	6/18/2013	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00101010015	T	CCN - 32099
V1.797	6/18/2013	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00101010016	T	CCN - 32099
V1.798	6/18/2013	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060010	T	CCN - 32099
V1.799	6/18/2013	R-SMA-0.5	Map Revision - (R7)	T	CCN - 32099
V1.800	6/18/2013	R-SMA-2.3	Retire Control - Damaged and/or Replaced - Control ID: R00502010001	T	CCN - 32104
V1.801	6/18/2013	R-SMA-2.3	Retire Control - Damaged and/or Replaced - Control ID: R00502020002	T	CCN - 32104
V1.802	6/18/2013	R-SMA-2.3	New Control - Routine/Replacement - Control ID: R00502040004	T	CCN - 32104
V1.803	6/18/2013	R-SMA-2.3	Map Revision - (R4)	T	CCN - 32104
V1.804	8/7/2013	DP-SMA-2.35	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 32827
V1.805	8/7/2013	DP-SMA-2.35	SMA Boundary Modification	T	CCN - 32827
V1.806	8/7/2013	DP-SMA-2.35	Map Revision - (R7)	T	CCN - 32827
V1.807	7/24/2013	R-SMA-1	Retire Control - Lifecycle Expired - Control ID: R00207010001	T	CCN - 32828
V1.808	7/24/2013	R-SMA-1	Map Revision - (R6)	T	CCN - 32828
V1.809	7/19/2013	LA-SMA-6.3	Retire Control - Damaged and/or Replaced - Control ID: L02202010003	T	CCN - 31635
V1.810	7/19/2013	LA-SMA-6.3	New Control - Routine/Replacement - Control ID: L02202040009	T	CCN - 31635
V1.811	7/19/2013	LA-SMA-6.3	Map Revision - (R8)	T	CCN - 31635



**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.812	7/19/2013	R-SMA-0.5	Retire Control - Lifecycle Expired - Control ID: R00103060020	T	CCN - 33323
V1.813	7/19/2013	R-SMA-0.5	Map Revision - (R8)	T	CCN - 33323
V1.814	7/19/2013	DP-SMA-0.3	Retire Control - Damaged and/or Replaced - Control ID: D00102020005	T	CCN - 31513
V1.815	7/19/2013	DP-SMA-0.3	Retire Control - Damaged and/or Replaced - Control ID: D00102010015	T	CCN - 31513
V1.816	7/19/2013	DP-SMA-0.3	New Control - Routine/Replacement - Control ID: D00102040025	T	CCN - 31513
V1.817	7/19/2013	DP-SMA-0.3	Retire Control - Damaged and/or Replaced - Control ID: D00103010014	T	CCN - 31513
V1.818	7/19/2013	DP-SMA-0.3	Map Revision - (R10)	T	CCN - 31513
V1.819	7/29/2013	LA-SMA-5.54	Retire Control - Lifecycle Expired - Control ID: L018C03060007	T	CCN - 32111
V1.820	7/29/2013	LA-SMA-5.54	New Control - Augment Existing - Control ID: L018C03060009	T	CCN - 32111
V1.821	7/29/2013	LA-SMA-5.54	Map Revision - (R5)	T	CCN - 32111
V1.822	7/29/2013	LA-SMA-6.25	Retire Control - Lifecycle Expired - Control ID: L02003060006	T	CCN - 32109
V1.823	7/29/2013	LA-SMA-6.25	New Control - Augment Existing - Control ID: L02003060008	T	CCN - 32109
V1.824	7/29/2013	LA-SMA-6.25	Map Revision - (R7)	T	CCN - 32109
V1.825	8/7/2013	ACID-SMA-1.05	New Control - Augment Existing - Control ID: P00103100006	T	CCN - 34079
V1.826	8/7/2013	ACID-SMA-1.05	Map Revision - (R3)	T	CCN - 34079
V1.827	7/31/2013	R-SMA-0.5	Retire Control - Damaged and/or Replaced - Control ID: R00103060012	T	CCN - 34373
V1.828	7/31/2013	R-SMA-0.5	New Control - Augment Existing - Control ID: R00103060026	T	CCN - 34373
V1.829	7/31/2013	R-SMA-0.5	Retire Control - Damaged and/or Replaced - Control ID: R00103060011	T	CCN - 34373
V1.830	7/31/2013	R-SMA-0.5	New Control - Augment Existing - Control ID: R00103060027	T	CCN - 34373
V1.831	7/31/2013	R-SMA-0.5	Map Revision - (R9)	T	CCN - 34373
V1.832	8/7/2013	B-SMA-0.5	Map Revision - (R9)	E	CCN - 34633
V1.833	8/19/2013	P-SMA-2.2	Retire Control - Lifecycle Expired - Control ID: P00803130014	T	CCN - 33982
V1.834	8/19/2013	P-SMA-2.2	Retire Control - Lifecycle Expired - Control ID: P00803130024	T	CCN - 33982
V1.835	8/19/2013	P-SMA-2.2	Retire Control - Lifecycle Expired - Control ID: P00803060023	T	CCN - 33982

**Attachment 1, Amendments (continued)**

Amendment Number	Effective Date	SMA Number or Section Number	Description of Changes	Type of Change [Technical (T), Documentation (D), or Errata (E)]	Reference
V1.836	8/19/2013	P-SMA-2.2	Minor Sampler Adjustment, Updated Coordinates in Attach D.	T	CCN - 33982
V1.837	8/19/2013	P-SMA-2.2	SMA Boundary Modification	T	CCN - 33982
V1.838	8/19/2013	P-SMA-2.2	New Control - Augment Existing - Control ID: P00803060026	T	CCN - 33982
V1.839	8/19/2013	P-SMA-2.2	Map Revision - (R10)	T	CCN - 33982
V1.840	8/12/2013	LA-SMA-4.1	Retire Control - Lifecycle Expired - Control ID: L01004060007	T	CCN - 34691
V1.841	8/12/2013	LA-SMA-4.1	Map Revision - (R7)	T	CCN - 34691
V1.842	8/16/2013	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060010	T	CCN - 34081
V1.843	8/16/2013	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060005	T	CCN - 34081
V1.844	8/16/2013	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060006	T	CCN - 34081
V1.845	8/16/2013	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060011	T	CCN - 34081
V1.846	8/16/2013	LA-SMA-5.02	New Control - Routine/Replacement - Control ID: L012A03060013	T	CCN - 34081
V1.847	8/16/2013	LA-SMA-5.02	New Control - Routine/Replacement - Control ID: L012A03060014	T	CCN - 34081
V1.848	8/16/2013	LA-SMA-5.02	New Control - Routine/Replacement - Control ID: L012A03060015	T	CCN - 34081
V1.849	8/16/2013	LA-SMA-5.02	Map Revision - (R8)	T	CCN - 34081
V1.850	8/16/2013	R-SMA-0.5	Map Revision - (R10)	T	CCN - 34656
V1.851	8/30/2013	P-SMA-2.2	Map Revision - (R11)	T	CCN - 34887
V1.852	8/16/2013	LA-SMA-10.11	Map Revision - (R3)	T	CCN - 34926
V1.853	8/27/2013	ACID-SMA-1.05	Map Revision - (R4)	T	CCN - 34964
V1.854	9/6/2013	ACID-SMA-1.05	Retire Control - Lifecycle Expired - Control ID: P00103100006	T	CCN - 35359
V1.855	9/6/2013	ACID-SMA-1.05	Map Revision - (R5)	T	CCN - 35359
V1.856	10/23/2013	ACID-SMA-2.1	Map Revision - (R8)	T	CCN - 35485
V1.857	11/5/2013	LA-SMA-5.91	Map Revision - (R6)	T	CCN - 36994
V1.858	11/5/2013	LA-SMA-5.33	Retire Control - Lifecycle Expired - Control ID: L01603010015	T	CCN - 37043
V1.859	11/5/2013	LA-SMA-5.33	Retire Control - Lifecycle Expired - Control ID: L01601030010	T	CCN - 37043

