ESHID-602280

2016 Update to the Site Discharge Pollution Prevention Plan, Revision 1

Los Alamos National Laboratory
NPDES Permit No. NM0030759
LA-UR-17-22985 • May 1, 2017

Overview

CERTIFICATION

LOS ALAMOS NATIONAL LABORATORY
NPDES Permit No. NM0030759

2016 UPDATE TO THE SITE DISCHARGE POLLUTION PREVENTION PLAN, REVISION 1

CERTIFICATION STATEMENT OF AUTHORIZATION

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

4/14/2017

Bruce Robinson, Program Director
Environmental Remediation Program
Associate Directorate for Environmental Management
Los Alamos National Security, LLC

Date

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4-21-2017

David S. Rhodes, Director
Office of Quality and Regulatory Compliance
Los Alamos Environmental Management Field Office

Date

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Appendixes

1.0 Background

1.1 Individual Permit

DOE and LANS, collectively the Permittees, have prepared this Update to the Site Discharge Pollution Prevention Plan, Revision 1 (hereafter, the SDPPP Update) for the Individual Storm Water Permit pursuant to the requirements of NPDES Permit No. NM0030759 (hereafter, the Individual Permit or Permit or IP), as authorized by the EPA. The SDPPP Update includes this Overview as well as five volumes addressing the watersheds covered under the IP. All acronyms and abbreviations are included in Appendix A of this Overview and are not defined at first use.

The Individual Permit regulates storm water discharges associated with historical industrial activities from 405 permitted SWMUs and/or AOCs (collectively, "Sites"). The majority of the Sites covered by the Individual Permit are remotely located and are not associated with current industrial activities. Storm water discharges associated with current conventional industrial activities at the Laboratory are excluded from the Individual Permit. The Permit—NPDES No. NM0030759—incorporating the latest modifications became effective on November 1, 2010. The Permit has been administratively continued since November 2015.


Storm water detention at LA-SMA-5.51

The Sites regulated under this Permit are a subset of the SWMUs and AOCs that are addressed under the June 2016 Consent Order. The Consent Order fulfills the corrective action requirements in §3004(u) and §3008(h) of RCRA for addressing releases of hazardous constituents from SWMUs and AOCs.

A SWMU is a discernible waste management unit from which hazardous waste or hazardous waste constituents may migrate, regardless of whether the unit was intended to manage solid or hazardous waste. SWMUs include any area at a facility at which solid wastes have been routinely and systematically released. An AOC is any area that is not a SWMU that may have had a release of a hazardous waste or hazardous constituent. All SWMUs and AOCs regulated under the Consent Order were evaluated for inclusion in the Permit based on the following criteria: (1) the SWMU/AOC is exposed to storm water (e.g., not capped or subsurface); (2) the SWMU/AOC may contain "significant industrial material" (e.g., not cleaned up or has contamination in place); and (3) industrial materials from the SWMU/AOC could potentially impact waters of the United States. Sites regulated by the Permit are designed at either "Moderate" or "High Priority." The two designations have different compliance schedules that apply to the Sites within each designation.

The Individual Permit categorizes a Site as having had an "industrial activity" that creates a "point source discharge" and directs the Permittees to monitor representative storm water discharges from Sites at specified sampling points known as SMAs. An SMA is a single drainage area within a subwatershed and may include more than one Site. Storm water from a Site may drain to multiple subwatersheds and may be associated with multiple SMAs.

Each SMA is assigned a Permitted Feature code that is used to identify the SMA for tracking purposes. Appendix E shows each Permitted Feature code assigned to each SMA.

The selection of analytical monitoring suites and Site priority designations was based on historical information and any storm water, sediment, and soil data available at the time the Permit application was submitted. The investigation and remediation of SWMUs and AOCs began during the 1990s before the effective date of the Individual Permit (November 1, 2010) and continue concurrently with implementation of the Individual Permit.

The Individual Permit contains nonnumeric technology-based effluent limitations, coupled with a comprehensive, coordinated inspection and monitoring program, to minimize pollutants in the Permittees' storm water discharges associated with historical industrial activities from specified SWMUs and AOCs. The Permittees are required to implement site-specific control measures (including BMPs) to address the nonnumeric technology-based effluent limits, as necessary, to reduce or minimize pollutants in their storm water discharges to the extent achievable.

The Permit establishes TALs that are equivalent to New Mexico water-quality criteria. These TALs are used as benchmarks to determine the effectiveness of control measures implemented under the Permit. That is, confirmation monitoring sample results for an SMA are compared with applicable TALs. If one or more confirmation monitoring result exceeds a TAL, the Permittees must take corrective action through the installation of measures reasonably expected to (1) meet applicable TALs at the Site, (2) achieve total retention of storm water discharges from the Site, (3) totally eliminate exposure of pollutants to storm water, or (4) demonstrate the Site has a COC under the Consent Order. The Individual Permit requires that the Permittees certify to EPA completion of corrective action at each Site by a specific deadline based upon the Site's status either as a High Priority or Moderate Priority Site. The SMAs monitored in 2016 have the status "baseline monitoring extended" or "enhanced control corrective action monitoring" listed in the compliance status table under each SMA. Only SMAs with 2016 analytical data presented had enough samples collected or were functioning properly in order to collect water for analysis. In addition, Section 3 of this Overview explains each monitoring status in more detail.

Where the Permittees have installed measures to minimize pollutants in their storm water discharges as required by Part l.A of the Permit at a Site or Sites, but are unable to certify completion of corrective action under Sections E.2(a) through E.2(d) (individually or collectively), the Permittees may submit an alternative compliance request to EPA. If EPA grants the alternative compliance request in whole or in part, it will issue a new individually tailored work plan for the Site or Sites. EPA will also extend the compliance deadline for completion of corrective action, as necessary, to implement this work plan. Corrective action will be accomplished on a case-by-case basis pursuant to an individually tailored compliance schedule determined by EPA. Figure 1 is a "road map" illustrating key activities in the Individual Permit and shows the steps involved in the corrective action process.

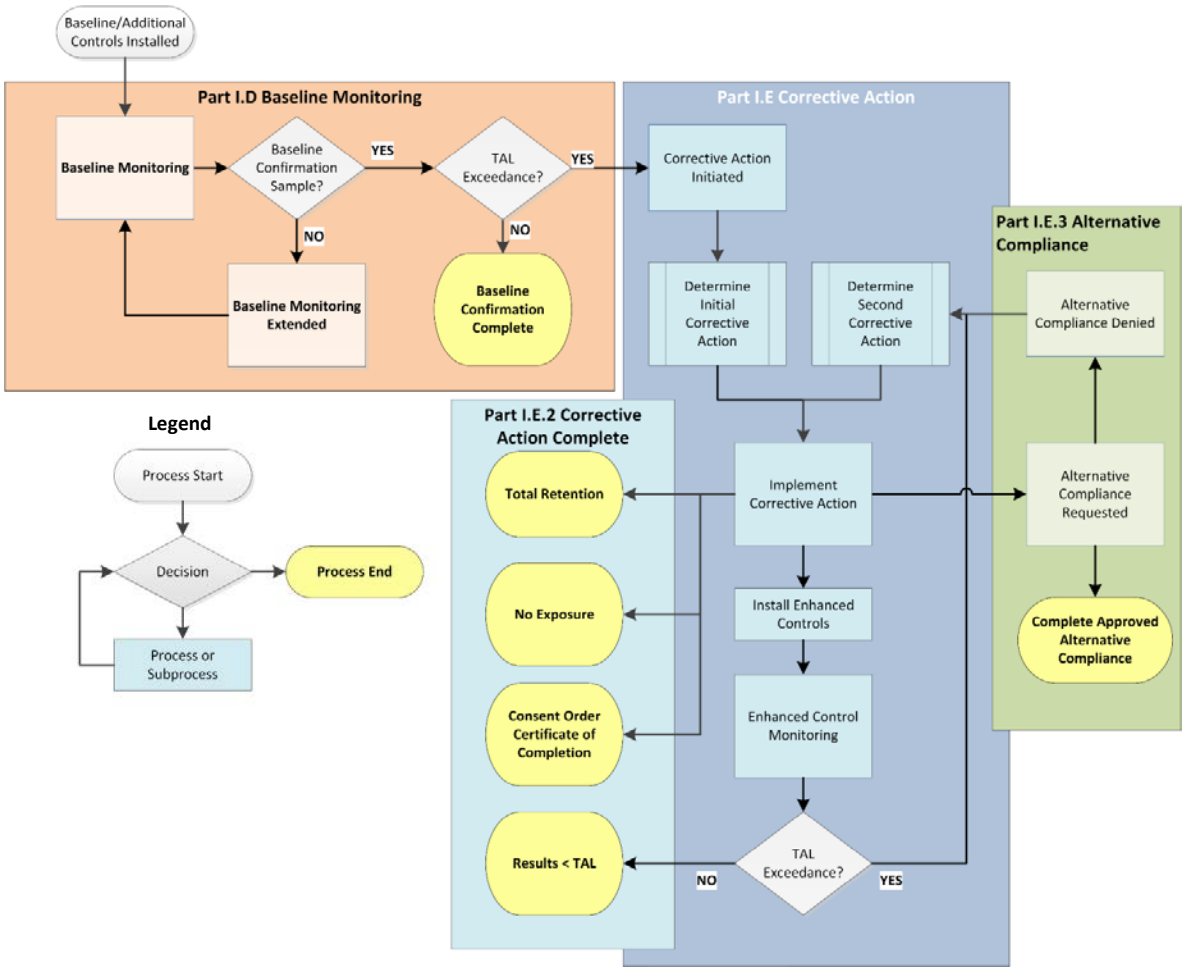


Figure 1 Permit compliance road map

1.2 2016 Update to the Site Discharge Pollution Prevention Plan, Revision 1

The SDPPP Update is written for use by the Permittees' personnel and for review by EPA and the public.

> Part I.F.4 of the Permit states, "The SDPPP shall be updated annually to fully incorporate all changes made during the previous year and to reflect any changes projected for the following year."

Historical industrial activities, storm water monitoring results, available data regarding the nature and extent of any surface contamination are carried forward from previous SDPPP updates. New information is provided if confirmation monitoring or baseline samples were collected and where additional erosion controls were installed, retired, repaired, or modified in 2016. Site descriptions are updated based on Consent Order investigation results from the previous year and from planned future work. The SDPPP Update also describes other relevant information, such as monitoring results, inspections and maintenance, and procedures. The report is intended to be a living document that is kept current throughout the year by maintaining records and relevant documents alongside the SDPPP. At the end of each field season, all changes made during the year and any projected for the coming year are incorporated into an update.

Storm water control measures at LA-SMA-0.9 in Los Alamos Canyon

The original SDPPP was published, submitted to EPA, and placed on the Individual Permit website on April 30, 2011. The following year, on May 1, 2012, the SDPPP was revised and was made available on the Permit website. Revision 1 is available at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-discharge-pollution-prevention-plan.php. Since the publication of Revision 1, updates to the SDPPP have been prepared and are made available on the IP website by May 1 of each year. The 2016 SDPPP Update, summarizing relevant information from 2016, together with Revision 1, meets the requirements of Part I.F of the Individual Permit. The reporting format is designed to be web-friendly, making information about a specific Site or SMA easier to find, download, and print. Table 1 provides a crosswalk of SDPPP requirements with the location of the information.

Table 1 SDPPP Requirements

Part I Requirement		SDPPP Section
Part	**Description**	
F.1 (a)	Site Discharge Pollution Prevention Team	2016 Update, Overview, Section 2.0, Site Discharge Pollution Prevention Team
F.1 (b)	Site Description: • historical activities at each Site • precipitation information • general location and Site maps	• 2016 Update, Volumes 1 to 5 (V1–5), Section xxx.1*, Site Descriptions • 2016 Update, V1–5, Attachment 3, Precipitation Network • 2016 Update, V1–5, Figure xxx.1; the latest Site map can be found on the IP website—http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.
F.1 (c)	Receiving Waters and Watershed	SDPPP V1–5, Rev. 1, Section 300.3
F.1 (d)	Summary of Pollutant Sources	2016 Update, Overview, Section 3.1.1, Evaluation of Potential Pollutant Sources, and Overview Appendix E
F.1 (e)	Description of Control Measures	2016 Update, Overview Appendix B, Control Measure Fact Sheets; 2014 Update, V1–5, Section xxx.2, Control Measures
F.1 (f)	Schedules for Control Measure Installation	2016 Update, V1–5, Attachment 6, Additional Compliance Status Details for SMAs/Sites in Corrective Action
F.1 (g)	Monitoring and Inspection Procedures: (i) Locations where samples are to be collected, including coordinates for sampling locations and any determination that two or more Sites are substantially identical (ii) Person(s) or positions of person(s) responsible for sample collection (iii) Parameters to be sampled and frequency of sampling for each parameter; (iv) Procedures for gathering storm event data	(i) The most recent maps showing SMA sampler location for planned sampling are posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php; 2016 Update, V1–5, Attachment 4, Physical Characteristics (ii) and (iv) 2016 Update, Overview, Section 1.3, Monitoring and Inspection Procedures, IP website—http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-discharge-pollution-prevention-plan.php. (iii) 2016 Update, V1–5, Attachment 5, Sampling Requirements and Plan
F.1 (h)	Signature Requirements	Signatures to 2016 Update can be found after cover page of Overview
F.2 (a)	Alongside Documentation: Dates of training sessions, names of employees trained, and subject matter of training	2016 Update, Overview, Section 2.0, Site Discharge Pollution Prevention Team

