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Stormwater Pollution Prevention Plan

for:

TECHNICAL AREA 3
Power and Steam Plant

Utilities and Infrastructure Division
Los Alamos National Security, LLC (LANS)
Los Alamos, New Mexico 87545

SWPPP Contact(s):

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SWPPP Preparation Date:

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SECTION 1: FACILITY DESCRIPTION AND CONTACT INFORMATION

1.1 Facility Information

Facility Information

Name of Facility: Los Alamos National Laboratory

Street: PO Box 1663 MS K490

City: Los Alamos State: NM ZIP Code: 87545

County or Similar Subdivision: Los Alamos

NPDES ID (i.e., permit tracking number): NMR05A734 (if covered under a previous permit)

Primary Industrial Activity SIC code, and Sector and Subsector (2015 MSGP [attached to this SWPPP as Appendix A], Appendix D and Part 8): 2951

Co-located Industrial Activity(s) SIC code(s), Sector(s) and Subsector(s) (2015 MSGP, Appendix D): Sector AA, Subsector 1;Sector D, Subsector 2

A copy of the facility's Notice of Intent (NOI) and LANS Delegation of Authority Letter is included in Appendix B of this SWPPP and at the Electronic Reading Room, http://eprr.lanl.gov.Latitude/Longitude

Latitude: 35.8739º N (decimal degrees)

Longitude: 106.3189º W (decimal degrees)

Method for determining latitude/longitude (check one):

☐USGS topographic map (specify scale:_____) ☐GPS

☒Other (please specify): EPA Website

Horizontal Reference Datum (check one):

☐NAD 27 ☒NAD 83 ☐WGS 84

Is the facility located in Indian country? ☐Yes ☒No

If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable."_____

Are you considered a "federal operator" of the facility?

Federal Operator – an entity that meets the definition of "operator" in this permit and is either any department, agency or instrumentality of the executive, legislative and judicial branches of the Federal government of the United States, or another entity, such as a private contractor, operating for any such department, agency, or instrumentality.

☒Yes ☐No

Estimated area of industrial activity at site exposed to stormwater: 7.5 (acres)

Discharge Information

Does this facility discharge stormwater into a municipal separate storm sewer system (MS4)? ☐Yes ☒No

If yes, name of MS4 operator: _____

Name(s) of surface water(s) that receive stormwater from your facility: Sandia Canyon

Does this facility discharge industrial stormwater directly into any segment of an "impaired water" (see definition in 2015 MSGP, Appendix A)? ☒Yes ☐No

If Yes, identify name of the impaired water(s) (and segment(s), if applicable): Sandia Canyon

Identify the pollutant(s) causing the impairment(s): aluminum, copper, gross alpha, polychlorinated biphenyls (PCBs), and thallium

Which of the identified pollutants may be present in industrial stormwater discharges from this facility?

Has a Total Maximum Daily Load (TMDL) been completed for any of the identified pollutants? If yes, please list the TMDL pollutants: _____

Does this facility discharge industrial stormwater into a receiving water designated as a Tier 2, Tier 2.5 or Tier 3 water (see definitions in 2015 MSGP, Appendix A)? ☐Yes ☒No

1.2 Contact Information/Responsible Parties

Facility Operator:
Name: Los Alamos National Security, LLC (LANS)
Address: PO Box 1663, MS K490
City, State, Zip Code: Los Alamos, NM 87545
Telephone Number: 505-667-5061

SWPPP Contact(s):
SWPPP Contact Name (Primary): Holly Wheeler, MSGP SWPPP Compliance Project Leader, Environmental Compliance Programs (ENV-CP) Technical Advisor
Telephone number: 505-667-1312
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SWPPP Contact Name (Backup): Cliff Heintschel, MSGP SWPPP Inspector, Deployed
Telephone number: 505-667-9462 Cell: 505-6991605
Email address: cliffh@lanl.gov
Name: Los Alamos National Security, LLC (LANS)
Address: PO Box 1663, MS K490
City, State, Zip Code: Los Alamos, NM 87545
Telephone Number: 505-699-1605

1.3 Stormwater Pollution Prevention Team

Staff Names	Individual Responsibilities
Russell Stone (Acting), Utilities Infrastructure – Facility Operations Director (UI-FOD) DSESH Group Leader	Responsible for the management of all environmental, safety, health, and quality programs for the buildings and facilities listed within this Plan. This includes performing oversight and periodic walk downs to ensure implementation of the requirements of the Multi-Sector General Permit (MSGP) and this Stormwater Pollution Prevention Plan (SWPPP) including overseeing the assigned duties of other Environmental Compliance Programs (ENV-CP) Pollution Prevention Team (PPT) members. The Group Leader is responsible for ensuring that problems noted in inspections are corrected. The Group Leader must also ensure funding is established to cover compliance requirements of the MSGP and this SWPPP.
Cliff Heintschel (primary), Leonard Sandoval (backup), Utilities Infrastructure – Facility	Responsible for the management of all environmental programs and issues for the buildings and facilities listed within this Plan. The DEP is responsible for training, recordkeeping, and SWPPP revision. The DEP will ensure that

Operations Director (UI-FOD) Deployed Environmental Professional (DEP)	all ENV-CP PPT, operations site workers (as appropriate), and applicable supervisors receive annual MSGP and SWPPP training. The DEP will ensure that inspection documents and other required MSGP records relative to the SWPPP are managed in accordance with the permit and established document control procedures and that the SWPPP is kept current. The DEP provides technical and regulatory support to Power and Steam Plant personnel regarding implementation of the MSGP and this SWPPP. Lastly, the DEP conducts routine inspections and visual assessments as required by the MSGP. Identified corrective actions from routine inspection are entered into the ENV-CP Corrective Action Report (CAR) database. The DEP is responsible for tracking and updating the status of corrective actions.
Lawrence Chavez, Utilities Infrastructure – Facility Operations Director (UI-FOD) Operations Manager	Responsible for managing the operation and maintenance of all aspects of the buildings and facilities listed within this Plan. The Facility Manager shall provide review and ensure coordination with core personnel and the ENV-CP PPT, as appropriate, when tenants within the UI-FOD propose a new process or a new site or operation that may be subject to the MSGP.
Holly Wheeler, ENV-CP MSGP Project Lead	The MSGP Project Lead is responsible for managing and administering the Multi-Sector General Permit Stormwater Program for all industrial facilities within Los Alamos National Laboratory. The MSGP Project Lead advises and provides guidance to facility personnel on National Pollutant Discharge Elimination System (NPDES) MSGP regulations/requirements. The MSGP Project Lead also acts as the institutional point of contact for all interactions with the regulatory authority (EPA) and supervises personnel implementing stormwater monitoring requirements for the facility.

1.4 Site Description

Industrial activities at this facility are classified under Sector O – Steam Electric Generating Facilities. The facility is a Power and Steam Plant located within the eastern half of Technical Area (TA)-3 of Los Alamos National Laboratory (LANL). It is situated approximately 0.2 miles south of the intersection of Diamond and West Jemez Road (S. R. 501) in Los Alamos County, New Mexico and is bordered on the east by Sandia Canyon (Appendix C, Figure C-1). The site area is approximately 7.51 acres, of which 95% is impervious surface area. The main structures at the plant consist of (Figure C-2): the main power and steam plant (Structure 22), three cooling towers (Structures 592, 285, and 58), the chemical treatment building for water to cooling towers (Structure 24), the main gas house (Structure 55), the switch gear building (Structure 1682), the fuel transfer pump house (Structure 57), two above ground storage tanks (Structures 26 and 2382), a combustion gas turbine generator (CGTG) (Structures 2373 and 2422), and a 1.25 MW emergency generator (Structure1404).

The CGTG has four oil-filled operational equipment containers (sumps) in which the oil is present solely to support the function of the turbine. The oil storage containers have capacities of 240, 1862, 50, and 37 gal., respectively. One container is located inside Structure 2373, and one inside Structure 2422. The other two containers (the 1862 and 37 gal.) are located outside of Structure 2422.

The facility provides electrical power and steam to the entire Laboratory. Natural gas is the primary fuel supply for the power and steam plant; however, #2 fuel oil (diesel fuel) is used for back-up and emergency supplies. The 1.25 MW emergency diesel generator is also used for temporary back-up. Due to the amount of fuel used and stored on site, the facility is also regulated under a Spill Prevention Control and Countermeasures (SPCC) plan. A copy of this plan is kept in the Control Room in Building 3-22.

Stormwater run-on occurs along the western border of the facility. Stormwater run-on comes from the paved employee parking area, a grassy knoll near the northwest border, and a gravel road for maintenance vehicles to access the switch yard.

Outfalls

There are eight outfalls at this facility as indicated on the Figure C-2 in Appendix C. The receiving water is Sandia Canyon (Figure C-3). Descriptions and activities at each outfall are listed below.

> 005 (former outfall 3-PSP-1): This outfall is associated with the outdoor metal storage area located south of Bldg. 22. Stormwater flows southwest through site(s) and discharges south to Sandia Canyon. This outfall also captures runoff previously associated with Outfall 2: drum storage with secondary containment, H_2SO_4 storage tank with secondary containment, loading and unloading operations (all south of Bldg. 22).
>
> 006 (former outfall 3-PSP-2): This outfall is associated with loading and unloading operations on the south and east side of Bldg. 22, and transformers east of Bldg. 22. Stormwater flows southeast through site(s) and discharges south to Sandia Canyon.
>
> 007 (former outfall 3-PSP-3): This outfall is associated with welding operations, loading and unloading operations east of Structure 24, and transformers east of Bldg. 22 (no longer operating and fortified with secondary containment). Stormwater flows southwest through site(s) and discharges south to Sandia Canyon.
>
> 008 (former outfall 3-PSP-4): This outfall is associated with the Combustion Gas Turbine Generator (CGTG). Stormwater flows northeast through the site and discharges northeast to Upper Sandia Canyon.
>
> 009 (former outfall 3-PSP-5): This outfall is associated with parked/maintenance vehicles outside of the loading docks on the north side of Bldg. 22, the metal recycling bin, the oil drip pan on the east side of Structure 2373, the diesel fuel loading areas on the east side of Structure 1404, and parked/maintenance vehicles on the south side of Structure 1790. Stormwater flows east through site(s) and discharges northeast to Upper Sandia Canyon.

3-PSP-6 (former outfall 3-PSP-6, INACTIVE): This outfall was associated with the diesel fuel loading areas on the south side of Structures 26 and 2383. Historically, stormwater flowed northeast through the site and discharged northeast to Upper Sandia Canyon. In 2007, an earthen berm was installed between the two secondary containment areas for the diesel tanks. This berm is designed to stop and hold any leaks and stormwater drainage. Therefore outfall 3-PSP-6 is no longer a discharge point for the facility.

010 (former outfall 3-PSP-7): This outfall is associated with parked/maintenance vehicles on the south side of Structure 1790. Stormwater flows northeast through the site and discharges northeast to Upper Sandia Canyon.

011 (former outfall 3-PSP-7.5): This outfall is associated with the switch-yard electrical transformers and switch yard oil-bearing equipment located north of Bldg. 232. Stormwater flows northeast through the site and discharges northeast to Upper Sandia Canyon.

012 (former outfall 3-PSP-8): This outfall is associated with the switch-yard electrical transformers and switch yard oil-bearing equipment located north of Bldg. 232. Stormwater flows north/northeast through the site and discharges north to Upper Sandia Canyon.

Substantially Identical Outfalls

The following outfalls at the TA-3 Power and Steam Plant have been identified as substantially identical based on common potential pollutant sources, drainage areas, activities within the drainage areas, and general site topography and characteristics. Required information supporting this outfall determination for monitoring requirements is listed in Section 4.7 of this SWPPP.

005 and 006: these outfalls are substantially identical in the types of potential pollutant sources, drainage areas and site topography. Monitoring is performed at outfall 005 and is considered representative of both 005 and 006.

007, 008, 009 and 010: these outfalls are substantially identical in the types of potential pollutant sources, drainage areas, and site topography. Outfall 009 receives runoff from all the central areas of the facility and is the outfall with the highest runoff coefficient. Therefore monitoring at this outfall is considered representative of the other substantially identical outfalls.

011 and 012: these outfalls both receive runoff primarily from the electrical switchyard and therefore are substantially identical. Monitoring is performed at outfall 012 and is considered representative of outfall 011.

1.5 General Location Map

The general location map for the facility is included as Figure C-1 in Appendix C. The map is provides a general overview of the facility boundary, structures, pervious and impervious areas. A regional location map is also provided as Figure C-3.

Receiving and Impaired Waters

Appendix C, Figure C-3 shows the receiving waters of the site. One-hundred percent of the site runoff flows to Sandia Canyon. The Canyon at this location is a perennial stream and eventually flows into the Rio Grande approximately 10 miles southeast of the site.

Sandia Canyon is on the New Mexico Environmental Department's 303d list for non-attainment of its designated uses. Total Maximum Daily Loads (TMDLs) have not been developed for the stream. Potential contaminants leading to the inclusion of Sandia Canyon on the 303d list are aluminum, PCBs, copper, gross alpha, and thallium. These listings are based primarily on stormwater data. Additional data and assessment methodologies specific to incorporation of stormwater data may be needed to verify the listing before scheduling subsequent TMDL development. There are currently no US EPA assessments or listing methodologies for incorporation of stormwater data.

Beginning in April 2009, LANL conducted and continues to conduct the required Impaired Waters sampling.

1.6 Site Map

Figure C-2 in Appendix C is the facility site map. Features located on this map provide the facility operators with information on where potential stormwater pollutants are located, where they mix with stormwater, and where stormwater leaves the site. All of this information is essential in identifying the best opportunities for stormwater pollution prevention or control.

There are no MS4s located on the site map because there are none that are applicable to this SWPPP.

There are no areas of designated critical habitat for endangered or threatened species on the site map because there are none at this site (see Appendix I).

A topo-aerial photo map (Figure C-3, Appendix C) identifies the location within 1 mile of the receiving water for potential stormwater discharges from the Facility. The receiving water for this Facility is contained within Sandia Canyon. The flow terminates into the Rio Grande. The stream flow in Sandia Canyon has been identified by the New Mexico Environment Department (NMED) on a 303(d) list as having probable causes of impairment, but no TMDL has yet been established.

SECTION 2: POTENTIAL POLLUTANT SOURCES

Most activities and materials occur within the buildings and are not exposed to stormwater. The following is a description of site activities and materials that have been, are, or could be exposed to stormwater. Controls used for each potential pollutant are described in Section 3.

2.1 Potential Pollutants Associated with Industrial Activity

The following is a description of site activities and all significant materials that have been exposed to stormwater in the 3 years prior to the date this SWPPP was updated. All of these areas are located on the site map (Figure C-2, in Appendix C). There are no industrial materials or activities exposed to stormwater releases from allowable non-stormwater discharges.

- There are several loading docks currently used at the facility. Two are located on the south side of Structure 22. Potential pollutants from these loading areas are chemical spills (Amines, 2-55 gal. drums delivered/wk; sodium hydroxide, 2-55 gal. drums delivered/wk). There is also a loading dock located on the north side of Structure 22 that is occasionally used to unload lubricant oil which is used for machinery located inside the building. Potential pollutants at this dock are hydraulic oil and/or mineral oils/fluids (maximum of eight 55-gal. drums approximately two deliveries/year).
- The loading dock at Structure 24 is associated with chemicals used to treat effluent from the Reuse tank (Structure 336) and the secondary environmental tank (Structure 784). Containers of chemicals (sodium bisulfite, four 55-gal. drums delivered/wk, and phosphate, 2-55 gal. drums delivered/wk.) are unloaded and stored inside this Structure. There is no chemical mixing or pouring of chemicals within or outside of this Structure. Chemicals are dispersed via tubing from containers within Structure 24 through underground lines to underground injection sites. The potential pollution sources for all of these loading areas are: spills and/or leaks that occur during the unloading process resulting from external corrosion of containers, structural failure of containers and/or the container openings and container puncture by mechanical moving equipment as a result of operator error.
- The fuel loading area for the two large fuel oil tanks: tanks 26 (emptied, isolated, and closed-in-place in 2011), and 2382 (approximately 85,400 gal. on-hand with a gross volume of 230,300 gal.) is within an asphalt-bermed area west of Structure 57 which is the pump house fueling port for these tanks. There is a fuel level alarm and automatic shut-off associated with the pump house to reduce the risk of overflowing the tank or draining it in the event of a fuel oil leak at Structure 57. This area is inspected pursuant to the facility's SPCC plan. There is also diesel fueling associated with the emergency generator (Structure 1404). Potential pollution sources/materials from all of these fueling areas are from diesel fuel that overflows due to failure of the alarm system and the automatic-shut off system (pump house) or diesel fuel spills that occur during pumping of liquid to the fuel tanks due to operator error and/or "topping off" of the tank, and/or failure of piping systems and/or tank.
- There is one area at the facility that is occasionally used for welding purposes. The welding benches are located on the east side of Structure 24. On the southwest side of Structure 22 there is also pipe/metal storage area. Potential pollution sources/materials from these areas are from metal shavings and from flux and chemicals used during welding that was not cleaned up by the operators. Metal erosion from the pipe storage area from exposure to rain water could also be a potential pollutant source.
- Various types of vehicles are parked and travel daily throughout the facility boundary. Potential pollution sources are from leaks of oil, lubricants, antifreeze/coolants, transmission fluids and gasoline due to poor maintenance/condition of these vehicles. Potential pollutants are oil, grease, heavy metals, organics, chlorinated solvents, and ethylene glycol.
- The electrical switch-yard contains oil-bearing equipment, transformers and traffic from maintenance vehicles. Potential pollutants from the vehicles are the same as described in the

previous bullet. The potential pollutant from the oil bearing equipment and transformers is mineral oil.

- There is one culvert that releases roof drainage through a culvert to a tributary that contributes to the Sandia Canyon stream flow. The roof is a hypolon cool roof. There are no potential pollutant sources from this type of roofing.
- There are banks of transformers located on the east side of Structure 22. These units are exposed to rainfall. Potential pollutants associated with these transformers would come from leaking units that have rusted. Potential pollutant source is mineral oil.

Solid Waste Management Units (SWMUs):

The eastern area of the facility contains a designated Solid Waste Management Unit (SWMU) according to the Los Alamos National Laboratory (Operable Unit 1148) Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan for Environmental Restoration (May 1992).

Consolidated SWMU 03-012(b)-00 consists of a re-use holding tank, SWMU 03-014(q) and NPDES Permitted Outfall 001 associated with SWMUs 03-012(b) and 03-045(b), which are the discharge point for the outfall. The permitted outfall currently receives treated effluent from the re-use holding tank and from cooling tower #03-592. The potential pollutant of concern for the cooling tower is metals. The outfall is monitored weekly for pH and chlorine as required by the NPDES Outfall Permit for LANL (NM0028355). Cooling towers #58 and #285 are inactive and no longer contribute to the effluent discharge. There is no surface water discharge of pollutants of concern from the cooling tower or the re-use holding tank.

Potential Pollutants Associated with Industrial Activity

Industrial Activity	Associated Pollutants
Loading/unloading areas	Amines, sodium hydroxide, lubricant oil, hydraulic oil, mineral oils/fluids, sodium bisulfite, and phosphate
Fuel oil storage tank	Diesel fuel
Diesel generator tank	Diesel fuel
Sulfuric acid storage tank	Sulfuric acid
Oil storage	Oil
Welding area	Metals
Electrical switch yard	Oil, lubricants, antifreeze/coolants (ethylene glycol), transmission fluids, gasoline, diesel, chlorinated solvents, metals, mineral oil
Machinery	Oil, lubricants, antifreeze/coolants (ethylene glycol/propylene glycol), transmission fluids, gasoline, diesel, chlorinated solvents, metals
Cooling tower blowdown	Metals
Metal storage	Metals

Transformer banks	Mineral oil

2.2 Spills and Leaks

Areas where leaks and spills could occur are summarized in the following table.

Areas of Site Where Potential Spills/Leaks Could Occur

Location	Discharge Points
South side Structure 22	
Oil drum storage area	005
Sulfuric Acid Tank	005, 007
Roof Drainage	005, 006, 007, 009
Loading Docks	005
Metal Pipe Storage Cage	005
Dumpster	005
East side Structure 22	
Standby generator diesel tank	009
Banks of Transformers	006, 007
East side Structure 24	
Loading Area	007, 009
Outdoor Welding Operations	007, 009
East side Structure 592	
Cooling Tower Blowdown and Water Reuse	008
North and South of Structure 2422	
CGTG Oil Storage	008
North side Structure 22	
Loading Docks	009
Parked/Maintenance Vehicles Leaks	009
Metal Recycling Roll-Off Bin	009
East side Structure 2373	
Oil Containment Unit (for Gas Compressor)	009
South side Structures 26 and 2382	

Diesel Fuel Loading Areas	009
East side Structure 1404	
Diesel Fuel Loading Areas	009
South side Structure 1790	
Parked/Maintenance Vehicles Leaks	009, 010
North side Structure 232	
Switch-Yard Electric Transformers	011, 012
Switch-Yard Oil-Bearing Equipment	011, 012
Vehicle Leaks	011, 012

Description of Past Spills and Leaks

In the past three years since the revision of this SWPPP (2012-2015), no significant spills and/or leaks of oil or toxic or hazardous pollutants have occurred at exposed areas or have drained to a stormwater conveyance from this facility. Three small leaks of hydraulic fluid and oil were recorded and are listed below. Metal scraps were also found to be in an unacceptable storage location, not in the appropriate metal bin. Spills are documented and reported immediately to ENV-CP personnel. The designated ENV-CP PPT member ensures that copies of all spill reports are entered into the SWPPP immediately upon the completion and documentation of the spill response and cleanup. Documentation of spills also must be entered into the ENV-CP MSGP Corrective Action Report (CAR) database.

Description of Past Spills/Leaks

Date	Description	Discharge Points
3/08/2012	Metal scraps were observed on the paved surface in front of the scrap metal bin. The metal scraps were placed in the bin and area was swept.	Not applicable
7/26/2012	Entrance lift gate leaked two gal. of hydraulic fluid; EM&R responded and cleaned spill; repaired leak	Not applicable
6/25/2013	Oil, approximately 1 quart, was spilled south of the Power and Steam Plan near outfall 005 (formerly 3-PSP-1). The spill was wiped down and sprayed with Micro-Blaze.	Not applicable
9/08/2014	South of building 3-22, approximately 1 qt of motor oil leaked from an automobile; cleaned by site personnel with absorbent and Microblaze	Not applicable

2.3 Unauthorized Non-stormwater Discharges Documentation

An evaluation was conducted in August 2015. No unauthorized discharges were found (Appendix D). Outfalls 005, 009, and 012 were observed. No potential significant sources of non-stormwater were identified and the test for the presences of non-stormwater discharge was negative.

2.4 Salt Storage

There are no salt piles at the TA-3 Power Plant. During the winter, salt for de-icing is stored at multiple locations around the facility. Salt is kept in closed containers and is used as necessary by site personnel to de-ice walkways and reduce the risk of slips.

2.5 Sampling Data Summary

Discharge monitoring reports for the past permit period (April 2009 through April 2015) are attached as Appendix D and summarized below by year. The site was sampled for impaired waters monitoring for thallium during the 2015 time period. No impaired waters or benchmark sampling was required for 2013-2014 time period. The site was sampled for impaired waters monitoring for copper during the 2011-2012 time period. The site was sampled for impaired waters monitoring for aluminum, gross alpha, and PCBs during the 2008-2010 time period. The site was sampled for benchmark monitoring of iron during the 2008-2011 time period.

2009

Quarterly visual assessments were conducted on stormwater obtained from the sampling station and no obvious indicators of pollutants were present. Evaluation of the analytical data from quarterly benchmark monitoring (4/1/2009 through 7/6/2009) indicated that iron was present at the monitored outfall 3-PSP-5 (now 009). The iron concentration exceeded the benchmark value from the 6/3/2009 sampling event. The impaired water quality standard was exceeded for aluminum. Welding appeared to be the potential pollution source, which has been moved under a hard roof, open sided structure. The impaired water pollutants PCBs and mercury were determined to not be present in the stormwater discharge. Annual monitoring for these pollutants was discontinued per Section 6.2.4.2 of the MSGP based on analytical data from the sampling events on 6/10/2209 and 6/30/2009 at outfall 3-PSP-5 (now 009).

2010

Evaluation of the annual analytical data from impaired waters monitoring showed the impaired water quality standard for gross alpha was exceeded at outfalls 3-PSP-1 (now 005) and 3-PSP-5 (now 009) for a storm event on 5/14/2010. However, this did not take into consideration adjusted gross alpha, which excludes source, special nuclear, and by-product material as defined by the Atomic Energy Act of 1954. Per "Preliminary Comments Regarding Use of Statistical Methods to Evaluate Background Surface Water Quality and Identify Laboratory Impacts" (LANL Nov 30, 2007, LAUR-07-8120), virtually all of the background concentration of adjusted gross alpha in surface water exceeded the NME D water quality criteria for livestock watering. The referenced document also demonstrates that the variability in gross alpha in stormwater samples is primarily due to variability in suspended load.