**Attachment 1, Amendments (continued)**

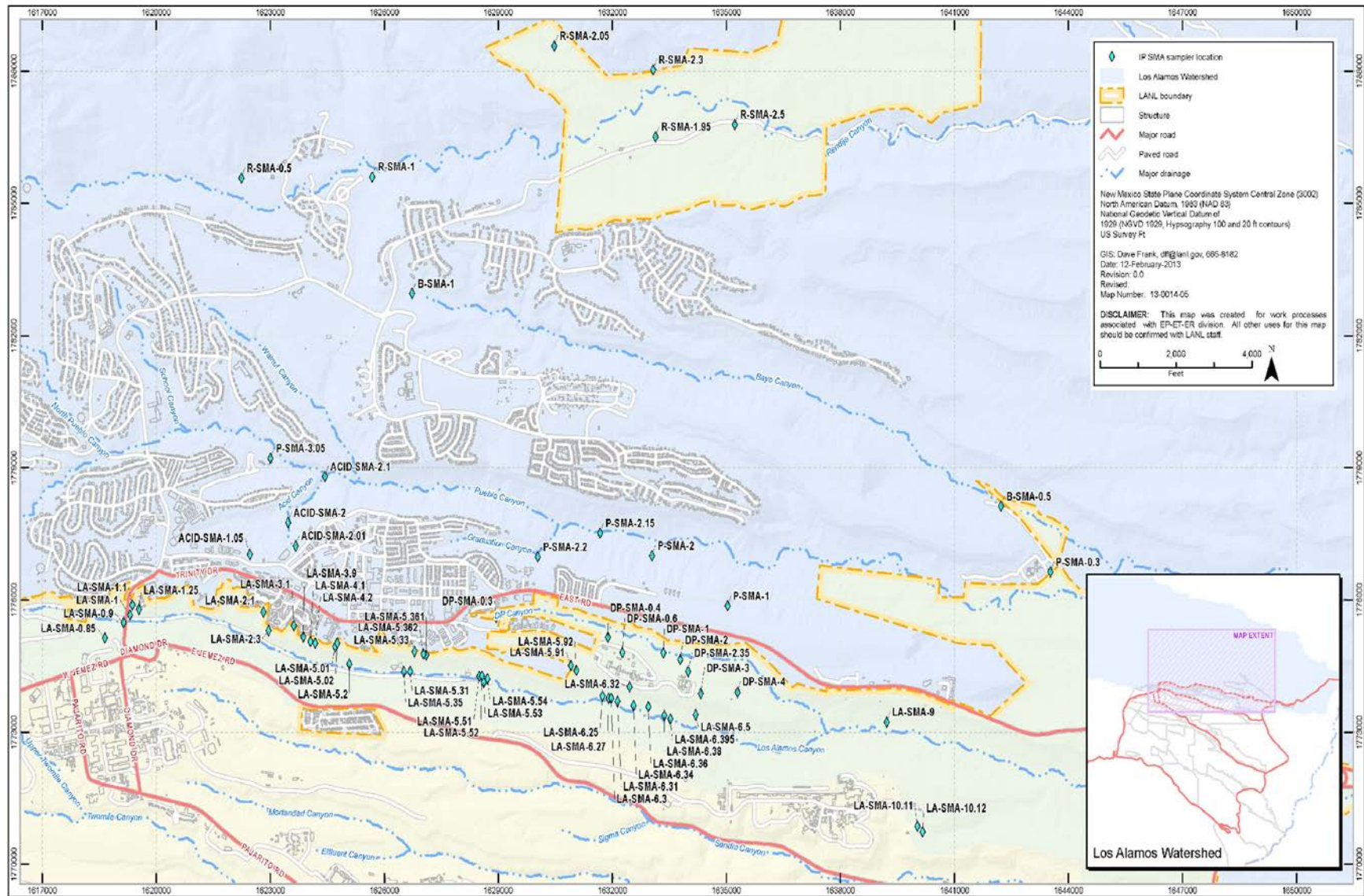
<b>Amendment Number</b>	<b>Effective Date</b>	<b>SMA Number or Section Number</b>	<b>Description of Changes</b>	<b>Type of Change [Technical (T), Documentation (D), or Errata (E)]</b>	<b>Reference</b>
V1.860	11/5/2013	LA-SMA-5.33	Map Revision - (R11)	T	CCN - 37043
V1.861	11/20/2013	LA-SMA-1	Retire Control - Damaged and/or Replaced - Control ID: L00306010014	T	CCN - 36917
V1.862	11/20/2013	LA-SMA-1	Map Revision - (R11)	T	CCN - 36917
V1.863	11/20/2013	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060013	T	CCN - 37302
V1.864	11/20/2013	LA-SMA-5.02	New Control - Routine/Replacement - Control ID: L012A03060016	T	CCN - 37302
V1.865	11/20/2013	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060014	T	CCN - 37302
V1.866	11/20/2013	LA-SMA-5.02	New Control - Routine/Replacement - Control ID: L012A03060017	T	CCN - 37302
V1.867	11/20/2013	LA-SMA-5.02	Retire Control - Damaged and/or Replaced - Control ID: L012A03060015	T	CCN - 37302
V1.868	11/20/2013	LA-SMA-5.02	New Control - Routine/Replacement - Control ID: L012A03060018	T	CCN - 37302
V1.869	11/20/2013	LA-SMA-5.02	Map Revision - (R9)	T	CCN - 37302
V1.870	11/20/2013	LA-SMA-5.54	Retire Control - Damaged and/or Replaced - Control ID: L018C03060006	T	CCN - 37303
V1.871	11/20/2013	LA-SMA-5.54	New Control - Routine/Replacement - Control ID: L018C03060009	T	CCN - 37303
V1.872	11/20/2013	LA-SMA-5.54	Retire Control - Damaged and/or Replaced - Control ID: L018C03060008	T	CCN - 37303
V1.873	11/20/2013	LA-SMA-5.54	New Control - Routine/Replacement - Control ID: L018C03060010	T	CCN - 37303
V1.874	11/20/2013	LA-SMA-5.54	Map Revision - (R6)	T	CCN - 37303
V1.875	11/20/2013	LA-SMA-5.53	Retire Control - Damaged and/or Replaced - Control ID: L018B03060005	T	CCN - 37304
V1.876	11/20/2013	LA-SMA-5.53	New Control - Routine/Replacement - Control ID: L018B03060008	T	CCN - 37304
V1.877	11/20/2013	LA-SMA-5.53	Retire Control - Damaged and/or Replaced - Control ID: L018B03060006	T	CCN - 37304
V1.878	11/20/2013	LA-SMA-5.53	New Control - Routine/Replacement - Control ID: L018B03060009	T	CCN - 37304
V1.879	11/20/2013	LA-SMA-5.53	Map Revision - (R5)	T	CCN - 37304
V1.880	11/20/2013	R-SMA-2.3	Retire Control - Damaged and/or Replaced - Control ID: R00506030003	T	CCN - 37291
V1.881	11/20/2013	R-SMA-2.3	New Control - Routine/Replacement - Control ID: R00503060005	T	CCN - 37291
V1.882	11/20/2013	R-SMA-2.3	New Control - Routine/Replacement - Control ID: R00503060006	T	CCN - 37291
V1.883	11/20/2013	R-SMA-2.3	New Control - Routine/Replacement - Control ID: R00503060007	T	CCN - 37291