Part I Requirement		SDPPP Section
Part	**Description**	
F.2 (b)	Alongside Documentation: Sampling Reports (sampling dates, analytical results, outfall locations, name and qualification of technician)	• Sampling dates and analytical results: 2016 Update, V1–5, Section xxx.3, Storm Water Monitoring • Outfall locations: 2016 Update, V1–5, Figure xxx.1; Attachment 4, Physical Characteristics • Name and qualification of technician: Laboratory's Electronic Document Management System
F.2 (c)	Alongside Documentation: Inspection Reports	• Inspection summary: 2016 Update, V1–5, Section xxx.4, Inspections and Maintenance • Electronic copy of inspection results: Laboratory's Electronic Document Management System
F.2 (d)	Alongside Documentation: An accounting of and explanation of length of time taken to modify or implement measure following discovery of deficiency.	2016 Update, V1–5, Section xxx.4, Inspections and Maintenance
F.2(e)	Documentation of Maintenance: Documentation of maintenance and repairs of control measures, including the date(s) of regular maintenance, date(s) of discovery of areas in need of repair/replacement, and for repairs, the date(s) that control measure(s) returned to full function, and the justification for any extended maintenance/repair schedules.	2016 Update, V1–5, Section xxx.4, Inspections and Maintenance
F.3 (a)	Required Modifications: Construction or change in design, operation or maintenance at the facility having a significant impact on the discharge, or potential for discharge, of pollutants from the facility.	2016 Update, V1–5, Section xxx.4, Inspections and Maintenance
F.3 (b)	Required Modifications: Findings of deficiencies in control measures during inspections or based on analytical monitoring results.	2016 Update, V1–5, Section xxx.4, Inspections and Maintenance
F.3 (c)	Required Modifications: • any change of monitoring requirement or • compliance status	• 2016 Update, V1–5, Attachment 5, Sampling Requirements and Plan • 2016 Update, V1–5, Section xxx.5, Compliance Status
F.3 (d)	Required Modifications: Any change of SMA location	2016 Update, V1–5, Section xxx.1, Site Descriptions, documented in the project map (Figure xxx.1) and in Attachment 4, Physical Characteristics
F.3 (e)	Required Modifications: Summary of changes from the last year's SDPPP	2016 Update, V1–5, Attachment 1, Amendments
F.4	SDPPP updated annually to incorporate previous year changes and following year projections	2016 Update, V1–5

Part I Requirement		SDPPP Section
Part	Description	
F.5	SDPPP Availability: Paper copy of current SDPPP to be immediately available at facility and copy of SDPPP to be made available on public website.	Paper copies of SDPPP V1–5, Rev. 1, and the 2016 Update, V1–5, are available in the Program Manager's Office (Pueblo Complex) and the Public Reading Room (Pojoaque, NM). The SDPPP is also available in the Laboratory's Electronic Document Management System and on the public website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-discharge-pollution-prevention-plan.php.
G.1	Erosion Inspection and Reevaluation	Electronic records system: Laboratory's Electronic Document Management System
G.2	Post-Storm Inspections: Adverse weather events shall be documented and maintained with the SDPPP.	2016 Update, V1–5, Section xxx.4, Inspections and Maintenance; Electronic records system: Laboratory's Electronic Document Management System
G.3	Inspection Report	• Inspection summary: 2016 Update, V1–5, Section xxx.4, Inspections and Maintenance • Electronic copy of inspection results: Laboratory's Electronic Document Management System
I.1	Construction Activity Permit associated with Site Remediation: Steps taken to minimize discharges of contaminated runoff during remediation activity shall be included in the SDPPP Update	2016 Update, V1–5, Section xxx.4, Inspections and Maintenance; Table xxx-2, Control Measure Inspections during 2016 (Inspection Type is "Remediation Construction Activity")
I.2	Deletion of Site: Documents to support a request of site deletion must be kept with facility's SDPPP.	All records associated with Individual Permit activities are maintained electronically in the Laboratory's Electronic Document Management System.
I.3	Watershed Protection Approach: EPA encourages the Permittees to voluntarily install watershed-based control measures, such as sediment barriers, to mitigate sediment or storm water runoff reaching the main channels of the canyons and/or the Rio Grande. The Permittees should include information and monitoring data regarding the installation of any such watershed-based control measures in the Annual Report or the SDPPP.	2016 Update, Overview, Section 5.0, Watershed Protection Approach
I.4	Record Keeping	All records associated with Individual Permit activities are maintained electronically in the Laboratory's Electronic Document Management System
I.5	Reopener: This Permit may be reopened and modified in accordance with 40 CFR. § 122.62. Any changes to monitoring and/or control measure requirements made to the Permit in accordance with such a permit modification shall be addressed in the Annual Report and in the annual SDPPP update.	Not yet applicable

*The xxx refers to the number assigned to each SMA in the Update.

This Overview includes information pertaining to all five watershed-based SDPPP Update volumes and describes the updated information that is new this year. Appendixes to the Overview include acronyms and a glossary of terms used in this report (Appendix A), control measures (Appendix B), a guide to understanding the information presented in the data graphs (Appendix C), references used throughout the report (Appendix D), and a list of potential pollutants of concern (Appendix E).

1.3 Monitoring and Inspection Procedures

Individual Permit procedures are reviewed and updated as needed throughout the year. Monitoring and Inspection Procedures that were valid at the end of 2016 and will be used in 2017 (unless a newer version becomes available) are listed below, and copies are posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-discharge-pollution-prevention-plan.php.

- EP-DIV-SOP-10004, Managing Electronic Precipitation Data for Storm Water Projects
- EP-DIV-SOP-10008, Installing, Setting Up, and Operating ISCO Samplers
- EP-DIV-SOP-10013, Inspecting ISCO Storm Water Samplers and Retrieving Samples
- EP-DIV-SOP-20012, Post-Storm Inspection of NPDES Individual Permit Storm Water Control Measures and Installation and Maintenance of Non-Engineered Storm Water Control Measures
- ER-AP-20060, Certifying Individual Permit Storm Water Control Measures
- EP-DIV-SOP-20125, Performing NPDES Storm Water Individual Permit Visual Inspections
- EP-DIV-SOP-20217, Processing Surface Water Samples
- ER-GUIDE-20211, Inspection Guidance for Environmental Programs Watershed, Retention, and No Exposure Controls

2.0 Site Discharge Pollution Prevention Team

To facilitate the implementation, maintenance, and revision of the SDPPP, a PPT has been established. The PPT is responsible for assisting in developing and revising the SDPPP, maintaining control measures and taking corrective actions for deficiencies, and fulfilling the regulatory requirements of the Individual Permit. The Program Manager is responsible for managing implementation of the IP requirements. The EM-LA Regulatory Compliance Director certifies the required reports and conducts oversight activities.

The PPT consists of qualified personnel who possess the knowledge and skills to perform requirements specific to the Individual Permit. PPT members who perform field activities are able to assess field conditions and activities that impact storm water quality and control measure function. The selection of the PPT field members requires familiarity with Site locations and surrounding operations. Field team members generally have, at a minimum, a Bachelor's degree and specialty qualifications, such as CISEC, CPESC, or other qualifications necessary to perform the field work required. The specific responsibilities of the PPT are provided in Table 2. Each member of the PPT has access to electronic and paper copies of the Individual Permit and this SDPPP Update.

Table 2 PPT Roles and Responsibilities

PPT Title	Functional Responsibility
Program Manager	Responsible for managing implementation of Individual Permit requirements. Responsible for signing the completed inspection work orders that satisfy the requirement for certification of findings by the IP.
EM-LA Regulatory Compliance Director	Certifies IP-required reports and conducts oversight activities.
Compliance Team Lead	Responsible for ensuring compliance is met for the Individual Permit Storm Water Program. Responsible for ensuring that Permit-specific training is up to date for all PPT members.
Corrective Actions Lead	Responsible for coordinating design and implementing corrective action field measures associated with TAL exceedances.
Planning and Reporting Lead	Responsible for coordinating and delivering reporting requirements defined by the Individual Permit.
Monitoring Lead	Responsible for implementing storm water monitoring, coordinating Site inspections, and maintaining control measures to address deficiencies as required by the Permit. Resolves issues related to successful conduct of operations.
Field Operations Lead	Authorizes all field operations associated with LANL ER Program environmental work, including, but not limited to, field work pertaining to the Individual Permit. Coordinates with the field team members to resolve issues related to successful conduct of operations.
Subcontractor Manager	Primary contact for the field team members conducting field work performed by the subcontractor's field team members.
Field Team Member	Responsible for the completion of field work, including site inspections, setting up and maintaining samplers, collection of storm water samples, control measure assessments, control measure maintenance, control measure construction, and construction verifications and/or documenting work completed.
Tracking and Reporting Team (aka Data Management Team)	Responsible for the generation of field work orders associated with the IP. Maintains work order information in the Maintenance Connection database. Maintains sampling associated data and Site related data in the EIM/SWTS. Provides reports generated from databases as needed.
Precipitation Data Management Team	Responsible for maintaining, verifying, and validating precipitation data in the Hydstra database. Responsible for transmitting validated data to Tracking and Reporting Team.
Sample Management Office Lead	Responsible for receiving samples from the sample processor and shipping for analysis. Responsible for verifying that sample results are uploaded correctly to EIM and maintaining long-term stewardship of the data.
Sample Data Steward	Responsible for maintaining the sampling and analysis plan, quality control once samples are received by the storm water laboratory, and assigning analytical processing requirements for samples retrieved.
Sample Processor	Responsible for accepting samples from the Route Lead, processing the samples as required by the sample data steward, and providing custody of the samples until samples are delivered to the LANL Sample Management Office.
Subcontractor Technical Representative	Primary LANL contact for subcontractor work performed in the field.

PPT Title	Functional Responsibility
Publications Team	Responsible for editing, compositing, obtaining signatures, and transmitting publications required by the IP.
Records Management Team Member	Responsible for long-term stewardship of IP records in LANL record database.

Employee training and qualification are essential for effective implementation of the SDPPP and the success of the storm water program. Project personnel receive both formal and informal training in the execution of storm water management at the IP Sites. Formal training is conducted annually before the field season starts, through online training applications and scheduled classroom sessions. Training records are maintained in the Permittees' online training system, UTrain. Training records include the dates training occurred and the subject matter of the training conducted. During the field season, daily tailgate meetings are conducted to inform personnel of work assignments, impending changes, and work-related issues.

LANS and DOE are co-Permittees on the IP. Since 2010, through the M&O contract, LANS was delegated responsibility for implementing a program to sustain compliance with the IP. In 2015, the DOE NNSA Los Alamos Field Office separated out the Environmental Management scope of work to create a new DOE EM Los Alamos Field Office. EM-LA contracted its scope of work, including the IP, in a separate Bridge Contract to LANS. EM-LA provided notice to EPA and NMED of its updated points of contact for the IP and delegations of authority pursuant to 40 CFR Part 122.22 in November 2015 and revised the delegations of authority in March 2015. LANS continues to facilitate implementation of the IP at LANL. EM-LA participates in decisions affecting compliance of the IP and performs contractor oversight of IP field activities to support certification of controls and deliverables to EPA.

3.0 Guide to the Updated Information in the 2016 SDPPP Update, Volumes 1–5

This SDPPP Update maintains the previous five-volume watershed organizational structure for administrative convenience (Table 3). For clarity, SMAs are uniquely and consecutively numbered from 1–250 across the five volumes, as presented in the last column of Table 3.

The 2010 SDPPP provides overviews of each of the five watersheds in section 300.3. These overviews give physical characteristics of the entire watershed. Since the publication of the 2010 SPPPP, no reportable changes have occurred for the watershed scale information. The 2010 SDPPP can be found on the IP website at http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-discharge-pollution-prevention-plan.php.

Table 3 SDPPP Update Organizational Structure: Volume, Watershed, and Associated SMAs

SDPPP Volume	Primary Watershed	Receiving Waters	SMA Numbers in the Contents Table
Volume 1	Los Alamos/Pueblo	Rendija Canyon Bayo Canyon Pueblo Canyon DP Canyon Los Alamos Canyon	1–64
Volume 2	Mortandad/Sandia	Mortandad Canyon Ten Site Canyon Cañada del Buey Sandia Canyon	65–128
Volume 3	Pajarito	Pajarito Canyon Starmers Canyon Twomile Canyon Threemile Canyon	129–179
Volume 4	Water/Cañon de Valle	Cañon de Valle Potrillo Canyon Water Canyon Fence Canyon	180–229
Volume 5	Ancho/Chaquehui	Ancho Canyon Chaquehui Canyon	230–250

The Site information, organized by SMA, has been updated as follows.

3.1 Section X.1, Site Descriptions

Site descriptions have not been updated since the submittal of the 2014 SDPPP Update, except to correct grammatical and editorial errors or to update Consent Order activities related to the Site. Changes are captured in redline and provided as part of Attachment 1 in each volume. References used for the Site descriptions are listed in Appendix D of this Overview.

A current project map is located at the end of each SMA chapter. Maps updated throughout the year will be posted on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-monitoring-area-maps.php.

3.1.1 Evaluation of Potential Pollutant Sources

Part I.F.1.(d) of the Individual Permit requires the Permittees to identify potential pollutants of concern associated with "industrial materials or activities" exposed to storm water. Appendix B of the Individual Permit lists the permitted Site Monitoring Requirements for each SMA/Site. As indicated in Part I.D. of the Permit, "pollutants of concern to be monitored are specified in Appendix B." The identification of pollutants of concern listed in Appendix B does not indicate whether the pollutant is associated with historical industrial materials managed at the Site or with potential releases at the Site. Therefore, the monitoring list in Appendix B of the Individual Permit should not currently be used to identify potential pollutants of concern.

The 2011 SDPPP, Revision 1, identified the initial pollutants of concern based solely on the Appendix B monitoring requirement and not on industrial activities because no storm water samples had been collected at that time. The Permittees have not made changes to the list of potential pollutant sources in subsequent SDPPP updates.

For the 2014, 2015, and 2016 SDPPP Updates, the Permittees revised the list of potential pollutants of concern, which can be found in Appendix E of this Overview. The list was developed by evaluating the Appendix B monitoring list based on the following criteria:

- Constituents were struck from the potential pollutants of concern list where
    - ❖ constituents did not exceed TALs in baseline monitoring;
    - ❖ TAL exceedance constituent(s) are not related to historical industrial activities at the Site;
    - ❖ the Site is not exposed to storm water and has been certified under Part I.E.2.(c) for no exposure; or
    - ❖ adjusted gross alpha is identified as a potential pollutant of concern (no Site on the Permit is a source of adjusted gross alpha, and any Site associated with historical management of gross-alpha radionuclides is exempt from regulation under the CWA).
- Constituents were added as a potential pollutant of concern where
    - ❖ Site descriptions indicate that historical management of that constituent occurred, but the constituent is not identified as a monitoring requirement in Appendix B of the Permit; and
    - ❖ Site visits with NMED and LANL and reviews of Site histories concluded that certain contaminants with water-quality standards should be identified as a monitoring requirement.