2011

At monitored outfall 3-PSP-8 (now 012), evaluation of quarterly monitoring from 8/1/2010 through 8/31/2011 indicated iron was present at a concentration above the benchmark. This was from storm events on 8/23/10, 9/22/10, and 10/20/10. At monitored outfalls 3-PSP-1 (now 005), the concentration of copper exceeded natural background for stormwater. No pollutants were documented during visual assessments at this facility.

2012

The impaired water quality standard for copper was exceeded at monitored outfall 3-PSP-1 (005). This was from a storm event on 5/8/2012. However, copper was present at a concentration solely attributable to natural background levels in stormwater. No pollutants were documented during visual assessments at the facility.

2013

For monitored outfalls 3-PSP-1 (005), 3-PSP-5 (009), and 3-PSP-8 (012), no benchmark or impaired waters monitoring was required. A sheen was identified in a grab sample collected in June. A small oil leak was discovered the same day and cleaned up immediately.

2014

For monitored outfalls 3-PSP-1 (005), 3-PSP-5 (009), and 3-PSP-8 (012), no benchmark or impaired waters monitoring was required. No pollutants were documented during visual assessments of this facility.

2015

A sample was collected from outfall 3-PSP-1 (005) on 4/26/2015 and analyzed for thallium. The impaired waters pollutant thallium was determined to not be present in stormwater discharge.

SECTION 3: STORMWATER CONTROL MEASURES

One of the important elements in the development of a SWPPP is identification of appropriate control measures to minimize exposure of certain activities to stormwater. Minimize means to reduce and/or eliminate to the extent achievable using control measures - including Best Management Practices (BMPs) - that are technologically available and economically practicable and achievable in light of best industry practice. This facility will control its stormwater discharges as necessary to meet applicable water quality standards. As backup there are several permanent structures that will capture runoff from parts of the site prior to discharging into a waterway. If the facility determines, or is informed by EPA, that any of its discharges contribute to or have caused an exceedance of water quality standards, corrective actions will be initiated to eliminate the problem. The EPA may impose additional requirements for this facility or require an individual permit if information suggests that activities at this facility cause or contribute to a water quality standard.

The following control measures and design criteria were considered in the considered in selection of stormwater controls at the site:

- Preventing stormwater from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from stormwater.
- Using control measures in combination may be more effective than using control measures in isolation for minimizing pollutants in stormwater discharge.
- Assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures that will achieve the limits in this permit.
- Minimizing impervious areas at the facility and infiltrating runoff onsite (including bio-retention cells, green roofs, and impervious pavement, among other approaches) can reduce runoff and improve ground water recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination.
- Attenuating flow using open vegetated swales and natural depressions can reduce in-stream impacts of erosive flows.
- Conserving and/or restoring riparian buffers will help protect streams from stormwater runoff and improve water quality.
- Using treatment interceptors (e.g., swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

The site map (Figure C-2) illustrates stormwater flow directions at the facility. Activities at the facility associated with manufacturing (e.g., welding), material storage (e.g., pipe storage), loading and unloading operations and fueling provide opportunities for pollutants to be transported by stormwater. Control measures in the form of BMPs; either administrative (e.g., standard operating procedures [SOPs] and/or Utility Operating Procedures) and/or maintenance procedures or structural (e.g., berms) provide a first line of defense at the facility in minimizing the potential for spills, exposure of materials, or any other event that could adversely affect the quality of water and sediment that is transported beyond the facility boundary. In minimizing exposure, facility staff will focus particular attention to the control measures described in Section 3. The following sections document the location and types of control measures that are installed and implemented to achieve the non-numeric effluent limits associated with this facility.

3.1 Non-numeric Technology-based Effluent Limits (BPT/BAT/BCT)

The following section details compliance with non-numeric effluent limits as well as any sector-specific non-numeric effluent limits. Table 3.1 summarizes for each industrial activity the best management practices use to control pollutant discharge. The LANL Stormwater BMP Manual is consulted as needed.

Table 3.1 BMPs for Potential Pollutant Sources at the TA-3 Steam and Power Plants	
Industrial Activity/Pollutant Source	BMPs
Material Storage Areas (oil drum storage area, sulfuric acid tank, metal pipe storage cage, generator, diesel tank, CGTG oil storage, oil containment unit)	Training Facility personnel are trained to ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program. Facility personnel are also trained in spill and leak response and notification. Spills and Leaks Any identified pollutants are immediately cleaned-up using dry absorbents and Micro-blaze is applied to petroleum-based spills/leaks. Minimize Exposure To eliminate the potential for pollutant release, there is a secondary containment located around the CGTG oil storage. There are leak/level alarms on the diesel storage tank and the emergency generator tank. The emergency generator is located in a building. The metal pipe storage cage is covered. The storage levels for the reuse water tank for the cooling tower are monitored. Good Housekeeping Stored materials are clearly labeled. Areas are kept clean. Daily or weekly walk-arounds for spills and leaks, and evaluation of pollutant sources, BMPs, and outfalls to minimize the potential for pollutant releases. Preventive maintenance/inspections are performed for the diesel generator and storage tanks on a set schedule. Management of Runoff/Erosion and Sediment Control Areas of the site are graded and bermed adequately. There are adequate storm drains and culverts to manage runoff. Erosion blankets, gravel bags, and Ecobloks are used to reduce erosion at the site.
Roll-off bins containing materials and debris for disposal (dumpster south side of 3-22; meal recycling bin north side of 3-22)	Training Facility personnel are trained to ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program. Facility personnel are also trained in spill and leak response and notification. Minimize Exposure Tarped or covered to prevent accumulation of stormwater. Good Housekeeping Municipal wastes are picked up on a regular schedule. Other wastes are scheduled for pickup by WMCs according to LANL's P409 guidance. Daily or weekly walk-arounds for spills and leaks, and evaluation of pollutant sources, BMPs, and outfalls to minimize the potential for pollutant releases.

Table 3.1 BMPs for Potential Pollutant Sources at the TA-3 Steam and Power Plants	
Industrial Activity/Pollutant Source	BMPs
	Management of Runoff/Erosion and Sediment Control Areas of the site are graded and bermed adequately. There are adequate storm drains and culverts to manage runoff. Erosion blankets, gravel bags, and Ecobloks are used to reduce erosion at the site.
Electrical transformers (east of building 3-22 and switch yard)	Training Facility personnel are trained to ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program. Facility personnel are also trained in spill and leak response and notification. Minimize Exposure The transformers to the east of building 3-22 have secondary containment and absorbent pads underneath. Good Housekeeping Areas are kept clean. Daily or weekly walk-arounds for spills and leaks, and evaluation of pollutant sources, BMPs, and outfalls to minimize the potential for pollutant releases. Management of Runoff/Erosion and Sediment Control Areas of the site are graded and bermed adequately. There are adequate storm drains and culverts to manage runoff. At the switch yard, the area is enclosed by an asphalt run-down area as well as a rock-lined ditch to control runoff.
Outdoor vehicle and equipment storage and parking (includes switch yard with oil-bearing equipment)	Training Facility personnel are trained to ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program. Facility personnel are also trained in spill and leak response and notification. Spills and Leaks Any identified pollutants are immediately cleaned-up using dry absorbents and Micro-blaze is applied to petroleum-based spills/leaks. Minimize Exposure Equipment is maintained to reduce likelihood of any spills/leaks. Good Housekeeping Areas are kept clean. Daily or weekly walk-arounds for spills and leaks, and evaluation of pollutant sources, BMPs, and outfalls to minimize the potential for pollutant releases. Management of Runoff/Erosion and Sediment Control Areas of the site are graded and bermed adequately. There are adequate storm drains and culverts to manage runoff. The overall site is sloped, has a rock-lined ditch, asphalt-rundown area, gravel bags, and erosion blankets

Table 3.1 BMPs for Potential Pollutant Sources at the TA-3 Steam and Power Plants	
Industrial Activity/Pollutant Source	BMPs
	installed. At the switch yard, the area is enclosed by an asphalt run-down area as well as a rock-lined ditch to control runoff.
Roofs	Training Facility personnel are trained to ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program. Facility personnel are also trained in spill and leak response and notification. Minimize Exposure Maintain any building filters that discharge air to the roof. Make sure roof is in good condition and is not eroding. Management of Runoff/Erosion and Sediment Control Runoff is directed through a slotted drain to a culvert with erosion blanket installed.
Diesel Fueling (south of structures 3-26 and 3-2382; east of 3-1404)	Training Facility personnel are trained to ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program. Facility personnel are also trained in spill and leak response and notification. Spills and Leaks Any identified pollutants are immediately cleaned-up using dry absorbents and Micro-blaze is applied to spills/leaks. Minimize Exposure Avoid fueling in the rain. Inspect area before fueling. Fuel in impermeable areas if possible. Secondary containment and berms are installed. Tanks are fitted with alarms to warn of leaks/levels. Do not leave fueling unattended. Maintain equipment. Good Housekeeping Areas are kept clean. Daily or weekly walk-arounds for spills and leaks, and evaluation of pollutant sources, BMPs, and outfalls to minimize the potential for pollutant releases. Management of Runoff/Erosion and Sediment Control Areas of the site are graded and bermed adequately. There are adequate storm drains and culverts to manage runoff.
Outside Welding Area	Training Facility personnel are trained to ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program. Facility personnel are also trained in spill and leak response and notification.

Table 3.1 BMPs for Potential Pollutant Sources at the TA-3 Steam and Power Plants	
Industrial Activity/Pollutant Source	BMPs
	Spills and Leaks Any identified pollutants are immediately cleaned-up and disposed of properly. Minimize Exposure Perform welding under designated covered area. Do not leave welding materials outside when not in use. Maintain equipment. Good Housekeeping Area is kept clean. Daily or weekly walk-arounds for spills and leaks, and evaluation of pollutant sources, BMPs, and outfalls to minimize the potential for pollutant releases. Management of Runoff/Erosion and Sediment Control This area has a diversion berm installed.

3.1.1 Minimize Exposure

Where feasible, minimizing exposure of potential pollutant sources to precipitation is an important control option at the facility. Minimizing exposure prevents pollutants, including debris, from coming into contact with precipitation and can reduce the need for BMPs to treat contaminated stormwater runoff. It can also prevent debris from being picked up by stormwater and carried into drains and surface waters. Examples of BMPs used for exposure minimization at this facility include:

- locating industrial materials and activities inside or protecting them with storm resistant coverings; (NOTE: Industrial materials do not need to be enclosed or covered if stormwater runoff from affected areas will not be discharged to receiving waters or if discharges are authorized under another NPDES permit).
- using grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas;
- locating materials, equipment, and activities so that leaks are contained in existing containment and diversion systems;
- cleaning up spills and leaks promptly using dry methods (e.g., absorbents) to prevent discharge of pollutants;
- using drip pans and absorbents under or around leaky vehicles and equipment or storing equipment indoors where feasible;
- use of spill/overflow protection equipment;
- keeping dumpster lids closed;
- draining fluids from equipment and vehicles prior to on-site storage or disposal; and
- performing all cleaning operations indoors, under cover, or in bermed areas that prevent runoff and run-on and also that capture any overspray.

3.1.2 Good Housekeeping

Good housekeeping is a practical, cost-effective way to maintain a clean and orderly facility and to prevent potential pollution sources from coming into contact with stormwater. It includes establishing protocols to reduce the possibility of mishandling materials or equipment and training employees in good housekeeping techniques. Common areas where good housekeeping practices are specifically applicable to the prevention of stormwater contamination at this facility include material storage areas, trash containers, adjacent areas, and loading docks.

All site areas exposed to precipitation are walked down weekly and during monthly inspections to ensure that the grounds are kept in an orderly condition.

All waste management and storage areas are kept clean and neat. Most materials and supplies used at the Facility are stored within enclosed buildings.
The site's Waste Management Coordinator is responsible for any used oil, hazardous, or New Mexico special waste disposal. They are required to dispose of waste within timeframes established by LANL. Municipal trash is picked up weekly.
All dumpster lids are closed when not in use. For dumpsters or roll-off boxes that may not have lids and could leak, secondary containment and covers are used. Consistent with Part 1.1.3 of the MSGP, this permit does not authorize dry weather discharges from dumpsters or roll-off boxes.

The entire facility is walked down daily and during RCRA required inspections of the container storage areas to ensure that the grounds are kept in an orderly condition and those structures such as stormwater control channels and outfalls are properly maintained and free of debris or other obstructions.

3.1.3 Maintenance

The preventive maintenance program consists of good housekeeping practices specifically applicable to the prevention of stormwater contamination.

The preventive maintenance program in general includes the following:

- SOPs that specify appropriate methods for handling wastes;
- Maintenance of operational areas in a clean and orderly state;
- Regular inspections to ensure that procedures are properly followed and that no potential contaminants are present in exposed areas.
- Facility equipment is evaluated by appropriate systems engineers to determine the need for, schedule for, and procedures for preventive maintenance. The results of these evaluations are documented and standing work orders are established for equipment and/or systems that are determined to need preventive maintenance. All preventive maintenance activities are tracked in maintenance history logs.

BMPs used for management of stormwater and sediment at the facility include drainage channels and outfalls along the eastern edge of the area. The channels are inspected periodically to ensure that they are not obstructed by debris and that any maintenance or repair of the structure is performed promptly and adequately.

Maintenance of containment structures and stormwater conveyances is an essential part of the program. Stormwater culverts are cleaned when necessary to prevent clogging.

The power and steam plant staff follows the ENV-CP WQ procedures for visual inspection of stormwater within containment before considering any releases. Staff notifies ENV-CP-WQ and the LANS contractor of the results of the visual inspection and the need to discharge stormwater from the containment. Visual examination includes a description of the odor, color, and clarity of the discharge. If present, foam, floating solids of raw or waste material, settled solids, and suspended solids are also described as part of the visual inspection. Staff complies with the decision made by ENV-CP-WQ regarding the request and files all findings and a record of all secondary containment releases. Copies are sent to ENV-CP-WQ and the LANS contractor.

Catch basins are cleaned when the depth of debris reaches two-thirds (2/3) of the sump or drain depth and keeping the debris surface at least six inches below the lowest outlet pipe (if applicable).

Any erosion, which becomes severe enough to weaken earthen containment berms, is repaired. All BMP structures are routinely inspected and maintained as necessary. The annual inspection of the facility by the ENV-CP PPT includes an evaluation of the conditions of all berms, containment structures and other stormwater conveyances.

Maintenance and repairs of control measures are documented in the ENV-CP MSGP CAR Database. Nonstructural control measures are also diligently maintained (e.g., spill response supplies available, personnel appropriately trained). Final repairs/replacements should be completed as soon as feasible (within 14 days).

3.1.4 Spill Prevention and Response

Spills are prevented by ensuring container integrity, plainly labeled containers that could be susceptible to spillage or leakage, properly maintaining equipment, inspecting equipment and BMPs, correcting deficiencies, maintaining proper housekeeping, ensuring adequate training, and diligently performing work. Spill control consists of proper BMPs, and engineering and administrative controls. The probability of spills or releases at the facility is minimized by application of good housekeeping and safe site operations.

In general, the approach to spill cleanup is to secure the spill area and contact ENV-CP and the Emergency Operations Center (EOC) Emergency Management & Response (EM&R) Team (if necessary). Contact information is available in the control room, so it is readily accessible and available. For incidental releases, absorbents are used to pick up free liquids and the contaminated absorbents are properly disposed. Spill kits are located in the power and steam plant areas where spills may occur.

All significant incidents shall be reported to the Emergency Operations Center (EOC) or Facility Duty Officer in accordance with LANL's Manual for Communicating, Investigating, and Reporting Abnormal Events: https://int.lanl.gov/policy/documents/P322-3.pdf.

The EOC or Facility Duty Officer shall report all spills or releases. All uncontrollable spills or releases must be reported to the EOC/EM&R Office or Facility Duty Officer by calling 667-6211 or, after hours, at 667-7080. If fire or explosion is present, or if the potential for such exists, the situation must be reported by dialing 911 from a non-cellular phone or by activating a fire pull box. In the event of a spill, the EOC/EM&R Office will determine appropriate cleanup procedures and will notify the individuals or organizations responsible for completing spill reports or fulfilling regulatory reporting requirements. An emergency trailer with spill cleanup and safety equipment ready for rapid transport to any part of the Laboratory is available at TA-63.

The completion of a spill report is also required in the event of a spill. Spill investigations are conducted per ENV-CP-QP-007, Spill Investigation. The spill report will be handled according to internal spill record keeping procedures and may require external agency notification, depending on the nature of the spilled material and the location of the release. External agency notification may consist of verbal or written notification to the National Response Center, Environmental Protection Agency Region VI, or the New Mexico Environment Department. The determination for the type of reporting will be made by the EOC/EM&R Office, and ENV-CP, in accordance with Laboratory and DOE policies and federal and state regulatory reporting requirements. Copies of internal spill reports are maintained by the responsible organization.

Where a leak, spill or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24-hour period, the National Response Center (NRC) must be contacted at (800) 424-8802 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302 as soon as there is knowledge of the discharge. State or local requirements may necessitate reporting spills or discharges to local emergency response, public health, or drinking water supply agencies.

3.1.5 Erosion and Sediment Controls

Sediment transport and erosion at the facility is minimal because 95% of the facility boundary is occupied by structures or has been paved for access and parking. Areas where erosion could occur (e.g., in unlined channels where runoff water is concentrated) are addressed by installation of appropriate BMPs. Erosion control BMPs (e.g., seeding and mulching) have been installed in those areas where soil may become or has been dislodged and/or transported during storm events (see Site Map for location). Sediment control (i.e., silt fences, sediment ponds, and stabilized entrances) will be used as back-up for erosion control BMPs if required.

Stormwater management practices at the facility have included placement of flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion and/or settle out pollutants (see Figure C-2). BMP placement will address any issues discovered during preventive

maintenance inspections, regular facility inspections, and/or observations made during monthly/quarterly routine inspections conducted at the facility by designated members of the ENV-CP PPT. These team members will examine the condition of conveyance channels and other unpaved areas for signs of excessive erosion, such as gullies on slopes or undermining of structures and paved areas. In the event that excessive erosion of the drainage channels is observed, corrective measures to minimize or prevent further erosion will be implemented. Members of the Pollution Prevention Team from ENV-CP Stormwater team will be consulted to ensure appropriate corrective measures are taken.

In selecting, designing, installing, and implementing control measures, the facility ENV-CP PPT Members will, in addition to obtaining recommendations proposed by ENV-CP Stormwater representatives, consult with EPA's internet-based resources relating to BMPs for erosion and sedimentation, including the sector-specific Industrial Stormwater Fact Sheet Series (EPA-833-F-06-030), (www.epa.gov/npdes/stormwater/msgp), National Menu of Stormwater BMPs (www.epa.gov/npdes/stormwater/menuofbmps), and National Management Measures to Control Nonpoint Source Pollution from Urban Areas (www.epa.gov/owow/nps/urbanmm/index.html), and any similar State or Tribal publications.

The facility operators have taken a pro-active approach in preventing facility- specific erosion from occurring and have implemented the following erosion controls at the facility. The following projects have been completed.

- In 2000, an extensive erosion control project was completed between Structure 22 and Structure 24. The east facing slope was divided into terraced sections to minimize slope length.
- In 2000, a culvert was installed from the east end of the access road up to the edge of the fence. The existing trench was backfilled and erosion control matting place on the slope.
- In 2002 a small culvert was added to convey stormwater from the edge of the southeast corner of the Facility to the edge of the drainage near Outfall 1. The culvert conveys flow underground and minimizes erosion from the edge of the facility to the drainage.
- In 2003, a swale was paved northeast of Structure 1682 to help flow travel into the inlet end of the culvert under the access road (see Site Map). An earthen swale was defined to carry flow from the lowest terrace in to the inlet end of the culvert. A gabion was used to dissipate energy at the lower end of the swale.
- In 2002 terraces were added to the slope east of the 1.25 MW emergency generator.
- An earthen swale was also added in 2002 to the slope NW of Structure 1404 to direct flow in to the culvert at the bottom of the slope.
- Asphalt swales were also added in 2003, and were somewhat modified in 2007 for the CGTG expansion to the east side of the access road near the bulk diesel storage tanks in order to divert sheet flow from the road into the culvert. This culvert discharges to a rock-lined ditch at the east fence line and flows into Upper Sandia Canyon.

- In 2007, an earthen berm was added behind the fuel oil house (Building 57) and between the two secondary containment areas for the two large diesel fuel tanks. This berm will catch any spills, and contain stormwater that otherwise would flow to Sandia Canyon via outfall 3-PSP-6. With the addition of this berm, outfall 3-PSP-6 no longer receives any stormwater flow and is considered inactive.

All BMPs at the facility are regularly maintained to ensure they function as intended. Inspections are conducted monthly and during runoff events. If any problems are found, corrective actions are initiated immediately. Final repairs/replacements should be completed as soon as feasible (within 14 days).

3.1.6 Management of Runoff

Approximately 95% of the entire surface region within the facility boundary is impervious - paved with asphalt or concrete and covered by buildings or structures. Water flows from the northern portion of the facility in the switch yard to the east and toward a culvert through the east fence and into Upper Sandia Canyon. The entire portion of the switch yard is graveled to control vegetation (see Figure C-2, Site Map). Water flows from west to east down the paved access road and between Structures 22 and 1682 through a slotted culvert and down a concrete trough and into a culvert that discharges at the east fence between the above ground storage tank (Structure 2382) and Water Cooling Tower (Structure 592).

A detailed view of stormwater flow direction at the facility is illustrated in Figure C-2. Stormwater flows mainly from west to east at the southern portion of the facility. Water leaves the facility and discharges into a tributary located in Upper to Sandia Canyon (Figures C-2 and C-3).

During routine inspections BMPs are evaluated by ENV-CP PPT members to determine if they are being maintained to function as intended, especially during runoff events. Problems found associated with runoff are addressed through corrective actions and initiated as soon as possible. Final repairs/replacements should be completed as soon as feasible (within 14 days).

3.1.7 Salt Storage Piles or Piles Containing Salt

There are no salt piles at this facility. Salt and de-icer are stored in containers.

3.1.8 Dust Generation and Vehicle Tracking of Industrial Materials

Erosion/dust generation at the power and steam plant facility is minimal because 95% of the site is paved or occupied by structures.

All non-municipal waste is tracked using LANL's Waste Compliance and Tracking System (WCATS). This tracks waste from cradle to grave and minimizes or eliminates any pollutant discharge.

3.2 Sector-Specific Non-Numeric Effluent Limits

<u>Vehicle and Equipment Storage Areas</u>
See Section 3.1 for specific control measures to control spills and leaks.

Material Storage Areas

See Section 3.1 for specific control measures to control spills and leaks.

Employee Training

See employee training in Section 4.5.

Part 8 of the 2015 MSGP identifies sector-specific requirements for Sector O – Steam Electric Generating Facilities. The Facility must comply with requirements associated with the primary industrial activities described in Section 2 and any co-located industrial activities as defined in Appendix A of the 2015 MSGP. The sector-specific requirements only apply to those areas of the facility where the sector-specific activities occur.

The following Sector-Specific Non-Numeric Effluent Limits are addressed at this facility:

- Delivery Vehicles: Contamination of stormwater from delivery vehicles arriving at the facility is address at this facility by inspecting each vehicle for overall integrity of the body or container/tank and by checking for spills and leaks.

- Fuel Oil Unloading Areas: Contamination of precipitation or surface runoff from fuel oil unloading areas is addressed at this facility by providing curbs at unloading areas, having facility personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and by using spill and overflow protection devices (e.g., drip pans or other containment devices [e.g., containment bladder]) beneath fuel oil connectors to contain potential spillage during deliveries or from leaks in the connectors.

- Chemical Loading and Unloading: Contamination of precipitation or surface runoff from chemical loading and unloading areas has been minimized at this facility by primarily having chemical unloading conducted inside the plant (mainly Structure 22). Chemical loading or unloading that does occur outside is administratively controlled by prohibiting such operations during inclement weather, as well as requiring personnel to be present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up.

- Miscellaneous Loading and Unloading Areas: Contamination to precipitation or surface runoff from loading areas (e.g., metal recycling roll-off bins), is addressed at the facility by berming and/or curbing around the loading/unloading areas and by locating these areas away from stormwater flow and/or by providing flow diversion.

- Liquid Storage Tanks: Contamination from surface runoff associated with above ground liquid storage tanks has been addressed by providing secondary containment, containment curbing, spill and overflow protection and either dry (or equivalent) cleanup methods.

- Large Bulk Storage Tanks: Contamination to surface runoff has been minimized by using berms and by complying with applicable State and Federal laws, including the Spill Prevention Control and Countermeasures (SPCC) plan requirements.

- Spill Reduction Measures: Minimization measures are described in Section 3.1.4 and in Sections 1.3 through 1.3.3 of the SPCC plan.

- Oil-Bearing Equipment in Switchyards: Contamination of surface runoff from these areas have been addressed by providing level grading and gravel surfaces to retard flow and berming to limit the spread of spills, and by addressing spills and leaks as described in Section 3.1.4.

There is no residue-hauling from the facility, nor ash loading areas located at the facility. The facility is not in the immediate vicinity of a Landfill, Disposal Pond, Scrap Yard, Surface Impoundment, Open Dump or General Refuse Site.