**Attachment 1, Amendments (continued)**

<b>Amendment Number</b>	<b>Effective Date</b>	<b>SMA Number or Section Number</b>	<b>Description of Changes</b>	<b>Type of Change [Technical (T), Documentation (D), or Errata (E)]</b>	<b>Reference</b>
V1.884	11/20/2013	R-SMA-2.3	Map Revision - (R5)	T	CCN - 37291
V1.885	11/22/2013	DP-SMA-0.3	Map Revision - (R11)	T	CCN - 36577
V1.886	8/16/2013	ACID-SMA-2.1	New Control - Routine/Replacement - Control ID: P00302040019	T	CCN - 31986
V1.887	2/28/2014	All Sections	Change to SDPPP - Updated storm water results section for each SMA in the SDPPP volume that had a storm water sample collected in 2013.	T	
V1.888	4/2/2014	Attachment 1	Change to SDPPP - Updated amendments to SDPPP completed in 2013.	T	
V1.889	4/2/2014	Attachment 3	Change to SDPPP - Updated precipitation data collected in 2013.	T	
V1.890	4/2/2014	Attachment 4	Change to SDPPP - Updated changes to SMA and Site Characteristics made in 2013.	T	
V1.891	4/2/2014	Attachment 5	Change to SDPPP - Updated sampling plan for samples to be collected in 2014.	T	
V1.892	4/2/2014	All Sections	Change to SDPPP - Updated AOC and SWMU (Site) descriptions in the SDPPP volume to the most recent updated versions prepared for the Permit Renewal.	T	
V1.893	4/2/2014	DP-SMA-4	Map Revision - (R7)	T	CCN - 38035



# Attachment 2 Vicinity Map



## Attachment 3 Precipitation Network

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG038	April 8, 2013	0.01	0.01	5
RG038	April 9, 2013	0.2	0.03	100
RG038	April 10, 2013	0.22	0.12	75
RG038	April 11, 2013	0.02	0.02	10
RG038	April 18, 2013	0.01	0.01	5
RG038	May 7, 2013	0.01	0.01	5
RG038	May 10, 2013	0.06	0.06	30
RG038	May 11, 2013	0.01	0.01	5
RG038	May 15, 2013	0.04	0.03	30
RG038	June 14, 2013	0.53	0.22	95
RG038	June 17, 2013	0.01	0.01	5
RG038	June 28, 2013	0.01	0.01	5
RG038	June 29, 2013	0.02	0.02	10
RG038	June 30, 2013	0.2	0.19	30
RG038	July 2, 2013	0.05	0.03	30
RG038	July 3, 2013	0.02	0.01	10
RG038	July 5, 2013	0.26	0.12	75
RG038	July 6, 2013	0.01	0.01	5
RG038	July 7, 2013	0.04	0.04	15
RG038	July 11, 2013	0.03	0.02	15
RG038	July 12, 2013	0.49	0.33	75
RG038	July 13, 2013	0.03	0.01	15
RG038	July 14, 2013	0.1	0.08	30
RG038	July 15, 2013	0.01	0.01	5
RG038	July 20, 2013	0.01	0.01	5
RG038	July 21, 2013	0.2	0.18	30
RG038	July 25, 2013	0.27	0.18	60
RG038	July 26, 2013	0.31	0.2	80
RG038	July 28, 2013	0.16	0.15	30
RG038	July 29, 2013	0.01	0.01	5
RG038	July 30, 2013	0.03	0.03	10
RG038	July 31, 2013	0.02	0.01	10
RG038	August 1, 2013	0.06	0.02	30
RG038	August 2, 2013	0.04	0.02	30
RG038	August 4, 2013	0.45	0.12	160

**Attachment 3, Precipitation Network (continued)**

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG038	August 5, 2013	0.28	0.21	60
RG038	August 6, 2013	0.03	0.02	15
RG038	August 7, 2013	0.01	0.01	5
RG038	August 8, 2013	0.03	0.03	15
RG038	August 9, 2013	0.09	0.06	30
RG038	August 13, 2013	0.03	0.02	10
RG038	August 14, 2013	0.01	0.01	5
RG038	August 17, 2013	0.01	0.01	5
RG038	August 18, 2013	0.05	0.04	30
RG038	August 20, 2013	0.02	0.02	10
RG038	August 25, 2013	0.02	0.01	10
RG038	September 2, 2013	0.11	0.08	30
RG038	September 8, 2013	0.02	0.02	10
RG038	September 10, 2013	1.16	0.16	420
RG038	September 11, 2013	0.02	0.02	10
RG038	September 12, 2013	1.33	0.2	420
RG038	September 13, 2013	2.08	0.71	300
RG038	September 14, 2013	0.16	0.06	80
RG038	September 15, 2013	0.03	0.02	15
RG038	September 17, 2013	0.33	0.23	60
RG038	September 18, 2013	0.04	0.01	30
RG038	September 21, 2013	0.12	0.12	30
RG038	September 22, 2013	0.43	0.21	90
RG038	September 27, 2013	0.01	0.01	5
RG038	October 10, 2013	0.12	0.05	60
RG038	October 13, 2013	0.15	0.05	60
RG038	October 15, 2013	0.14	0.04	60
RG038	October 16, 2013	0.05	0.02	30
RG038	October 24, 2013	0.35	0.12	120
RG038	October 25, 2013	0.02	0.01	10
RG038	October 29, 2013	0.01	0.01	5
RG038	October 30, 2013	0.03	0.01	15
RG038	November 4, 2013	0.58	0.15	240
RG038	November 5, 2013	0.03	0.01	15
RG055.5	April 8, 2013	0.02	0.02	10
RG055.5	April 9, 2013	0.3	0.05	145
RG055.5	April 10, 2013	0.29	0.19	75