In 2017 and continuing until completed, all available SWMU/AOC Site knowledge is being reviewed to determine appropriate Site monitoring constituents and monitoring locations, per the draft language established in the SIP process provided by the Permittees and NMED-SWQB, for inclusion in EPA's March 2014 draft IP (unless otherwise modified by the EPA). This process will eventually determine the list of potential pollutants of concern. Site knowledge under the SIP, includes, but is not limited to, Site-related historical information that may include past environmental investigation information, engineering drawings, as well as validated soil and storm water sampling data. These reviews include field visits and are occurring in coordination with LANS, DOE EM-LA, NMED-SWQB, and NMED's DOE Oversight Bureau staff.

At SMAs where storm water baseline monitoring samples did not exceed TALs for any constituent, no further monitoring is required for that constituent per Part I.D.4 of the Permit. The Permittees no longer consider these constituents as potential pollutants of concern.

In Volumes 1 through 5 of the SDPPP Update, each TAL exceedance is evaluated to determine whether the TAL exceedance constituent was historically managed at the Site. In many cases, the Permittees have determined that TAL exceedance constituent(s) are not related to historical industrial activities. These constituents should no longer be listed as Appendix B monitoring requirements, nor should they be considered as potential pollutants of concern. If the constituent that exceeded the TAL was historically managed at the Site, it is retained as a potential pollutant of concern.

The Site descriptions provide a brief description of Site-associated historical industrial activities from which new pollutants of concern can be identified. For example, a Site description that identifies the Site as an outfall from an HE sump would result in the identification of HE as a potential pollutant of concern. If HE is not currently an Appendix B monitoring requirement, it would be added to the list of potential pollutants of concern. Appendix E presents a list of additional constituents the Permittees have identified as potential pollutants of concern based on reviews of Site descriptions under the column heading "Add."

If baseline confirmation storm water monitoring samples have not been collected at an SMA, the Sites within that SMA were not evaluated for removal of potential pollutants of concern based on historical industrial activities. For these SMA/Site combinations, the list of potential pollutants of concern remains the same as the Appendix B monitoring requirements (with the exception of removing adjusted gross alpha as a potential pollutant of concern and unless constituents were added based on the Site description).

The Appendix B monitoring list and potential pollutants of concern should match. However, only when baseline monitoring samples did not exceed TALs is no further monitoring of a constituent allowed by the Permit. All other additions or subtractions of constituents from the list of potential pollutants of concern discussed above do not change the Appendix B monitoring requirements of the Permit. A Permit modification is required to remove or add specific monitoring requirements from Appendix B. Instead of submitting a large Permit modification request to EPA, EPA has requested that the Permit renewal process be used to develop a more Site-specific monitoring list.

3.2 Section X.2, Control Measures

Rock check dam controlling storm water in Acid Canyon

This section in the SDPPP Update describes control measures that have been installed and are currently "active" as of the end of the 2016 calendar year. An active control measures table is provided for each SMA and has been updated to include the enhanced controls constructed in 2016 and to remove any controls that were retired. Control measures may be retired for several reasons. For example, the lifespan of the control type may have expired, or the control measure may have been damaged by wildlife or flooding. In some cases, the retired control measure is replaced with an equal or more effective measure. Storm water run-on, runoff, and erosion potential are assessed before controls are selected and installed at an SMA. The goal is to select and install controls to minimize the potential for erosion when storm water runoff flows across an area; minimize sediment transport; retain transported sediment on-site; and divert, infiltrate, reuse, contain, or otherwise reduce storm water run-on and runoff. A detailed assessment or alternatives analysis is performed for all SMAs that require the installation of enhanced controls. The alternatives-analysis process evaluates the possible corrective action controls, including installation of enhanced controls, total retention, no exposure, and Site remediation. From this alternatives-evaluation process the most appropriate control(s) is selected, designed, and implemented. Alternatives-analysis documentation is maintained as a record alongside this SDPPP Update. The fact sheets in Appendix B provide sufficient detail to identify and describe the baseline and enhanced control measures constructed at the Sites. Representative photographs of control measures are interspersed throughout

the text in the SDPPP Update. Photographs of all baseline and enhanced controls that have been certified are available by following the Construction Certification link on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/construction-certifications.php.

Ten enhanced controls were certified at two SMAs in 2016. As of January 1, 2017, additional enhanced controls are not currently planned. However, changes in compliance status may result in the need for additional enhanced controls.

3.3 Section X.3, Storm Water Monitoring

The monitoring section in the SDPPP Update describes the storm water data, date of sample collection (if applicable), and comparison with the applicable TALs. For any constituents exceeding the TAL, a summary of the results from soil and sediment samples collected at the Site during Consent Order or previous investigations is provided and a determination is made of whether or not the TAL exceedance constituent is known to have been associated with industrial materials historically managed at the Site. Screening-level soil data are used when decision-level data are not available to make comparisons. Although screening-level data do not have the same rigorous quality assurance information, their use in this context is appropriate and gives an estimate of what constituents are potentially present in soil at the Site and at what levels. The discussion is organized by Site and analyte. This information will assist the screening process discussed in section 3.5.1 below as the appropriate compliance path selected for the SMA/Site is evaluated.

Also included for all constituents exceeding the TAL at an SMA is a discussion of storm water natural and anthropogenic background concentrations that could be present in run-on and could be a contributing source of the TAL exceedances at the monitoring station.

The storm water monitoring results are plotted on graphs located at the end of each SMA chapter. Organic and inorganic analytes are presented in different plots. A graphic explaining how to read the plots is presented in Appendix C, Understanding the Analytical Results Plots, and is also available on the IP website: http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/site-discharge-pollution-prevention-plan.php.

No sampler moves or adjustments occurred in 2016.

The sampling plans for 2017 have been updated and are presented in Attachment 5 of each SDPPP Update volume.

3.4 Section X.4, Inspections and Maintenance

Active control measures are inspected as follows: Storm Rain Event (after a rain event at or near the Site that registers 0.25 in. or more of rain within 30 min [the precipitation network for each watershed and rain event data in 2016 are presented in Attachment 3 in each SDPPP Update volume]); TAL Exceedance (to reevaluate the existing control measures when water sample results are above TALs); Annual

Automated storm water sampler installed on retention basin spillway

Erosion Evaluation (annually for changes of conditions affecting erosion, or otherwise affecting the potential for discharge of pollutants); Remediation Construction Activity (weekly during remediation construction activities to ensure sediments and runoff controls are working); Significant Event (such as a fire or flood that could significantly impact the control measures and environmental conditions in the affected area[s]); Verification Inspections for Enhanced Controls (verification of the installation of enhanced controls); and Pre-SIP Field Walkdown Inspections (performed before SIP group field visits to determine if the current SMA boundary is correct and if the current Site map accurately shows field controls; not currently required by the IP). The control measures inspection table is provided for each SMA.

Maintenance is completed following inspections and is performed during the calendar year to address deficiencies, or potential deficiencies, in control measures as listed in the maintenance table. Actions described in the table include maintenance and/or installation activities that result from findings on inspections or from recommendations not derived from inspections. These recommendations are often made during planning stages to improve existing conditions at an SMA. This table is provided for each SMA where maintenance was performed. If no maintenance table is included for an SMA, then no maintenance was required to be performed during the calendar year.

The IP regulates approximately 2100 active control measures. Because of the number of active controls, maintenance must be prioritized and scheduled. Following the date of discovery of a potential maintenance item by the field inspection team, the discovery is reviewed by the Permittees' field team lead to determine the scope of maintenance required. Following the finalization of the maintenance/installation scope, a work order is issued to perform the maintenance with a target date for completion. Typically, the target date is set for 2 to 4 wk from the date of discovery or the date a work order is issued for recommendation not derived from inspections. If the maintenance is performed within 30 d from that date, the table indicates that the maintenance was performed as soon as practicable.

Often maintenance is delayed because of events outside the Permittees' control, such as site access control restrictions by Laboratory active facilities; severe weather conditions (i.e., lightning stand-downs, red-flag fire weather work restrictions, winter weather); seasonal biological habitat restrictions (i.e., Mexican spotted-owl); staffing limitations resulting from Site-wide rain events; and force majeure events (i.e., government shutdowns). If maintenance is delayed, but occurs within 31 to 60 d, the maintenance table states the maintenance was delayed. The delays in these cases are considered normal and further explanation is not provided in the maintenance table.

If the maintenance exceeds 60 d, the reason for the maintenance delay is noted in the SMA maintenance table. Any maintenance activities that are associated with enhanced controls typically take more than 60 d to complete because of the planning activities that are required as part of corrective action measure selection through the screening and alternative analysis process (see section 3.5.1 for further information).

3.5 Section X.5, Compliance Status

The compliance status table has been updated for 2016. The terms used to track compliance status are defined in Appendix A of this Overview. Five major categories are used to define compliance status. If necessary, additional details are provided in Attachment 6 regarding compliance status.

Baseline Confirmation Complete (BCComp)—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.

Baseline Monitoring Extended (MEx)—Baseline confirmation monitoring is in progress, and no storm water from a measurable storm event has been collected. There has been no TAL exceedance.

Corrective Action Initiated (CAI)—A sample was collected during confirmation monitoring and the analytical results show at least one pollutant concentration is above TALs, resulting in initiation of corrective action. Corrective action may include installing enhanced control measures, installing control measures that totally retain storm water, installing control measures that totally eliminate the exposure of pollutants, or receiving a COC (with or without controls) from NMED.

Enhanced Control Corrective Action Monitoring (CAM)—Confirmation monitoring at an SMA is initiated to determine how well enhanced controls are performing. This monitoring occurs after certification that the enhanced control measures have been installed and are complete.

Corrective Action Complete (CAComp)—Completion of corrective action is demonstrated by one of the following:

- Analytical results from enhanced control monitoring show pollutant concentrations for all pollutants of concern at the Site to be at or below applicable TALs; or
- Control measures that totally retain and prevent the discharge of storm water have been installed at the Site; or
- Control measures that totally eliminate exposure of pollutants to storm water have been installed at the Site; or
- The Site has achieved RCRA “no further action” status or a COC with or without controls from NMED.

3.5.1 Selecting a Compliance Path Following Corrective Action Initiation

If confirmation monitoring sample results demonstrate that one or more TALs are exceeded at a Site, Part I.E requires the Permittees to initiate corrective action. Corrective action consists of one of the following: (i) enhanced control measures to meet the TAL; (ii) total retention of storm water discharges from the Site; (iii) total elimination of exposure of pollutants to storm water at the Site; or (iv) receipt of an NMED-issued COC under the Consent Order.

Part I.E.4 of the Permit categorizes the Sites into “High Priority Sites” and “Moderate Priority Sites” and establishes deadlines for corrective action based on this prioritization.

- If a baseline confirmation monitoring sample was not collected by September 30, 2012, the Permittees are required to certify completion of corrective action at “High Priority Sites” within one (1) year following the first successful confirmation sampling event.
- Permittees are required to certify completion of corrective action at “Moderate Priority Sites” within five (5) years of the effective date of the Permit (which is November 2015).

The Permittees have been granted administrative continuance because the EPA did not renew the IP before its expiration date. The continuance means Sites listed on the IP are required to continue to comply with the current IP, even after its expiration, until a final new IP is issued.

A screening procedure has been developed to provide the IP team with a process for evaluating existing information pertaining to the Site(s) and the associated SMA(s) and for recommending appropriate corrective action measure(s). This screening requires evaluating available storm water, soil, tuff, and sediment data (site-specific and regional); physical knowledge of the Site(s), operating history of the Site(s), and the status of the Site(s) under the Consent Order; and any proposed LANL infrastructure or other facility improvements. Based on this evaluation, a determination is made as to whether the Site is a likely or unlikely source of the TAL exceedance to determine if additional storm water controls would be effective in reducing Site-related constituents that contribute to the TAL exceedance.

If the Site is determined to be an unlikely source of the TAL exceedance and the Permittees are unable to certify completion of corrective action under Parts I.E.2(a) through (d), individually or collectively, the screening process may result in a recommendation that an alternative compliance request be submitted to EPA. The alternative compliance request presents the evidence for why the Site or Sites are not a source of the TAL exceedance. If the Site or Sites are determined to be a likely or potential source of the TAL exceedance, the Site or Sites are recommended to undergo alternatives analysis. The alternatives-analysis process evaluates the possible corrective action controls, including installation of enhanced controls, total retention, no exposure, and Site remediation. From this alternatives-evaluation process, the most appropriate control(s) is selected, designed, and implemented.

In Attachment 6 of each SDPPP Update volume, the Permittees provide updated information regarding the planned compliance path for each SMA/Site in corrective action where corrective action has not yet been completed and the path has changes from the previous year. In addition, information is provided to explain any delays that have occurred in completing corrective action planned. In 2016, all SMAs regulated under the IP were in compliance.

4.0 Public Involvement

4.1 Website Updates

- The website structure is designed to make IP documents easy to locate. The major links from the home page (http://www.lanl.gov/environment/protection/compliance/individual-permit-stormwater/index.php) are as follows:
- **Site Discharge Pollution Prevention Plan**—provides links to the most current SDPPP Updates, archived SDPPPs and updates (years 2010 through 2015), and monitoring and inspection procedures currently used by the PPT.
- **SMA Maps**—provides a direct link to each project map; maps are organized by SDPPP volume and updated when any change is made.
- **Reports**—provides links to the Annual Reports, Compliance Status Reports, and the Target Action Level Exceedance Reports.
- **Alternative Compliance**—provides links to the EPA submittal letter and alternative compliance package, provides links to underlying technical studies, and provides a placeholder for public comments and the Permittees' response to be submitted to EPA.

- **Miscellaneous EPA Submittals**—provides links to letters submitted to EPA regarding force majeure, boundary changes, requests to extend the Permit renewal application deadline, requests to delete Sites from the permit and sample results after no exposure.
- **Construction Certifications**—provides links to the certification letters submitted to EPA following construction of enhanced controls and baseline controls and analytical results following construction certification.
- **Corrective Action**—provides links to letters submitted to EPA that certify analytical results below TALs, total retention construction, construction to eliminate exposure, and COCs received from NMED under the Consent Order.
- **Public Meetings**—provides a link to the agenda and presentations for all meetings held to date.

4.2 Email Notification

A "Subscribe" link is available on the IP website, in the right column, and allows anyone with an email address to sign up to receive email updates about compliance with the Individual Permit. The public can also ask questions of the IP team from the "Get Expertise" link in the right column.