3.3 Numeric Effluent Limitations Based on Effluent Limitations Guidelines

The TA-3 Power and Steam Plant is classified under Sector O-Steam Electric Generating Facilities with a benchmark limit for iron of 1.0 mg/L.

3.4 Water Quality-based Effluent Limitations and Water Quality Standards

Stormwater monitoring data for this site confirms that the controls implemented, as described in Section 3 of this SWPPP, result in stormwater discharges that meet applicable water quality standards. To date, no additional water quality standards are imposed upon this site.

SECTION 4: SCHEDULES AND PROCEDURES

4.1 Good Housekeeping

All site areas exposed to precipitation are walked down weekly and during monthly inspections to ensure that the grounds are kept in an orderly condition. The Laboratory has a Pollution Prevention and Sustainability website for maintenance and operations waste, which includes the path forward and procedures for waste disposal and storage. For example, lead acid batteries can be managed as recyclable material as outlined in ADESH-TOOL-703, Lead/Acid Gel Batteries Manage by Salvage as Recyclable Material. It outlines the general requirements for storage, labeling, and transportation. The Laboratory also has a website with all applicable waste management tools. This is the main reference site for LANL waste management coordinators and provides series tools for storage, labeling, and management of hazardous waste, radiological waste, universal waste, New Mexico Special waste, and other wastes. Figure 4.1 below shows the waste management process at LANL.

Good housekeeping practices that are specifically applicable to the prevention of stormwater contamination include:

- Regular daily and weekly walk through inspections are conducted to ensure that procedures are properly followed and that no potential contaminants are present in exposed areas.
- Procedures and practices for material management and storage as detailed in Section 3.1 minimize the potential for runoff contamination.
- All storage areas are kept clean and neat. Vehicles and other equipment are stored and maintained in specified areas.
- Garbage and floatables are routinely picked up by facility personnel. All garbage containers are covered to prevent windblown debris. Backup practices including the installation of temporary BMPs are installed to mitigate runoff while a control measure is offline.

WM Process 9/09

This work instruction cannot establish new requirements; it may only summarize the requirements in federal or state statutes/ regulations/permits, DOE Orders, and authorized Laboratory policies.

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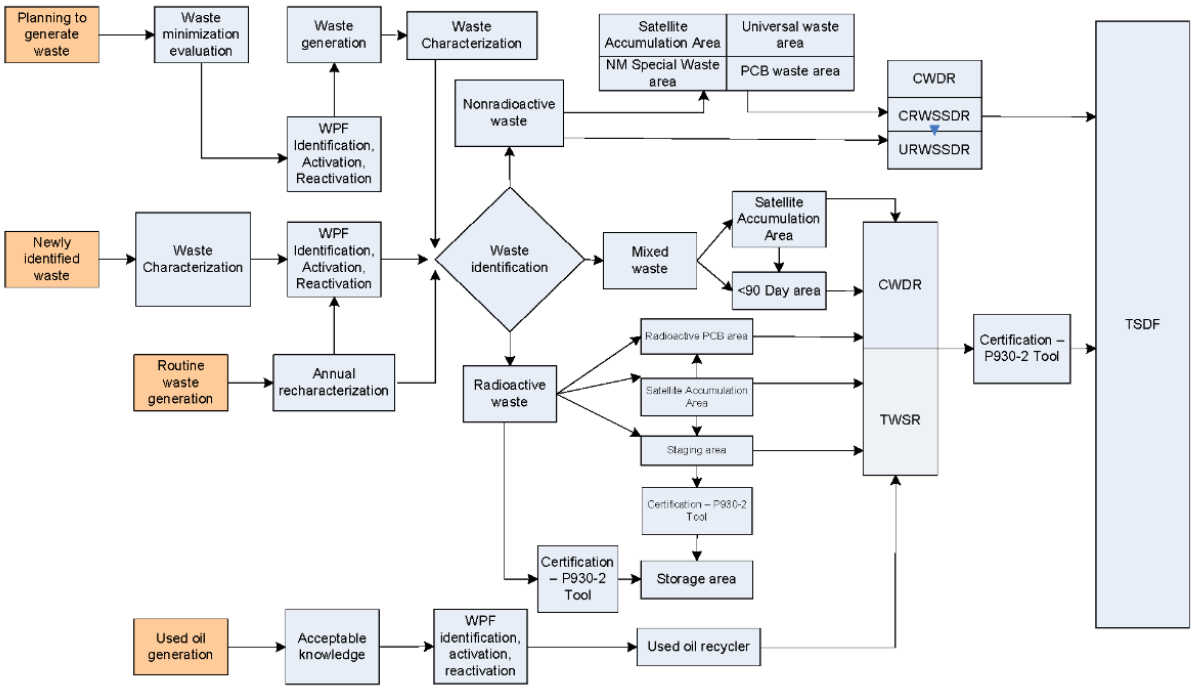
Contact P409rep@LANL.gov to report errors or broken links

P409 WASTE MANAGEMENT PROCESS

Glossary **and** Acronyms



This document was DC reviewed and is unclassified.

4.2 Maintenance

At the power and steam plant, numerous preventive maintenance activities of the facility-owned equipment are conducted on set schedules. In addition, the entire facility is walked down daily and during RCRA required inspections of the container storage areas to ensure that the grounds are kept in an orderly condition and those structures such as stormwater control channels and outfalls are properly maintained and free of debris or other obstructions. If any maintenance or repairs of the BMPs are required, SOP ENV-RCRA-QP-022, MSGP Stormwater Corrective Actions is followed. In addition, personnel involved in maintaining BMPs at the Steam and Power Plant are trained to this SWPPP and ENV-RCRA QAPP-MSGP, Quality Assurance Project Plan for the Stormwater Multi-Sector General Permit for Industrial Activities.

4.3 Spill Prevention and Response Procedures

At a minimum the following actions are currently implemented at the Facility.

ENV-CP staff and contract personnel who perform spill response and investigation require training on the latest version of procedure ENV-CP-QP-007, Spill investigations.

Annual re-training to this SWPPP is required. Specific training requirements are updated as needed.

The training method for spill investigations is part “self-study” and part on-the-job training (OJT). The OJT training is to be conducted by a Team Leader or person designated as Subject Matter Expert (SME) by the ENV-CP Group Leader. The self-study and OJT will be documented in accordance with ENV-DO-QP-115, Personnel Training.

Spill Prevention at Fuel and Chemical and Miscellaneous Loading and/or Unloading Areas:

- Procedures UI-PROC-66-20-020 (Spill Prevention Control & Countermeasure Plan), UI-PROC-66-20-170 (Fuel Oil Delivery and Reloading onto Trucks), and UI-PROC- 66-20-050 (Chemical Hygiene) have been implemented and will be improved if necessary. The Operations and Maintenance personnel assure that these procedures are used to minimize contamination of precipitation or surface runoff from fuel oil and chemical unloading areas. These procedures include the use of containment curbs and having personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up.

- Waste containers must be plainly labeled, inspected, and managed per P409. This applies to such items as used oil.

- All chemical containers are to be plainly labeled per UI-PROC- 66-20-050 (Chemical Hygiene) to encourage proper handling and facilitate rapid response if spills or leaks occur.

- Loading and unloading activities are confined to designated areas and away from drainage pathways and free of exposure to stormwater and use preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling.

- Spill and overflow protection (e.g., drip pans) beneath fuel oil connectors are being used and procedures are in place for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect, or respond to a spill or leak are trained to the latest version of UI-PROC-66-20-055, Spill Response- Steam Plant TA-03. Employees are also trained to the latest version of Multi-Sector General Permit Annual Industrial Stormwater Training. Site workers are instructed to check under heavy equipment for spills/leaks and to:

    - Call EM&R to treat oil leaks with MicroBlaze.

    - Absorb diesel, gasoline and oil to the extent possible.

    - If the leak or spill is to soil, dig up and containerize the spill residue. The necessary spill response equipment is available for quick response.

The following list of procedures are being implemented by personnel at the Facility:

- Minimize contamination of stormwater runoff from delivery and/or residue hauling vehicles arriving at the plant site:
  Procedure UI-PROC-66-20-170 (Fuel Oil Delivery and Reloading onto Trucks) is implemented to address this effluent limit. Modifications or changes to any of these procedures will be made by Operations personnel if needed. This procedure ensures overall integrity of the body or container and deal with leakage or spillage from vehicles or containers.

- Implement spill reduction measures:
  Spill reduction measures have been implemented at the facility through Procedure UI-PROC-66-20-020 (Spill Prevention Control and Countermeasure Compliance). Modifications or changes to these measures will be addressed as needed.

- Minimize contamination by oil-bearing equipment in switchyards:
  Contamination of surface runoff from oil-bearing equipment in switchyard areas has been addressed at this facility. The switch-yard area is level and surfaces are graveled. In addition, berms and stormwater drainage has been added. Modifications or changes to these measures will be addressed as needed.

- Minimize contamination at the large bulk fuel storage tanks:
  Procedures UI-PROC-76-71-002 (Above Ground Storage Tank Inspection), UI-PROC-76-71-010 (Internal Integrity Testing of the AST), UI-PROC-76-71-012 (External Integrity Testing of the AST), UI-PROC-76-71-500 (Inspection of Cathodic Protection on ASTs), and UI-PROC-76-

71-510 (Under Ground Pressure Testing of Fuel Oil Lines) are in place to address contamination from surface runoff from above ground liquid storage tanks located within the facility boundary.

4.4 Erosion and Sediment Control

Polymers and/or other chemical treatments are not used for erosion or sediment control at the site. Structures used at the site for erosion and sediment control include erosion blankets, eco blocks, gravel bags, straw wattles, and rock run downs.

4.5 Employee Training

Employee training is essential to effective implementation of the SWPPP. The goals for the training program are to ensure that employees are more capable of preventing spills, responding safely and effectively to an accident when one occurs, and recognizing situations that could lead to stormwater contamination.

Training relevant to the SWPPP is required for all operational workers at the facility who work in areas where industrial materials or activities are exposed to stormwater including personnel responsible for the storage and handling of chemicals and materials that could become contaminants in stormwater discharges; managers and supervisors who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel); and all members of the ENV-CP PPT. Training provided and assigned to these personnel cover both the specific control measures used to achieve the effluent limits in Section 3 of this SWPPP; along with monitoring, inspection, planning, reporting, and documentation requirements described in Sections 4 and 5 of this SWPPP. Training is conducted at least annually. Training records are kept in Appendix G of the SWPPP.

The topics in this SWPPP to be covered in the latest version of training made available to staff (LANL training course ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program) include the following:

- Overview and goals of the SWPPP;
- Spill response and cleanup procedures, good housekeeping, maintenance requirements, and material management practices to prevent stormwater pollution;
- The location of all controls on the site required by this permit and how they are to be maintained;
- The proper procedures to follow with respect to the permit's pollution prevention requirements; and
- When and how to conduct inspections, record applicable findings, and take corrective actions.

Additional training is provided to the ENV-CP PPT members responsible for design, installation, maintenance, and/or repair of controls (including pollution prevention measures), conducting and documenting monitoring and inspections, and taking and documenting corrective actions. Qualified team

members are hired and trained as prescribed in ENV-DO-QP-115, Personnel Training. This initial and annual training includes quality assurance requirements, reporting, inspections, logbook use, health and safety, report preparation, and engineering and design criteria.

Training activities are documented in accordance with the LANL's Training Standards. In cases where staff briefings are formalized enough to include written learning objectives; an outline of topics covered, and instructor or presenter qualifications and training activity will be recorded in LANL's official training database, UTRAIN.

Informal briefings, such as those included in group safety meetings for temporary workers or for safety documentation, are not recorded in UTRAIN. Sign-in sheets are used to track attendance.

At LANL, the MSGP Program requires personnel with the following training requirements:

MSGP Inspectors
Curricula 10697 ENV-RCRA MSGP Inspector
Item 43337 ENV-CP-QAPP-MSGP
Item 54892 ENV-RCRA-QP-022 MSGP Stormwater Corrective Actions
Item 42415 ENV-DO-QP-101 Environmental Reporting Requirements for Releases or Events
Item 42547 ENV-DO-QP-111 Reporting Environmental Releases to Pueblo Governments
Item 40708 ENV-DO-QP-108 Preparation of External Correspondence for Review and Approval
Item 43172 ENV-DO-QP-112 Coordinating Regulatory Inspections
Item 42891 ENV-DO-QP-113 Tracking Issues and Actions
Item 43805 ENV-DO-QP-114 Logbook Use and Control
Item 45777 ENV-DO-QP-100 General Field Safety
Curricula 131 Field Worker Training Requirements
Item 43562 or 3583 or 16585 CPR/AED: LANL Workplace
Item 3574 or 13264 First Aid
MSGP SWPPP Preparers
Curricula 7814 ENV-RCRA MSGP SWPPP Preparer
Item 43337 ENV-CP-QAPP-MSGP
Item 56593 ENV-RCRA-QP-044 Preparing Stormwater Discharge Monitoring Reports (MDMRs) for the NPDES Multi-Sector General Permit
Item 40708 ENV-DO-QP-108 External Correspondence
Item 43172 ENV-DO-QP-112 Coordinating Regulatory Inspections
Item 42891 ENV-DO-QP-113 Tracking Issues and Actions
Item 43805 ENV-DO-QP-114 Logbook Use and Control
Item 45777 ENV-DO-QP-100 General Field Safety
Curricula 51 ENV-RCRA Design Engineer
Item 44269, COE Review of LANL Produced Design Documents, AP-341-620
Item 44266, COE System Design Descriptions, AP-341-61
Item 44263, COE Engineering Drawings and Sketches, AP-341-608
Item 44261, COE Calculation, AP-341-605
Item 44258, COE Requirements and Criteria Document, AP-341-602

Item 44257, COE Functions & Requirements Document, AP-341-601
Item 43658, CORE Engineering Overview
Item 55428, COE Management Level Determination, AP-341-502
Item 54168, P342 Engineering Standards
Item 47029, COE LANL Review of Design by External Agencies, AP-341-622
Item 43666, Engineering Design Management
Item 43663, Engineering Technical Baseline
Item 44225, COE Evaluation of Vendor Information, AP-341-701
MSGP Visual Assessors
Curricula 10698 ENV-RCRA MSGP Visual Assessor
Item 43337 ENV-RCRA-QAPP-MSGP
Item 50493 ENV-RCRA-QP-064 MSGP Stormwater Visual Assessments
Item 42415 ENV-DO-QP-101 Environmental Reporting Requirements for Releases or Events
Item 42547 ENV-DO-QP-111 Reporting Environmental Releases to Pueblo Governments.
Item 40708 ENV-DO-QP-108 External Correspondence
Item 43172 ENV-DO-QP-112 Coordinating Regulatory Inspections
Item 42891 ENV-DO-QP-113 Tracking Issues and Actions
Item 43805 ENV-DO-QP-114 Logbook Use and Control
Item 45777 ENV-DO-QP-100 General Field Safety
Curricula 131 Field Worker Training Requirements
Item 43562 or 3583 or 16585 CPR/AED: LANL Workplace
Item 3574 or 13264 First Aid

4.6 Inspections and Assessments

4.6.1 Routine Facility Inspections

Routine inspections are conducted and documented monthly by a qualified member of the ENV-CP PPT (typically the Deployed Environmental Professional or ENV-CP SME).

One routine inspection is conducted during an active stormwater discharge, if possible. Routine inspections evaluate the following, at a minimum (checklist/procedure attached as Appendix H):

- Presence of previously unidentified discharges of pollutants;
- Control measures needing maintenance or repairs;
- Failed controlled measures that need replacement;
- Incidents of noncompliance; and
- Need for additional control measures needed to comply with the permit requirements.

Specific areas of the facility to be inspected include:

- Oil drum storage areas
- Liquid tank storage areas
- Sediment trap and outfalls

- Loading docks
- Vehicle parking all locations
- Pipe storage areas
- Vehicle storage areas
- Outfalls
- Metal scrap roll-off bin
- Garbage containers
- Welding area
- Secondary containment areas
- Fuel loading areas
- Switch yard
- Transformers

The ENV-CP PPT member performing the inspection documents the inspection and notes potential stormwater pollution problems that were encountered on the routine facility inspection form. Monthly inspection reports are retained in this SWPPP as Appendix H. Corrective actions are recorded and documented in the ENV-CP MSGP CAR database, and stored in Appendix J of this SWPPP. Any required corrective actions identified during the assessment are addressed in accordance with ENV-RCRA-QP-022, MSGP Stormwater Corrective Actions.

Any deviations from schedule are noted in the form. Findings are summarized in the annual report required by part 7.5 of the 2015 MSGP. An annual report is submitted to EPA annually by January 30th for each year of permit coverage containing information generated from the past calendar year.

4.6.2 Quarterly Visual Assessment of Stormwater Discharges

Quarterly inspections are directed in the latest version of procedure ENV-RCRA-QP-064, MSGP Stormwater Visual Inspections. Requirements in the procedure apply to the power and steam plant. The MSGP Visual Inspection Form is filled out as part of the inspection process and is attached as Appendix H.

The quarterly visual assessments are conducted by a qualified member of the ENV-CP PPT (Deployed Environmental Professional or ENV-CP SME). Visual assessments will:

- use a clean clear glass or plastic sample container in a well-lit area;
- be collected in the first 30 minutes of a discharge from a storm event or document why it couldn't be collected during the specified time frame (adverse conditions etc.);
- be conducted at least 72 hours since the last storm event;
- document rationale if a visual assessment is unable to be collected in a quarter (no precipitation event or adverse conditions);
- perform an additional assessment during the next qualifying storm event if unable to perform in a particular quarter and
- perform one quarterly assessment during snow melt discharge.

For facilities with significantly identical outfalls, quarterly visual assessments may be performed at only one of the outfalls; provided that visual inspections are performed on a rotating basis at each outfall.

Exceptions to visual assessments:

- Document rationale if a visual assessment is unable to be collected in a quarter (no precipitation event or adverse conditions, etc.);
- Perform an additional assessment during the next qualifying storm event if unable to perform in a particular quarter; and
- Perform one quarterly assessment during snow melt discharge (taken during a measurable discharge from the site).
-

Performing quarterly visual assessments occurs on the following schedule for each calendar year in accordance with ENV-RCRA QP-064, MSGP Stormwater Visual Inspections:

- Jan-March,
- April-June,
- July-September, and
- October-December.

Any deviations from schedule are noted in the form. Outfalls to be inspected are those identified on the site map C-2 in Appendix C.

The visual assessment will inspect for the following water quality characteristics: color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollution.

The ENV-CP PPT member performing the visual assessment documents potential stormwater pollution problems that were observed during the assessment on the Quarterly Visual Assessment form. Any required corrective actions identified during the assessment are addressed in accordance with ENV-RCRA-QP-022, MSGP Stormwater Corrective Actions. If an event triggering corrective action is associated with a single outfall that is identified as a substantially identical outfall, the review of the need for action will encompass all related substantially identical outfalls. Findings are summarized in the annual report required by the MSGP. An annual report is submitted to EPA annually by January 30th for each year of permit coverage containing information generated from the past calendar year.

4.6.3 Exception to Routine Facility Inspections and Quarterly Visual Assessments for Inactive and Unstaffed Sites

No exemption is invoked for Power and Steam Plant for Routine Facility Inspection and Quarterly Visual Assessments for Inactive and Unstaffed Sites.

4.7 Monitoring

Benchmark Monitoring

Benchmark monitoring is no longer required because the average of four monitoring values for iron was less than the concentration in the natural background. It was discontinued in 2011 per Section 6.2.1.2 of the 2008 MSGP.

Impaired Waters Monitoring

Sample Locations

The 2015 MSGP Sampling and Analysis Plan require outfalls 005, 009, and 012 to be sampled. See Figure C-2 for the locations of each substantially identical discharge point.
The following outfalls at the TA-3 Power and Steam Plant have been identified as substantially identical based on common potential pollutant sources, drainage areas, activities within the drainage areas, and general site topography and characteristics.

Outfalls 005 and 006 (formerly 3-PSP-1 and 3-PSP-2): these outfalls are substantially identical in the types of potential pollutant sources, drainage areas and site topography. They are located south of building 22. There is an asphalt berm and two diversion berms north of these outfalls. Potential contaminants include chemical spills (hydraulic oil, mineral oil, amines, and sodium hydroxide) and vehicles (oil, lubricants, antifreeze/coolants, transmission fluids, diesel, and gas). Monitoring is performed at Outfall 005 and is considered representative of both 005 and 006. Outfall 005 has a runoff coefficient of 7.7% (low).

Outfalls 007, 008, 009 and 010 (formerly 3-PSP-3, 3-PSP-4, 3-PSP-5, and 3-PSP-7): these outfalls are substantially identical in the types of potential pollutant sources, drainage areas, and site topography. They are located along the east side of the site. There are earthen berms around the nearby fuel tanks, eco blocks, gravel bags, asphalt berms, erosion blankets, and a rock run down used as BMPs. Potential contaminants include diesel, metals, welding chemicals, sodium bisulfite, phosphate, pipe storage erosion, and vehicles (oil, lubricants, antifreeze/coolants, transmission fluids, diesel, gas). Outfall 009 receives runoff from all the central areas of the facility. Therefore monitoring at this outfall is considered representative of the other outfalls. This outfall as a runoff coefficient of 20.4% (low).

Outfalls 011 and 012 (formerly 3-PSP-7.5 and 3-PSP-8): these outfalls both receive runoff primarily from the electrical switchyard and therefore are substantially identical. They are located along the north side of the site. There are asphalt berms to the south. Potential contaminants include mineral oil and vehicles (oil, lubricants, antifreeze/coolants, transmission fluids, diesel, gas). Monitoring is performed at Outfall 012. This outfall has a runoff coefficient of 10.6% (low).

Pollutants to be Sampled

Outfalls 005, 009, and 012 will be sampled for aluminum, copper, adjusted gross alpha, PCBs, and thallium, and visually inspected. The pollutants to be sampled can change yearly based on the requirements of the MSGP. The sampling and analysis plan is updated every year.

Monitoring Schedules

For this permit term, monitoring will begin October 1, 2015. Benchmark monitoring will be performed on a quarterly basis at least once in each of the following 4-month intervals:

- October 1 – November 30
- April 1 – May 31
- June 1 – July 31
- August 1 – September 30

Impaired waters monitoring will be performed on an annual basis with a sample collected in the period between April 1 and November 30.

LANL is located in a high elevation, semi-arid climate where the majority of rainfall occurs during a period between July and September. Freezing conditions that would prevent runoff from occurring for extended periods may also occur during the winter months. For these conditions if benchmark monitoring cannot be performed on the quarterly schedule above, monitoring events will be distributed during seasons when precipitation occurs, or when snowmelt results in a measurable discharge from the site. If adverse weather conditions prevent the collection of samples according to the relevant monitoring schedule, a substitute sample will be collected during the next qualifying storm event or as soon as practical.

Summary of Monitoring Requirements

Monitoring Type	Location	Parameter	Monitoring Concentration	Schedule	Procedures
Benchmark Sector O-Steam Electric Generating Facilities	Outfall 005 (Station number 03-0022S) Outfall 009 (Station number E121.9) Outfall 012 (Station number 03-0022N)	Iron	1.0 mg/L (benchmark)	Quarterly	1. Collect samples in automated samplers; 2. Samples retrieved by ENV-CP personnel; 3. Samples taken to the LANL Sample Management Office (SMO), and shipped to off-site laboratory for analysis and data reporting. LANL Procedure, ENV-CP-QAPP-MSGP: http://int.lanl.gov/training/env-courses/43337/env-cp-qapp-msgp.pdf
Impaired Waters	Outfall 005 (Station number 03-0022S) Outfall 009 (Station number E121.9) Outfall 012 (Station number 03-0022N)	Aluminum Gross Alpha, adjusted Copper, Acute Thallium, dissolved PCBs in Water Column	0.75 mg/L[a] 15 pCi/L[a] 0.0090 mg/L [a,b] 0.00047 mg/L[a] 0.00064 mg/L[a]	Annual	1. Collect samples in automated samplers; 2. Samples retrieved by ENV-CP personnel; 3. Samples taken to the LANL Sample Management Office (SMO), and shipped to off-site laboratory for analysis and data reporting. LANL Procedure, ENV-CP-QAPP-MSGP: http://int.lanl.gov/training/env-courses/43337/env-cp-qapp-msgp.pdf

[a] The lowest water quality standard from the Standards for Interstate and Intrastate Surface Waters (as approved on June. 5, 2013), 20.6.4.900 NMAC.

[b] Copper value based on hardness value of 57 mg/L.

Procedures

ENV-CP staff and contract personnel who process stormwater samples for the MSGP will be trained to procedure ENV-CP-QAPP-MSGP, Stormwater Multi-Sector General Permit for Industrial Activities Program. In addition, personnel must be familiar with and use the following procedures as applicable:

ENV-CP MSGP Sampling and Analysis Plan

ENV-RCRA-QP-047: Inspecting Stormwater Runoff Samplers and Retrieving Samples for the MSGP

ENV-CP-QP-04: Processing MSGP Stormwater

ENV-RCRA-QP-066: Chemical Preservation of Water Samples.