**Attachment 3, Precipitation Network (continued)**

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG055.5	April 18, 2013	0.01	0.01	5
RG055.5	April 24, 2013	0.01	0.01	5
RG055.5	May 7, 2013	0.01	0.01	5
RG055.5	May 9, 2013	0.04	0.03	20
RG055.5	May 10, 2013	0.08	0.05	40
RG055.5	May 15, 2013	0.08	0.07	15
RG055.5	June 14, 2013	0.93	0.45	110
RG055.5	June 17, 2013	0.05	0.04	15
RG055.5	June 28, 2013	0.01	0.01	5
RG055.5	June 29, 2013	0.05	0.05	20
RG055.5	June 30, 2013	0.31	0.21	50
RG055.5	July 2, 2013	0.17	0.08	45
RG055.5	July 3, 2013	0.01	0.01	5
RG055.5	July 5, 2013	0.37	0.17	85
RG055.5	July 6, 2013	0.04	0.02	20
RG055.5	July 7, 2013	0.01	0.01	5
RG055.5	July 11, 2013	0.11	0.1	30
RG055.5	July 12, 2013	1.05	0.64	80
RG055.5	July 13, 2013	0.34	0.14	95
RG055.5	July 14, 2013	0.1	0.04	45
RG055.5	July 15, 2013	0.01	0.01	5
RG055.5	July 20, 2013	0.01	0.01	5
RG055.5	July 21, 2013	0.13	0.07	40
RG055.5	July 22, 2013	0.01	0.01	5
RG055.5	July 24, 2013	0.01	0.01	5
RG055.5	July 25, 2013	0.25	0.15	70
RG055.5	July 26, 2013	0.19	0.09	80
RG055.5	July 28, 2013	0.24	0.24	15
RG055.5	July 29, 2013	0.01	0.01	5
RG055.5	July 30, 2013	0.02	0.02	5
RG055.5	July 31, 2013	0.02	0.02	10
RG055.5	August 1, 2013	0.09	0.05	30
RG055.5	August 2, 2013	0.04	0.02	20
RG055.5	August 4, 2013	0.41	0.23	110
RG055.5	August 5, 2013	0.57	0.35	75
RG055.5	August 9, 2013	0.16	0.11	30
RG055.5	August 13, 2013	0.07	0.05	30



**Attachment 3, Precipitation Network (continued)**

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG055.5	August 14, 2013	0.02	0.02	10
RG055.5	August 17, 2013	0.03	0.02	15
RG055.5	August 18, 2013	0.1	0.05	50
RG055.5	August 20, 2013	0.04	0.03	20
RG055.5	August 25, 2013	0.01	0.01	5
RG055.5	August 30, 2013	0.06	0.05	30
RG055.5	September 1, 2013	0.11	0.1	30
RG055.5	September 2, 2013	0.08	0.07	20
RG055.5	September 3, 2013	0.01	0.01	5
RG055.5	September 8, 2013	0.07	0.07	30
RG055.5	September 10, 2013	1.5	0.23	480
RG055.5	September 11, 2013	0.08	0.06	30
RG055.5	September 12, 2013	1.91	0.28	480
RG055.5	September 13, 2013	2.26	0.96	300
RG055.5	September 14, 2013	0.17	0.04	65
RG055.5	September 15, 2013	0.25	0.23	30
RG055.5	September 17, 2013	0.56	0.23	90
RG055.5	September 18, 2013	0.06	0.03	30
RG055.5	September 22, 2013	0.65	0.17	125
RG055.5	September 27, 2013	0.03	0.02	15
RG055.5	October 9, 2013	0.01	0.01	5
RG055.5	October 10, 2013	0.28	0.13	120
RG055.5	October 13, 2013	0.15	0.04	60
RG055.5	October 15, 2013	0.22	0.04	120
RG055.5	October 16, 2013	0.19	0.08	60
RG055.5	October 24, 2013	0.34	0.09	120
RG055.5	October 25, 2013	0.01	0.01	5
RG055.5	October 29, 2013	0.02	0.01	30
RG055.5	October 30, 2013	0.06	0.03	60
RG055.5	November 4, 2013	0.57	0.18	180
RG121.9	April 8, 2013	0.01	0.01	5
RG121.9	April 9, 2013	0.3	0.06	140
RG121.9	April 10, 2013	0.28	0.15	80
RG121.9	April 23, 2013	0.01	0.01	5
RG121.9	May 9, 2013	0.06	0.04	25
RG121.9	May 10, 2013	0.05	0.03	25
RG121.9	May 15, 2013	0.07	0.06	25

**Attachment 3, Precipitation Network (continued)**

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG121.9	May 20, 2013	0.01	0.01	5
RG121.9	June 14, 2013	0.44	0.17	70
RG121.9	June 17, 2013	0.01	0.01	5
RG121.9	June 28, 2013	0.01	0.01	5
RG121.9	June 29, 2013	0.07	0.06	25
RG121.9	June 30, 2013	0.4	0.23	55
RG121.9	July 2, 2013	0.27	0.16	55
RG121.9	July 5, 2013	0.14	0.06	40
RG121.9	July 6, 2013	0.09	0.08	20
RG121.9	July 7, 2013	0.01	0.01	5
RG121.9	July 11, 2013	0.16	0.16	25
RG121.9	July 12, 2013	0.79	0.63	75
RG121.9	July 13, 2013	0.24	0.11	55
RG121.9	July 14, 2013	0.22	0.16	55
RG121.9	July 15, 2013	0.02	0.01	10
RG121.9	July 20, 2013	0.01	0.01	5
RG121.9	July 21, 2013	0.08	0.06	20
RG121.9	July 24, 2013	0.01	0.01	5
RG121.9	July 25, 2013	0.29	0.11	80
RG121.9	July 26, 2013	0.19	0.08	75
RG121.9	July 28, 2013	0.06	0.05	15
RG121.9	August 1, 2013	0.12	0.07	40
RG121.9	August 2, 2013	0.01	0.01	5
RG121.9	August 4, 2013	0.22	0.05	110
RG121.9	August 5, 2013	0.35	0.18	75
RG121.9	August 8, 2013	0.03	0.03	10
RG121.9	August 9, 2013	0.12	0.05	35
RG121.9	August 13, 2013	0.06	0.04	20
RG121.9	August 18, 2013	0.2	0.15	55
RG121.9	August 19, 2013	0.02	0.02	10
RG121.9	August 20, 2013	0.14	0.12	30
RG121.9	August 21, 2013	0.01	0.01	5
RG121.9	August 25, 2013	0.02	0.02	5
RG121.9	August 30, 2013	0.12	0.12	25
RG121.9	August 31, 2013	0.01	0.01	5
RG121.9	September 1, 2013	0.05	0.05	20
RG121.9	September 2, 2013	0.06	0.05	25

**Attachment 3, Precipitation Network (continued)**

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG121.9	September 8, 2013	0.06	0.06	25
RG121.9	September 10, 2013	1.35	0.15	440
RG121.9	September 11, 2013	0.02	0.01	10
RG121.9	September 12, 2013	2.31	0.35	575
RG121.9	September 13, 2013	2.35	1.11	330
RG121.9	September 14, 2013	0.19	0.05	80
RG121.9	September 15, 2013	0.07	0.06	20
RG121.9	September 17, 2013	0.38	0.2	70
RG121.9	September 18, 2013	0.07	0.04	30
RG121.9	September 22, 2013	0.74	0.15	120
RG121.9	September 27, 2013	0.05	0.03	30
RG121.9	October 9, 2013	0.01	0.01	5
RG121.9	October 10, 2013	0.35	0.16	120
RG121.9	October 13, 2013	0.12	0.04	60
RG121.9	October 15, 2013	0.21	0.04	120
RG121.9	October 16, 2013	0.21	0.06	120
RG121.9	October 24, 2013	0.29	0.09	120
RG121.9	October 25, 2013	0.01	0.01	5
RG121.9	October 29, 2013	0.04	0.02	30
RG121.9	October 30, 2013	0.05	0.03	30
RG121.9	October 31, 2013	0.01	0.01	5
RG121.9	November 4, 2013	0.53	0.16	180
RG-NCOM	January 26, 2013	0.54	0.31	270
RG-NCOM	January 28, 2013	0.02	0.01	30
RG-NCOM	March 8, 2013	0.27	0.06	255
RG-NCOM	April 8, 2013	0.02	0.02	30
RG-NCOM	April 9, 2013	0.43	0.04	600
RG-NCOM	April 10, 2013	0.01	0.01	15
RG-NCOM	April 17, 2013	0.01	0.01	15
RG-NCOM	April 23, 2013	0.01	0.01	15
RG-NCOM	May 9, 2013	0.01	0.01	15
RG-NCOM	May 10, 2013	0.04	0.03	45
RG-NCOM	May 15, 2013	0.07	0.07	30
RG-NCOM	June 13, 2013	0.01	0.01	15
RG-NCOM	June 14, 2013	1.04	0.49	210
RG-NCOM	June 17, 2013	0.05	0.05	15
RG-NCOM	June 29, 2013	0.04	0.04	30