4.3 Public Meetings

Public meetings are announced through the email notification process and in local newspapers.

5.0 Watershed Protection Approach

Storm water controls have been installed within each watershed where SMAs exist. These controls have been installed under a variety of programs, including, but not limited to, the NMED Consent Order, Multi-Sector General Permit, Construction General Permit, NPDES outfall permit, EISA storm water guidance, post-fire runoff protection measures, flood mitigation, and general "good-housekeeping" practices. As a whole, these storm water controls prevent erosion and reduce sediment discharge in the watershed. Each year, additional storm water mitigation measures are being evaluated and installed throughout the Laboratory.

Under the Consent Order, some of the Permittees' largest sediment transport mitigations have been installed in several watersheds, including in Sandia, Mortandad, Los Alamos, Ten Site, and Pueblo Canyons. The goal is to reduce the transport of sediment through a variety of means, including reducing the potentially erosive nature of storm water runoff, enhancing deposition of sediment, and reducing or eliminating access of contaminated sediments to flood erosion. The specific mitigations include the DP Canyon grade-control structure and associated wetlands; two Pueblo Canyon grade-control structures, willow planting, wetlands, and erosion-control measures; the Los Alamos Canyon low-head weir and associated sediment-retention basins; the Mortandad Canyon sediment-retention basins (which are also IP baseline controls that have undergone significant upgrades from initial baseline control status); Ten Site Canyon grade-control structure, and the Sandia Canyon grade-control structure and associated wetlands. In 2016, these installations were inspected quarterly and after higher-flow storm-water runoff. In 2017, these installations will be inspected semiannually and after higher-flow storm water runoff. Maintenance is conducted to ensure these installations are working properly. Maintenance includes debris removal and minor/major repairs to structure to maintain function. Sediment, storm water, and geomorphic monitoring is conducted in these watersheds to evaluate the effectiveness of the mitigations.

Pueblo Canyon Grade-Control Structure

Appendix A
Acronyms and Glossary

All acronyms and abbreviations in the Overview and Volumes 1 through 5 of this report are included in this list and are not defined at first use in the Overview and in each volume.

Acronyms

ACA	accelerated corrective action
AEA	Atomic Energy Act
AOC	area of concern
ATAL	average target action level
B	additional baseline control measure
BCComp	baseline confirmation complete
BFM	bonded-fiber matrix
bgs	below ground surface
BMP	best management practice
BV	background value
CAComp	corrective action complete
CAI	corrective action initiated
CAM	enhanced control corrective action monitoring
CB	certified baseline control measure
CCN	change control notice
CEARP	Comprehensive Environmental Assessment and Response Program
CFR	Code of Federal Regulations
CISEC	Certified Inspector of Sediment and Erosion Control
CME	corrective measures evaluation
CMP	corrugated metal pipe
CMR	Chemistry and Metallurgy Research
COC	certificate of completion
Consent Order	Compliance Order on Consent
COPC	chemical of potential concern
County	Los Alamos County
CPESC	Certified Professional in Erosion and Sediment Control
cpm	counts per minute
CWA	Clean Water Act
CWWTP	Central Wastewater Treatment Plant
D&D	decontamination and decommissioning
DL	detectable level

Appendix A, Acronyms and Glossary (continued)

Acronyms (continued)

DOE	U.S. Department of Energy
DU	depleted uranium
EC	enhanced control
ECB	erosion-control blanket
EIM	Environmental Information Management (LANL database)
EISA	Energy Independence and Security Act
EM	electromagnetic
EM	Environmental Management
EM-LA	DOE EM Los Alamos Field Office
EPA	Environmental Protection Agency (U.S.)
EQL	estimated quantitation limit
ER Project	Environmental Restoration Project
ESH	Environment, Safety, and Health (Directorate)
ET	evapotranspiration
FFCA	Federal Facility Compliance Agreement
FGM	flexible-growth medium
FV	fallout value
FY	fiscal year
GPR	ground-penetrating radar
GSA	General Services Administration
HE	high explosives
HDPE	high density polyethylene
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HRL	Health Research Laboratory
HYPO	high power
IA	interim action
ID	identification
IM	interim measure
IP	National Pollutant Discharge Elimination System (NPDES) Permit No. NM0030759
Laboratory	Los Alamos National Laboratory
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LASCP	Los Alamos Site Characterization Program
LASL	Los Alamos Scientific Laboratory

Appendix A, Acronyms and Glossary (continued)

Acronyms (continued)

LLW	low-level waste
LOPO	low power
M&O	management and operating
MD	munitions debris
MDA	material disposal area
MDL	method detection limit
MEC	munitions and explosives of concern
MEx	baseline monitoring extended
MLLW	mixed LLW
MQL	minimum quantification level
MSGP	Multi-Sector General Permit
MTAL	maximum target action level
NES	nuclear environmental site
NFA	no further action
ng/L	nanograms per liter
NMED	New Mexico Environment Department
NMDOT	New Mexico Department of Transportation
NMED-SWQB	NMED Surface Water Quality Bureau
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
NSSB	National Security Science Building
OD	open detonation
OEW	ordnance and explosives waste
OU	operable unit
OWR	Omega West Reactor
PBX	plastic-bonded explosive (potassium butyl xanthate)
pCi/L	picocuries per liter
PCB	polychlorinated biphenyl
Permittees	DOE and LANS
PF	permitted feature
PHERMEX	Pulsed High-Energy Radiographic Machine Emitting X-Rays
PLS	pure live seed
PPT	Pollution Prevention Team
PQL	practical quantitation limit

Appendix A, Acronyms and Glossary (continued)

Acronyms (continued)

PRS	Potential Release Sites (LANL database)
RADS	radionuclides
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RG	rain gauge
RLW	radioactive liquid waste
RLWTF	Radioactive Liquid Waste Treatment Facility
SAA	satellite accumulation area
SAFR	small arms firing range
SAL	screening action level
SDPPP	Site Discharge Pollution Prevention Plan
SIP	sampling implementation plan
SIR	supplemental investigation report
SMA	site monitoring area
SSA	satellite storage area
SSL	soil screening level
SUPO	super power
SVC/SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWSC	Sanitary Wastewater Systems Consolidation (plant)
SWTS	Storm Water Tracking System
TA	technical area
TAL	target action level
TCLP	toxicity characteristic leaching procedure
TNT	trinitrotoluene(2,4,6-)
TRM	turf-reinforcement mat
TRU	transuranic
TSCA	Toxic Substance Control Act
TSD	treatment, storage, and disposal (unit)
TSTA	Tritium Systems Test Assembly
ULR	unassigned land release
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
UTL	upper tolerance limit

Appendix A, Acronyms and Glossary (continued)

Acronyms (continued)

UXO	unexploded ordnance
µg/L	micrograms per liter
VCA	voluntary corrective action
VCM	voluntary corrective measure
VCP	vitrified clay pipe
VOC	volatile organic compound
WBR	Water Boiler Reactor
WQDB	Water Quality Database
WWTP	waste water treatment plant

Appendix A, Acronyms and Glossary (continued)

Glossary

Alternative Compliance—Where the Permittees believe they have installed measures to minimize pollutants in storm water discharges but are unable to certify completion of corrective action because of force majeure events, background concentrations of pollutants of concern, site conditions that make it impracticable to install further control measures, or pollutants of concern contributed by sources beyond the Permittees' control, a Site may be placed into alternative compliance. EPA will determine an individually tailored compliance schedule on a case-by-case basis.

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.

Baseline Monitoring Extended—Baseline confirmation monitoring is in progress, and no storm water from a measurable storm event has been collected. There has been no TAL exceedance.

Corrective Action Initiated—A sample was collected during confirmation monitoring and analytical results show at least one pollutant concentration is above TAL, resulting in initiation of corrective action. Corrective action may include installing enhanced control measures, installing control measures that totally retain storm water, installing control measures that totally eliminate the exposure of pollutants, or receiving a COC (with or without controls) from NMED.

Enhanced Control Corrective Action Monitoring—Confirmation monitoring at an SMA is initiated to determine how well enhanced controls are performing. This monitoring occurs after certification that the enhanced control measures have been installed and are complete.

Corrective Action Complete—Completion of corrective action is demonstrated by one of the following:

- Analytical results from enhanced control monitoring show pollutant concentrations for all pollutants of concern at the Site to be at or below applicable TALs; or
- Control measures that totally retain and prevent the discharge of storm water have been installed at the Site; or
- Control measures that totally eliminate exposure of pollutants to storm water have been installed at the Site; or
- The Site has achieved RCRA "no further action" status or a COC with or without controls from NMED.

Appendix B
Control Measures

The control measures discussed below have been installed under the IP to prevent run-on to the Site or runoff from the Site. The list is not exhaustive but represents those measures usually installed to prevent erosion and/or to control/capture sediment.

Maintenance and inspection of control measures follow procedures in section 3.4 of the Overview, Inspections and Maintenance.

The table below lists the primary purpose of type of control measure. Photographs in this appendix demonstrate control measures installed on Laboratory property and are for informational purposes only.

Control Type	Control Sub Type	Control Name	Life Cycle (months)	Control Purpose Erosion Control (EC)/Sediment Control (SC)
01	**00**	**Seed and Mulch**		
	01	Seed and Wood Mulch	24	EC
	02	Seed and Gravel Mulch	120	EC
	03	Hydromulch	12	EC
	04	Seeding	24	EC
	05	Gravel mulch	120	EC
	06	Erosion Control Blanket	24	EC
	07	Seed and Compost	24	EC
02	**00**	**Permanent Vegetation**		
	~~01~~	~~Grasses and Shrubs~~	~~120~~	~~EC~~*
	~~02~~	~~Forested/Needle Cast~~	~~120~~	~~EC~~*
	03	Vegetation Buffer Strip	120	EC
	04	Established Vegetation	120	EC
03	**00**	**Berms**		
	01	Earthen Berm	120	SC
	02	Base Course Berm	120	SC
	03	Log Berm	120	SC
	04	Asphalt Berm	120	SC
	05	Silt Dike	24	SC
	06	Straw Wattle	24	SC
	07	Terra Tube	120	SC
	08	Retaining Wall	120	SC
	09	Curbing	120	SC
	10	Gravel Bags	120	SC
	11	Eco-Block	120	SC
	12	Rock Berm	120	SC

Appendix B, Control Measures (continued)

Control Type	Control Sub Type	Control Name	Life Cycle (months)	Control Purpose Erosion Control (EC)/Sediment Control (SC)
	13	Silt Fence	120	SC
	14	Coir log	120	SC
	15	Redi-Rock Berm	120	SC
	16	Wood Chip Wattle	36	SC
04	**00**	**Channel/Swale**		
	01	Earthen Channel/Swale	120	EC
	02	Concrete/Asphalt Channel/Swale	120	EC
	03	Rock Channel/Swale	120	EC
	04	Culvert	120	EC
	05	Water Bar	120	EC
	06	Riprap	120	EC
	07	Vegetated Swale	120	EC
	08	TRM-Lined Swale	120	EC
05	**00**	**Sediment Traps and Basins**		
	01	Sediment Trap	120	SC
	02	Sediment Basin	120	SC
	03	Sand Filter	120	EC
	04	Gravel Infiltration Strip	120	SC
	05	Bioretention Basin	120	SC
	06	Infiltration Basin	120	SC
06	**00**	**Check Dam**		
	01	Rock Check Dam	36	SC
	02	Log Check Dam	36	SC
	03	Juniper Bale	120	SC
	04	Energy Dissipater	240	SC
07	**00**	**Gabions**		
	01	Gabion	120	SC
	02	Gabion Blanket	120	EC
08	**00**	**Cap**		
	01	Earth Cap	120	EC
	02	Rock Cap	120	EC
	03	Asphalt Cap	120	EC
	04	Metal Cap	120	EC

* These two types of controls were retired in 2013, and active instances of the control types at SMAs were recoded. These two still appear in the master list because the retired asset codes are still in use and may appear in information published before 2013.

Appendix B, Control Measures (continued)

Seed and Mulch

General Description

Seed and mulch are used in combination. Mulch includes wood, hydromulch, gravel, erosion-control blankets, and turf-reinforcement blankets.

Perennial vegetative cover from seeding has been shown to remove between 50% and 100% of total suspended solids from storm water runoff, with an average removal of 90%.

Control Function

Seed and mulch controls are used primarily to control erosion and to reestablish areas disturbed by construction activities. However, these control measures can also be used for run-on, runoff, and sediment control if the storm water discharge is localized producing sheet flow (nonchannelized).

Selection Criteria, Materials, and Construction Specifics

Selection Criteria

The selection of seed and mulch is related to the slope of the area where protection is required. The table below presents common guidance used at the Laboratory.

Erosion Control	Slopes Steeper than 1:1	Slopes Flatter than 1:1	Slopes Flatter than 1:2	Slopes Flatter than 1:3	Channels
Permanent blankets	X	X	X	X	X
BFM, FGM hydromulch		X	X	X	
Wood fiber hydromulch			X	X	
Straw/Coir blankets		X	X	X	

Materials and Construction Specifics

Seed and mulch requirements are selected during planning stages of the work. The Laboratory provides technical specifications that specify quality control, materials, approved vendors, and execution requirements. In most cases, seed is applied in contact with soil and mulch is used to provide a protective cover for raindrop protection, promote seed germination, and help with seedling survival. Materials readily available from established suppliers are described below.

Wood Mulch

- Wood straw mulch, wood chips, green-waste mulch, and bark chips are all accepted forms of wood mulch. Wood mulch application covers the ground surface up to 4 in. thick. Wood mulch is not used in areas with steep slopes and is not used where it could run on to a storm water control and interfere with the function of the control.

Gravel Mulch

- Gravel is ¾ in. to 2 in. in diameter, round or crushed. Gravel mulch is applied 2–6-in. thick over the soil surface and is not compacted.

Appendix B, Control Measures (continued)

Hydromulch

- Wood fiber hydromulch is applied on slopes flatter than 2:1. Mulch is combined with an organic plantago-based tackifier.
- For slopes steeper than 2:1, bonded fiber products are available.

Blankets and Matting

- On slopes less than 1:1, straw/coir blend blankets are specified.
- For high-flow channels or slopes steeper than 1:1, permanent composite TRM is specified.

Seed

- Standard seed mixes used at the Laboratory consist of a variety of pure live seed of grass species, wildflowers, forbs, and shrubs. Only two approved sources have proven consistent in meeting the demands of high altitude and typical rainfall amounts at the Laboratory.