OIO-QP-219: Sample Control and Field Documentation

OIO-QP-220: Sample Containers, Preservation and Field Quality Control

OIO-QP-221: Handling, Packaging, and Transporting Field Samples

OIO-TP-222: Shipping/Receiving of Environmental Samples by the Sample Management Office (SMO)

SOP-5255: Shipping of Environmental Samples by the SMO

OIO-SOP-5269: Chain-of-Custody and Final Records Preparation for Analytical Data

Samples are retrieved in accordance with Inspecting Stormwater Runoff Samplers and Retrieving Samples for the MSGP. Stormwater samples are processed in accordance with Processing MGSP Stormwater Samples, ENV-CP-QP-048. All stormwater monitoring is conducted in accordance with the QA Project Plan for the Stormwater Multi-Sector General Permit for Industrial Activities Program, ENV-CP-QAPP-MSGP and the current year MSGP Field Implementation Plan.

A minimum of one grab sample from a discharge resulting from a measurable storm event will be collected. Samples must be collected within the first 30 minutes of a measurable storm event. If that is not possible, the sample must be collected as soon as practicable after the first 30 minutes and documentation must be kept with the SWPPP explaining why it was not possible to take samples within the required time frame. In the case of snowmelt, samples must be taken during a period with a measurable discharge. Sampling must be conducted at least 72 hours since the last storm event.

The collection, screening (if applicable), and transport of samples are documented on standard forms generated by the SMO. These include sample collection logs, chain-of-custody forms, and sample container labels. Collection logs are completed at the time of sample collection and are signed by the sampler and a reviewer who verifies the logs for completeness and accuracy. Corresponding labels are initialed and applied to each sample container, and custody seals are placed around container lids or

openings. Chain-of-custody forms are completed and assigned to verify that the samples are not left unattended.

Specific requirements/processes for sample containers, preservation techniques, and holding times are based on EPA guidance for environmental sampling, preservation, and quality assurance. Specific requirements for each sample are printed on the sample collection logs provided by the SMO (size and type of container (glass, amber glass, polyethylene, preservative, etc.). All samples are preserved by placing in insulated containers with ice to maintain a temperature of 4˚C. Other requirements such as nitric acid or other preservatives may apply.

Field-team members seal and label samples before packing and ensure that the sample containers and the containers used for transport are free of external contamination. Field team members package all samples so as to minimize the possibility of breakage during transportation. After all environmental samples are collected, packaged, and preserved; a field team member transports the samples to either the SMO under chain of custody. The SMO arranges for shipping of samples to analytical laboratories.

Monitoring Results

If the average of the 4 monitoring values for any parameter exceeds the benchmark, or if prior to completion of 4 quarterly samples, an exceedance of the 4 quarter average is mathematically certain, the Pollution Prevention Team and ENV-CP personnel will:

- Review the selection, design, installation, and implementation of control measures to determine if modifications are necessary to meet the effluent limits,
- Implement the necessary modifications, and
- Continue quarterly monitoring until 4 additional quarters of monitoring have been completed for which the average does not exceed the benchmark.

If the average of the 4 monitoring values for any parameter does not exceed the benchmark, monitoring for that particular parameter will no longer be performed.

Recordkeeping

For each monitoring event, except snowmelt monitoring, the following information is recorded and maintained through field data sheets, LANL database systems, and Discharge Monitoring Records:

- The date, exact place, and time of sampling or measurements;
- The date and duration (in hours) of the rainfall event;
- Rainfall total (in inches) for that rainfall event;
- Time (in days) since the previous measurable storm event;
- The individual(s) who performed the sampling or measurements;

- The date(s) analyses were performed;
- The individual(s) who performed the analyses;
- The analytical techniques or methods used; and
- The results of such analyses.

All monitoring data collected will be submitted to EPA using EPA's NetDMR system (available at www.epa.gov/netdmr) no later than 30 days after LANS has received the complete laboratory results for all monitoring outfalls for the reporting period. The results are also reported in the Annual MSPG reports.

SECTION 5: DOCUMENTATION TO SUPPORT ELIGIBILITY CONSIDERATIONS UNDER OTHER FEDERAL LAWS

5.1 Documentation Regarding Endangered Species

The Los Alamos National Laboratory (LANL) Threatened and Endangered Species Habitat Management Plan (HMP) was prepared to provide for the protection of federally listed threatened and endangered species and their habitats at LANL. The HMP was designed to be a comprehensive landscape-scale management plan that balances the current operations and future development needs of LANL with the habitat requirements of threatened and endangered species. It also facilitates DOE compliance with the Endangered Species Act and related federal regulations. The HMP received concurrence from the U.S. Fish and Wildlife Service (USFWS) and was first implemented in 1999. All changes to the HMP, such as adding new species or changing requirements, are assessed in a new consultation with the USFWS before being implemented. The HMP provides guidance by species for different types of activities allowed without further review by the USFWS.

Currently, the only federally-listed species that have habitat or occur at LANL are the Southwestern Willow Flycatcher (Empidonax trailii extimus), Jemez Mountains Salamander (Plethodon neomexicanus), and Mexican Spotted Owl (Strix occidentalis lucida). Suitable habitats for these species, along with a protective buffer area surrounding the habitats, have been designated as Areas of Environmental Interests (AEIs). An AEI consists of a core area that contains important breeding or wintering habitat for a specific species and a buffer area around the core area. The buffer protects the core area from disturbances that would degrade the value of the core area to the species.

The HMP includes ecorisk analyses which account for any industrial facility's stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities. In addition, the Site-wide Environmental Impact Statement (SWEIS) biological assessment (BA) covered the continuation of Laboratory operations and included outfalls.

As determined by earlier evaluations, stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities from LANL MSGP locations are not likely to adversely affect any species that is federally-listed as endangered or threatened under Criterion D Section iii, the ESA, and will not result in the adverse modification or destruction of habitat that is federally-designated as "critical habitat" under the ESA. New activities are evaluated to determine if they will have an impact to any species. If an activity can be completed within the guidelines of the HMP it can go forward as scheduled;

however, if the activity can not comply with the guidelines, the HMP requires that a project-specific BA be prepared for the action and go through the consultation process with the USFWS.

Appendix I of this SWPPP includes the USFWS IPaC Trust Resource Report and concurrence on LANL's biological assessment of the effects of implementing the Jemez Mountain Salamander Site Plan. It also includes the HMP.

5.2 Documentation Regarding Historic Properties

In August, 2015 and December 2008, the Cultural Resources Team (using GPS spatial data as well as conducting visual inspections), reviewed the Laboratory industrial sites (see list below) and their associated outfalls and monitoring stations subject to the 2015 Multi-Sector General Permit (Permit #NMR050000) for effects on historic properties. All of these sites were found to be undertakings of no effect and in compliance with Section 106 of the National Historic Preservation Act (i.e., Criterion B).

- TA-3-22 Power and Steam Plant
- TA-3-38 Metals Fabrication Shop
- TA-3-38 Wood Shop
- TA-3-39 and 102 Metal Shop
- TA-3-66 Sigma Complex
- TA-60 Asphalt Batch Plant
- TA-60-1 Heavy Equipment Yard
- TA-60 Material Recycle Facility
- TA-60 Roads and Grounds
- TA-60-2 Warehouse
- TA-54 Area L
- TA-54 Area G
- TA-54 Maintenance Facility West
- TA-54 RANT

6.0 Corrective Actions Process

When any of the following conditions occur or are detected during an inspection, monitoring or any other means, this SWPPP (e.g., sources of pollution; spill and leak procedures; non-stormwater discharges; the selection, design, installation and implementation of control measures) will be reviewed and revised (as appropriate) so that the effluent limits of the 2015 MSGP permit are met and pollutant discharges are minimized:

- An unauthorized release or discharge (e.g., spill, leak, or discharge of non-stormwater not authorized by this or another NPDES permit to a water of the U.S.) occurs at the facility;
- A discharge violates a numeric effluent limit;
- Control measures are not stringent enough for the discharge to meet applicable water quality standards or non-numeric effluent limits;
- An inspection identifies that a required control measure was never installed, was installed incorrectly or is not being properly operated or maintained; and
- Whenever a visual assessment shows evidence of stormwater pollution.

Immediate Actions: If a corrective action is required, immediate steps must be reasonably taken to minimize or prevent discharges from occurring (i.e. spill clean-up, scheduling repairs) until a permanent solution (if needed) can be implemented. Immediate action means all reasonable steps must be taken within 24 hours (on the same work day or no later than the following work day if it is too late in the day to take corrective action). In the case of leaks and/or spills, response actions, date and time of cleanup, notifications, and any other requirements outlined in section 3.1.4 must be documented.

Subsequent Actions: If further corrective actions are required (e.g. installing or making operational a new or modified control, completing repairs, ordering BMPs) they must be completed by the next storm event, if possible or within 14 calendar days (from initial discovery). If it is infeasible to complete corrective actions within 14 days, documentation of why it is infeasible must be provided in the SWPPP. This documentation must also include a timeframe and schedule for completion of the work, which must be completed no later than 45 days (from initial discovery).

Within 14 days of discovery of the identified condition, corrective actions (or documentation that no corrective action is needed) will be documented by the DEP on the form provided in Appendix J. Upon completion of this information, the form will be emailed to ENV-CP personnel for review and comment. Upon review and comment by ENV-CP, the form will be emailed back to the Deployed Environmental Professional and to the ENV Division Issues Management Coordinator. Only repeat CARs are tracked in the Performance Feedback Issues Tracking System (PFITS). Documentation of Maintenance and Repairs of Control Measures (BMPs) will be kept in Appendix F of this SWPPP. If any problems are found, corrective actions are initiated immediately.

6.1 Conditions Requiring Review to Determine if Modifications Are Necessary

If any of the following conditions occur, a review of the selection, design, installation, and implementation of control measures will be performed to determine if modifications are necessary to meet the effluent limits in this permit:

- construction or a change in design, operation, or maintenance at your facility significantly changes the nature of pollutants discharged in stormwater from the facility, or significantly increases the quantity of pollutants discharged; or
- the average of 4 quarterly sampling results exceeds an applicable benchmark. If less than 4 benchmark samples have been taken, but the results are such that an exceedance of the 4 quarter average is mathematically certain (i.e., if the sum of quarterly sample results to date is more than 4 times the benchmark level) this is considered a benchmark exceedance, triggering this review.

If a review identifies any necessary modifications, they will be performed following the corrective action process identified in Section 6.0 above.

SECTION 7: SWPPP CERTIFICATION

I certify under penalty of law that this document and all appendices 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.

Name: _____ Title: _____

Signature: _____ Digitally signed by Andrew Erickson, 141880
DN: cn=Andrew Erickson, 141880, o=Los Alamos National Laboratory, ou=Facility Operations Director Utility and Institutional Facilities, email=ericksonaalanl.gov, c=US
Date: 2015.09.01 14:45:41 -06'00' Date: _____

SECTION 8: SWPPP MODIFICATIONS

SWPPP Modification Log

This log will be completed as modifications are made to this SWPPP in response to corrective actions and other changes.

Description of Modification	Name of Person Responsible for Modification	Signature	Date

SECTION 9: SWPPP APPENDICES

Appendix A - MSGP

Appendix B - NOI and Delegation of Authority Letter

Appendix C - Maps

Appendix D - Non-Stormwater Discharge Assessment and Certification

Appendix E – Monitoring Data

Appendix F – Maintenance/ Repair Records

Appendix G – Training Records

Appendix H – Inspection Forms

Appendix I – Endangered Species Documentation

Appendix J – Corrective Actions

Appendix K – Referenced Documents

Appendix A
MSGP

Appendix B

NOI and Delegation of Authority Letter

Can be found at Electronic Reading Room, http://eprr.lanl.gov

Appendix C
Maps

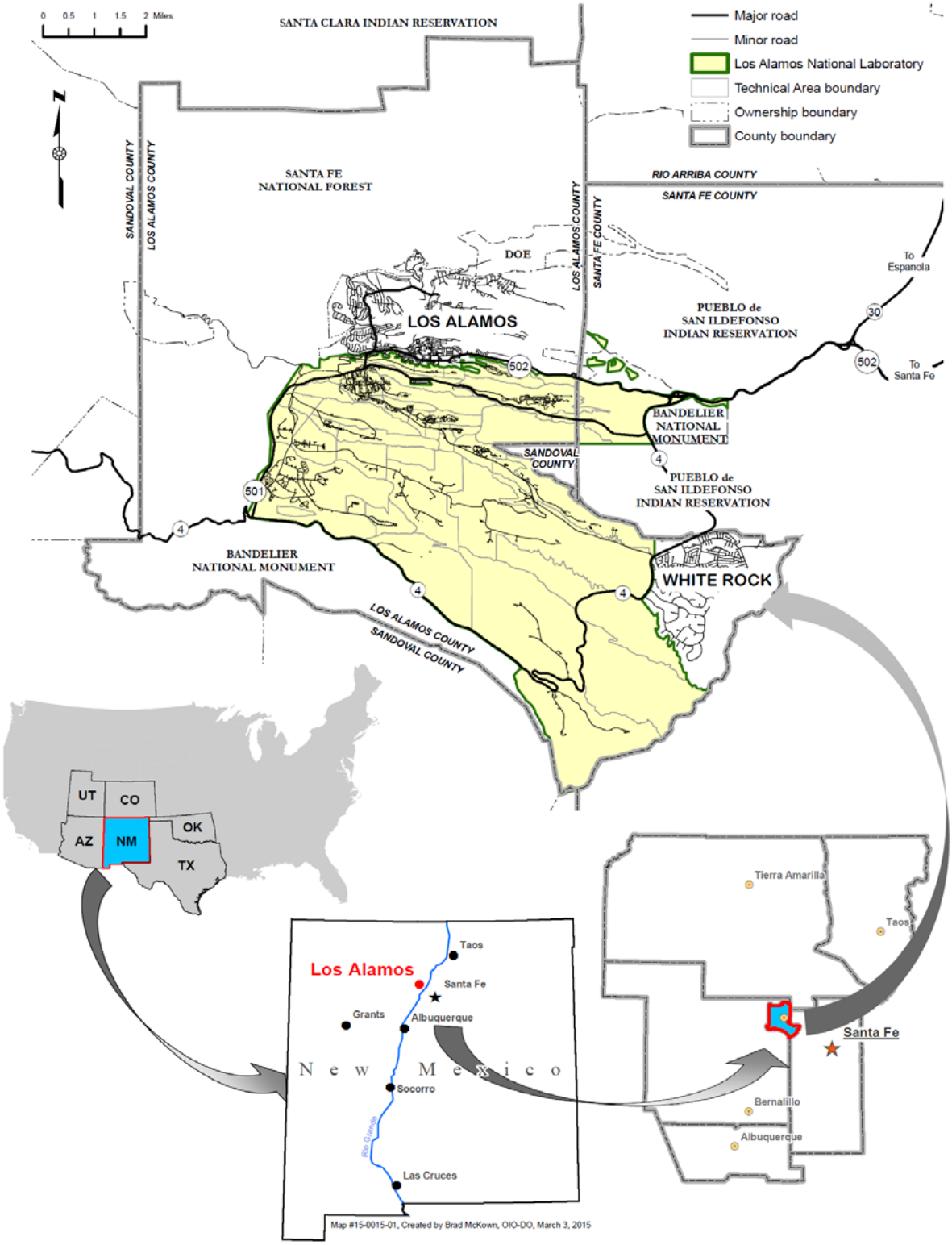


Figure C-1. Site Map

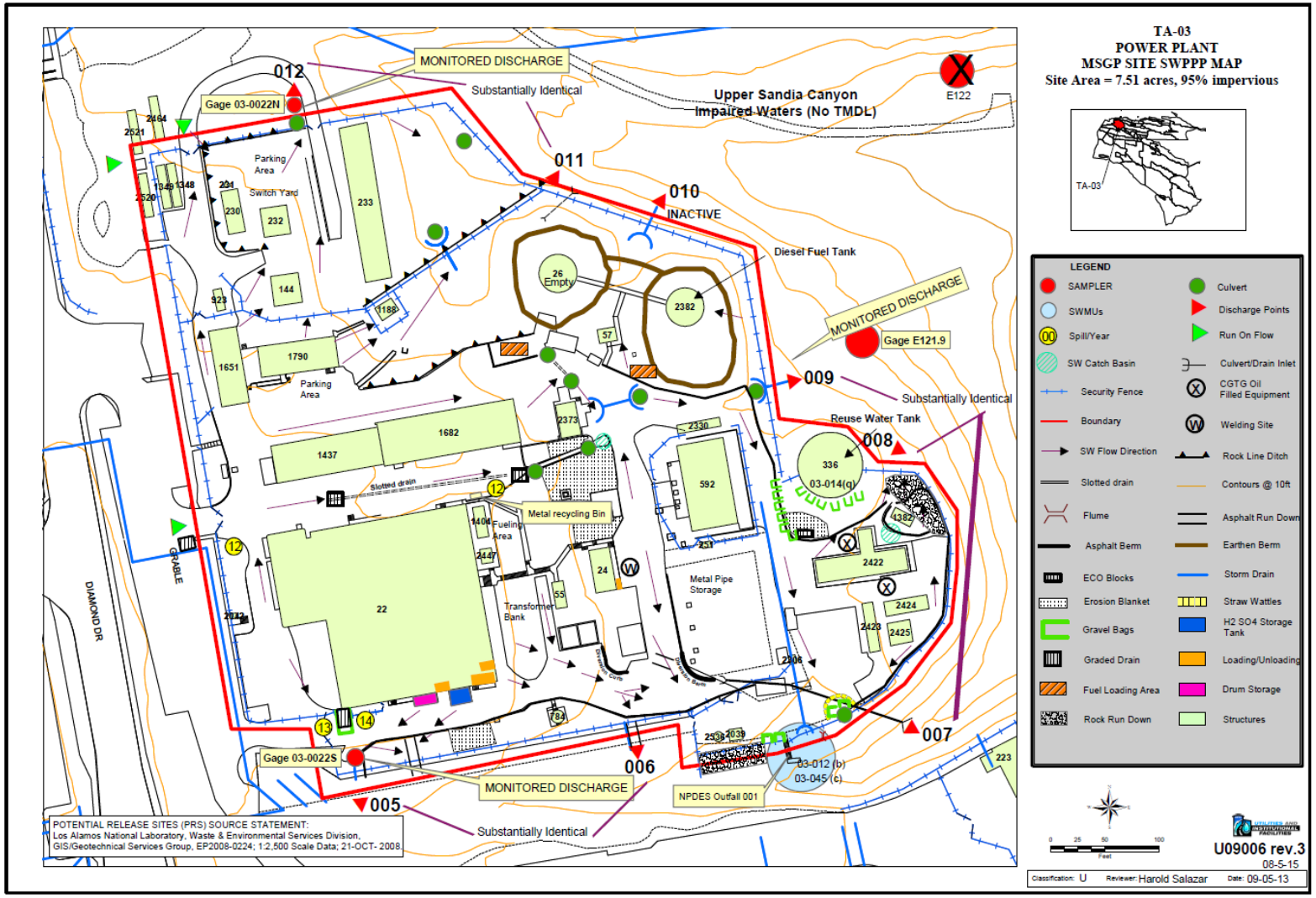


Figure C-2. Site Features

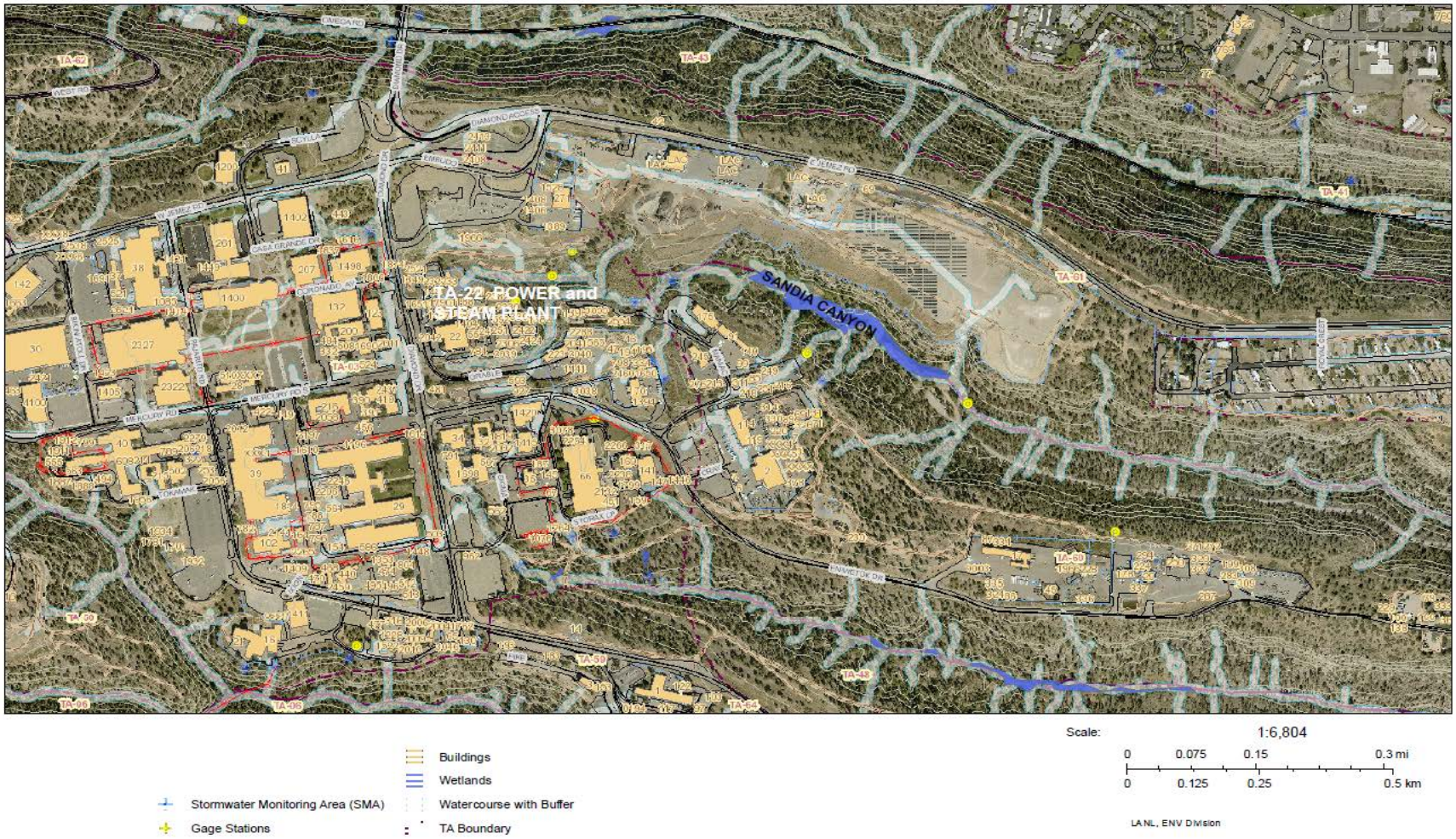


Figure C-3. Regional Map with Impaired Waters

Appendix D
Non-Stormwater Discharge Assessment and Certification

NON-STORM WATER DISCHARGE TA-03-0022 Power Plant

ASSESSMENT AND CERTIFICATION

Completed by: Cliff Heintschel
Title: DEP
Date: 8/25/15

Date of Evaluation	Outfall Directly Observed During the Test (Location)	Identify Potential Significant Sources of Non- Storm Water	Method Used to Test or Evaluate Discharge	Is Non-Storm Water Present?	How Often?	Describe Results from Test for the Presence of Non-Storm Water Discharge
8/25/15	005	None	Visual	No	N/A	Negative
8/25/15	009	None	Visual	No	N/A	Negative
8/25/15	012	None	Visual	No	N/A	Negative

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

Name & Official Title: Russell Stone ESH Manager UI FOD

Signature: Russell Stone

Date Signed: 8/25/2015

Appendix E

Monitoring Data

Power and Steam Plant Stormwater Sampling Data 2009-2015

Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Detected
03-0022N	06/28/2010	Aroclor-1260	0.0351	ug/L	N
03-0022N	06/28/2010	Aroclor-1254	0.0351	ug/L	N
03-0022N	06/28/2010	Aroclor-1221	0.0351	ug/L	N
03-0022N	06/28/2010	Aroclor-1232	0.0351	ug/L	N
03-0022N	06/28/2010	Aroclor-1248	0.0351	ug/L	N
03-0022N	06/28/2010	Aroclor-1016	0.0351	ug/L	N
03-0022N	06/28/2010	Aroclor-1262	0.0351	ug/L	N
03-0022N	06/28/2010	Aroclor-1242	0.0351	ug/L	N
03-0022N	06/28/2010	Aluminum	5350	ug/L	Y
03-0022N	06/28/2010	Iron	5420	ug/L	Y
03-0022N	06/28/2010	Gross alpha	13.9	pCi/L	Y
03-0022N	06/28/2010	Mercury	0.066	ug/L	N
03-0022N	08/23/2010	Iron	3930	ug/L	Y
03-0022N	09/22/2010	Iron	12600	ug/L	Y
03-0022N	10/20/2010	Iron	4300	ug/L	Y
03-0022N	08/05/2011	Copper	53.3	ug/L	Y
03-0022S	05/14/2010	Iron	10300	ug/L	Y
03-0022S	05/14/2010	Gross alpha	44.6	pCi/L	Y
03-0022S	05/14/2010	Aluminum	13000	ug/L	Y
03-0022S	05/14/2010	Aroclor-1242	0.0378	ug/L	N
03-0022S	05/14/2010	Aroclor-1262	0.0378	ug/L	N
03-0022S	05/14/2010	Aroclor-1016	0.0378	ug/L	N
03-0022S	05/14/2010	Aroclor-1248	0.0378	ug/L	N
03-0022S	05/14/2010	Aroclor-1232	0.0378	ug/L	N
03-0022S	05/14/2010	Aroclor-1221	0.0378	ug/L	N
03-0022S	05/14/2010	Aroclor-1254	0.0378	ug/L	N
03-0022S	05/14/2010	Aroclor-1260	0.0378	ug/L	N
03-0022S	05/14/2010	Mercury	0.087	ug/L	N
03-0022S	06/07/2010	Iron	2220	ug/L	Y
03-0022S	08/04/2010	Iron	1080	ug/L	Y
03-0022S	10/01/2010	Iron	854	ug/L	Y
03-0022S	07/28/2011	Copper	181	ug/L	Y
03-0022S	05/08/2012	Copper	36.4	ug/L	Y
03-0022S	04/26/2015	Thallium	0.45	ug/L	N
Sandia E of Power Plant	04/11/2009	Iron	1090	ug/L	Y

Location ID	Date Sampled	Parameter Name	Report Result	Report Units	Detected
Sandia E of Power Plant	06/03/2009	Iron	6500	ug/L	Y
Sandia E of Power Plant	06/03/2009	Mercury	0.067	ug/L	N
Sandia E of Power Plant	06/03/2009	Gross alpha	12.9	pCi/L	Y
Sandia E of Power Plant	06/03/2009	Aluminum	11500	ug/L	Y
Sandia E of Power Plant	06/10/2009	Aroclor-1262	0.037	ug/L	N
Sandia E of Power Plant	06/10/2009	Aroclor-1016	0.037	ug/L	N
Sandia E of Power Plant	06/10/2009	Aroclor-1221	0.037	ug/L	N
Sandia E of Power Plant	06/10/2009	Aroclor-1254	0.037	ug/L	N
Sandia E of Power Plant	06/10/2009	Aroclor-1260	0.037	ug/L	N
Sandia E of Power Plant	06/10/2009	Aroclor-1248	0.037	ug/L	N
Sandia E of Power Plant	06/10/2009	Aroclor-1232	0.037	ug/L	N
Sandia E of Power Plant	06/10/2009	Aroclor-1242	0.037	ug/L	N
Sandia E of Power Plant	08/14/2009	Iron	1690	ug/L	Y
Sandia E of Power Plant	10/07/2009	Iron	491	ug/L	Y
Sandia E of Power Plant	05/14/2010	Iron	5370	ug/L	Y
Sandia E of Power Plant	05/14/2010	Gross alpha	50.6	pCi/L	Y
Sandia E of Power Plant	05/14/2010	Aluminum	4830	ug/L	Y
Sandia E of Power Plant	06/07/2010	Iron	1560	ug/L	Y
Sandia E of Power Plant	08/04/2010	Iron	1170	ug/L	Y
Sandia E of Power Plant	10/02/2010	Iron	2780	ug/L	Y
Sandia E of Power Plant	04/07/2011	Copper	64.2	ug/L	Y
Sandia E of Power Plant	04/26/2015	Thallium	0.45	ug/L	N

Appendix F

Maintenance/Repair Records

Documentation of Maintenance and Repairs of Control Measures (BMPs)

You must maintain all control measures that are used to achieve the effluent limits required by the 2015 MSGP in effective operating condition. If you find that your control measures need to be replaced or repaired, you must make the necessary repairs or modifications as expeditiously as practicable.