**Attachment 3, Precipitation Network (continued)**

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-NCOM	June 30, 2013	0.29	0.29	30
RG-NCOM	July 2, 2013	0.29	0.2	75
RG-NCOM	July 5, 2013	0.16	0.06	135
RG-NCOM	July 7, 2013	0.01	0.01	15
RG-NCOM	July 11, 2013	0.03	0.03	15
RG-NCOM	July 12, 2013	0.88	0.5	105
RG-NCOM	July 13, 2013	0.21	0.08	120
RG-NCOM	July 14, 2013	0.08	0.05	75
RG-NCOM	July 15, 2013	0.01	0.01	15
RG-NCOM	July 20, 2013	0.06	0.05	45
RG-NCOM	July 21, 2013	0.01	0.01	15
RG-NCOM	July 25, 2013	0.3	0.2	120
RG-NCOM	July 26, 2013	0.18	0.08	90
RG-NCOM	July 28, 2013	0.08	0.08	30
RG-NCOM	July 31, 2013	0.01	0.01	15
RG-NCOM	August 1, 2013	0.09	0.04	105
RG-NCOM	August 4, 2013	0.18	0.07	180
RG-NCOM	August 5, 2013	0.34	0.21	105
RG-NCOM	August 8, 2013	0.01	0.01	15
RG-NCOM	August 9, 2013	0.21	0.16	75
RG-NCOM	August 13, 2013	0.07	0.06	45
RG-NCOM	August 17, 2013	0.03	0.03	30
RG-NCOM	August 18, 2013	0.07	0.03	90
RG-NCOM	August 19, 2013	0.01	0.01	15
RG-NCOM	August 20, 2013	0.52	0.41	60
RG-NCOM	August 25, 2013	0.01	0.01	15
RG-NCOM	September 2, 2013	0.15	0.13	60
RG-NCOM	September 3, 2013	0.02	0.02	30
RG-NCOM	September 8, 2013	0.06	0.06	30
RG-NCOM	September 10, 2013	1.46	0.2	705
RG-NCOM	September 11, 2013	0.03	0.02	45
RG-NCOM	September 12, 2013	2.57	0.47	795
RG-NCOM	September 13, 2013	2.27	0.81	420
RG-NCOM	September 14, 2013	0.12	0.05	120
RG-NCOM	September 15, 2013	0.04	0.03	45
RG-NCOM	September 17, 2013	0.28	0.13	150
RG-NCOM	September 18, 2013	0.03	0.01	45



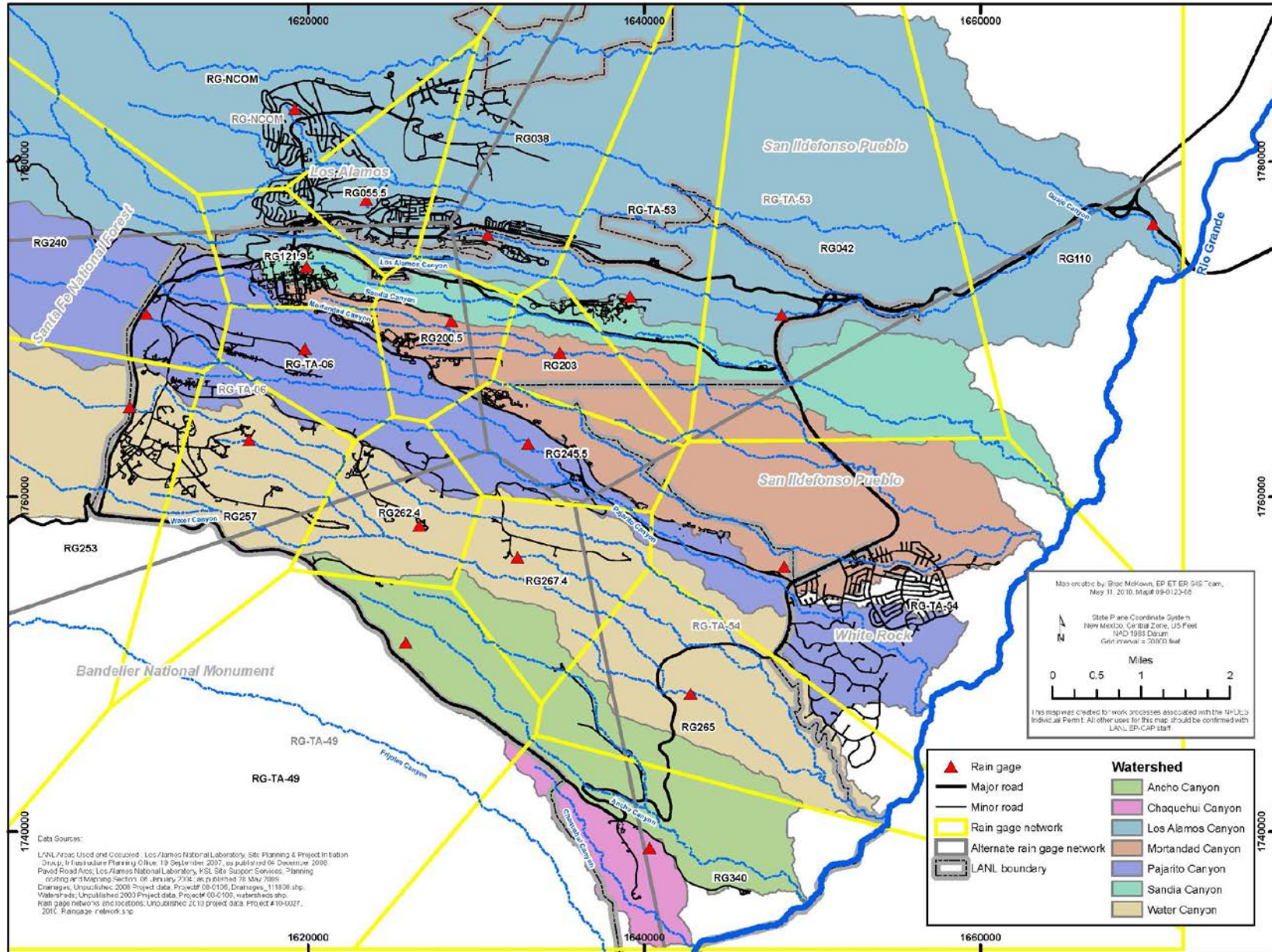
**Attachment 3, Precipitation Network (continued)**