Inspection and Maintenance

For seeding and mulch, typical maintenance actions may result from rainfall events that strip the ground of seed and mulch before it has established, animal disturbance, and human disturbance such as vehicular traffic. Maintenance actions may include reseeding of damaged areas and installing temporary barriers.

Hydromulch applied at a detention pond in Chaquehui Canyon

Appendix B, Control Measures (continued)

Permanent Vegetation

General Description

Established vegetation is made up of areas of existing mature vegetation that provides erosion control and storm-water infiltration. There are two broad categories of established vegetation at the Laboratory: (1) low-growing vegetation is classified as grasses and shrubs and (2) piñon-juniper, ponderosa, pine, and mixed conifer vegetation are classified as forested.

Control Function

Established vegetation is primarily used for erosion control, including sediment control, run-on control, and runoff control in situations with no concentrated flow.

Selection Criteria, Materials, and Construction Specifics

Selection Criteria

Any area of existing perennial vegetation that increases storm-water infiltration and protects the soil from wind erosion, raindrop impact, or storm water overland flow. In areas where wetland-type vegetation is planned or is in place, specific plant materials are selected for propagation. In existing vegetated areas, examination of current coverage and robustness of the area (organic material, water availability) is required for expanding the area.

Materials

Grasses and shrubs are examined for native habitat. Areas that are determined to be wetland plantings may include specific variety of plants for long-term establishment.

Construction Specific

Permanent vegetation is installed by qualified personnel specializing in landscaping. Tree and woody plants are planted in accordance with work being performed during correct seasonal conditions. Plantings for permanent vegetation sometimes include a long-term watering program.

Inspection and Maintenance

- Inspection for significant disturbances to vegetation (e.g., construction, fire, thinning, road building, and new storm water channels). Repair, if possible, is initiated.
- The determination to continue a watering program is evaluated during inspection activities.

Appendix B, Control Measures (continued)

Established vegetation at a detention pond in Chaquehui Canyon

Berms

General Description

This category of storm-water control includes earthen berms, base-course berms, log berms, asphalt berms, silt dikes, straw wattles, retaining walls, curbing, gravel bags, Eco-Block, Redi-Rock, rock berms, S-fence, and coir logs.

Control Function

Berms are used primarily for run-on diversion of sheet flow and channelized flow and also for retention of run-on, runoff, and sediment in low-flow applications. Straw wattles, S-fences, rock berms, and gravel bags can be used along the toe, top, and face and at-grade breaks of slopes to shorten slope length and along the perimeter of exposed soil areas to reduce flow velocities and retain sediment. Filter fabric may be used where reductions in turbidity are required. Retaining walls are used primarily for slope stabilization and sediment control.

Appendix B, Control Measures (continued)

Selection Criteria, Material Requirement, and Construction Specifics

Selection Criteria

- The velocity of on-coming water, including the energy of water, will lead to the type of berm used. Incorrect berm construction could result in scour and overtopping where overtopping is not desired.
- High berms require select materials and compaction testing.

Material Requirement

- Diversion berms are constructed primarily from select compactable granular material such as base course or asphalt (berms and curbing).
- Retention berms are constructed primarily from earth, base course, logs, or asphalt.

Construction Specifics

Berms

- The Laboratory maintains construction specifications that describe required materials, quality control, and execution and testing requirements.
- Earthen berms require vegetative controls to prevent erosion of the berm itself. Riprap is added if additional armoring is necessary.
- Asphalt berms and curbs are installed per design drawings and Laboratory standard drawings.
- For areas with significant traffic, gravel or asphalt berms may be recommended.
- Where berms will retain water, berm fill material requires compaction testing.
- Berms should be stabilized with appropriate stabilization such as seed and ECBs.
- When used as a perimeter or downslope control, berms divert runoff to a sediment trapping control such as a sediment trap or basin.

Wattle and Coir Log

- Straw wattles are installed along the contour with the ends of each wattle turned upslope to prevent runoff from flowing around the end. Wattles are installed in shallow trenches dug 3 to 5 in. deep for soft, loamy soils and 2 to 3 in. deep for hard, rocky soils.
- The vertical spacing requirements for slope installations are based on a higher density of wattles for steep slopes and less dense for flatter slopes.
- Wood stakes or rebar are driven through the middle of the wattle and deep enough into the ground to anchor the roll in place.

Other Berm Types

- Installation of log berm is similar to the installation of wattles. Logs are delimbed, trenched in, and backfilled. Wooden stakes may be used for additional support.

Appendix B, Control Measures (continued)

- Rock berms are constructed of large angular rock. Height and depth of the berm depend on the expected storm-water flow.
- Gravel-bag berms are constructed of bags of woven polypropylene, polyethylene, or polyamide fabric and filled with gravel.
- Eco-Blok rubber sediment control block installation is similar to gravel bag berms. Eco-Blok can be staked down to soils or glued to asphalt or concrete. Ertec S-fence is installed perpendicular to sheet flow. The fencing is trenched in 3-in. and backfilled.
- Retaining walls and Redi-Rock berms are constructed to appropriate engineering standards.

Inspection and Maintenance

Berms

- Inspections may find that berms were not installed to sufficient height, requiring rework to raise, widen, or extend the berm.
- Compacted earthen or granular berms degrade, scour, and settle. Fill materials may need to be added and recompacted.
- Rodent burrows may result in undermining. Recompacting the berm can help reduce impacts from burrows.

Wattles

- Wattle anchorages can be displaced, crushed, torn, and misalignment. Typical maintenance entails restoring or replacing the wattle to address evident failure issues.
- Rodents and other animals can destroy wattles. Wattles are removed and reinstalled or new wattles installed on top of existing damaged wattles. With time, wattles degrade to a point where they require replacement.

Retaining Walls

- Inspections may observe cracking, spalling, slumping, and slope changes. Depending upon the severity of failure, maintenance may be requested. Maintenance includes addressing issues that contribute to failure, including recompacting areas and crack repair.

Appendix B, Control Measures (continued)

Berm in Potrillo Canyon

Appendix B, Control Measures (continued)

Coir logs placed in Bayo Canyon

Earthen berm with TRM at the top of Pueblo Canyon

Appendix B, Control Measures (continued)

Channels and Swales

General Description

This category of storm-water control includes earthen swales, concrete or asphalt swales, rock-lined (riprap) swales, vegetated swales, culverts, riprap outlet protection, and water bars.

Control Function

Channels and swales are constructed within natural terrain or lined diversions using riprap and concrete that collect and convey concentrated flows of storm-water runoff around an area. Lined channels or swales and culverts can also be used as erosion control if they transport storm water across a SWMU or AOC without contacting it. Water bars are used to divert water off a roadway without blocking access. Riprap outlet protection is used to stabilize soil and sediment below a storm-water source.

Selection Criteria, Material Requirement, Construction Specifics

Selection Criteria

- Channels and swale selection are based on the location where installed.
    - In natural terrain areas using rock-lined swales or channels, vegetated swales or water bars made from base course that fit into the surrounding area are encouraged.
    - In institutional areas, such as parking lots, an asphalt water bar or concrete valley gutter may be selected.
    - Size and function are designed to meet anticipated storm-water volume.
    - Where a storm drain is required, an engineered design may be required for headwalls requiring reinforced concrete.

Material Requirement

- Based on the size, location, and flow rate, channels and swales are primarily made of concrete, base course, or earth. Vegetation may be required in areas where there is no vehicular traffic. For added stability, TRM or riprap may be added.
- Storm-water culverts are made of corrugated metal pipe or corrugated HDPE smooth wall pipe.

Construction Specifics

- Concrete valley gutters are typically 4 ft to 6 ft wide. Valley gutters are often a part of new construction in facility parking areas.
- Storm drain culverts require construction procedures to avoid subsurface utilities. For areas requiring concrete work, procedures are required for issues related to access roads for concrete-ready mix trucks to deliver to the Site. In areas with difficult access, roads may be graded and improved.
- Areas that are planned to be vegetated require that seed plantings be timed to take advantage of a favorable growing season.

Appendix B, Control Measures (continued)

Inspection and Maintenance

- Channel erosion or breaching may occur after storm events. Eroded areas may require reconstruction and compaction.
- Clogging of inlet structures for storm water culverts require periodic cleaning.
- Vegetation loss from high flows may require reseeding an area or changing the type of surface coverage to one that is more appropriate.
- Removing sediment accumulation is routinely performed.

Channel with TRM bank stabilization in Pueblo Canyon.

Appendix B, Control Measures (continued)

Sediment Traps and Detention Basins

General Description

Detention basins are used to detain sediment and control the release of runoff. Runoff is released at a controlled rate through an outlet structure. Sediment traps perform the same function as basins but are typically smaller in size and do not have pipe outlets.

Control Function

Sediment traps and detention basins are used for sediment control. Under appropriate conditions, they are used for runoff control in the IP program.

Selection Criteria, Material Requirements, and Construction Specifics

Material Requirements

- Basin and trap embankment are constructed primarily from earth or compactable granular material such as base course, which is free of roots, woody vegetation, and large stones.
- Inlets and outlets are constructed of a hardened surface such as concrete or riprap or may consist of a pipe with stabilized outlet.
- Spillways are constructed of a hardened surface such as concrete or riprap.

Construction Specifics

- Sediment trap outflows must discharge through a stabilized low point. Spillways should be designed to provide the trap with a settling zone and a sediment storage zone.
- Embankment fill material is placed and compacted with a compactor or the appropriate earth-moving equipment. Specifications require compaction testing where berms will retain water.
- Embankments are stabilized with seed and erosion control blankets, seed and hydromulch, or other appropriate stabilization controls

Inspection and Maintenance

- Inlets, outlets, spillways, and pond/trap embankments are inspected for damage such as vegetation loss or excess, bank instability, debris build-up, erosion, and rock displacement and are maintained as needed to effectively convey storm water runoff.
- Basin inlet and outlet pipes may become plugged with debris or sediment and require cleaning. Spillways may become clogged or damaged and may require repair.
- Sediment deposits and debris need to be routinely removed from detention basins to maintain the appropriate structure storage capacity for both sediment and runoff. Generally, sediment traps are not permanent structures.

Appendix B, Control Measures (continued)

Sediment trap and detention basin to collect parking lot flow at TA-03.

Check Dams

General Description

This category of storm water control includes rock and log check dams and juniper bales. Note: Straw wattles and silt fence are not used.

Control Function

Check dams are used primarily for sediment control but may also be used in small channels to control run-on and runoff.

Selection Criteria, Material Requirements, and Construction Specifics

Material Requirements

- Rock check dams are built using angular rock with an appropriate density and size to withstand the design water velocity.
- Logs check dams are built using logs that may be harvested on-site with an appropriate diameter for the application.

Appendix B, Control Measures (continued)

Construction Specifics

- Check dams are placed at a distance and height to allow water ponding from downstream check dam to reach the toe of the upstream dam.
- Structures are designed to allow high flows (typically a 2-yr storm or larger) to pass safely over the check dam without an increase in upstream flooding or damage to the check dam.
- Dams are stabilized by entrenching the material into the sides and bottom of the channel.
- Rock is placed individually by hand or by mechanical methods.
- Log check dams may be doweled into the channel to withstand high flows.
- Scour protection may be placed on the downstream side of the dam to reduce downstream erosion.

Inspection and Maintenance

- Check dams are inspected as flow conditions change to ensure they are located in the preferential flow path to reduce flow velocity and/or retain sediment. Relocation or resizing of the structure is completed as necessary.
- Check dams are inspected for scour, structural damage, and erosion caused by flows around, under, or below the dam structure. Repairs to the control are made as needed.
- As Site conditions change and rocks shift, the check dam is maintained to ensure the dam center is lower than its edges and the edges are below the edge of the channel. Stone may be added or removed to maintain appropriate structure geometry.
- Check dams are maintained by removing large debris, trash, and leaves so the function of the structure is not compromised.

Doweled log check dam during flow event in Acid Canyon.

Appendix B, Control Measures (continued)

Native rock checked dams installed in preferential flow path.

Gabions

General Description

This category of storm-water control includes gabions and gabion blankets.

Control Function

Gabions are pervious structures designed to stabilize and protect channels and slopes subject to erosion. When installed perpendicular to the storm-water flow, gabions act as a check dam allowing sediments to accumulate behind and within the open void structure. Gabion blankets, also called a gabion mattresses, are used to line channels and swales for the purpose of additional stability. Gabion blankets are often installed contiguously with gabion baskets.

Appendix B, Control Measures (continued)

Selection Criteria, Material Requirement, Construction Specific

Selection Criteria

- The decision to place a gabion structure rather than a berm or rock check dam is based on whether the structural stability and pervious nature of gabions are required.
    - ❖ Gabion structure stability will manage design storms based on criteria provided. The long-term stability of the structure does not rely upon vegetated growth because a berm may require for long-term stability. Once built on a stable foundation, the gabion does not require a compacted fill as a berm requires. The gabion itself resists failure modes by mass.
    - ❖ Gabion mattresses are selected downstream at discharge locations of other storm-water controls. The mattress is selected where just amending riprap into a channel will not prevent movement of erosion downstream.

Material Requirement

- Gabion fill is well-graded round river rock or Type A angular riprap.
- Wire enclosures come in different configurations and can be assembled in the field or manufactured and delivered empty to the site.
- Gabion fasteners are of similar gage to the wire enclosure.
- Gabion mattresses may need additional anchorages. These include steel angles, pipe, or railroad rails that are driven through the gabions at regular spacing.
- Gabions are bedded on filter fabric.

Construction Specific

Gabions are installed in accordance with NMDOT standards and specifications. Placement of gabions include the following

- Subgrade below the gabion is either placed on firm bedrock or tuff or are built on a compacted foundation.
- At ends not in the water course, gabions are keyed into stable banks.
- Gabions are stacked on each other in a staggered manner, much like masonry blocks.

Inspection and Maintenance

- Gabions that become unseated causing scouring underneath the structure require maintenance. The structure may need to be excavated down to the point of failure, and recompacting and rebuilding the basket may be required.
- Gabions wire may break and rock spills out. The basket may be rebuilt or mended to restore function.

Appendix B, Control Measures (continued)

- Gabions that slip out of place are generally replaced rather than mended.
- Gabion blankets the slip out of position require additional anchorage. Anchorage methods, such as driving railroad rails into good material, is one method.