Date of Discovery	Control Measure (BMP) and Location	Reason for maintenance or repairs	Reason for extended maintenance or repair schedule	Date Completed

Appendix G

Training Records

Appendix H

Inspection Forms

MSGP Quarterly Visual Assessment Form

Complete a separate form for each outfall you assess. When adverse weather conditions prevent the collection of a sample during the quarter, a substitute sample must be taken during the next qualifying storm event. Maintain this document in your SWPPP).

Name/Location of Facility:	Permit Number: NMR05GB21	Inspection Quarter: ☐Apr-May ☐Jun-July ☐Aug-Sep ☐ Oct-Nov
Outfall ID:	"Substantially Identical Outfall"? ☐ Yes ☐ No	If YES identify other Outfalls in the Group:

Person(s) collecting sample (PRINT): Signature :

PPT Member? ☐ Yes ☐ No

Person(s) examining sample (PRINT): Signature :

PPT Member? ☐ Yes ☐ No

Date & Time Discharge Began:	Date & Time Sample Collected:	Date & Time Sample Examined:
Substitute Sample? ☐ Yes ☐ No	If YES, identify quarter/year when sample was originally scheduled to be collected:	

Was the sample collected in the first 30 minutes? ☐ Yes ☐ No If No, explain why not:

Nature of Discharge: ☐ Rainfall. Amount_____inches ☐ Snowmelt. Amount_____inches

Previous Storm Ended > 72 hours Before Start of This Storm? ☐Yes ☐ No	If No, Explain: *

PARAMETERS

Color	☐ None ☐ Other	If Other describe:
Odor ☐ None ☐ Musty ☐ Sewage ☐ Sulfur ☐ Sour ☐ Solvents ☐Petroleum/Gas ☐ Other		If Other, describe the odor:
Clarity: ☐ Clear ☐ Slightly Cloudy ☐ ☐ Opaque ☐ Other (describe):		
Floating Solids: ☐ Yes ☐ No		If YES, describe if raw or waste materials(s):
Settled Solids:** ☐ Yes ☐ No		If YES, are solids Fine ☐ Coarse ☐ If Other describe:
Suspended Solids: ☐ Yes ☐ No		If YES, are solids Fine ☐ Coarse ☐ If Other describe:
Foam (gently shake sample): ☐ Yes☐ No		If YES, on the surface ☐or ☐ in the water. Describe color:
Oil Sheen ☐ Yes ☐ No Color of Sheen:		Thickness: Flecks ☐ Globs ☐ Describe if other:
Other Obvious Indicators of Pollution Present in the sample? Yes☐ No☐		If YES describe:

SITE OBSERVATIONS			
Potential pollutants found during visual examination? ☐ Yes ☐ No **If Yes**, list pollutant(s)and if possible indicate the source: If source is identified during collection of sample, please notify Holly Wheeler @ 667-1312			
Pollutant	Source	Pollutant	Source
NOTE: A clean up of the site should be conducted if the pollutant source is known. Was proper Notification made? ☐ Yes ☐ No **If Yes**, indicate who was notified:			
CORRECTIVE ACTION			
If storm water contamination was identified in this sample through visual assessment, was a Corrective Action Form filled out within 24 hrs of observation? Yes☐ No☐ **If No**, explain why not: Was a Corrective Action Plan identified within 14 days of the observation? Yes☐ No☐ **If No**, explain why not:			
Other Relevant Information: Yes☐ No☐ Use the back of this form to list any concerns, comments, and/or descriptions of pictures taken, (attach additional sheets as necessary).			
* The 72-hour interval can be waived when the previous storm did not yield a measurable discharge or if you are able to document (attach applicable documentation) that less than a 72-hour interval is representative of local storm events during the sampling period.			
** Observe for settled solids after allowing the sample to sit for approximately one-half hour.			

Stormwater Industrial Routine Facility Inspection Report

General Information			
Facility Name	Insert Name		
NPDES Tracking No.	Insert Tracking No.		
Date of Inspection	Insert Date	**Start/End Time**	Insert Start/End Time
Inspector's Name(s)	Insert Name		
Inspector's Title(s)	Insert Title		
Inspector's Contact Information	Insert Contact Info		
Inspector's Qualifications	Insert qualifications or add reference to the SWPPP		

Weather Information

Weather at time of this inspection?

❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snow ❑ High Winds

❑ Other: Temperature:

Have any previously unidentified discharges of pollutants occurred since the last inspection? ❑Yes ❑No

If yes, describe: Describe

Are there any discharges occurring at the time of inspection? ❑Yes ❑No

If yes, describe: Describe

Control Measures

- *Number the structural stormwater control measures identified in your SWPPP on your site map and list them below (add as many control measures as are implemented on-site). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required control measures at your facility.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	Structural Control Measure	**Control Measure is Operating Effectively?**	**If No, In Need of Maintenance, Repair, or Replacement?**	**Corrective Action Needed and Notes** (identify needed maintenance and repairs, or any failed control measures that need replacement)
1	Insert Control Measure	❑Yes ❑No	❑ Maintenance	Describe Corrective Actions

	Structural Control Measure	**Control Measure is Operating Effectively?**	**If No, In Need of Maintenance, Repair, or Replacement?**	**Corrective Action Needed and Notes** (identify needed maintenance and repairs, or any failed control measures that need replacement)
	Name		❑ Repair ❑ Replacement	
2	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions
3	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions
4	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions
5	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions
6	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions
7	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions
8	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions
9	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions
10	Insert Control Measure Name	❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	Describe Corrective Actions

Areas of Industrial Materials or Activities exposed to stormwater

Below are some general areas that should be assessed during routine inspections. Customize this list as needed for the specific types of industrial materials or activities at your facility.

	Area/Activity	**Inspected?**	**Controls Adequate (appropriate, effective, and operating)?**	**Corrective Action Needed and Notes**
1	**Material loading/unloading and storage areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
2	**Equipment operations and maintenance areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions

	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
3	**Fueling areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
4	**Outdoor vehicle and equipment washing areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
5	**Waste handling and disposal areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
6	**Erodible areas/construction**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
7	**Non-stormwater/ illicit connections**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
8	**Salt storage piles or pile containing salt**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
9	**Dust generation and vehicle tracking**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
10	**(Other)**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
11	**(Other)**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions
12	**(Other)**	❑Yes ❑No ❑ N/A	❑Yes ❑No	Describe Corrective Actions

Non-Compliance

Describe any incidents of non-compliance observed and not described above: Describe Non-compliance

Additional Control Measures

Describe any additional control measures needed to comply with the permit requirements: Describe Additional Controls Needed

Notes

Use this space for any additional notes or observations from the inspection: Additional Notes

CERTIFICATION STATEMENT

"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."

Print name and title: _____

Signature:_____Date:_____

Table for Tracking Past and Future Spills

Date	Spill Location	What Spilled	Quantity Spilled	Corrective Action Taken	Plans to Prevent Recurrence

Appendix I

Endangered Species Documentation

Endangered Species Habitat Within Los Alamos National Laboratory

SANTA FE NATIONAL FOREST

LOS ALAMOS TOWNSITE

PUEBLO de SAN ILDEFONSO

BANDELIER NATIONAL MONUMENT

WHITE ROCK

EAST JEMEZ ROAD

PAJARITO ROAD

To Fenton Hill

Los Alamos Canyon
Pueblo Canyon
Rio Grande
Fenton Hill (USFS Owned)

Legend

- Structures
- Land ownership
- LANL Boundary
- Technical Areas
- Major roads
- Paved Roads
- Drainages

Mexican Spotted Owl

HABITAT
- Buffer
- Core

Jemez Mountains Salamander

HABITAT
- Buffer
- Core

Southwestern Willow Flycatcher

HABITAT
- Buffer
- Core

Elevation (ft)
- 5,331 - 5,500
- 5,501 - 5,750
- 5,751 - 6,000
- 6,001 - 6,250
- 6,251 - 6,500
- 6,501 - 6,750
- 6,751 - 7,000
- 7,001 - 7,250
- 7,251 - 7,500
- 7,501 - 7,750
- 7,751 - 8,000

Elevations outside LANL boundary are shown in muted colors.

0 0.25 0.5 1 Miles

0 0.5 1 2 Kilometers

PROJECTION: New Mexico State Plane Coordinates, Central Zone, North America Datum 1983, Units Feet.

Disclaimer: This map was created as an overview map of endangered species habitat at LANL. All other uses for this map should be confirmed with the Environmental Stewardship Services Group.

Map Produced by OIO-DO-GIS Team
Date: February 21, 2014,
Map Document Reference: X:\Projects\14-Projects\14-0020\14-0020

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

December 9, 2013

Cons. #02ENNM00-2014-I-0014

Geoffrey L. Beausoleil, Acting Manager
National Nuclear Security Administration, Los Alamos Field Office
Department of Energy
Los Alamos, New Mexico 87544

Dear Mr. Beausoleil:

Thank you for your biological assessment entitled, "Biological Assessment of the Effects of Implementing the Jemez Mountains Salamander Site Plan on Federally Listed Threatened and Endangered Species at Los Alamos National Laboratory" (BA); the request for informal consultation and conferencing received on July 25, 2013 and supplemental information supplied in the "Jemez Mountains Salamander (*Plethodon neomexicanus*) Los Alamos National Laboratory (LANL) Site Plan" (Site Plan); and emails dated November 19 and December 3, 2013. The Department of Energy (DOE) requested concurrence with the determination of effects for the endangered Jemez Mountains salamander (*Plethodon* neomexicanus) (salamander) pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. § 1531 *et seq.*). Your proposed action consists of implementing the Site Plan, and includes of the incorporation of this Site Plan into LANL's Habitat Management Plan (HMP). The HMP was consulted upon in 1999 (Consultation #2-22-981-336) as the primary mechanism to ensure compliance with the ESA at LANL. The actions described in the Site Plan and analyzed in the BA, and supplemental emails are hereby incorporated by reference. You determined that implementing the Site Plan "may affect, is not likely to adversely affect" the salamander, and includes placing restrictions on certain types of work in areas identified as core habitat for the salamander on LANL property with the purpose of ensuring that effects to the salamander from those actions identified in the Site Plan are insignificant and discountable.

The Site Plan does not include any areas within designated salamander critical habitat, indicating that no critical habitat will be affected. The Site Plan has modeled and field validated the model to identify the areas on LANL property with the highest potential to be occupied by salamanders based on habitat features for the salamander. Each area identified by the modeling is termed "Area of Environmental Interest" (AEI) and consists of a "core area" and a "buffer area". The core area habitat is defined as suitable habitat where the salamander occurs or may occur at LANL. The core area habitat consists of sections of north-facing slope that contain the required

micro-habitat to support salamanders. The buffer area is 328 feet (100 meters) wide extending outward from the edge of the core area. Only the Los Alamos Canyon AEI is known to be occupied based on surveys. Surveys for the salamander are known to have a very low detection rate for occupied areas and DOE has assumed that all AEIs at LANL are occupied at all times by the salamander.

Within the Site Plan, DOE has assessed activities that could cause habitat alteration and includes any action that alters the soil structure, vegetative components necessary to the species, water quality, or hydrology in undeveloped areas of an AEI. If an activity were to take place outside of the AEI the activity will be assessed if it will have effects inside the AEI core. Within the core areas, only activities specified within the Site Plan and those that have no effect in the core areas (e.g. no habitat alterations or effects within the core areas) will be conducted without further consultation with the Service. Habitat alterations also include soil pits for soil samples deeper than 6 inches (15.2 centimeters) using either hand or mechanized augers. Within the Site Plan, DOE is proposing fuels management practices to reduce wildfire risk and maintenance of utility corridors within the AEIs. The likelihood that salamanders may be affected by the actions in the Site Plan is very low. To ensure that effects to the salamander are insignificant and discountable, the Site Plan incorporates the following conservation measures as restrictions to the identified work:

Fuels Management Practices to Reduce Wildfire Risk

a. Within undeveloped core areas, thinning trees to a level of 80% canopy cover or higher may occur; tree thinning below 80% canopy cover is not part of the action under this consultation.
b. Large logs on the ground will be left in place and not chipped.
c. Large trees that are felled will be left as large logs on the ground
d. When appropriate, smaller trees and understory shrubs that may be thinned will be dispersed and left on-site to aid in soil moisture retention.
e. In buffer areas, thinning of trees may occur to the current LANL-approved prescription level; clear-cutting will not occur.
f. Thinning activities will not occur during the rainy season when salamanders are surface active, between July 1 – October 31. Thinning activities may occur earlier in October if freezing temperatures are present.
g. In the unlikely event that a salamander is observed surface active during thinning activities, all activities shall cease, and the Service will be notified.

Utility Corridors

a. Cutting trees that threaten power lines may occur within 26 feet (8 meters) of either side of an existing utility line at LANL
b. New utility lines and utility lines requiring clearance of a right-of-way greater than 52 feet (16 meters) total in core habitat is not part of the action under this consultation.

Habitat alterations other than the fuels management practices and utility corridor maintenance described above will not occur in undeveloped core areas under the guidelines of the Site Plan or this consultation. The Service concurs with DOE's determination regarding the salamander for the following reasons:

Within the Site Plan, DOE has placed the above detailed restrictions to ensure that any effects to the salamander and its habitat remain insignificant and discountable. Canopy cover will remain at 80% or greater in undeveloped core areas and fire management actions will occur outside of the salamander surface activity period. Maintaining utility line corridors in areas with existing infrastructure (the utility lines) by removing individual hazard trees is not expected to have any measurable effect on salamanders or their potential habitat. Consequently, we concur that potential effects to the salamander from the proposed action will be insignificant and discountable.

This concludes section 7 consultation regarding the proposed action. If monitoring or other information results in modification or the inability to complete all aspects of the proposed action, consultation should be reinitiated. Please contact the Service if: 1) future surveys detect listed, proposed or candidate species in habitats where they have not been previously observed; 2) the proposed action changes or new information reveals effects of the proposal to listed species that have not been considered in this analysis; or 3) a new species is listed or critical habitat designated that may be affected by the action.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. In future correspondence regarding this project, please refer to consultation #02ENNM00-2014-I-0014. If you have any questions, please contact Michelle Christman of my staff at (505) 761-4715.

Sincerely,

for Wally Murphy
Field Supervisor

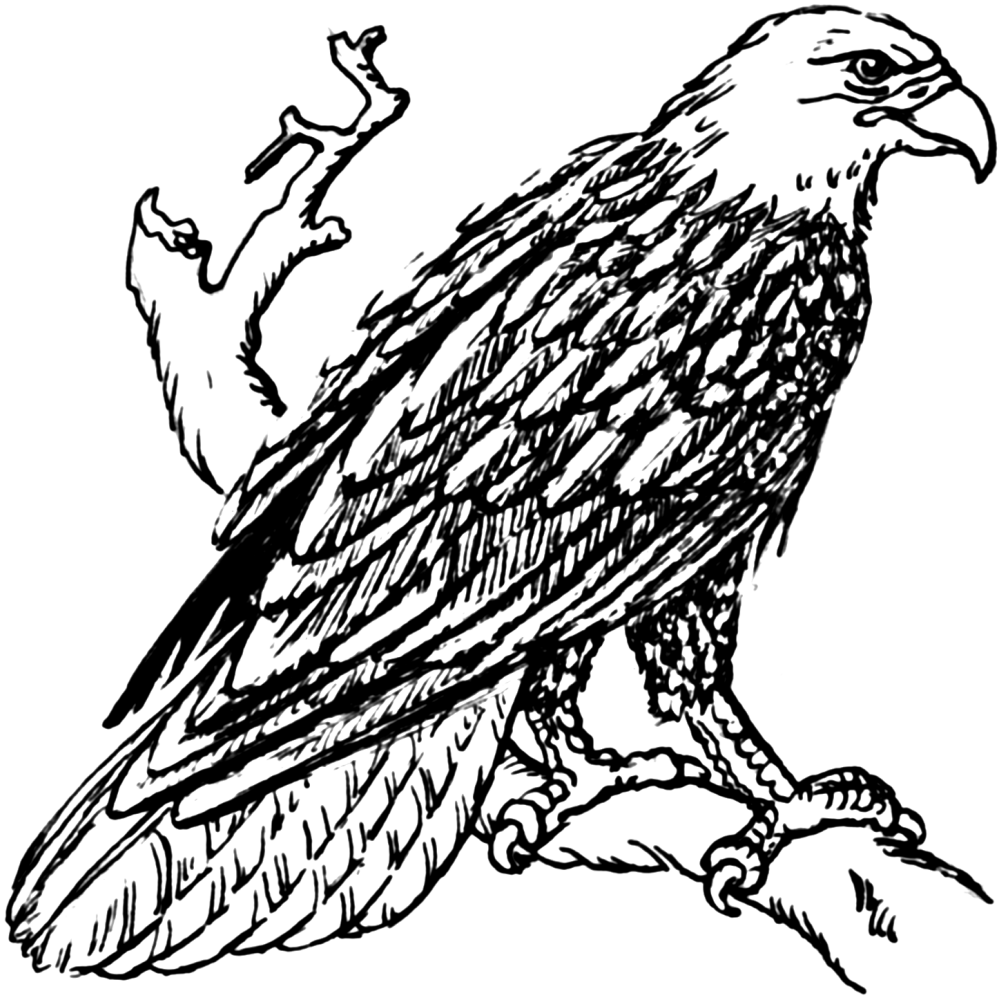
cc:
Wildlife Biologist, Cuba Ranger District, Cuba, NM (Attn: Ramon Borrego)
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico

U.S. Fish & Wildlife Service

MSGP

IPaC Trust Resource Report

Generated July 27, 2015 07:29 PM MDT



US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

MSGP

PROJECT CODE

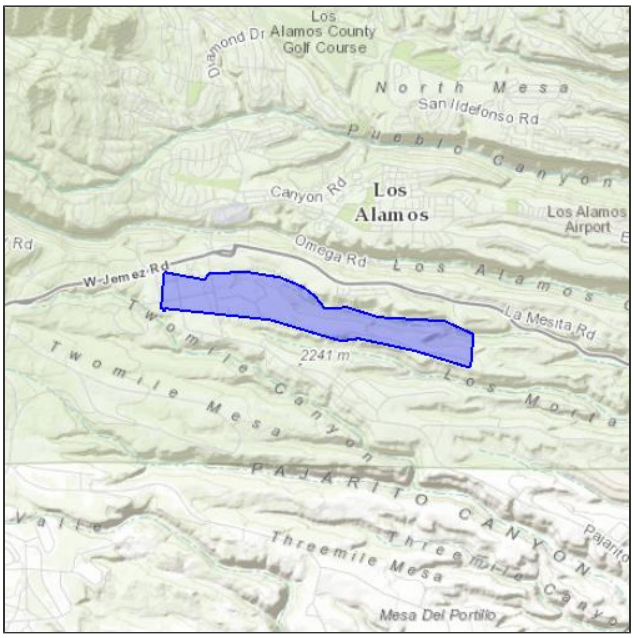
LXATM-TI5EJ-BAJEQ-3NC5E-SOGYTE

LOCATION

Los Alamos County, New Mexico

DESCRIPTION

Facilities that discharge to Sandia Canyon within TA-3 and TA-60. Industrial facilities subject to the MSGP. July, 2015.



U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
(505) 346-2525

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an Official Species List from the regulatory documents section.

Amphibians

Jemez Mountains Salamander Plethodon neomexicanus **Endangered**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D019

Birds

Mexican Spotted Owl Strix occidentalis lucida **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B074

Southwestern Willow Flycatcher Empidonax traillii extimus **Endangered**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B094

Yellow-billed Cuckoo Coccyzus americanus **Threatened**

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06R

Mammals

New Mexico Meadow Jumping Mouse Zapus hudsonius luteus **Endangered**

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0BX

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

Bald Eagle Haliaeetus leucocephalus — **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008

Bendire's Thrasher Toxostoma bendirei — **Bird of conservation concern**
Season: Breeding

Brewer's Sparrow Spizella breweri — **Bird of conservation concern**
Season: Migrating
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HA

Brown-capped Rosy-finch Leucosticte australis — **Bird of conservation concern**
Season: Wintering

Burrowing Owl Athene cunicularia — **Bird of conservation concern**
Season: Breeding

Cassin's Finch Carpodacus cassinii — **Bird of conservation concern**
Year-round

Flammulated Owl Otus flammeolus — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DK

Fox Sparrow Passerella iliaca — **Bird of conservation concern**
Season: Wintering

Golden Eagle Aquila chrysaetos — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DV

Grace's Warbler Dendroica graciae — **Bird of conservation concern**
Season: Breeding

Juniper Titmouse Baeolophus ridgwayi — **Bird of conservation concern**
Year-round

Lewis's Woodpecker Melanerpes lewis — **Bird of conservation concern**
Year-round

Loggerhead Shrike Lanius ludovicianus — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY

Mountain Plover Charadrius montanus **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B078

Olive-sided Flycatcher Contopus cooperi **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU

Pinyon Jay Gymnorhinus cyanocephalus **Bird of conservation concern**
Year-round

Prairie Falcon Falco mexicanus **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0ER

Swainson's Hawk Buteo swainsoni **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B070

Williamson's Sapsucker Sphyrapicus thyroideus **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FX

Willow Flycatcher Empidonax traillii **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0F6

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands identified in this project area

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Author(s): Environmental Protection Division
Resources Management Team

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ACRONYMS

AEI	Area of Environmental Interest
BA	biological assessment
Bd	Batrachochytrium dendrobatidis
BSL-3	Biosafety Level 3
COPCs	chemicals of potential concern
DARHT	Dual-Axis Radiographic Hydrodynamic Test (Facility)
dB	Decibel
DDT	(dichloro-diphenyl-trichloroethane)
DOE	U.S. Department of Energy
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973
fc	foot candles
FR	Federal Register
GIS	geographic information system
HMP	Threatened and Endangered Species Habitat Management Plan
HVAC	heating, ventilation, and air conditioning
LANL	Los Alamos National Laboratory
NEPA	National Environmental Policy Act
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Eliminations System
PCBs	polychlorinated biphenyls
PR-ID	Permits and Requirements Identification
SME	subject matter expert
USFWS	U.S. Fish and Wildlife Service

I. THREATENED AND ENDANGERED SPECIES HABITAT MANAGEMENT PLAN GENERAL OVERVIEW

1.0 INTRODUCTION

Los Alamos National Laboratory's (LANL) Threatened and Endangered Species Habitat Management Plan (HMP) was prepared to fulfill a commitment made in the U.S. Department of Energy's (DOE) "Final Environmental Impact Statement for the Dual-Axis Radiographic Hydrodynamic Test Facility Mitigation Action Plan" (DOE 1996). The HMP received concurrence from the U.S. Fish and Wildlife Service (USFWS) in 1999 (USFWS consultation numbers 2-22-98-I-336 and 2-22-95-I-108). In this 2014 update, we retained the management guidelines from the 1999 HMP for listed species, updated some descriptive information, and added the Jemez Mountains salamander (*Plethodon neomexicanus*), which was federally listed in September 2013 (USFWS consultation number 02ENNM00-2014-I-0014).