Rain Gage	Date	Total (in.)	Intensity (in./30 min)	Duration (min)
RG-NCOM	September 21, 2013	0.17	0.14	60
RG-NCOM	September 22, 2013	0.52	0.19	195
RG-NCOM	September 27, 2013	0.03	0.02	45
RG-NCOM	October 10, 2013	0.26	0.1	120
RG-NCOM	October 13, 2013	0.14	0.05	150
RG-NCOM	October 15, 2013	0.32	0.04	375
RG-NCOM	October 24, 2013	0.26	0.06	225
RG-NCOM	October 30, 2013	0.04	0.01	60
RG-NCOM	November 4, 2013	0.38	0.1	300
RG-NCOM	November 15, 2013	0.15	0.05	135
RG-NCOM	November 16, 2013	0.05	0.03	60
RG-TA-53	January 26, 2013	0.33	0.16	195
RG-TA-53	January 27, 2013	0.01	0.01	15
RG-TA-53	January 28, 2013	0.03	0.01	45
RG-TA-53	March 8, 2013	0.16	0.07	90
RG-TA-53	April 8, 2013	0.04	0.04	30
RG-TA-53	April 9, 2013	0.3	0.04	360
RG-TA-53	April 17, 2013	0.02	0.02	30
RG-TA-53	May 10, 2013	0.05	0.04	45
RG-TA-53	May 15, 2013	0.06	0.05	45
RG-TA-53	May 30, 2013	0.08	0.08	30
RG-TA-53	June 13, 2013	0.01	0.01	15
RG-TA-53	June 14, 2013	0.24	0.13	105
RG-TA-53	June 17, 2013	0.01	0.01	15
RG-TA-53	June 29, 2013	0.02	0.02	15
RG-TA-53	June 30, 2013	0.11	0.11	30
RG-TA-53	July 2, 2013	0.05	0.04	45
RG-TA-53	July 3, 2013	0.04	0.04	30
RG-TA-53	July 5, 2013	0.19	0.09	105
RG-TA-53	July 6, 2013	0.02	0.01	30
RG-TA-53	July 7, 2013	0.01	0.01	15
RG-TA-53	July 10, 2013	0.02	0.02	15
RG-TA-53	July 11, 2013	0.01	0.01	15
RG-TA-53	July 12, 2013	0.04	0.04	30
RG-TA-53	July 13, 2013	0.11	0.05	75
RG-TA-53	July 14, 2013	0.05	0.04	45
RG-TA-53	July 21, 2013	0.06	0.05	45

**Attachment 3, Precipitation Network (continued)**

<b>Rain Gage</b>	<b>Date</b>	<b>Total (in.)</b>	<b>Intensity (in./30 min)</b>	<b>Duration (min)</b>
RG-TA-53	July 25, 2013	0.45	0.25	105
RG-TA-53	July 26, 2013	0.32	0.2	105
RG-TA-53	July 28, 2013	0.18	0.16	60
RG-TA-53	July 30, 2013	0.01	0.01	15
RG-TA-53	August 1, 2013	0.03	0.02	30
RG-TA-53	August 2, 2013	0.03	0.01	45
RG-TA-53	August 4, 2013	0.2	0.04	180
RG-TA-53	August 5, 2013	0.05	0.05	30
RG-TA-53	August 6, 2013	0.01	0.01	15
RG-TA-53	August 8, 2013	0.16	0.07	60
RG-TA-53	August 13, 2013	0.04	0.02	45
RG-TA-53	August 18, 2013	0.03	0.02	30
RG-TA-53	September 2, 2013	0.06	0.04	45
RG-TA-53	September 8, 2013	0.02	0.02	15
RG-TA-53	September 10, 2013	1.26	0.19	615
RG-TA-53	September 12, 2013	1.94	0.33	450
RG-TA-53	September 13, 2013	1.96	0.63	375
RG-TA-53	September 14, 2013	0.31	0.1	240
RG-TA-53	September 17, 2013	0.35	0.27	60
RG-TA-53	September 18, 2013	0.01	0.01	15
RG-TA-53	September 19, 2013	0.01	0.01	15
RG-TA-53	September 21, 2013	0.39	0.35	45
RG-TA-53	September 22, 2013	0.31	0.12	165
RG-TA-53	October 9, 2013	0.01	0.01	5
RG-TA-53	October 10, 2013	0.14	0.06	120
RG-TA-53	October 13, 2013	0.06	0.05	60
RG-TA-53	October 15, 2013	0.08	0.03	120
RG-TA-53	October 24, 2013	0.17	0.08	120
RG-TA-53	November 4, 2013	0.87	0.39	240
RG-TA-53	November 15, 2013	0.03	0.01	30
RG-TA-53	November 22, 2013	0.37	0.07	360
RG-TA-53	November 23, 2013	0.06	0.01	30

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> )
Rendija	R001	R-SMA-0.5	1622233 (35.9074)	1785564 (-106.3114)	7,904.02	C-00-020	5,713.50
Rendija	R002	R-SMA-1	1625681 (35.907483)	1785593 (-106.299767)	11,184,193.74	C-00-041	167,622.33
Rendija	R003	R-SMA-1.95	1633138 (35.91)	1786505 (-106.274583)	36,350.91	00-015	36,258.48
Rendija	R004	R-SMA-2.05	1630468 (35.915667)	1788570 (-106.2836)	8,326,059.38	00-011(c)	315,501.23
Rendija	R005	R-SMA-2.3	1633071 (35.914167)	1788024 (-106.2748)	997,811.95	00-011(e)	589,347.70
Rendija	R006	R-SMA-2.5	1635220 (35.910767)	1786786 (-106.26755)	1,051,999.79	00-011(a)	555,288.30
Bayo	B001	B-SMA-0.5	1642229 (35.886967)	1778118 (-106.243883)	47,382,063.07	10-001(a) 10-001(b) 10-001(c) 10-001(d) 10-004(a) 10-004(b) 10-008 10-009	0.67 0.67 0.67 0.67 0.67 0.67 16,469.47 53,761.21
Bayo	B002	B-SMA-1	1626728 (35.900217)	1782948 (-106.296217)	742,668.92	00-011(d)	257,355.99
Pueblo	P001	ACID-SMA-1.05	1622456 (35.88395)	1777026 (-106.310633)	329.31	00-030(g)	0.00
Pueblo	P002	ACID-SMA-2	1623468 (35.885917)	1777746 (-106.307217)	2,293,481.12	01-002(b)-00 45-001 45-002 45-004	44,098.36 10,282.41 597.17 11,705.58
Pueblo	P002A	ACID-SMA-2.01	1623664 (35.884483)	1777219 (-106.30655)	745.92	00-030(f)	0.00
Pueblo	P003	ACID-SMA-2.1	1624432 (35.8888)	1778791 (-106.303967)	12,608,570.36	01-002(b)-00	138,431.18
Pueblo	P004	P-SMA-0.3	1643529 (35.88285)	1776625 (-106.2395)	22,304.54	00-018(b)	1,466.59
Pueblo	P005	P-SMA-1	1635623 (35.8807451)	1776527 (-106.2681854)	127,851.00	73-001(a) 73-004(d)	115,216.90 0.00
Pueblo	P006	P-SMA-2	1633043 (35.883867)	1776993 (-106.2749)	153,330.93	73-002 73-006	6,229.99 0.73
Pueblo	P007	P-SMA-2.15	1631676 (35.885283)	1777508 (-106.279517)	343,412.62	31-001	60,660.85
Pueblo	P008	P-SMA-2.2 <sup>1</sup>	1629562 (35.883366)	1776812 (-106.286643)	2,265.12	00-019	0