Stacked gabion baskets with downstream gabion blanket in Potrillo Canyon

Permanent Caps

General Description

This category of storm water control includes clay or soil, rock, concrete, and asphalt caps.

Control Function

Caps are used primarily to control erosion and to isolate areas of potential soil contamination from storm water. Caps result in an impermeable surface removing the potential of water movement through the area capped.

Appendix B, Control Measures (continued)

Selection Criteria, Material Requirement, Construction Specific

Selection Criteria

Permanent caps are selected when no other alternative is available to prevent pollutants at a Site from migrating.

- Facility usage such as frequent vehicle use and limited space may prevent other means, such as berms or ponds, from being used. The type of cap is selected based upon the facility usage of the area. In areas where vehicle traffic may wear the cap, a hard surface such as concrete or asphalt is selected.

Material Requirement

- Earthen caps are at least 24 in. thick and typically covered with rock or gravel to protect the cap from erosion. The type of earth cover selected is intended to be impervious with no intrusion of water into the area with pollutants.
- Hard caps such as concrete and asphalt are a minimum thickness with consideration of use and vehicle traffic.

Construction Specific

Caps are engineered to meet the specific need. Additional design considers installing diversions, curbs, berms, and cut-off walls to ensure storm water does not cause future erosion features either near or on the cap itself.

Caps using earthen materials meet a specification for material type and compaction requirement. Hard caps also require minimum testing requirements.

Inspection and Maintenance

- Typical inspections that lead to maintenance are done with condition assessments of diversions and the cap itself.
- Intrusions may occur with both earthen and hard caps. Weeds growing in cracks, rodent burrows, large woody plants, or vehicular damage require repair or removal.
- Inspections noting erosional features that could migrate to the cap are maintained and BMPs added to remedy the feature.

Appendix C
Understanding the Analytical Results Plots

For each SMA where storm water samples were collected and analyzed in 2011 to 2016, the analytical results plots have been prepared. The purpose of the analytical plots is to present the analytical results in a manner that allows direct comparison with the TALs as defined in the Individual Permit (ATAL, MTAL, or MQL). Data are presented in one or more plots. The first plot contains the results for all metals, weak acid dissociable cyanide, and gross-alpha radioactivity and radium, and the second presents the results for organic compounds, if analyzed. The organic plot is presented only if one or more groups of organic compounds were analyzed in the storm water sample collected at the Site and associated SMA per the requirements set forth in Appendix B of the Permit.

Analytical results for each analyte presented in the plots are normalized by calculating an exceedance ratio. This ratio is defined as the analytical result divided by applicable TAL (ATAL, MTAL, or MQL). Thus, results exceeding the TAL will be greater than an exceedance ratio of 1.0. The exceedance ratios are plotted on a log scale to allow the display of a larger range of values. A solid symbol on the plot represents a result that is detected above the MDL, while a hollow symbol represents a value that is considered a nondetect, meaning the analytical laboratory was not able to detect a concentration greater than the MDL. From CFR 40 Appendix B Part 136, the MDL is defined as "...the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte."

For the storm water data, a nondetected result is either reported as the MDL value or the PQL value. The PQL, also referred to as the MQL, is an estimation of the concentration measurement and is normally 2.5 to 10 times the MDL. In 2011 to 2014, nondetected analytes were reported at the value of the PQL. However, starting in 2015, nondetected analytes were reported at the value of the MDL. By reporting nondetects at the MDL, the Permittees have "99% confidence" that the actual concentration of the analyte is below the MDL.

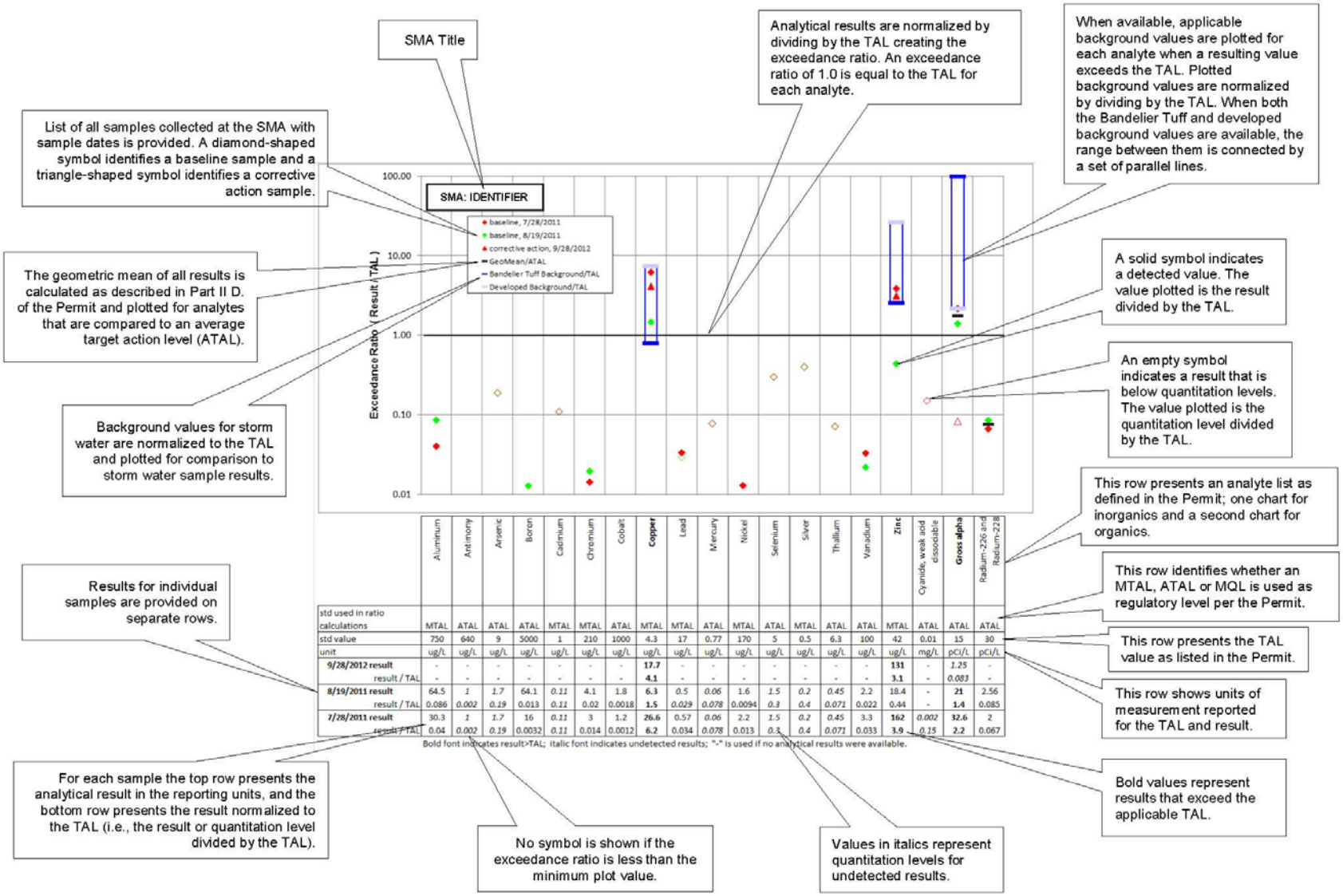
The reported value for a nondetected result may be greater than or equal to a TAL (ATAL, MTAL, or MQL). During 2011 to 2014, some nondetected values were reported above the TALs but had MDLs less than the TALs. Starting in 2015, all nondetected results for these analytes were reported at the MDL less than the TAL.

Between 2011 and 2014, several nondetected results reported at the PQL for benzo(a)pyrene and hexachlorobenzene were greater than their TALs (MQLs), and the MDLs for these constituents were also greater than their ATALs. In 2015, the Permittees changed the analytical method for benzo(a)pyrene to EPA method 8310. This change will most likely allow for the reporting of nondetects of this constituent below the ATAL. In 2015, the Permittees also changed the analytical method for hexachlorobenzene to EPA method 8081B. This method is the most sensitive commercially available EPA-approved method but consistently has an MDL greater than the TAL. These methods were in use by the Permittees starting in 2015.

Background storm water values for some metals, gross-alpha radioactivity, and PCBs where available, are also plotted to provide additional points of reference when evaluating the significance of the analytical result. The process for the determination of the background storm water values is presented in a report prepared by the Permittees' on PCBs in storm water (LANL 2012, 219767) and another report on metals and selected radionuclides in storm water (LANL 2013, 239557).

The following schematic provides more specific details related to individual components of the analytical results plots.

Appendix C, Understanding the Analytical Results Plots (continued)



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	**Copper**	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	**Zinc**	Cyanide, weak acid dissociable	**Gross alpha**	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L
9/28/2012 result	-	-	-	-	-	-	-	**17.7**	-	-	-	-	-	-	-	**131**	-	*1.25*	-
result / TAL	-	-	-	-	-	-	-	**4.1**	-	-	-	-	-	-	-	**3.1**	-	*0.083*	-
8/19/2011 result	64.5	*1*	*1.7*	64.1	*0.11*	4.1	1.8	**6.3**	*0.5*	*0.06*	1.6	*1.5*	*0.2*	*0.45*	2.2	18.4	-	**21**	2.56
result / TAL	0.086	*0.002*	*0.19*	0.013	*0.11*	0.02	0.0018	**1.5**	*0.029*	*0.078*	0.0094	*0.3*	*0.4*	*0.071*	0.022	0.44	-	**1.4**	0.085
7/28/2011 result	30.3	*1*	*1.7*	16	*0.11*	3	1.2	**26.6**	0.57	*0.06*	2.2	*1.5*	*0.2*	*0.45*	3.3	**162**	*0.002*	**32.6**	2
result / TAL	0.04	*0.002*	*0.19*	0.0032	*0.11*	0.014	0.0012	**6.2**	0.034	*0.078*	0.013	*0.3*	*0.4*	*0.071*	0.033	**3.9**	*0.15*	**2.2**	0.067

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

Appendix D
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The following list includes all documents cited in this plan. Parenthetical information following each reference provides the author(s), publication date, and ER ID or ESH ID. This information is also included in text citations. ER IDs were assigned by the Environmental Programs Directorate's Records Processing Facility (IDs through 599999), and ESH IDs are assigned by the Environment, Safety, and Health (ESH) Directorate (IDs 600000 and above). IDs are used to locate documents in the Laboratory's Electronic Document Management System.

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Appendix E
Potential Pollutants of Concern and Permitted Features

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other[a]	Add[b]
R-SMA-0.5	R001	C-00-020	Ra	Cyanide	Metals		HE		
R-SMA-1	R002	C-00-041							SVC
R-SMA-1.95	R003	00-015	Ra	Cyanide	Metals		HE		
R-SMA-2.05	R004	00-011(c)	Ra	Cyanide	Metals		HE		
R-SMA-2.3	R005	00-011(e)							
R-SMA-2.5	R006	00-011(a)	Ra	Cyanide	Metals		HE		
B-SMA-0.5	B001	10-001(a)	Ra	Cyanide	Metals				HE
B-SMA-0.5	B001	10-001(b)	Ra	Cyanide	Metals				HE
B-SMA-0.5	B001	10-001(c)	Ra	Cyanide	Metals				HE
B-SMA-0.5	B001	10-001(d)	Ra	Cyanide	Metals				HE
B-SMA-0.5	B001	10-004(a)	Ra	Cyanide	Metals				
B-SMA-0.5	B001	10-004(b)	Ra	Cyanide	Metals				
B-SMA-0.5	B001	10-008	Ra	Cyanide	Metals				
B-SMA-0.5	B001	10-009	Ra	Cyanide	Metals				
B-SMA-1	B002	00-011(d)	Ra	Cyanide	Metals		HE		
ACID-SMA-1.05	P001	00-030(g)							
ACID-SMA-2	P002	01-002(b)-00				PCBs			
ACID-SMA-2	P002	45-001							
ACID-SMA-2	P002	45-002							
ACID-SMA-2	P002	45-004							
ACID-SMA-2.01	P002A	00-030(f)	Ra	Cyanide	Metals				
ACID-SMA-2.1	P003	01-002(b)-00				PCBs			
P-SMA-0.3	P004	00-018(b)							
P-SMA-1	P005	73-001(a)	Ra	Cyanide	Metals				
P-SMA-1	P005	73-004(d)	Ra	Cyanide	Metals				
P-SMA-2	P006	73-002	Ra	Cyanide	Metals			Dioxin	
P-SMA-2	P006	73-006	Ra	Cyanide	Metals			Dioxin	
P-SMA-2.15	P007	31-001	Ra	Cyanide	Metals	PCBs			
P-SMA-2.2	P008	00-019	Ra	Cyanide	Metals	PCBs			
P-SMA-3.05	P009	00-018(a)							
LA-SMA-0.85	L001	03-055(c)							
LA-SMA-0.9	L002	00-017	Ra	Cyanide	Metals	PCBs			
LA-SMA-0.9	L002	C-00-044	Ra	Cyanide	Metals	PCBs			
LA-SMA-1	L003	00-017							
LA-SMA-1.25	L005	C-43-001							