2.0 ROLE OF SITE PLANS IN THE HMP

The purpose of the HMP is to provide a management strategy for the protection of threatened and endangered species and their habitats on LANL property. The HMP consists of site plans for federally listed threatened or endangered species with a moderate or high probability of occurring at LANL. The following federally listed threatened or endangered species currently have site plans at LANL: Mexican Spotted Owl (*Strix occidentalis lucida*), Southwestern Willow Flycatcher (*Empidonax trailii extimus*), and the Jemez Mountains salamander. Site plans provide guidance to ensure that LANL operations do not adversely affect threatened or endangered species or their habitats.

3.0 DESCRIPTION OF AREAS OF ENVIRONMENTAL INTEREST

Suitable habitats for federally listed threatened and endangered species have been designated as Areas of Environmental Interest (AEIs). AEIs are geographical units at LANL that are managed for the protection of federally listed species and consist of core habitat areas and buffer areas. The purpose of the core habitat is to protect areas essential for the existence of the specific threatened or endangered species. This includes the appropriate habitat type for breeding, prey availability, and micro-climate conditions. The purpose of buffer areas is to protect core areas from undue disturbance and habitat degradation.

Site plans identify restrictions on activities within the AEIs. Allowable activities are activities that the USFWS has reviewed and provided concurrence that these activities are not likely to adversely affect federally listed species. Activities discussed in site plans include day-to-day activities causing disturbance (hereafter referred to as "disturbance activities"), such as access into an AEI, and long-term impacts, such as habitat alteration.

3.1 Definition and Role of Developed Areas in AEI Management

Summary: Habitat alteration is not restricted in developed areas unless it impacts undeveloped core areas of an AEI (e.g., noise and light impacts on a core area). Current ongoing disturbance activities are not restricted in developed areas. Disturbance activities not currently ongoing are

restricted when impacts occur to undeveloped core areas of an AEI that are occupied by a threatened or endangered species.

Developed areas include all building structures, paved roads, improved gravel roads, paved and unpaved parking lots, and firing sites. The extent of developed areas in each AEI was determined using two methods. First, LANL geographic information system (GIS) analysts placed a 15 m (49 ft) border around all buildings and parking lots. For paved and improved gravel roads, the developed area was defined as the area to a roadside fence, if one exists within 9 m (30 ft) of the road, or 5 m (15 ft) on each side of the road, if there is no fence within 9 m (30 ft). If an area of highly fragmented habitat was enclosed by roads, a security fence, or connected buildings, that area was also classified as developed. Developed areas at firing sites were defined as a circle with a 91-m (300-ft) radius from the most centrally located firing pad. Second, LANL GIS analysts overlaid scanned orthophotos onto a map of the Los Alamos area and digitized all areas that appeared developed. These two information sources were overlaid and combined, so that areas classified as developed by either method were considered developed in final maps and analyses. Some areas were confirmed by ground surveys, such as the firing sites. Developed areas are contained in the HMP GIS database.

Developed areas are located in the core and/or buffer of some AEIs. However, developed areas do not constitute suitable habitat for federally listed species. Current ongoing activities in developed areas constitute a baseline condition for the AEIs and are not restricted. New activities including further development within already existing developed areas are not restricted unless they impact undeveloped portions of an AEI core. For example, if light or noise from a new office building in a developed area were to raise levels in an undeveloped core area, those light and noise levels would be subject to the guidelines on habitat alterations. If a proposed action within a developed area does not meet site plan guidelines, it must be individually reviewed for compliance with the Endangered Species Act of 1973 (ESA).

Building a new structure or clearing land within a previously designated developed area in an AEI core does not add to the size of the developed area. New structures in core areas will not be given any developed-area border unless they are individually reviewed for ESA compliance.

Development occurring in the developed area in an AEI buffer can be given a 15 m (49 ft) developed-area border at the discretion of the project leader or facility manager. To expand the size of a developed area in a buffer based on new developments, please contact a LANL biological resources subject matter expert (SME) (http://int.lanl.gov/environment/bio/controls/index.shtml).

3.2 General Description of Buffer Areas and Allowable Buffer Area Development

Summary: Limited future development is allowed in the currently undeveloped DOE-controlled buffer area under the guidelines of this HMP as long as it does not alter habitat in the undeveloped AEI core (including light and noise guidelines). Development beyond the cap established for each AEI, or greater than 2 ha (5 ac) in size including the developed-area border, requires independent review for ESA compliance.

The purpose of buffer areas is to protect core areas from undue disturbance or habitat degradation. The current levels of development in buffer and core areas represent baseline conditions for this

HMP. No further development is allowed in the core area under the guidelines of this HMP. A limited amount of development is allowed in buffer areas. Under the guidelines of this HMP, individual development projects are limited to 2 ha (5 ac) in size, including a 15 m (49 ft) developed-area border around structures and a 5 m (15 ft) developed-area border around paved and improved gravel roads. Projects greater than 2 ha (5 ac) in area require individual review for ESA compliance (see exceptions for fuels management activities and utility corridor maintenance). New development projects in AEI buffer areas must be reported to LANL biological resources SMEs for tracking (http://int.lanl.gov/environment/bio/controls/index.shtml). Descriptions of each of the AEIs give the total area in each buffer area available for development.

3.3 Emergency Actions

Summary: Contact DOE and LANL biological resources SMEs as soon as possible.

If safety and/or property is immediately threatened by something occurring within an AEI (for example, wildfire, water line breakage, etc.) managers may activate emergency actions. Contact a LANL biological resources SME (http://int.lanl.gov/environment/bio/controls/index.shtml), the Environmental Stewardship Group (1-505-665-8855), or the DOE Los Alamos Field Office (Field Office; 1-505-667-6819) as soon as possible. If the emergency occurs outside of regular business hours, contact the Emergency Management Office (1-505-667-6211). This office will then communicate with the appropriate LANL and DOE Field Office personnel.

4.0 IMPLEMENTATION OF SITE PLANS

4.1 Roles and Responsibilities

Summary: LANL's facility managers and operational staff are responsible for ensuring that activities are reviewed for compliance with all applicable site plans. Figure 1 illustrates the process for utilizing site plans. If activities follow approved guidance, there is no requirement for additional ESA regulatory compliance. However, additional National Environmental Policy Act (NEPA), cultural resources, wetlands, or other regulatory compliance actions may be required.

If an activity or project occurs outside of all LANL AEIs and will not impact habitat within an AEI, it does not have to be reviewed for ESA compliance, unless it is a large project. Projects that are larger than 2 ha (5 ac) or cost more than $5 million require an individual ESA compliance review, even if they are not located within an AEI.

LANL's facility managers are responsible for determining if operations within their geographic and/or programmatic area of responsibility comply with the guidelines in these site plans. Submission of a Permits and Requirements Identification (PR-ID) for a new or modified project is required under Program Description 400 (LANL 2013) and allows managers to identify the requirements within their project area. Deployed environmental professionals and core LANL biological resources SMEs are available to support facility managers. If activities follow site plan guidelines, they do not require any additional ESA regulatory compliance action. However, NEPA, cultural resources, wetlands, or other regulatory compliance actions are not addressed in site plans and additional compliance actions may be required. It is the responsibility of the project leader or facility management staff to ensure that all requirements are satisfied. If you have

questions, contact biological, cultural, NEPA, or other environmental SMEs. Contacts can be found at http://int.lanl.gov/environment/compliance/ier/index.shtml.

A single facility may have one or more AEIs within its boundary and the AEIs may be for different species. Some AEIs overlap. In areas where overlap occurs, project managers must follow the guidelines for AEIs of all involved species.

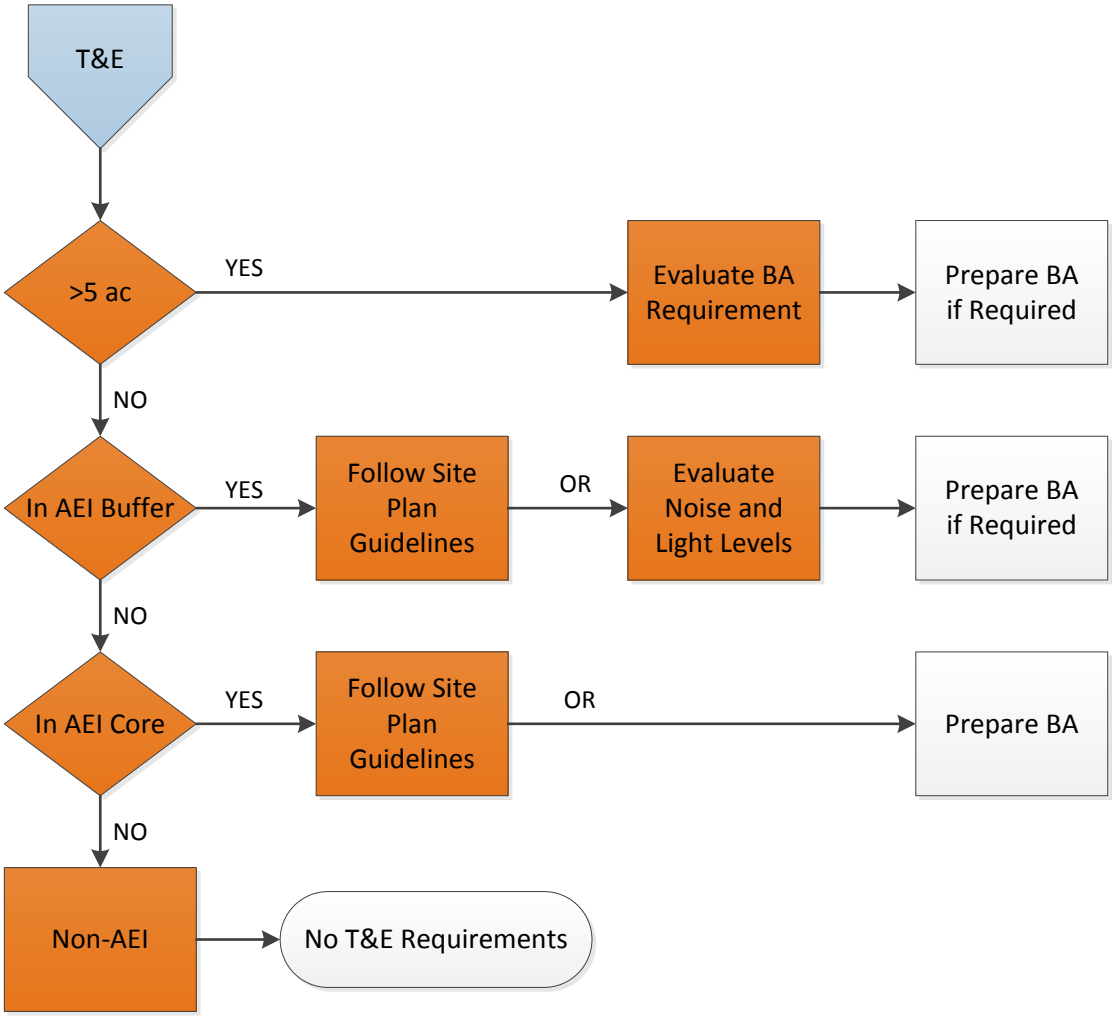

Figure 1. Process flowchart for determining site plan requirements.

4.2 If an Activity Does Not Meet Site Plan Guidelines

Summary: Activities or projects that do not meet all applicable site plan guidelines must be evaluated individually for compliance with the ESA.

If a project reviewer determines that an activity or project cannot meet the guidelines in applicable site plans, LANL biological resources SMEs evaluate that activity individually for compliance with the ESA. Results of the evaluation of potential impacts allow LANL biological resources SMEs to make recommendations to the DOE Field Office Biological Resources Program Manager

regarding the need for USFWS consultation. An evaluation may result in 1) a DOE Field Office determination that there is no possibility of adverse effects and the activity can proceed, 2) a DOE Field Office suggestion for modifications of the action to avoid adverse effects so that it can proceed, or 3) a DOE Field Office decision to prepare a biological assessment (BA) for the activity and submit it to the USFWS for concurrence. Fieldwork and preparation of a BA can take a few months with an additional 2 to 12 months for DOE Field Office review and then final USFWS concurrence.

4.3 Dissemination of Information

Although information about threatened and endangered species is not classified, it is considered sensitive information. It is in the best interest of threatened and endangered species to restrict specific knowledge about their locations. Habitat locations of threatened and endangered species are not considered sensitive.

5.0 CHANGES IN THE HMP SINCE IMPLEMENTION

The HMP received concurrence from USFWS and was first implemented in 1999. Since that time, both the Peregrine Falcon (*Falco peregrinus*) and the Bald Eagle (*Haliaeetus leucocephalus*) have been delisted. Site plans for those species have been removed from LANL's HMP. Both species are protected at LANL under the Migratory Bird Treaty Act, and the Bald Eagle is also protected under the Bald and Golden Eagle Protection Act.

The black-footed ferret (*Mustela nigripes*) is federally listed as endangered. However, no sightings of black-footed ferrets have been reported in Los Alamos County for more than 50 years. In addition, no large prairie dog towns, which are prime habitat for black-footed ferrets, have been observed on DOE property around LANL. Therefore, there is no site plan for this species.

In 2005, the USFWS concurred with DOE's proposal for new Mexican Spotted Owl habitat boundaries based on a revised analysis of Mexican Spotted Owl habitat quality within DOE property around LANL (USFWS consultation number22420-2006-I-0010).

In 2012, the USFWS concurred with DOE's proposal to modify the habitat boundaries for the Los Alamos Canyon Mexican Spotted Owl AEI due to changes from the fire response activities after the Las Conchas wildfire (USFWS consultation number 02ENNM00-2012-IE-0088).

In 2013, the USFWS concurred with the DOE's new site plan for the Jemez Mountains salamander and its addition to LANL's HMP (USFWS consultation number 02ENNM00-2014-I-0014).

6.0 DATA MANAGEMENT

The data used in the implementation of the HMP is stored in a GIS database at LANL.

II. AREA OF ENVIRONMENTAL INTEREST SITE PLAN FOR THE MEXICAN SPOTTED OWL

1.0 SPECIES DESCRIPTION—MEXICAN SPOTTED OWL

1.1 Status

In 1993, the USFWS determined the Mexican Spotted Owl to be a threatened species under the authority of the ESA, as amended (58 Federal Register [FR] 14248). In 1995, the USFWS released its final recovery plan for the owl (USFWS 1995), which was revised in 2012 (USFWS 2012). The USFWS most recently designated critical habitat for Mexican Spotted Owl in 2004 (69 FR 53181).

1.2 General Biology

The Mexican Spotted Owl is found in northern Arizona, southeastern Utah, and southwestern Colorado south through New Mexico, west Texas, and into Mexico. It is the only subspecies of Spotted Owl recognized in New Mexico (USFWS 1995).

The Mexican Spotted Owl generally inhabits mixed conifer and ponderosa pine (*Pinus ponderosa;* Lawson & C. Lawson) - Gambel oak (*Quercus gambelli;* Nutt.) forests in mountains and canyons. High canopy closure, high stand diversity, multilayered canopy resulting from an uneven-aged stand, large, mature trees, downed logs, snags, and stand decadence as indicated by the presence of mistletoe are characteristic of Mexican Spotted Owl habitat. Some owls have been found in second-growth forests (i.e., younger forests that have been logged); however, these areas were found to contain characteristics typical of old-growth forests. Mexican Spotted Owls in the Jemez Mountains seem to prefer cliff faces in canyons for their nest sites (Johnson and Johnson 1985). The recovery plan for the Mexican Spotted Owl recommends that mixed conifer and pine-oak woodland types on slopes greater than 40 percent be protected for the conservation of this owl.

A mated pair of adult Spotted Owls may use the same home range and general nesting areas throughout their lives. A pair of owls requires approximately 800 ha (1,976 ac) of suitable nesting and foraging habitat to ensure reproductive success. Incubation is carried out by the female. The incubation period is approximately 30 days, and most eggs hatch by the end of May. Most owlets fledge in June, 34 to 36 days after hatching (USFWS 1995). The owlets are “semi-independent” by late August or early September, although juvenile begging calls have been heard as late as September 30. Young are fully independent by early October. The non-breeding season runs from September 1 through February 28. Although seasonal movements vary among owls, most adults remain within their summer home ranges throughout the year.

The diet of Mexican Spotted Owls nesting in canyons consists primarily of woodrats (*Neotoma* spp.) and mice (*Peromyscus* spp.) with lesser amounts of rabbits, birds, reptiles, and arthropods (Willey 2013). The relative abundance of prey types in Mexican Spotted Owl pellets collected at LANL are listed in Table A-1 in the Appendix. Ganey and Balda (1994) found core areas of individuals (i.e., where owls spent 60 percent of their time) averaged 134 ha (331 ac), and core areas for pairs averaged 160 ha (395 ac).

1.3 Threats

The Mexican Spotted Owl was listed as threatened because of destruction and modification of habitat caused by timber harvest and fires, increased predation on owls associated with habitat fragmentation, and a lack of adequate protective regulations.

2.0 IMPACT OF HUMAN ACTIVITIES

2.1 Introduction

The primary threats to Mexican Spotted Owls on DOE property around LANL property are 1) impacts to habitat quality from LANL operations and 2) disturbance of nesting owls. This section provides a review and summary of scientific knowledge of the effects of various types of human activities on the Mexican Spotted Owl and provides an overview of the current levels of activities at LANL.

2.2 Impacts on Habitat Quality

2.2.1 Development

The type of habitat used by Mexican Spotted Owls, late seral stage forests with large trees, are usually not found in large quantities near developed areas or near areas that have had recent agricultural or forest product extraction land uses. Therefore, Mexican Spotted Owls are generally not found near developments. Whether it is the development itself or a lack of suitable habitat that discourages colonization of these areas by Mexican Spotted Owls is unknown.

Areas of LANL vary from remote undeveloped areas to heavily developed and/or industrialized facilities. Most LANL facilities are situated atop mesas, primarily in the northern and western portion of the DOE property. LANL is bounded by developed residential, industrial, and retail areas along its northern boundary (the town of Los Alamos) and by residential and retail development along a portion of its eastern boundary (the town of White Rock). Three major paved roads traverse LANL from northeast to southwest. Sandia, Pajarito, and Los Alamos canyons have paved roads within AEIs, and several AEIs have dirt roads along at least a portion of the canyon bottom. AEIs containing paved or dirt roads in the canyon bottoms have not been occupied at LANL (Hathcock et al. 2010).

2.2.2 Ecological Risk

There is no specific information on the impact of chemicals on the Mexican Spotted Owl, although experience with other raptor species suggests that exposure to polychlorinated biphenyls (PCBs), dichloro-diphenyl-trichloroethane (DDT) and its derivatives, and other organophosphate or organochlorine pesticides would probably be harmful. Exposure to other chemicals could also be harmful (Cain 1988).

LANL completed three ecological risk assessments that included the Mexican Spotted Owl between 1997 and 2009. The ecological risk assessment process involves using computer modeling to assess potential effects to animals from chemicals of potential concern (COPCs) that have been detected in the environment. All of the following ecological risk assessments concluded that, on average, no appreciable impact is expected to Mexican Spotted Owls from COPCs (Gallegos et al. 1997; Gonzales et al. 2004; Gonzales et al. 2009).

2.2.3 Disturbance

2.2.3.1 Pedestrians and Vehicles

Based on work with other raptors, LANL biological resources SMEs assume that Mexican Spotted Owls would likely be disturbed by the approach of either pedestrians or vehicles. At an equal distance, pedestrians are frequently more disturbing to raptors than vehicles (Grubb and King 1991). Brown and Stevens (1997) reported that during surveys in Grand Canyon National Park, 22 times more Bald Eagles were found in canyon reaches with low human recreational use compared to reaches with moderate to high human recreational use. Human activity 100 m (328 ft) from Bald Eagle nests in Alaska caused clear and consistent changes in behavior of breeding eagles (Steidl and Anthony 2000).

Swarthout and Steidl (2001) found that both juvenile and adult roosting Mexican Spotted Owls were unlikely to alter their behavior in the presence of a single hiker at distances greater than 55 m (180 ft). Swarthout and Steidl (2003) concluded that cumulative effects of high levels of short-duration recreational hiking near Mexican Spotted Owl nests may be detrimental.

Many canyon bottoms and mesa tops at LANL have dirt roads traversing them. Most of these roads are gated. However, these roads are accessible to LANL employees and some of them are accessible to the public on foot or by bike. LANL biological resources SMEs have found that AEIs are occupied less often if there is recreational access into a canyon (Hathcock et al. 2010).

2.2.3.2 Aircraft

Ground-based disturbances appear to impact raptor reproductive success more than aerial disturbances (Grubb and King 1991). Grubb and Bowerman (1997) concluded that an exclusion of aircraft within 600 m (1,968 ft) of Bald Eagle nest sites would limit Bald Eagle response frequency to 19 percent.

Delaney et al. (1999) found for Mexican Spotted Owls that chainsaws consistently elicited higher response rates than helicopters at similar distances. Owl flush rates did not differ between nesting and non-nesting seasons. No owls flushed when noise stimuli (helicopter or chainsaws) were at distances greater than 105 m (344 ft). Distance was generally a better predictor of owl response to helicopter overflights than sound level.

LANL is restricted airspace, and planes infrequently fly less than 609 m (2,000 ft) above ground level. The County of Los Alamos operates an airport along the northern edge of LANL. The airport is located on the southern rim of Pueblo Canyon. Most flights approach and depart to the east of the airport, over the Rio Grande.

2.2.3.3 Explosives

There is no specific information on the reaction of Mexican Spotted Owls to explosives detonation currently available. Explosive blasts set off 120 to 140 m (393 to 459 ft) from active Prairie Falcon (*Falco mexicanus*) nests caused perched Prairie Falcons to flush from perches 79 percent of the time, and, in 26 percent of the cases, caused incubating Prairie Falcons to flush from nests. Measured sound levels at aerie entrances during blasts ranged from 129 to 141 decibel (dB) (Holthuijzen et al. 1990). Explosives blasting for dam construction 560 to 1,000 m (1,837 to 3,280 ft) from active Prairie Falcon nests caused a change in behavior 26 percent of the time, and

birds flushed in 17 percent of all cases. No incubating birds flushed (Holthuijzen et al. 1990). Brown et al. (1999) found little activity change in roosting or nesting Bald Eagles and no population-level impacts from weapons detonations at the Aberdeen Proving Ground. Holthuijzen et al. (1990) found that a 167-g (5.89-oz) charge of Kinestik produced noise levels between 138 and 141 dB at 100 m (328 ft), and that a 500-g (17.6-oz) charge of TNT produced noise levels between 144 and 146 dB at 100 m (328 ft). A 20-kg (44-lb) charge of TNT produced noise levels that measured 163 dB at 100 m (328 ft) (Paakkonen 1991).

Measurements of noise levels during explosives testing were conducted at three locations at LANL using quantities of high explosives ranging from 4.5 to 67.5 kg (10 to 148 lb) of TNT during six shots. Noise levels increased during the test from a background level of 31 dB(A)[1] to a range between 64 and 71 dB(A) during shots at a distance of 1.8 km (1.1 mi). At a distance of 4.3 km (2.67 mi), noise levels rose from a background range of 35 to 64 dB(A) to a range of 60 to 63 dB(A) (Vigil 1995). At a distance of 6.7 km (4.16 mi), noise levels rose from a background range of 38 to 51 dB(A) to a range of 60 to 71 dB(A) (Burns 1995). LANL biological resources SMEs estimated that the noise from a shot at the Dual-Axis Radiographic Hydrodynamic Test (DARHT) Facility would be 150 dB(A) at the source and 80 dB(A) at 400 m (1,312 ft) (Keller and Risberg 1995). LANL biological resources SMEs found that Mexican Spotted Owl AEIs located within the explosives testing buffer area were occupied more frequently than AEIs in other locations (Hathcock et al. 2010). This is likely due to the strict access control in explosives areas which limit human activity and development in the canyon bottoms.