**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> )
Pueblo	P009	P-SMA-3.05	1623000 (35.889933)	1779208 (-106.3088)	11,355.80	00-018(a)	11,355.80
Los Alamos	L001	LA-SMA-0.85	1618658.74 (35.87872)	1775065.61 (-106.3235089)	178057.29	03-055(c)	0.77
Los Alamos	L002	LA-SMA-0.9	1619131 (35.8797)	1775480 (-106.32185)	3,088.01	00-017 C-00-044	1,032.47 86.97
Los Alamos	L003	LA-SMA-1	1619174.81 (35.880175)	1775679.12 (-106.321275)	44720.09	00-017 C-00-044	1,486.60 25,900.62
Los Alamos	L004	LA-SMA-1.1	1619362 (35.880767)	1775873 (-106.321067)	215,092.44	43-001(b2)	266.22
Los Alamos	L005	LA-SMA-1.25 <sup>1</sup>	1619541 (35.880504)	1775776 (-106.320473)	40,118.76	C-43-001	0.77
Los Alamos	L006	LA-SMA-2.1	1622814 (35.88035)	1775719 (-106.309417)	2,939.96	01-001(f)	813.10
Los Alamos	L007	LA-SMA-2.3	1622953 (35.879183)	1775293 (-106.30895)	5,248.82	01-001(b)	482.13
Los Alamos	L008	LA-SMA-3.1	1623619 (35.879483)	1775403 (-106.3067)	1,726.20	01-001(e) 01-003(a)	0.00 1,562.95
Los Alamos	L009	LA-SMA-3.9	1623864 (35.8788)	1775152 (-106.305883)	1,629.06	01-001(g) 01-006(a)	439.90 0.00
Los Alamos	L010	LA-SMA-4.1	1624051 (35.878483)	1775039 (-106.30525)	211,995.73	01-003(b) 01-006(b)	3,766.35 775.51
Los Alamos	L011	LA-SMA-4.2	1624181 (35.878417)	1775012 (-106.3048)	12,042.67	01-001(c) 01-006(c) 01-006(d)	847.56 463.40 124.55
Los Alamos	L012	LA-SMA-5.01	1624703 (35.8782)	1774932 (-106.30305)	29,869.76	01-001(d) 01-006(h)	6,529.24 512.99
Los Alamos	L012A	LA-SMA-5.02	1624757 (35.878417)	1775009 (-106.302867)	5,676.41	01-003(e)	5,271.56
Los Alamos	L013	LA-SMA-5.2 <sup>1</sup>	1625048 (35.877170)	1774559 (-106.301879)	34,238.16	01-003(d)	6,982.48
Los Alamos	L015	LA-SMA-5.31	1626676 (35.87665)	1774371 (-106.296383)	270,158.18	41-002(c)	162.95
Los Alamos	L016	LA-SMA-5.33	1626786 (35.877883)	1774819 (-106.296017)	1,035.74	32-004	202.62
Los Alamos	L014	LA-SMA-5.35	1626511 (35.876617)	1774357 (-106.296933)	991,479.07	C-41-004	5,515.26
Los Alamos	L017	LA-SMA-5.361	1627101 (35.877683)	1774742 (-106.29495)	1,896.99	32-002(b)	469.31
Los Alamos	L017A	LA-SMA-5.362	1627030 (35.877733)	1774766 (-106.295183)	1,938.38	32-003	566.30

**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> )
Los Alamos	L018	LA-SMA-5.51	1628494 (35.87635)	1774255 (-106.29025)	532,039.20	02-003(a) 02-003(e) 02-004(a) 02-005 02-006(b) 02-006(c) 02-006(d) 02-006(e) 02-008(a) 02-009(b) 02-011(a) 02-011(b) 02-011(c) 02-011(d)	1,219.90 47.61 18,836.00 0.77 1,164.89 2,614.65 2,614.65 549.82 67.02 3,405.27 4,846.61 80.98 69.30 30.82
Los Alamos	L018A	LA-SMA-5.52	1628565 (35.876367)	1774264 (-106.29)	67,659.19	02-003(b) 02-007 02-008(c)	559.70 199.10 196.61
Los Alamos	L018B	LA-SMA-5.53	1628612 (35.875983)	1774123 (-106.28985)	45,134.04	02-009(a)	626.98
Los Alamos	L018C	LA-SMA-5.54	1628707 (35.876183)	1774197 (-106.289533)	9,901.95	02-009(c)	0.00
Los Alamos	L019	LA-SMA-5.91	1630910.622 (35.877)	1774500.899 (-106.282)	135,189.13	21-009 21-021 21-023(c) 21-027(d)	422.04 131,978.85 7,239.92 4,530.48
Los Alamos	L019A	LA-SMA-5.92	1631053 (35.876717)	1774390 (-106.281617)	40,952.69	21-013(b) 21-013(g) 21-018(a) 21-021	30,910.98 1,085.18 754.38 40,952.69
Los Alamos	L020	LA-SMA-6.25	1631736 (35.875133)	1773814 (-106.2793)	36,694.83	21-021 21-024(d) 21-027(c)	35,158.12 9,126.66 166.22
Los Alamos	L021	LA-SMA-6.27	1631895 (35.874967)	1773755 (-106.278767)	84,336.82	21-021 21-027(c)	16,225.68 5,570.05
Los Alamos	L022	LA-SMA-6.3	1631968 (35.874967)	1773753 (-106.278517)	49,510.74	21-006(b)	3,334.27
Los Alamos	L022A	LA-SMA-6.31	1632134 (35.874767)	1773683 (-106.27795)	41,520.65	21-027(a)	3,415.95
Los Alamos	L023	LA-SMA-6.32	1632453 (35.8757)	1774019 (-106.276883)	1,306.64	21-021	1,306.64
Los Alamos	L024	LA-SMA-6.34	1632556 (35.874517)	1773588 (-106.276533)	47,523.59	21-021 21-022(h)	18,514.86 1,806.06
Los Alamos	L025	LA-SMA-6.36	1632946 (35.87445)	1773565 (-106.275217)	51,271.33	21-021 21-024(a)	51,271.33 6,256.19
Los Alamos	L026	LA-SMA-6.38	1633364 (35.873917)	1773368 (-106.2738)	29,336.27	21-021 21-024(c)	39,652.88 830.51

**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> )
Los Alamos	L027	LA-SMA-6.395	1633522 (35.8737)	1773291 (-106.273267)	78,216.16	21-021 21-024(j)	78,216.16 8,407.95
Los Alamos	L028	LA-SMA-6.5	1634193 (35.87395)	1773382 (-106.271017)	41,930.68	21-021 21-024(i)	31,435.91 8,168.18
Los Alamos	L029	LA-SMA-9	1639218 (35.8735)	1773218 (-106.25405)	223,211.70	26-001 26-002(a) 26-002(b) 26-003	2,954.44 89.00 74.90 59.77
Los Alamos	L030	LA-SMA-10.11	1640027 (35.867017)	1770857 (-106.251317)	614.30	53-002(a)	0.00
Los Alamos	L030A	LA-SMA-10.12	1640162 (35.866667)	1770729 (-106.250867)	41,262.29	53-008	0.00
DP	D001	DP-SMA-0.3	1628939 (35.880017)	1775595 (-106.28875)	79,157.60	21-029	79,157.60
DP	D002	DP-SMA-0.4	1631884 (35.878783)	1775146 (-106.2788)	25,403.38	21-021	25,403.38
DP	D003	DP-SMA-0.6	1632263 (35.877833)	1774795 (-106.277533)	21,298.08	21-021 21-024(l)	21,298.08 16,304.05
DP	D004	DP-SMA-1	1633342 (35.877817)	1774790 (-106.273883)	133,285.91	21-011(k) 21-021	52,573.57 133,285.91
DP	D005	DP-SMA-2	1633784 (35.8774)	1774636 (-106.272383)	24,659.43	21-021 21-024(h)	24,490.29 2,787.74
DP	D006	DP-SMA-2.35	1633991 (35.87665)	1774364 (-106.2717)	8,394.88	21-021 21-024(n)	8,394.88 4,902.18
DP	D007	DP-SMA-3	1634208.6385 (35.875291)	1774341.78359 (-106.270552)	27,442.8	21-013(c) 21-021	20,503.82 27,410.07
DP	D008	DP-SMA-4	1635297 (35.875333)	1773888 (-106.267283)	2,059.25	21-021	1,777.41

<sup>1</sup> Minor sampler movement.