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
LA-SMA-2.1	L006	01-001(f)				PCBs			
LA-SMA-2.3	L007	01-001(b)	Ra	Cyanide	Metals				
LA-SMA-3.1	L008	01-001(e)	Ra	Cyanide	Metals	PCBs			
LA-SMA-3.1	L008	01-003(a)	Ra	Cyanide	Metals	PCBs			
LA-SMA-3.9	L009	01-001(g)	Ra	Cyanide	Metals				
LA-SMA-3.9	L009	01-006(a)	Ra	Cyanide	Metals				
LA-SMA-4.1	L010	01-003(b)							
LA-SMA-4.1	L010	01-006(b)							
LA-SMA-4.2	L011	01-001(c)	Ra	Cyanide	Metals	PCBs			
LA-SMA-4.2	L011	01-006(c)	Ra	Cyanide	Metals	PCBs			
LA-SMA-4.2	L011	01-006(d)	Ra	Cyanide	Metals	PCBs			
LA-SMA-5.01	L012	01-001(d)	Ra	Cyanide	Metals	PCBs			
LA-SMA-5.01	L012	01-006(h)	Ra	Cyanide	Metals	PCBs			
LA-SMA-5.02	L012A	01-003(e)							
LA-SMA-5.2	L013	01-003(d)	Ra	Cyanide	Metals				SVC
LA-SMA-5.31	L015	41-002(c)	Ra	Cyanide	Metals				
LA-SMA-5.33	L016	32-004	Ra	Cyanide	Metals				
LA-SMA-5.35	L014	C-41-004	Ra	Cyanide	Metals				
LA-SMA-5.361	L017	32-002(b) 32-002(b1) 32-002(b2)	Ra	Cyanide	Metals				
LA-SMA-5.362	L017A	32-003	Ra	Cyanide	Metals	PCBs			
LA-SMA-5.51	L018	02-003(a)							
LA-SMA-5.51	L018	02-003(e)							
LA-SMA-5.51	L018	02-004(a)			Hg				
LA-SMA-5.51	L018	02-005							
LA-SMA-5.51	L018	02-006(b)			Hg				
LA-SMA-5.51	L018	02-006(c)							
LA-SMA-5.51	L018	02-006(d)							
LA-SMA-5.51	L018	02-006(e)			Hg				
LA-SMA-5.51	L018	02-008(a)							
LA-SMA-5.51	L018	02-009(b)			Hg				
LA-SMA-5.51	L018	02-011(a)			Hg	PCBs			
LA-SMA-5.51	L018	02-011(b)							
LA-SMA-5.51	L018	02-011(c)							
LA-SMA-5.51	L018	02-011(d)							

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
LA-SMA-5.52	L018A	02-003(b)							
LA-SMA-5.52	L018A	02-007							
LA-SMA-5.52	L018A	02-008(c)			Hg				
LA-SMA-5.53	L018B	02-009(a)	Ra	Cyanide	Metals	PCBs			
LA-SMA-5.54	L018C	02-009(c)							
LA-SMA-5.91	L019	21-009	Ra	Cyanide	Metals				
LA-SMA-5.91	L019	21-021	Ra	Cyanide	Metals				
LA-SMA-5.91	L019	21-023(c)	Ra	Cyanide	Metals				
LA-SMA-5.91	L019	21-027(d)	Ra	Cyanide	Metals				SVC
LA-SMA-5.92	L019A	21-013(b)							
LA-SMA-5.92	L019A	21-013(g)							
LA-SMA-5.92	L019A	21-018(a)							
LA-SMA-5.92	L019A	21-021							
LA-SMA-6.25	L020	21-021	Ra	Cyanide	Metals				
LA-SMA-6.25	L020	21-024(d)	Ra	Cyanide	Metals				SVC
LA-SMA-6.25	L020	21-027(c)	Ra	Cyanide	Metals				
LA-SMA-6.27	L021	21-021	Ra	Cyanide	Metals				
LA-SMA-6.27	L021	21-027(c)	Ra	Cyanide	Metals				
LA-SMA-6.3	L022	21-006(b)	Ra	Cyanide	Metals			SVC	
LA-SMA-6.31	L022A	21-027(a)	Ra	Cyanide	Metals			SVC	Dioxin
LA-SMA-6.32	L023	21-021	Ra	Cyanide	Metals				
LA-SMA-6.34	L024	21-021	Ra	Cyanide	Metals				
LA-SMA-6.34	L024	21-022(h)	Ra	Cyanide	Metals				SVC
LA-SMA-6.36	L025	21-021	Ra	Cyanide	Metals				
LA-SMA-6.36	L025	21-024(a)	Ra	Cyanide	Metals				
LA-SMA-6.38	L026	21-021	Ra	Cyanide	Metals				
LA-SMA-6.38	L026	21-024(c)	Ra	Cyanide	Metals				PCBs
LA-SMA-6.395	L027	21-021	Ra	Cyanide	Metals				
LA-SMA-6.395	L027	21-024(j)	Ra	Cyanide	Metals				
LA-SMA-6.5	L028	21-021	Ra	Cyanide	Metals	PCBs		SVC	
LA-SMA-6.5	L028	21-024(i)	Ra	Cyanide	Metals	PCBs		SVC	
LA-SMA-9	L029	26-001	Ra	Cyanide	Metals				HE
LA-SMA-9	L029	26-002(a)	Ra	Cyanide	Metals				
LA-SMA-9	L029	26-002(b)	Ra	Cyanide	Metals				
LA-SMA-9	L029	26-003	Ra	Cyanide	Metals				
LA-SMA-10.11	L030	53-002(a)	Ra	Cyanide	Metals				

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
LA-SMA-10.12	L030A	53-008	Ra	Cyanide	Metals				SVC
DP-SMA-0.3	D001	21-029							SVC
DP-SMA-0.4	D002	21-021							
DP-SMA-0.6	D003	21-021	Ra	Cyanide	Metals				
DP-SMA-0.6	D003	21-024(l)	Ra	Cyanide	Metals				
DP-SMA-1	D004	21-011(k)	Ra	Cyanide	Metals	PCBs			
DP-SMA-1	D004	21-021	Ra	Cyanide	Metals	PCBs			
DP-SMA-2	D005	21-021	Ra	Cyanide	Metals				
DP-SMA-2	D005	21-024(h)		Cyanide	Metals				
DP-SMA-2.35	D006	21-021	Ra	Cyanide	Metals				
DP-SMA-2.35	D006	21-024(n)	Ra	Cyanide	Metals				
DP-SMA-3	D007	21-013(c)							
DP-SMA-3	D007	21-021							
DP-SMA-4	D008	21-021	Ra	Cyanide	Metals				
S-SMA-0.25	S001	03-013(a)							
S-SMA-0.25	S001	03-052(f)				PCBs			SVC
S-SMA-1.1	S002	03-029							SVC
S-SMA-2	S003	03-012(b)							
S-SMA-2	S003	03-045(b)							
S-SMA-2	S003	03-045(c)							
S-SMA-2	S003	03-056(c)				PCBs			SVC
S-SMA-2.01	S003A	03-052(b)							
S-SMA-2.8	S004	03-014(c2)	Ra	Cyanide	Metals	PCBs		SVC	
S-SMA-3.51	S005	03-009(i)	Ra	Cyanide	Metals	PCBs		SVC	
S-SMA-3.52	S005A	03-021	Ra	Cyanide	Metals	PCBs		SVC	
S-SMA-3.53	S005B	03-014(b2)							
S-SMA-3.6	S006	60-007(b)				PCBs			SVC
S-SMA-3.7	S007	53-012(e)	Ra	Cyanide	Metals	PCBs			
S-SMA-3.71	S008	53-001(a)	Ra	Cyanide	Metals	PCBs			SVC
S-SMA-3.72	S009	53-001(b)			Metals				
S-SMA-3.95	S010	20-002(a)	Ra	Cyanide	Metals		HE	SVC	
S-SMA-4.1	S011	53-014							
S-SMA-4.5	S012	20-002(d)	Ra	Cyanide	Metals		HE		
S-SMA-5	S013	20-002(c)	Ra	Cyanide	Metals	PCBs	HE		
S-SMA-5.2	S014	20-003(c)	Ra	Cyanide	Metals	PCBs	HE	SVC	
S-SMA-5.5	S015	20-005	Ra	Cyanide	Metals				

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
S-SMA-6	S016	72-001			Cu				
CDB-SMA-0.15	C001	04-003(a)			Metals				
CDB-SMA-0.15	C001	04-004			Metals				
CDB-SMA-0.25	C002	46-004(c2)							
CDB-SMA-0.25	C002	46-004(e2)							
CDB-SMA-0.55	C003	46-004(g)							
CDB-SMA-0.55	C003	46-004(m)							
CDB-SMA-0.55	C003	46-004(s)							
CDB-SMA-0.55	C003	46-006(f)							
CDB-SMA-1	C004	46-003(c)							
CDB-SMA-1	C004	46-004(d2)							
CDB-SMA-1	C004	46-004(f)							
CDB-SMA-1	C004	46-004(t)							
CDB-SMA-1	C004	46-004(w)							SVC
CDB-SMA-1	C004	46-008(g)				PCBs			SVC
CDB-SMA-1	C004	46-009(a)							
CDB-SMA-1	C004	C-46-001							
CDB-SMA-1.15	C005	46-004(b)	Ra	Cyanide	Metals	PCBs			SVC
CDB-SMA-1.15	C005	46-004(y)	Ra	Cyanide	Metals	PCBs			
CDB-SMA-1.15	C005	46-004(z)	Ra	Cyanide	Metals	PCBs			
CDB-SMA-1.15	C005	46-006(d)	Ra	Cyanide	Metals	PCBs			SVC
CDB-SMA-1.35	C006	46-004(a2)	Ra	Cyanide	Metals	PCBs		PEST, SVC	
CDB-SMA-1.35	C006	46-004(u)	Ra	Cyanide	Metals	PCBs		PEST, SVC	
CDB-SMA-1.35	C006	46-004(v)	Ra	Cyanide	Metals	PCBs		PEST, SVC	
CDB-SMA-1.35	C006	46-004(x)	Ra	Cyanide	Metals	PCBs		PEST, SVC	
CDB-SMA-1.35	C006	46-006(d)	Ra	Cyanide	Metals	PCBs		PEST, SVC	
CDB-SMA-1.35	C006	46-008(f)	Ra	Cyanide	Metals	PCBs		PEST, SVC	
CDB-SMA-1.54	C007	46-004(h)	Ra	Cyanide	Metals	PCBs		PEST	
CDB-SMA-1.54	C007	46-004(q)	Ra	Cyanide	Metals	PCBs		PEST	
CDB-SMA-1.54	C007	46-006(d)	Ra	Cyanide	Metals	PCBs		PEST	
CDB-SMA-1.55	C008	46-003(e)	Ra	Cyanide	Metals				
CDB-SMA-1.65	C009	46-003(b)	Ra	Cyanide	Metals				

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
CDB-SMA-4	C010	54-017							
CDB-SMA-4	C010	54-018							
CDB-SMA-4	C010	54-020							
M-SMA-1	M001	03-050(a)							
M-SMA-1	M001	03-054(e)							
M-SMA-1.2	M002	03-049(a)			Cu				
M-SMA-1.21	M002A	03-049(e)	Ra	Cyanide	Metals				
M-SMA-1.22	M002B	03-045(h)							
M-SMA-3	M003	48-001							
M-SMA-3	M003	48-005							
M-SMA-3	M003	48-007(c)							SVC
M-SMA-3.1	M004	48-001	Ra	Cyanide	Metals	PCBs			
M-SMA-3.1	M004	48-007(b)	Ra	Cyanide	Metals	PCBs			
M-SMA-3.5	M005	48-001	Ra	Cyanide	Metals	PCBs			
M-SMA-3.5	M005	48-003	Ra	Cyanide	Metals	PCBs			
M-SMA-4	M006	48-001							
M-SMA-4	M006	48-005							
M-SMA-4	M006	48-007(a)							
M-SMA-4	M006	48-007(d)							
M-SMA-4	M006	48-010							
M-SMA-5	M007	42-001(a)	Ra	Cyanide	Metals	PCBs			Dioxin
M-SMA-5	M007	42-001(b)	Ra	Cyanide	Metals	PCBs			Dioxin
M-SMA-5	M007	42-001(c)	Ra	Cyanide	Metals	PCBs			Dioxin
M-SMA-5	M007	42-002(a)	Ra	Cyanide	Metals	PCBs			
M-SMA-5	M007	42-002(b)	Ra	Cyanide	Metals	PCBs			
M-SMA-6	M008	35-016(h)							
M-SMA-7	M009	35-016(g)							
M-SMA-7.9	M010	50-006(d)				PCBs			
M-SMA-9.1	M011	35-016(f)	Ra	Cyanide	Metals	PCBs			
M-SMA-10	M012	35-008	Ra	Cyanide	Metals				
M-SMA-10	M012	35-014(e)	Ra	Cyanide	Metals				
M-SMA-10.01	M012A	35-016(e)							
M-SMA-10.3	M013	35-014(e2)							
M-SMA-10.3	M013	35-016(i)							
M-SMA-11.1	M014	35-016(o)	Ra	Cyanide	Metals	PCBs			
M-SMA-12	M015	35-016(p)			Metals	PCBs			

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
M-SMA-12.5	M016	05-005(b)	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.5	M016	05-006(c)	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.6	M017	05-004	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.7	M018	05-002	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.7	M018	05-005(a)	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.7	M018	05-006(b)	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.7	M018	05-006(e)	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.8	M019	05-001(a)	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.8	M019	05-002	Ra	Cyanide	Metals		HE	SVC	
M-SMA-12.9	M020	05-001(b)			Metals				
M-SMA-12.9	M020	05-002			Metals				
M-SMA-12.92	M021	00-001	Ra	Cyanide	Metals				
M-SMA-13	M022	05-001(c)							
Pratt-SMA-1.05	T001	35-003(h)							
Pratt-SMA-1.05	T001	35-003(p)							
Pratt-SMA-1.05	T001	35-003(r)			Hg	PCBs			
Pratt-SMA-1.05	T001	35-004(h)							
Pratt-SMA-1.05	T001	35-009(d)							
Pratt-SMA-1.05	T001	35-016(k)							
Pratt-SMA-1.05	T001	35-016(l)							
Pratt-SMA-1.05	T001	35-016(m)							
T-SMA-1	T002	50-006(a)							
T-SMA-1	T002	50-009							
T-SMA-2.5	T003	35-014(g3)	Ra	Cyanide	Metals				SVC
T-SMA-2.85	T004	35-014(g)							
T-SMA-2.85	T004	35-016(n)							
T-SMA-3	T005	35-016(b)							
T-SMA-4	T006	35-004(a)							
T-SMA-4	T006	35-009(a)							
T-SMA-4	T006	35-016(c)							
T-SMA-4	T006	35-016(d)							
T-SMA-5	T007	35-004(a)	Ra	Cyanide	Metals				
T-SMA-5	T007	35-009(a)	Ra	Cyanide	Metals				
T-SMA-5	T007	35-016(a)	Ra	Cyanide	Metals				
T-SMA-5	T007	35-016(q)	Ra	Cyanide	Metals				
T-SMA-6.8	T008	35-010(e)	Ra	Cyanide	Metals				