2.2.3.4 Other Sources of Noise

Major noise-producing activities at LANL include automobile and truck traffic and noise associated with office buildings, construction activities, a live-fire range, and explosives testing. Also, there is noise associated with aircraft traffic at the Los Alamos County airport. Construction and maintenance activities involved with operations at LANL are fairly common. In addition, implementation of the 2005 Compliance Order on Consent (NMED 2005) issued by the New Mexico Environmental Department (NMED) has resulted in an increased frequency of drilling groundwater monitoring wells in protected habitat at LANL. Also, forest fuels management operations use chainsaws, chippers, and other noise-generating equipment. The 2010 National Pollutant Discharge Elimination System (NPDES) Individual Permit (EPA 2010) issued by the Environmental Protection Agency (EPA) requires sediment control features such as berms and small rock check dams to be installed at various sites with stormwater runoff; these are sometimes installed in protected habitat. LANL biological resources SMEs conducted a study of noise levels in canyons and found that the primary sources of noise exceeding 55 dB(A) were cars and trucks. Readings taken near flowing water were up to 11 dB(A) higher than readings taken elsewhere. The average dB(A) in canyons near paved roads ranged from 41 to 62, with maximum values ranging from 62 to 74. Away from paved roads 1.6 km (1 mi) or more, average dB(A) in canyons ranged from 37 to 50, with all but one average below 45. Maximum dB(A) away from paved roads ranged from 38 to 76 [76 dB(A) was measured during a thunder clap] (Huchton et al. 1997).

[1] Sound can be measured as decibels (dB), C-weighted dB [dB(C)], or A-weighted dB [dB(A)]. The dB(A) measurement best resembles the response of the human ear by filtering out lower and higher frequency sound not normally heard by the human ear.

Noise measurements were conducted by LANL biological resources SMEs at the Los Alamos County airport and in Bayo and Pueblo canyons, including the Los Alamos County Sewage Treatment Facility, in December 1997. Sound levels near the airport runway during the maximum use time (6:30 to 7:30 am) had background values averaging 54 dB(A). Noise during plane arrivals ranged from 47 to 63 dB(A). No measurements were collected during plane take-off. Sound measurements conducted in the bottoms of Pueblo and Bayo canyons ranged from 37 to 40 dB(A) in most areas of the canyon. At the sewage treatment facility parking lot during a working day, the average dB(A) during a three-minute period was 46 (range 45 to 49). At the intersection of the road going into Pueblo Canyon with State Road 502, the average dB(A) during a three-minute period was 60 (range 41 to 70).

LANL biological resources SMEs conducted sound measurements at successive distances from an industrial area near a canyon rim, into the canyon, and to the opposite rim, using a C-weighted decibel scale (Keller and Foxx 1997). Measurements of noise levels using the C-weighted decibel scale are greater than if measured using A-weighted decibels. The average background noise on the mesa was 65.8 dB(C) [with a range of 43–81 dB(C)]. The average background noise in the canyon bottom was 62.3 dB(C) [with a range of 54–78 dB(C)]. The average background noise at the bottom of the north-facing slope was 53.8 dB(C) [with a range of 48–64 dB(C)]. Measurements were taken mid-day.

LANL biological resources SMEs measured sound levels from various pieces of construction equipment used at project sites at LANL over 5-minute intervals at distances of 6 to 31 m (20 to 100 ft) (Knight and Vrooman 1999). Average values ranged from 58.5 dB(A) to 80.9 dB(A). Peak values ranged from 75.7 to 155.4 dB(A). Additional data were collected by other LANL operators on specific pieces of construction equipment and on the Security Computer Complex construction site fence perimeter at Technical Area 3 before and during construction (Knight and Vrooman 1999). The average noise levels before construction began was 56.6 dB(A), and the average during construction was 82.1 dB(A).

LANL biological resources SMEs conducted a series of sound measurements at LANL to investigate background noise levels around AEIs (Vrooman et al. 2000). Background noise levels were significantly higher in daytime than in nighttime. AEIs with greater than 10 percent developed area in their buffers had significantly higher levels of background noise than undeveloped AEIs. Mean background sound levels were 51.3 dB(A) in developed AEIs and 39.6 dB(A) in undeveloped AEIs. The LANL biological resources project review process uses the individual AEI background measurements from Vrooman et al. (2000) to screen project activities for increases more than 6 dB(A) above background.

LANL biological resources SMEs took sound level measurements of heavy equipment use associated with concrete recycling on Sigma Mesa at LANL in 2004 (Hansen 2004). At this location, background noise levels at two different locations were 55.2 and 58.8 dB(A). Operation of a dump truck hauling and dumping concrete increased noise levels above background by a mean of 22.7 dB(A) at 30 m (98 ft) and 2.4 dB(A) at 80 m (262 ft). Additional sound level measurements were taken in the same general area on Sigma Mesa in 2005 as part of a BA for the operation of an asphalt batch plant (Hansen 2005). Measurements were taken on the north rim of Mortandad Canyon (south of the asphalt batch plant at distances of approximately 30 to 122 m (100 to 400 ft), at the bottom of Mortandad Canyon, approximately 183 to 244 m (600 to 800 ft) from the asphalt

batch plant, and on the south rim of Mortandad Canyon approximately 305 m (1,000 ft) from the asphalt batch plant. Background noise levels at the various locations ranged from 41.1 to 48.7 dB(A). The only locations with increases greater than 3 dB(A) during operation of the asphalt batch plant were the locations on the north rim of Mortandad Canyon, within 122 m (400 ft) of the asphalt batch plant. Noise from the operation of the asphalt batch plant was not detected in the bottom of Mortandad Canyon or on the south rim.

LANL biological resources SMEs took sound level measurements around the LANL Biosafety Level 3 (BSL-3) Laboratory with the heating, ventilation, and air conditioning (HVAC) system on and with it off (Hansen 2009). The area to the north of the BSL-3 is developed, the area to the south is not. Background noise levels north of the facility ranged from 53.6 to 57.6 dB(A). Background noise levels south of the facility ranged from 41.6 to 49.7 dB(A). Noise from the HVAC system was detected at 25 m (82 ft) from the facility on both sides, but was not detected at 81 m (266 ft) on the north side, or at 107 m (351 ft) on the south side.

Overall, these studies appear to show that areas adjacent to or within developed areas or paved roads are likely to have daytime average background noise levels between 45 and 63 dB(A). Less disturbed areas are likely to have average background noise levels between 37 and 50 dB(A).

2.2.3.5 Artificially Produced Light

There is no information available on the effects of artificially produced light on Mexican Spotted Owls. Under the Los Alamos County Code, commercial site development plans are reviewed to ensure that lighting serves the intended use of the site while minimizing adverse impacts to adjacent residential property (Section 16-276). Section 16-276 of the County Code includes light source measurement limitations by zoning district. The code allows off-site light to be 0.5 foot candles (fc) in residential areas. By comparison, full moonlight measures 0.1 fc, and a crescent moon was measured at 0.01 fc. Table A-2 in the Appendix presents preliminary light measurements in fc.

Preliminary surveys were conducted for light levels within Los Alamos Canyon at the Omega Reactor (Keller and Foxx 1997). The Omega Reactor was brightly lit for purposes of security; therefore, total light intensity was greater than the average street lighting. Measurements were conducted at a light pole with an open parking lot at the reactor as the source. Trees did not obscure the area. Using the relationship of light intensity reducing as a square of the distance, calculations using the field data indicated that at 30 m (98 ft) from the source the light levels would be equivalent or nearly equivalent to full moonlight.

3.0 AEI GENERAL DESCRIPTION FOR MEXICAN SPOTTED OWL

An AEI consists of two areas—a core and a buffer. The core of the habitat is defined as suitable canyon habitat from rim to rim and 100 m (328 ft) out from the top of the canyon rim. The buffer area is 400 m (1,312 ft) wide extending outward from the edge of the core area. Although adult Mexican Spotted Owls may be found within their home range anytime throughout the year, the primary threat from disturbance to the owls is during the breeding season when owl pairs are tied to their nest sites. Therefore, management of disturbance in Mexican Spotted Owl AEIs is concentrated on the breeding season.

3.1 Method for Identifying a Mexican Spotted Owl AEI

The original location of each Mexican Spotted Owl AEI was identified using a habitat model developed by Johnson (1998) that classified nesting and roosting habitat for Mexican Spotted Owls using topographic characteristics and vegetative diversity. LANL biological resources SMEs compared the results from the Johnson (1998) model to a different model identifying slopes >40 percent in mixed conifer and ponderosa pine cover types at LANL. Areas identified from the Johnson (1998) model application to LANL that were over five contiguous 30 × 30 m (97 × 98 ft) pixels in size, were above 1,980 m (6,496 ft) in elevation, and that had mixed conifer or ponderosa pine forest cover, were considered suitable Mexican Spotted Owl habitat. Where suitable habitat was identified, AEI core area boundaries were established to include the canyons and 100 m (328 ft) outward from the canyon rims.

A new Mexican Spotted Owl habitat model was developed and refined for application on LANL following the Cerro Grande wildfire (Hathcock and Haarmann 2008). This model incorporated finer-scale vegetation characteristics into the Mexican Spotted Owl habitat quality assessment. This model was used to redelineate the boundaries of the Mexican Spotted Owl AEIs at LANL in 2005 following wildfire, drought, and a regional bark beetle outbreak (USFWS consultation number 22420-2006-I-0010).

The new core boundaries were delineated with an area approximately 0.4 km (0.25 mi) from the edge of the nearest suitable habitat, up and down canyon. Core boundaries were established along readily recognizable geologic features or anthropogenic features in the terrain wherever possible to facilitate the ease of identification of core boundaries when in the field.

3.2 Location and Number of Mexican Spotted Owl AEIs

There are currently five Mexican Spotted Owl AEIs on LANL, each encompassing one or more canyons. In general, the AEI cores are centered in canyons on the western side of LANL. The canyons with AEIs are Cañon de Valle, Water, Pajarito, Los Alamos, Sandia, Mortandad, and Three-Mile. AEI boundaries are maintained in the LANL biological resources program GIS database.

4.0 AEI MANAGEMENT

4.1 Overview

This AEI management section provides guidelines for LANL operations to reduce or eliminate the threats to Mexican Spotted Owls from 1) habitat alterations that reduce habitat quality and 2) disturbance of breeding or potentially breeding owls. Habitat alterations are considered for all AEIs and for both core and buffer areas. Disturbance activities to owls are considered only for occupied AEIs and only for impacts on core areas. Developed areas (see Part I, Section 3.1) that have ongoing baseline levels of activities and are not suitable habitat for Mexican Spotted Owls have different restrictions than undeveloped core or buffer areas. Therefore, the location of the disturbance activity within the AEI, the occupancy status of the AEI, and the type of activity all affect whether or not the activity is allowable. AEIs for different species may overlap, and an activity must meet the guidelines of all applicable site plans to be allowable.

4.2 Definition and Role of Occupancy in AEI Management

Summary: The occupancy status of an AEI affects what disturbance activities are allowable in different areas (core, buffer, developed) of the AEI. All Mexican Spotted Owl AEIs are considered occupied during March 1 through August 31 or until surveys show the AEI to be unoccupied. See the Activity Table (Table 1, Section 4.5.2) for restrictions on occupied undeveloped core and buffer areas, and Part I, Section 3.1 for restrictions on developed areas.

Occupancy simply refers to whether or not an AEI is occupied during a species' period of sensitivity. For Mexican Spotted Owls, LANL is primarily concerned with protecting the owls from disturbance during the breeding season. Because individuals may colonize suitable habitat, all Mexican Spotted Owl AEIs are treated as though they are occupied from March 1 through August 31 or until surveys show an AEI to be unoccupied. Mexican Spotted Owl surveys are conducted from late March through June. In general, surveys in areas with ongoing or proposed projects are completed by May 15. If a nest is located during surveys, then the AEI can be treated as unoccupied except for the area within a 400 m (1,312 ft) radius of the nest site. Because owls are not as sensitive to disturbance during the non-breeding season, Mexican Spotted Owl AEIs are treated as unoccupied from September 1 to February 28.

The occupancy status of an AEI affects what activities are allowable in the AEI. Although activities causing habitat alterations are restricted in all AEIs, disturbance activities are restricted only in occupied AEIs. The Activity Table (Table 1, Section 4.5.2) provides dates and levels of allowable disturbance activities within occupied Mexican Spotted Owl AEIs under the guidelines of this site plan. Contact a LANL biological resources SME to find out the current occupancy status of an AEI (http://int.lanl.gov/environment/bio/controls/index.shtml).

4.3 Introduction to AEI Management Guidelines

Summary: The habitat alterations section and the activities section give the guidelines for habitat alteration and disturbance activities, respectively, for Mexican Spotted Owl AEIs. The flow chart (see Figure 1) provides a quick reference to determine what, if any, guidelines need to be consulted for a specific activity. Protective measures give management practices that should be applied when working or considering work in AEIs. LANL biological resources SMEs are available to answer questions and provide advice (http://int.lanl.gov/environment/bio/controls/index.shtml).

Sections 4.4 and 4.5 provide the guidelines for habitat alterations and allowable activities in AEI core and buffer areas. Section 4.4 describes what and where habitat alterations are allowed under the guidelines of this site plan. Section 4.5 describes what, when, and where disturbance activities are allowed in occupied AEIs under the guidelines of this site plan. If an activity does not meet the restrictions given in the guidelines, the activity must be individually reviewed for ESA compliance. This site plan only provides guidelines for Mexican Spotted Owl AEIs. If an activity is desired in an area with overlapping AEIs, all applicable site plans must be consulted. AEI maps show the location of all AEIs in an area. Section 4.6 describes management practices that should be applied when working or considering work in an AEI. LANL biological resources SMEs are available to answer questions and provide advice (http://int.lanl.gov/environment/bio/controls/index.shtml).

4.4 Definition of and Restrictions on Habitat Alterations

4.4.1 Definition of Habitat Alterations

Habitat alteration includes any action that alters the soil structure, vegetative components necessary to the species, prey quality and quantity, water quality, hydrology, or noise or light levels in undeveloped areas of an AEI. Long-term means the alteration lasts for more than one year. For physical disturbances, in general, any activity that can be accomplished by one person with a hand tool is generally not considered habitat alteration; any activity that requires mechanized equipment on a landscape is habitat alteration. An actual activity may take place outside of the AEI and will be considered habitat alteration if consequences of the activity have effects inside the AEI core.

The habitat components most important to Mexican Spotted Owls include vegetative structure, food quality and quantity, and disturbance levels, including noise and light. The forest structure within a canyon designated as a Mexican Spotted Owl AEI is important because it provides roost sites and a suitable habitat for nesting and foraging. Trees along the canyon rim are used for foraging and territorial calling, and they shelter the canyon interior from light and noise disturbances.

A long-term change in light or noise levels within the undeveloped core of an AEI is considered to be a habitat alteration if it increases average noise levels by $\geq$6 dB(A) during any portion of the 24-hour day, or it increases average light levels by $\geq$0.05 fc at night. Changes in noise and light levels are measured at the core area boundary if the source is outside the core area, or at 10 m (33 ft) from the source if the source is inside the undeveloped core area. Impacts of changes in developed areas on undeveloped cores are measured at the developed area boundary if it is within the core, or at the core area boundary if the developed area is outside of the core.

4.4.2 Fuels Management Practices to Reduce Wildfire Risk

The recovery plan for the Mexican Spotted Owl lists stand-replacing wildfires as a primary threat to their habitat and encourages land managers to reduce fuel levels and abate fire risks in ways compatible with owl presence on the landscape (USFWS 1995). Within undeveloped core areas, on slopes >40 percent, in the bottoms of steep canyons, and within 30 m (100 ft) of a canyon rim, thinning of trees <22 cm (9 in) diameter at breast height, treatment of fuels, and prescribed and natural prescribed fires are allowed. Exceptions allowing trees >22 cm (9 in) to be thinned within 30 m (100 ft) of buildings are granted to protect facilities. Large logs (>30 cm [11.8 in] midpoint diameter) and snags should be retained. Thinning within core areas not meeting the characteristics listed above, and in buffer areas, may include trees of any size to achieve 8 m (25 ft) spacing between tree crowns. However, clear cutting is not allowed in undeveloped core areas.

For health and safety reasons, any trees within 30 m (100 ft) of buildings, but outside a developed area, may be thinned to achieve 8 m (25 ft) spacing between crowns. Habitat alterations including thinning are not restricted in developed areas. However, LANL biological resources SMEs encourage the retention of trees and snags along canyon rims if the rim is in a developed area. Because of the extreme fire danger associated with firing sites and the potential impact of a fire on Mexican Spotted Owl habitat, firing sites and burn areas are treated separately for the purposes of fuels management. Trees within 380 m (1,246 ft) of firing sites and burn areas in both core and

buffer areas may be thinned to a 15 m (49 ft) spacing between trees everywhere except on slopes >40 percent or in the bottoms of steep canyons. Any tree over 22 cm (9 in) diameter at breast height within 380 m (1,246 ft) of a firing site may be delimbed to a height of 2 m (6 ft) to help prevent crown fires.

In historically occupied core areas, fuels treatment may not exceed 10 percent of the undeveloped core area and is not allowed within 400 m (1,312 ft) of nesting areas. In occupied core areas, forest management activities must take place during the nonbreeding season (September 1 to February 28) (USFWS 1995). Fuels management activities that are allowable in core areas have to be reported to LANL biological resources SMEs for tracking.

4.4.3 Utility Corridors

Habitat alterations such as cutting down trees that threaten power lines are allowed within 8 m (26 ft) of either side of an existing utility line in all areas of an AEI (Trujillo and Racinez 1995). New utility lines and utility lines requiring clearance of a right-of-way greater than 16 m (52 ft) total must be individually reviewed for ESA compliance. Disturbance activities must follow the guidelines given in the Activities Table (Table 1, Section 4.5.2) for occupied AEIs.

4.4.4 Restrictions on Habitat Alterations

Summary: Habitat alterations other than fuels management practices and utility corridor maintenance are not allowed in undeveloped core areas. Habitat alterations in buffer areas are restricted to 2 ha (5 ac) per project, with a maximum cap on development in the buffer for each AEI. Habitat alterations other than fuels management and utility corridor maintenance must be reported to LANL biological resources SMEs for tracking (http://int.lanl.gov/environment/bio/controls/index.shtml).

Habitat alterations other than the fuels management practices and utility corridor maintenance described above are not allowed in undeveloped core areas under the guidelines of this site plan. If a project or activity is planned that would alter habitat in an undeveloped core area, it must be individually evaluated for ESA compliance. Habitat alterations in undeveloped buffer areas other than the fuels management activities and utility corridor maintenance described above are restricted to 2 ha (5 ac) in area per project and are subject to other restrictions including light and noise effects in the core (see Section 2.2.3). Projects in the buffer over 2 ha (5 ac) in size will require individual ESA compliance review.

Habitat alterations in a buffer area other than the fuels management and utility corridor maintenance described above must be reported to LANL's biological resources SMEs for tracking (http://int.lanl.gov/environment/bio/controls/index.shtml). There is a cumulative maximum area that can be developed in each AEI's buffer. Once that cumulative area is reached, all habitat alterations in a buffer will require individual ESA reviews for compliance.

4.5 Definition of and Restrictions on Disturbance Activities

4.5.1 Definitions of Disturbance Activities

LANL biological resources SMEs considered six categories of activities that might cause disturbance in an AEI. Most of the categories were first identified in the document "Peregrine

Falcon Habitat Management in the National Forests of New Mexico," prepared for the United States Forest Service (Johnson 1994). LANL biological resources SMEs added explosives detonation, other light production, and other noise production to provide the most comprehensive list of activities possible, thereby reducing the need for individual review of activities for ESA compliance. The categories of activities are people, vehicles, aircraft, other light production, other noise production, and explosives detonation. LANL biological resources SMEs have defined low, medium, and high levels of impact for these activities except for explosives detonation. Activity levels for explosives detonation have been designed to follow the guidelines agreed upon by LANL, DOE, and USFWS in the DARHT BA (Keller and Risberg 1995). Restrictions on explosives detonation are described in the definition of the activity, but are not included in the Activity Table (Table 1, Section 4.5.2). These six categories of activities are restricted only in AEIs that are classified as occupied.

People—includes any entry of people into an AEI on foot.

- Low impact is the presence of three or fewer people per project and duration of one day or less during a breeding season.
- Medium impact is the exceedance of either the number of people or the duration criteria.
- High impact is the exceedance of both the number of people and the duration criteria.

Vehicles—includes the entry of any two-axle highway vehicle, all-terrain vehicle, or motorized machinery into an AEI by any route other than a paved road or an improved gravel road.

- Low impact is the presence of two or fewer vehicles per project and duration of one day or less during a breeding season.
- Medium impact is the exceedance of either the number of vehicles or the duration criteria.
- High impact is the exceedance of both the number of vehicles and the duration criteria.

Aircraft—includes the operation of any aircraft below an elevation of 600 m (2,000 ft) above the highest ground level in the local vicinity.

- Low impact is the presence of one single-engine airplane and the duration of one day or less during a breeding season.
- Medium impact is the exceedance of either the number of aircraft or the duration criteria.
- High impact is the exceedance of both the number of aircraft and the duration criteria.

Any use of helicopters, jet airplanes, and propeller airplanes with two or more engines is classified as medium impact or above, depending on duration.

Other Light Production—includes any activity not previously listed that causes additional light to occur in an AEI core area. For example, plans for construction of a new building at the edge of a developed area may call for lighting at night to facilitate nighttime work that impacts an undeveloped core area.

- Low impact is the increase of light intensity by ≤0.05 fc and a duration of one night or less per project per breeding season.
- Medium impact is the exceedance of either the intensity or duration criteria.
- High impact is the exceedance of both the intensity and duration criteria.

Measurements for increases in light are taken at the AEI core area boundary closest to the light source if the source is outside the core and at 10 m (33 ft) from the source if the source is inside the core. Light measurements for developed areas are taken at the edge of the developed area if the developed area is within an AEI core or at the closest core boundary if the developed area is outside of an AEI core.

Other Noise Production—includes any activity not previously listed except for explosives detonation that causes additional noise to occur in an AEI. For example, operation of machinery creates noise.

- Low impact is increasing noise levels in an AEI core by 6 dB(A) or less for one day or less per project per breeding season.
- Medium impact is the exceedance of either the level or the duration criteria.
- High impact is the exceedance of both the level and the duration criteria.

Measurements for increases in noise are taken at the AEI core boundary closest to the noise source if the source is outside the core and at 10 m (33 ft) from the source if the source is inside the core. Noise measurements for developed areas are taken at the edge of the developed area if the developed area is within an AEI core or at the closest core boundary if the developed area is outside of an AEI core.

Explosives Detonation—includes the use of high explosives for any purpose. LANL biological resources SMEs did not define low, medium, and high levels of this activity because of the difficulty of determining levels for a shot before actually doing the shot. For the purpose of explosives detonation near Mexican Spotted Owl AEIs, occupied habitat is defined as the area within 400 m (1,312 ft) of the current year's nest/roost sites or the previous year's nest site if a current site has not been identified. No explosives detonation will take place within 400 m (1,312 ft) of nest/roost sites in occupied habitat between March 1 and August 31. Explosives detonation at night at sites within 400 to 800 m (1,312 to 2,624 ft) of a nest site in occupied habitat is restricted to once a month from March 1 and August 31.There are no restrictions on daytime explosives testing between 400 and 800 m (1,312 to 2,624 ft). There are no restrictions between September 1 and February 28 or in unoccupied habitat. Explosives detonation adjacent to AEIs that have not previously been recorded by LANL as occupied will have no restrictions unless surveys detect Mexican Spotted Owls. Explosives tests not allowed under the guidelines of this site plan must be individually reviewed for ESA compliance.

4.5.2 Activity Table

The dates shown in the Activity Table (Table 1) are the dates between which the activity in the row is restricted under the guidelines of this site plan. All AEIs are considered occupied from March 1 to August 31 or until surveys show an AEI to be unoccupied. If owls are detected, AEIs

are considered occupied until August 31 within 400 m (1,312 ft) of the nest site. Consult with LANL biological resources SMEs to find out occupancy status of AEIs and what locations are within 400 m (1,312 ft) of nest sites (http://int.lanl.gov/environment/bio/controls/index.shtml).

Table 1. Restrictions on Activities in Undeveloped Occupied Mexican Spotted Owl AEIs

		Core	Buffer
People			
	Low	No Restrictions*	No Restrictions
	Medium	March 1 to August 31	No Restrictions
	High	March 1 to August 31	No Restrictions
Vehicles			
	Low	No Restrictions	No Restrictions
	Medium	March 1 to August 31	No Restrictions
	High	March 1 to August 31	No Restrictions
Aircraft			
	Low	March 1 to August 31	No Restrictions
	Medium	March 1 to August 31	March 1 to May 15
	High	March 1 to August 31	March 1 to August 31
Other Light Production			
	Low	March 1 to August 31	No Restrictions**
	Medium	March 1 to August 31	No Restrictions**
	High	March 1 to August 31	No Restrictions**
Other Noise Production			
	Low	March 1 to August 31	No Restrictions**
	Medium	March 1 to August 31	No Restrictions**
	High	March 1 to August 31	No Restrictions**
Explosives Detonation (see text in Section 4.5.1)			

*Entry is restricted in core areas that are occupied within 400 m (1,312 ft) of the nest site from March 1 to August 31. If the current nest has not been located, entry is restricted within 400 m (1,312 ft) of the previous year's nest site.