## 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	Copper	PCBs	High Explosives	Dioxins/ Furans	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 1668A	SW8321	EPA 1613B	EPA 625
Order code	SW-IP- Gross Alpha	SW-Ra226/ Ra-228	SW-IP- Cyanide	SW-Metals- Dissolved	SW-Metals- Total	SW-IP-Cu F	SW-PCB- 1668A-PQL	SW-HEXP-8330	SW-IP-D/ F-1613B	SW-SVOC-625
Field prep code	UF	UF	UF	F	UF	F	UF	UF	UF	UF
Preservation	HNO <sub>3</sub>	HNO <sub>3</sub>	NaOH, Ice	HNO <sub>3</sub>	HNO <sub>3</sub>	HNO <sub>3</sub>	Ice	Ice	Ice	Ice, store some analytes in dark
Holding time (days)	180	180	14	180	180	180	365	7	365	7
Preferred volume (L)	2	2	1	0.5	0.5	0.5	3	2.5	2	3
Minimum volume required (L)	1	2	0.5	0.25	0.25	0.25	1	0.77	1	1
Shipping container	Poly	Poly	Poly	Poly	Poly	Poly	Glass	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	Copper	PCBs	High Explosives	Dioxins/ Furans	SVOCs
R-SMA-0.5	1	SS082701	CACompD										
R-SMA-1	2	SS00	CAI										
R-SMA-1.95	3	SS092701	CAI										
R-SMA-2.05	4	SS092702	MEx	X	X	X	X	X			X		
R-SMA-2.3	5	SS082704	BCComp										
R-SMA-2.5	6	SS082705	MEx	X	X	X	X	X			X		
B-SMA-0.5	7	SS100302	CAI										
B-SMA-1	8	SS080301	CAI										
ACID-SMA-1.05	9	SS090102	BCComp										
ACID-SMA-2	10	SS100105	CAI										
ACID-SMA-2.01	11	SS090101	MEx	X	X	X	X	X		X			
ACID-SMA-2.1	12	SS100104	CAI										
P-SMA-0.3	13	SS080801	CACompD										
P-SMA-1	14	SS080802	MEx	X	X	X	X	X					
P-SMA-2	15	SS057	MEx	X	X	X	X	X				X	
P-SMA-2.15	16	SS080803	MEx	X	X	X	X	X		X			
P-SMA-2.2	17	SS130804	MEx	X	X	X	X	X		X			
P-SMA-3.05	18	SS090802	CAI										
LA-SMA-0.85	19	SS121043	CAI2										
LA-SMA-0.9	20	SS081002	MEx	X	X	X	X	X		X			
LA-SMA-1	21	SS121044	CAM5	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	Copper	PCBs	High Explosives	Dioxins/ Furans	SVOCs
LA-SMA-1.1	22	SS081004	CACompD										
LA-SMA-1.25	23	SS131045	CAI2										
LA-SMA-2.1	24	SS081005	CAI										
LA-SMA-2.3	25	SS081024	CACompD										
LA-SMA-3.1	26	SS101034	MEx	X	X	X	X	X		X			
LA-SMA-3.9	27	SS081026	MEx	X	X	X	X	X					
LA-SMA-4.1	28	SS101035	CAI										
LA-SMA-4.2	29	SS091009	MEx	X	X	X	X	X		X			
LA-SMA-5.01	30	SS091012	MEx	X	X	X	X	X		X			
LA-SMA-5.02	31	SS091013	CACompD										
LA-SMA-5.2	32	SS131046	MEx	X	X	X	X	X					
LA-SMA-5.31	33	SS081012	CAM5	X					X				
LA-SMA-5.33	34	SS081013	CACompD										
LA-SMA-5.35	35	SS091014	CAM5	X					X				
LA-SMA-5.361	36	SS091022	MEx	X	X	X	X	X					
LA-SMA-5.362	37	SS101036	MEx	X	X	X	X	X		X			
LA-SMA-5.51	38	SS091015	CAI										
LA-SMA-5.52	39	SS091016	MEx	X	X	X	X	X		X			
LA-SMA-5.53	40	SS091017	MEx	X	X	X	X	X		X			
LA-SMA-5.54	41	SS091018	CAI										
LA-SMA-5.91	42	SS091019	CAM5	X									
LA-SMA-5.92	43	SS091020	CAI										

## 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	Copper	PCBs	High Explosives	Dioxins/ Furans	SVOCs
LA-SMA-6.25	44	SS081015	MEx	X	X	X	X	X					
LA-SMA-6.27	45	SS081016	MEx	X	X	X	X	X					
LA-SMA-6.3	46	SS028	MEx	X	X	X	X	X					X
LA-SMA-6.31	47	SS081033	MEx	X	X	X	X	X					X
LA-SMA-6.32	48	SS081017	MEx	X	X	X	X	X					
LA-SMA-6.34	49	SS081018	MEx	X	X	X	X	X					
LA-SMA-6.36	50	SS081019	MEx	X	X	X	X	X					
LA-SMA-6.38	51	SS081020	MEx	X	X	X	X	X					
LA-SMA-6.395	52	SS091002	CAI										
LA-SMA-6.5	53	SS0287	MEx	X	X	X	X	X		X			X
LA-SMA-9	54	SS0304	MEx	X	X	X	X	X					
LA-SMA-10.11	55	SS091001	MEx	X	X	X	X	X					
LA-SMA-10.12	56	SS091021	CAM5	X		X							
DP-SMA-0.3	57	SS0375	CAI2										
DP-SMA-0.4	58	SS081901	CAI										
DP-SMA-0.6	59	SS081902	MEx	X	X	X	X	X					
DP-SMA-1	60	SS0385	MEx	X	X	X	X	X		X			
DP-SMA-2	61	SS0387	MEx	X	X	X	X	X					
DP-SMA-2.35	62	SS091901	CAI										

## 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	Copper	PCBs	High Explosives	Dioxins/ Furans	SVOCs
DP-SMA-3	63	SS121907	CAM5	X	X	X	X	X					
DP-SMA-4	64	SS081905	MEx	X	X	X	X	X					

CACompD = The Site has achieved RCRA “corrective action complete” status or a certificate of completion under NMED’s Compliance Order on Consent.

CAI = Corrective Action Initiated: A sample was collected during baseline confirmation monitoring, and analytical results show at least one pollutant concentration is above TAL, resulting in initiation of corrective action.

MEx = Extended Baseline Monitoring: One confirmation monitoring sample is collected to determine if corrective action is required.

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.

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.

CAI2 = Enhanced control corrective action monitoring has exceeded a target action level. A path to completion of corrective action is being planned.