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
T-SMA-7	T009	04-003(b)	Ra	Cyanide	Metals				
T-SMA-7.1	T010	04-001	Ra	Cyanide	Metals				
T-SMA-7.1	T010	04-002	Ra	Cyanide	Metals				
2M-SMA-1	E001	03-010(a)							SVC
2M-SMA-1.42	E002	06-001(a)							
2M-SMA-1.43	E003	22-014(a)							HE
2M-SMA-1.43	E003	22-015(a)			Al				SVC
2M-SMA-1.44	E004	06-001(b)			Cu				SVC
2M-SMA-1.45	E005	06-006	Ra	Cyanide	Metals				PCBs
2M-SMA-1.5	E006	22-014(b)	Ra	Cyanide	Metals		HE	SVC	
2M-SMA-1.65	E007	40-005	Ra	Cyanide	Metals				
2M-SMA-1.67	E008	06-003(h)	Ra	Cyanide	Metals		HE		
2M-SMA-1.7	E009	03-055(a)							PCBs
2M-SMA-1.8	E010	03-001(k)							PCBs
2M-SMA-1.9	E011	03-003(a)							SVC, PCBs
2M-SMA-2	E012	03-050(d)							
2M-SMA-2	E012	03-054(b)							
2M-SMA-2.2	E013	03-003(k)							
2M-SMA-2.5	E015	40-001(c)							
2M-SMA-3	E014	07-001(a)			Cu				
2M-SMA-3	E014	07-001(b)			Cu				
2M-SMA-3	E014	07-001(c)							
2M-SMA-3	E014	07-001(d)			Cu				
2M-SMA-2.5	E015	40-001(c)	Ra	Cyanide	Metals				
3M-SMA-0.2	H001	15-010(b)	Ra	Cyanide	Metals				HE
3M-SMA-0.4	H002	15-006(b)	Ra	Cyanide	Metals		HE		
3M-SMA-0.5	H003	15-006(c)							
3M-SMA-0.5	H003	15-009(c)			Cu				
3M-SMA-0.6	H004	15-008(b)	Ra	Cyanide	Metals				
3M-SMA-2.6	H005	36-008	Ra	Cyanide	Metals		HE	SVC	
3M-SMA-2.6	H005	C-36-003	Ra	Cyanide	Metals		HE	SVC	
3M-SMA-4	H006	18-002(b)			Cu				
3M-SMA-4	H006	18-003(c)							SVC, PCBs
3M-SMA-4	H006	18-010(f)							

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
PJ-SMA-1.05	J001	09-013				PCBs			
PJ-SMA-2	J002	09-009	Ra	Cyanide	Metals				Sr-90
PJ-SMA-3.05	J003	09-004(o)							HE
PJ-SMA-4.05	J004	09-004(g)	Ra	Cyanide	Metals				HE
PJ-SMA-4.05	J004	09-005(g)	Ra	Cyanide	Metals				HE
PJ-SMA-5	J005	22-015(c)			Cu				
PJ-SMA-5.1	J006	22-016 22-010(b)			Cu, Zn				HE, SVC
PJ-SMA-6	J007	40-010	Ra	Cyanide	Metals				
PJ-SMA-7	J008	40-006(c)	Ra	Cyanide	Metals		HE		
PJ-SMA-8	J009	40-006(b)	Ra	Cyanide	Metals		HE		
PJ-SMA-9	J010	40-009			Cu				
PJ-SMA-10	J012	40-006(a)							
PJ-SMA-11	J013	40-003(a)							HE
PJ-SMA-11.1	J014	40-003(b)							HE
PJ-SMA-13	J015	18-002(a)	Ra	Cyanide	Metals		HE		
PJ-SMA-13.7	J016	18-010(b)	Ra	Cyanide	Metals				
PJ-SMA-14	J017	54-004	Ra	Cyanide	Metals		HE		
PJ-SMA-14.2	J018	18-012(b)	Ra	Cyanide	Metals				
PJ-SMA-14.3	J019	18-003(e)	Ra	Cyanide	Metals				SVC, PCBs
PJ-SMA-14.4	J020	18-010(d)	Ra	Cyanide	Metals				
PJ-SMA-14.6	J021	18-010(e)	Ra	Cyanide	Metals				
PJ-SMA-14.8	J022	18-012(a)							
PJ-SMA-16	J023	27-002							
PJ-SMA-17	J024	54-018							
PJ-SMA-18	J026	54-014(d)							
PJ-SMA-18	J026	54-017							
PJ-SMA-19	J025	54-013(b)							
PJ-SMA-19	J025	54-017							
PJ-SMA-19	J025	54-020							
PJ-SMA-20	J027	54-017							
STRM-SMA-1.05	J028	08-009(f)							SVC
STRM-SMA-1.5	J029	08-009(d)			Ag				
STRM-SMA-4.2	J030	09-008(b)							
STRM-SMA-5.05	J031	09-013							

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
CDV-SMA-1.2	V001	16-017(b)-99							
CDV-SMA-1.2	V001	16-029(k)							
CDV-SMA-1.3	V002	16-017(a)-99	Ra	Cyanide	Metals		HE		
CDV-SMA-1.3	V002	16-026(m)	Ra	Cyanide	Metals				HE
CDV-SMA-1.4	V003	16-020							
CDV-SMA-1.4	V003	16-026(l)							
CDV-SMA-1.4	V003	16-028(c)							HE
CDV-SMA-1.4	V003	16-030(c)							
CDV-SMA-1.45	V004	16-026(i)	Ra	Cyanide	Metals				HE
CDV-SMA-1.7	V005	16-019			Cu		HE		
CDV-SMA-2	V006	16-021(c)	Ra	Cyanide	Metals			SVC	HE
CDV-SMA-2.3	V007	13-001							
CDV-SMA-2.3	V007	13-002							
CDV-SMA-2.3	V007	16-003(n)							HE
CDV-SMA-2.3	V007	16-003(o)							HE
CDV-SMA-2.3	V007	16-029(h)							HE
CDV-SMA-2.3	V007	16-031(h)							HE
CDV-SMA-2.41	V008	16-018				PCBs			HE
CDV-SMA-2.42	V008A	16-010(b)							HE
CDV-SMA-2.5	V009	16-010(c)							
CDV-SMA-2.5	V009	16-010(d)							
CDV-SMA-2.5	V009	16-028(a)							
CDV-SMA-2.51	V009A	16-010(i)	Ra	Cyanide	Metals		HE	SVC	
CDV-SMA-3	V010	14-009	Ra	Cyanide	Metals		HE		
CDV-SMA-4	V011	14-010	Ra	Cyanide	Metals		HE		
CDV-SMA-6.01	V012	14-001(g)			Cu				
CDV-SMA-6.01	V012	14-006							
CDV-SMA-6.02	V012A	14-002(d) 14-002(c)							
CDV-SMA-6.02	V012A	14-002(e)							
CDV-SMA-7	V013	15-008(d)							
CDV-SMA-8	V014	15-011(c)							
CDV-SMA-8.5	V015	15-014(a)	Ra	Cyanide	Metals				
CDV-SMA-9.05	V016	15-007(b)	Ra	Cyanide	Metals			SVC	HE
F-SMA-2	F001	36-004(c)			Cu				
PT-SMA-0.5	I001	15-009(e)							

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
PT-SMA-0.5	I001	C-15-004							
PT-SMA-1	I002	15-004(f)			Cu				
PT-SMA-1	I002	15-008(a)							
PT-SMA-1.7	I003	15-006(a)	Ra	Cyanide	Metals		HE		
PT-SMA-2	I004	15-008(f)			Cu				
PT-SMA-2	I004	36-003(b)							
PT-SMA-2	I004	36-004(e)			Cu				
PT-SMA-2.01	I004A	C-36-001	Ra	Cyanide	Metals		HE	SVC	
PT-SMA-2.01	I004A	C-36-006(e)	Ra	Cyanide	Metals		HE	SVC	
PT-SMA-3	I005	36-004(a)	Ra	Cyanide	Metals		HE		
PT-SMA-3	I005	36-006	Ra	Cyanide	Metals		HE		
PT-SMA-4.2	I007	36-004(d)							
W-SMA-1	W001	16-017(j)-99							SVC
W-SMA-1	W001	16-026(c2)							SVC
W-SMA-1	W001	16-026(v)							SVC
W-SMA-1.5	W002	16-026(b2)			Cu				SVC
W-SMA-1.5	W002	16-028(d)			Cu				SVC
W-SMA-2.05	W003	16-028(e)							HE
W-SMA-3.5	W004	16-026(y)	Ra	Cyanide	Metals				HE
W-SMA-4.1	W005	16-003(a)	Ra	Cyanide	Metals		HE		
W-SMA-5	W006	16-001(e)							
W-SMA-5	W006	16-003(f)							HE
W-SMA-5	W006	16-026(b)							HE
W-SMA-5	W006	16-026(c)							HE
W-SMA-5	W006	16-026(d)							HE
W-SMA-5	W006	16-026(e)							HE
W-SMA-6	W007	11-001(c)	Ra	Cyanide	Metals		HE		
W-SMA-7	W008	16-029(e) 16-026(h2)							HE
W-SMA-7.8	W009	16-031(a)	Ra	Cyanide	Metals				
W-SMA-7.9	W010	16-006(c)	Ra	Cyanide	Metals			SVC	
W-SMA-8	W011	16-016(g)			Al, Cu				
W-SMA-8	W011	16-028(b)			Al, Cu				
W-SMA-8.7	W012	13-001							
W-SMA-8.7	W012	13-002							
W-SMA-8.7	W012	16-004(a)							

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
W-SMA-8.7	W012	16-026(j2)							HE
W-SMA-8.7	W012	16-029(h)							
W-SMA-8.7	W012	16-035							HE
W-SMA-8.71	W012A	16-004(c)							
W-SMA-9.05	W013	16-030(g)							
W-SMA-9.5	W014	11-012(c)	Ra	Cyanide	Metals				
W-SMA-9.7	W015	11-011(a)							
W-SMA-9.7	W015	11-011(b)							
W-SMA-9.8	W016	11-005(c)	Ra	Cyanide	Metals				
W-SMA-9.9	W017	11-006(b)							HE
W-SMA-10	W018	11-002	Ra	Cyanide	Metals				HE
W-SMA-10	W018	11-003(b)	Ra	Cyanide	Metals				HE
W-SMA-10	W018	11-005(a)	Ra	Cyanide	Metals				
W-SMA-10	W018	11-005(b)	Ra	Cyanide	Metals				
W-SMA-10	W018	11-006(c)	Ra	Cyanide	Metals				HE
W-SMA-10	W018	11-006(d)	Ra	Cyanide	Metals				HE
W-SMA-10	W018	11-011(d)	Ra	Cyanide	Metals				
W-SMA-11.7	W019	49-008(c)							HE, SVC
W-SMA-12.05	W020	49-001(g)	Ra	Cyanide	Metals		HE		
W-SMA-14.1	W021	15-004(h)							
W-SMA-14.1	W021	15-014(l)							
W-SMA-15.1	W022	49-005(a)	Ra	Cyanide	Metals				
A-SMA-1.1	A001	39-004(a)	Ra	Cyanide	Metals		HE		
A-SMA-1.1	A001	39-004(d)	Ra	Cyanide	Metals		HE		
A-SMA-2	A002	39-004(b)			Cu				
A-SMA-2	A002	39-004(e)			Cu				
A-SMA-2.5	A003	39-010	Ra	Cyanide	Metals				HE
A-SMA-2.7	A004	39-002(c)							SVC
A-SMA-2.7	A004	39-008							
A-SMA-2.8	A005	39-001(b)	Ra	Cyanide	Metals				PCBs
A-SMA-3	A006	39-002(b)			Cu	PCBs			SVC
A-SMA-3	A006	39-004(c)			Al, Cu, Hg	PCBs			
A-SMA-3.5	A007	39-006(a)							
A-SMA-4	A008	33-010(d)	Ra	Cyanide	Metals		HE		
A-SMA-6	A009	33-004(k)							
A-SMA-6	A009	33-007(a)							

Appendix E, Potential Pollutants of Concern and Permitted Features (continued)

SMA Number	PF	Site Number	Radioactivity	Cyanide	Metals	PCBs	High Explosives	Other	Add
A-SMA-6	A009	33-010(a)							
CHQ-SMA-0.5	Q001	33-004(g)							
CHQ-SMA-0.5	Q001	33-007(c)							
CHQ-SMA-0.5	Q001	33-009				PCBs			
CHQ-SMA-1.01	Q002	33-002(d)	Ra	Cyanide	Metals	PCBs			
CHQ-SMA-1.02	Q002A	33-004(h)							
CHQ-SMA-1.02	Q002A	33-008(c)			Cu				
CHQ-SMA-1.02	Q002A	33-011(d)			Cu				
CHQ-SMA-1.02	Q002A	33-015							Dioxin
CHQ-SMA-1.03	Q002B	33-008(c)			Cu	PCBs			
CHQ-SMA-1.03	Q002B	33-012(a)			Cu	PCBs			SVC
CHQ-SMA-1.03	Q002B	33-017							
CHQ-SMA-1.03	Q002B	C-33-001				PCBs			SVC
CHQ-SMA-1.03	Q002B	C-33-003							
CHQ-SMA-2	Q003	33-004(d)							
CHQ-SMA-2	Q003	33-007(c)			Al, Cu				
CHQ-SMA-2	Q003	C-33-003							
CHQ-SMA-3.05	Q004	33-010(f)	Ra	Cyanide	Metals	PCBs		PEST	
CHQ-SMA-4	Q005	33-011(e)	Ra	Cyanide	Metals	PCBs	HE		
CHQ-SMA-4.1	Q006	33-016	Ra	Cyanide	Metals	PCBs	HE		
CHQ-SMA-4.5	Q007	33-011(b)	Ra	Cyanide	Metals				
CHQ-SMA-5.05	Q008	33-007(b)	Ra	Cyanide	Metals				HE
CHQ-SMA-6	Q009	33-004(j)							
CHQ-SMA-6	Q009	33-006(a)			Cu				
CHQ-SMA-6	Q009	33-007(b)			Cu				
CHQ-SMA-6	Q009	33-010(c)			Cu				
CHQ-SMA-6	Q009	33-010(g)							
CHQ-SMA-6	Q009	33-010(h)							
CHQ-SMA-6	Q009	33-014							Dioxin
CHQ-SMA-7.1	Q010	33-010(g)	Ra	Cyanide	Metals		HE		

[a] Other constituents that do not fall under the previous five categories of analytes.

[b] These constituents are not currently required under the IP and are not analyzed. See section 3.1.1 of the Overview for further details.