**Noise or light production in the buffer is restricted if the activity would violate core area restrictions on noise or light.

4.6 Protective Measures

Summary: This section provides a list of management practices to apply in Mexican Spotted Owl AEIs.

- Timing of projects must take into account that projects in core areas or projects that violate restrictions for occupied buffer areas must stop on February 28 each year until occupancy status of the AEI is determined.
- Every reasonable effort should be made to reduce the noise from explosives testing within 800 m (2,624 ft) of occupied habitat. Methods to reduce noise could include contained shots, noise shields in the direction of AEI cores, etc. For night shots, every reasonable effort should be made to limit the amount of light directed into AEI core areas.

- Put signs on dirt roads and trails leading into AEIs labeling them as restricted access areas and providing a number to contact for access restrictions.
- Keep disturbance and noise to a minimum.
- Avoid unnecessary disturbance to vegetation (e.g., excessive parking areas or equipment storage areas, off-road travel, materials storage areas, crossing of streams or washes).
- Avoid removal of vegetation along drainage systems and stream channels.
- Avoid all vegetation removals not absolutely necessary.
- Appropriate erosion and runoff controls should be employed to reduce soil loss. The controls must be put in place and periodically checked throughout the life of projects.
- All exposed soils must be revegetated as soon as feasible after construction to minimize erosion.
- In the Los Alamos Canyon AEI, development should be focused away from undeveloped areas on the western end of the AEI.

5.0 LEVELS OF DEVELOPMENT IN AEI CORE AND BUFFERS

5.1 Allowable Habitat Alteration in the Buffer Areas

The following quantifications of development and guidance for allowable habitat alteration in buffer areas were published and consulted on in the 1999 version of the HMP. Most AEIs changed in dimensions during the 2005 redelination of the habitats, and many have experienced additional development. Development in buffer habitat was not addressed during the 2005 consultation. Many projects were reviewed and received USFWS concurrence between 1999 and 2014.

LANL biological resources SMEs have provided the current development status for each of the AEIs at the end of each paragraph. The percent developed numbers were derived with the original size of the AEIs.

Cañon de Valle—In 1999, 16.3 ha (40.3 ac, 2.9 percent) of the core was developed and 52.2 ha (129 ac, 6.8 percent) of the DOE-controlled buffer was developed. For this AEI, it was recommended that only an additional 25.30 ha (62.5 ac) of the AEI buffer be developed. The 1999 HMP stated that once this cap is reached or a large-scale project is proposed, additional consultation with USFWS would be required. By 2011, 28 ha (69.2 ac) of the core and 84 ha (207.5 ac) of the buffer had been developed.

Pajarito—In 1999, there were 6.7 ha (16.5 ac, 5.5 percent) of the core developed and 75.1 ha (186.5 ac, 16.7percent) developed in the buffer. LANL biological resources SMEs recommended only an additional 35 ha (86.4 ac) of the buffer be developed before additional USFWS consultations take place. The 1999 HMP stated that once the cap is reached or a single large-scale project is proposed, additional consultation would be required. By 2011, 27 ha (66.7 ac) of the core and 89 ha (220 ac) of the buffer had been developed.

Los Alamos—In 1999, there were 77.16 ha (190 ac) of the core developed and 167.2 ha (413.1 ac) developed in the buffer. For this AEI, LANL biological resources SMEs recommended only an

additional 28.6 ha (70.6 ac, 5.9 percent) of the DOE-owned buffer be developed before additional USFWS consultations take place.

Because this AEI is so heavily developed, additional development was restricted to a few selected areas within the buffer. Development outside of these areas requires individual review for ESA compliance. A large percentage of this AEI was removed in the 2005 and 2013 BAs. By 2011, 94 ha (232.2 ac) of the core and 181 ha (447.3 ac) of the buffer had been developed.

Sandia-Mortandad—In 1999, 98.4 ha (243.2 ac) of this AEI on DOE lands were developed, including 29 ha (71.7 ac, 10.7 percent) of the core and 75.1 ha (185.6 ac, 16.7 percent) of the buffer. For this AEI, LANL biological resources SMEs recommended only an additional 38.1 ha (94.1 ac) of the buffer be developed before additional USFWS consultations take place. Once this cap is reached or a single large-scale project is proposed, additional consultation will be required. By 2011, 45 ha (111.2 ac) of the core and 83 ha (205.1 ac) of the buffer had been developed.

Three Mile—In 1999, 25.3 ha (62.5 ac) of this AEI on DOE lands were developed, including 3.8 ha (9.4 ac, 2.8percent) of the core and 21.5 ha (51.1 ac, 7.3 percent) of the buffer. For this AEI, LANL biological resources SMEs recommended only 64.3 ha (158.8 ac) additional area of buffer be developed before additional USFWS consultations take place. Once this cap is reached or a single large-scale project is proposed, additional consultation will be required. By 2011, 12 ha (29.6 ac) of the core and 37 ha (91.4 ac) of the buffer had been developed.

III. AREA OF ENVIRONMENTAL INTEREST SITE PLAN FOR THE SOUTHWESTERN WILLOW FLYCATCHER

1.0 SPECIES DESCRIPTION—SOUTHWESTERN WILLOW FLYCATCHER

1.1 Status

In 1995, the USFWS designated the Southwestern Willow Flycatcher as a federally endangered species (60 FR 10693). The USFWS most recently designated critical habitat for the Southwestern Willow Flycatcher in 2005 (70 FR 60885). The most recent recovery plan was published for Southwestern Willow Flycatcher in 2002 (USFWS 2002).

1.2 General Biology

The Southwestern Willow Flycatcher is one of four subspecies of the Willow Flycatcher. The historic range of the Southwestern Willow Flycatcher included Arizona, California, Colorado, New Mexico, Texas, Utah, and Mexico. Currently, this flycatcher breeds in riparian habitats from southern California to Arizona and New Mexico, plus southern Colorado, Utah, Nevada, and far western Texas. In winter it is found in southern Mexico, Central America, and northern South America (USFWS 2002).

Southwestern Willow Flycatchers are present in New Mexico from early May through mid-September and breed from late May through late July (Finch and Kelly 1999; USFWS 2002; Yong and Finch 1997). The flycatcher's nesting cycle is approximately 28 days. Three or four eggs are laid at one-day intervals, and incubation begins when the clutch is complete. The female incubates eggs for approximately 12 days, and the young fledge about 13 days after hatching.

Southwestern Willow Flycatchers typically raise one brood per year (USFWS 2002). Because arrival dates vary, northbound migrant Willow Flycatchers (of all subspecies) pass through areas where Southwestern Willow Flycatchers have already begun nesting. Similarly, southbound migrants (of all subspecies) in late July and August may occur where Southwestern Willow Flycatchers are still breeding. Therefore, it is only during a short period of the breeding season (approximately June15 through July 20) that one can assume that a Willow Flycatcher seen within Southwestern Willow Flycatcher range is probably of that subspecies (USFWS 2002).

The Southwestern Willow Flycatcher only nests along rivers, streams, and other wetlands. It is found in close association with dense stands of willows (*Salix* spp.), arrowweed (*Pluchea* spp.), buttonbush (*Cephalanthus* spp.), tamarisk (*Tamarix* spp.), Russian olive (*Eleagnus angustifolia* L.), and other riparian vegetation, often with a scattered overstory of cottonwood (*Populus* spp.) (USFWS 2002). The size of vegetation patches or habitat mosaics used by Southwestern Willow Flycatchers varies considerably and ranges from as small as 0.8 ha (1.9 ac) to several hundred hectares (Hatten and Paradzick 2003). The Southwestern Willow Flycatcher nests in thickets of trees and shrubs approximately 2 to 15 m (6 to 49 ft) tall, with a high percentage of canopy cover and dense foliage from 0 to 4 m (0 to 13 ft) above ground. Regardless of the plant species composition or height, occupied sites always have dense vegetation in the patch interior (Allison et al. 2003; USFWS 2002).

The Southwestern Willow Flycatcher is an insectivore. It forages within and occasionally above dense riparian vegetation, taking insects on the wing and gleaning them from foliage. The flycatcher's prey includes flies, bees, wasps, ants, beetles, moths, butterflies, grasshoppers, crickets, dragonflies, damselflies, and spiders (Durst et al. 2008; Wiesenborn and Heydon 2007).

1.3 Threats

The current population of Southwestern Willow Flycatchers in the United States is estimated at 1,214 territories (Durst et al. 2006). The distribution of breeding groups is highly fragmented, with groups often separated by considerable distances. This subspecies has suffered declines attributed to extensive loss of its cottonwood-willow habitat and to poor productivity resulting from brood parasitism by Brown-headed Cowbirds (*Molothrus ater*) (USFWS 2002).

2.0 IMPACT OF HUMAN ACTIVITIES

2.1 Introduction

The primary threats to the Southwestern Willow Flycatcher on LANL property are 1) impacts on habitat quality from LANL operations and 2) disturbance of nesting flycatchers. This section includes a review and summary of the known effects of various types of human activities to the Southwestern Willow Flycatcher and an overview of the current levels of activities at LANL within species habitat.

2.2 Impacts on Habitat Quality

2.2.1 Development

Throughout the Southwest, riparian habitats are rare and tend to be small and separated by vast expanses of arid lands. The Southwestern Willow Flycatcher has experienced extensive loss and

modification of its habitat resulting from urban and agricultural development, water diversion and impoundment, channelization of waterways, livestock grazing, off-road vehicle and other recreational uses, and hydrological changes resulting from these and other land uses (USFWS 2002). River and stream impoundments, groundwater pumping, and overuse of riparian areas have altered as much as 90 percent of the Southwestern Willow Flycatcher's habitat (USFWS 2002). Loss of cottonwood-willow riparian forests has had widespread impact on the distribution and abundance of bird species associated with that forest. Development itself may be tolerated if the habitat is left intact.

Because watercourses at LANL tend to be intermittent to ephemeral, riparian habitat is uncommon. There has been extensive degradation of the riparian zone along the Rio Grande caused by feral cattle grazing and flood control operations of Cochiti Lake. There are other riparian/wetland areas on LANL associated with canyon bottoms, the most significant one being Pajarito wetlands in the lower end of Pajarito Canyon. A major paved road traverses the wetlands area in Pajarito Canyon.

2.2.2 Ecological Risk

There is no specific information on the impact of chemicals on Southwestern Willow Flycatcher.

2.2.2.1 Ecorisk Assessment

LANL completed two ecological risk assessments that included the Southwestern Willow Flycatcher between 1997 and 2009. The ecological risk assessment process involves using computer modeling to assess potential effects to animals from COPCs that have been detected in the environment. The ecological risk assessments concluded that, in general, there is a small potential for effects to Southwestern Willow Flycatcher from COPCs (Gonzales et al. 1998; Gonzales et al. 2009).

An ecotoxicological risk assessment for the Southwestern Willow Flycatcher, centered on the Pajarito wetlands, found that between 7 and 16 percent of 100 hypothetical nest sites examined had hazard indices >1.0 and <10.0, depending on the foraging scenario (Gonzales et al. 1998). This indicates a small potential for impacts from chemicals. The primary chemicals driving the risk scenario were pentachlorophenol, aluminum, radium-226, calcium, and thorium-228. Aluminum, radium, and thorium are naturally occurring substances in northern New Mexico.

2.2.3 Disturbance

2.2.3.1 Pedestrians and Vehicles

There is no specific information on the reactions of Southwestern Willow Flycatchers to pedestrians and vehicles available. The recovery plan for the Southwestern Willow Flycatcher recommends providing protected areas, reducing unpredictable activities providing visual barriers, and reducing noise disturbance (USFWS 2002).

2.2.3.2 Aircraft

There is no specific information on the reaction of Southwestern Willow Flycatchers to aircraft available.

LANL lies within restricted airspace and planes infrequently fly less than 609 m (2,000 ft) above ground level. The County of Los Alamos operates an airport along the northern edge of LANL. The airport is located on the southern rim of Pueblo Canyon. Most flights approach and depart to the east of the airport, over the Rio Grande.

2.2.3.3 Explosives

There is no specific information on the reaction of Southwestern Willow Flycatchers to explosives detonation available. The Southwestern Willow Flycatcher AEI is not located close to any explosives testing sites at LANL.

2.2.3.4 Other Sources of Noise

LANL biological resources SMEs do not have good information on the effects of noise, including machinery operation, on Southwestern Willow Flycatchers. However, Southwestern Willow Flycatchers are probably not as sensitive to disturbance as some other threatened or endangered species (USFWS 2002). For a description of noise levels at LANL, see Part I, Section 2.2.3.

2.2.3.5 Artificially Produced Light

There is no information on the effects of artificially produced light on Southwestern Willow Flycatchers available. Under the Los Alamos County Code, commercial site development plans are reviewed to ensure that lighting serves the intended use of the site while minimizing adverse impacts to adjacent residential property (Section 16-276). Section 16-276 of the County Code includes light source measurement limitations by zoning district. The code allows off-site light to be 0.5 fc in residential areas. By comparison, full moonlight measures 0.1 fc, and a crescent moon was measured at 0.01 fc.

3.0 AEI GENERAL DESCRIPTION FOR SOUTHWESTERN WILLOW FLYCATCHER

The AEI consists of two types of areas—core and buffer. Core areas represent wetland areas with suitable vegetation for nesting, primarily dense willows. The buffer area is the area within 100 m (328 ft) of core areas. The Southwestern Willow Flycatcher AEI on LANL consists of two separate core areas. For purposes of this site plan, both core areas and associated buffers are considered one AEI unit.

3.1 Method for Identifying the Southwestern Willow Flycatcher AEI

The core areas were defined by the presence of riparian habitat and suitable wetland vegetation. These areas were identified in 1994 during a survey of wetlands at LANL and mapped using a global positioning system receiver. Wetlands without stands of dense willows at least 2 m (7 ft) tall and 30 m (98 ft) wide were not included in the AEI. The buffer area is the area within 100 m (328 ft) of the core areas.

3.2 Location of the Southwestern Willow Flycatcher AEI

LANL has one AEI for Southwestern Willow Flycatcher. It is composed of two core areas with associated buffers. The AEI core areas are located in the bottom of Pajarito Canyon, on the eastern side of LANL adjacent to Pajarito Road and State Road 4. The boundaries of the Southwestern

Willow Flycatcher AEI are maintained in the biological resources program GIS database at LANL.

4.0 AEI MANAGEMENT

4.1 Overview

This AEI management section provides guidelines for LANL operations to reduce or eliminate the threats to the Southwestern Willow Flycatcher from 1) habitat alterations that reduce habitat quality and 2) disturbance of breeding or potentially breeding flycatchers. Habitat alterations are considered for all AEIs and for both core and buffer areas. Disturbance activities to flycatchers are considered only for occupied AEIs and only for impacts on core areas. Developed areas (see Part I, Section 2.3) with ongoing baseline levels of activities and are not suitable habitat for Southwestern Willow Flycatchers have different restrictions than undeveloped core or buffer areas. Therefore, the location of the disturbance activity within the AEI, the occupancy status of the AEI, and the type of activity all affect whether or not the activity is allowable. AEIs for different species may overlap, and an activity must meet the guidelines of all applicable site plans to be allowable. Protective measures are described as management practices that should be followed when working in AEIs.

4.2 Definition and Role of Occupancy in AEI Management

Summary: The occupancy status of an AEI affects what disturbance activities are allowable in different areas (core, buffer, developed) of the AEI. The Southwestern Willow Flycatcher AEI is considered occupied during May 15 through September 15 or until the surveys show the AEI to be unoccupied. See the Activity Table (Table 2, Section 4.5.2) for restrictions on occupied undeveloped core and buffer areas, and Part I, Section 2.3 for restrictions on developed areas.

Occupancy simply refers to whether or not an AEI is occupied during a species' period of sensitivity. For Southwestern Willow Flycatchers, LANL biological resources SMEs are primarily concerned with protecting the birds from disturbance during the breeding season. Because individuals may colonize suitable habitat, the Southwestern Willow Flycatcher AEI is treated as though it is occupied from May 15 through September 15 or until surveys show an AEI to be unoccupied. Southwestern Willow Flycatcher surveys are conducted during May, June, and July. Because Southwestern Willow Flycatchers migrate south for the winter, the AEI is treated as unoccupied from September 16 to May 14.

The occupancy status of an AEI affects what activities are allowable in the AEI. Although activities causing habitat alterations are always restricted, disturbance activities are restricted only in occupied AEIs. Table 2 provides dates and levels of disturbance activities allowable in the occupied Southwestern Willow Flycatcher AEI under the guidelines of this site plan. The dates in Table 2 indicate the time period during which the activity is restricted. Contact a LANL biological resources SME to find out the current occupancy status of an AEI (http://int.lanl.gov/environment/bio/controls/index.shtml).

4.3 Introduction to AEI Management Guidelines

Summary: The habitat alterations section (Section 4.4) and the activities section (Section 4.5) gives the guidelines for habitat alteration and disturbance activities, respectively, for the

Southwestern Willow Flycatcher AEI. The flow chart (see Figure 1) provides a quick reference to determine what, if any, guidelines need to be consulted for a specific activity. Protective measures give management practices that should be applied when working or considering work in AEIs. LANL biological resources SMEs are available to answer questions and provide advice (http://int.lanl.gov/environment/bio/controls/index.shtml).

Sections 4.4 and 4.5 provide the guidelines for habitat alterations and allowable activities in AEI core and buffer areas. The flow chart (see Figure 1) provides a quick reference that should be used to determine whether a project or activity will affect an AEI and what sections of the site plan need to be consulted. The section on habitat alterations (Section 4.4) describes what and where habitat alterations are allowed under the guidelines of this site plan. The section and table on allowable activities (Section 4.5 and Table 2) describe what, when, and where disturbance activities are allowed in occupied AEIs under the guidelines of this site plan. If an activity does not meet the restrictions given in the guidelines, the activity must be individually reviewed for ESA compliance. This site plan only provides guidelines for the Southwestern Willow Flycatcher AEI. If an activity is desired in an area with overlapping AEIs, all applicable site plans must be consulted. Section 4.6 describes management practices that should be applied when working or considering work in an AEI. LANL biological resources SMEs are available to help interpret site plans and answer questions (http://int.lanl.gov/environment/bio/controls/index.shtml).

4.4 Definition of and Restrictions on Habitat Alterations

4.4.1 Definition of Habitat Alterations

Habitat alteration includes any action that alters over the long-term the soil structure, vegetative components necessary to the species, prey quality and quantity, water quality, hydrology, or noise or light levels in undeveloped areas of an AEI. Long-term means the alteration lasts for more than one year. Habitat alteration includes any activity that removes vegetative components important to the Southwestern Willow Flycatcher (primarily trees and shrubs). An actual activity may take place outside of the AEI and will be considered habitat alteration if consequences of the activity have effects inside the AEI core.

The habitat components most important to flycatchers include vegetative structure, food quality and quantity, and disturbance levels, including noise and light. The thickets of certain trees and shrubs along wetlands are important because they provide roost sites and a suitable habitat for nesting and foraging.

4.4.2 Fuels Management Practices to Reduce Wildfire Risk

Thinning within undeveloped buffer areas may include trees of any size to achieve 7.6 m (25 ft) spacing between tree crowns. However, clear cutting is not allowed in undeveloped buffer areas. No fuels management practices are allowed in core areas. Habitat alterations including thinning are not restricted in developed areas. All fuels management activities in developed and buffer areas must follow the guidelines in the Activity Table (Table 2, Section 4.5.2) if the AEI is occupied.

4.4.3 Utility Corridors

Habitat alterations such as cutting down trees that threaten power lines are allowed within 8 m (26 ft) of either side of an existing utility line in all areas of an AEI (Trujillo and Racinez 1995).

New utility lines and utility lines requiring clearance of a right-of-way greater than 16 m (52 ft) total must be individually reviewed for ESA compliance. Disturbance activities must follow the guidelines given in the Activities Table for occupied AEIs.

4.4.4 Restrictions on Habitat Alterations

Summary: Habitat alterations other than the utility corridor maintenance described above are not allowed in undeveloped core areas under the guidelines of this site plan. Habitat alteration in buffers is limited. If a project or activity is planned that would alter habitat in an undeveloped core area, it must be individually evaluated for ESA compliance. Habitat alterations in a buffer area other than fuels management activities or utility corridor maintenance must be reported to a LANL biological resources SME for tracking (http://int.lanl.gov/environment/bio/controls/index.shtml).

4.5 Definition of and Restrictions on Disturbance Activities

4.5.1 Definition of Disturbance Activities

LANL biological resources SMEs considered five categories of activities that might cause disturbance in an AEI. Most of the categories were first identified in the document "Peregrine Falcon Habitat Management in the National Forests of New Mexico" prepared for the U.S. Forest Service (Johnson 1994). Other light production and other noise production were included to provide the most comprehensive list of activities possible, reducing the need for individual review of activities for ESA compliance. The categories of activities are people, vehicles, aircraft, other light production, and other noise production. The impact of explosives detonation on this species is not considered here because there are no explosives testing sites within 2 km (1.25 mi) of potential nesting habitat. Low, medium, and high levels of impact for these activities are considered here. The following categories of activities are restricted only in AEIs that are classified as occupied.

People—includes any entry of people into an AEI on foot.

- Low impact is the presence of three or fewer people per project and duration of one day or less during a breeding season.
- Medium impact is the exceedance of either the number of people or the duration criteria.
- High impact is the exceedance of both the number of people and the duration criteria.

Vehicles—includes the entry of any two-axle highway vehicle, all-terrain vehicle, or motorized machinery into an AEI by any route other than a paved road or an improved gravel road.

- Low impact is the presence of two or fewer vehicles per project and duration of one day or less during a breeding season.
- Medium impact is the exceedance of either the number of vehicles or the duration criteria.
- High impact is the exceedance of both the number of vehicles and the duration criteria.

Aircraft—includes the operation of any aircraft below an elevation of 600 m (2,000 ft) above the highest ground level in the local vicinity.

- Low impact is the presence of one single-engine airplane and duration of one day or less during a breeding season.
- Medium impact is the exceedance of either the number of aircraft or the duration criteria.
- High impact is the exceedance of both the number of aircraft and the duration criteria.

Any use of helicopters, jet airplanes, and propeller airplanes with two or more engines is classified as medium impact or above, depending on duration.

Other Light Production—includes any activity not previously listed that causes additional light to occur in an AEI core area (e.g., plans for construction of a new building at the edge of a developed area may call for lighting at night to facilitate nighttime work that impacts an undeveloped core area).

- Low impact is the increase of light intensity by up to 0.05 fc and a duration of one night or less per project per breeding season.
- Medium impact is the exceedance of either the intensity or duration criteria.
- High impact is the exceedance of both the intensity and duration criteria.

Measurements for increases in light are taken at the AEI core area boundary closest to the light source, if the source is outside the core, and at 10 m (33 ft) from the source if the source is inside the core. Light measurements for developed areas are taken at the edge of the developed area if the developed area is within an AEI core, or at the closest core boundary, if the developed area is outside of an AEI core.

Other Noise Production—includes any activity not previously listed except for explosives detonation that causes additional noise to occur in an AEI. For example, operation of machinery causes noise.

- Low impact is increasing noise levels in an AEI core by 6 dB(A) or less for one day or less per project per breeding season.
- Medium impact is the exceedance of either the level or the duration criteria.
- High impact is the exceedance of both the level and the duration criteria.

Measurements for increases in noise are taken at the AEI core boundary closest to the noise source if the source is outside the core, and at 10 m (33 ft) from the source if the source is inside the core. Noise measurements for developed areas are taken at the edge of the developed area if the developed area is within an AEI core, or at the closest core boundary if the developed area is outside of an AEI core.

4.5.2 Activity Table

Disturbance activities are of concern only when Southwestern Willow Flycatchers occupy an AEI. The AEI is always considered occupied between May 15 and September 15, or until surveys show the AEI to be unoccupied. The Southwestern Willow Flycatcher AEI is always considered unoccupied between September 16 and May 14, when flycatchers have migrated for the winter.

For occupancy status of an AEI after completion of surveys, contact a LANL biological resources SME (http://int.lanl.gov/environment/bio/controls/index.shtml).

Table 2. Restrictions on Activities in Undeveloped Occupied Southwestern Willow Flycatcher AEI

Restrictions on Occupied Habitat		**Core**	**Buffer**
People			
	Low	No Restrictions	No Restrictions
	Medium	May 15 to August 15	No Restrictions
	High	May 15 to September 15	No Restrictions
Vehicles			
	Low	May 15 to September 15	No Restrictions
	Medium	May 15 to September 15	No Restrictions
	High	May 15 to September 15	No Restrictions
Aircraft			
	Low	No Restrictions	No Restrictions
	Medium	May 15 to August 15	May 15 to August 15
	High	May 15 to September 15	May 15 to August 15
Other Light/Noise Production			
	Low	May 15 to September 15	No Restrictions*
	Medium	May 15 to September 15	No Restrictions*
	High	May 15 to September 15	No Restrictions*

*Noise or light production in the buffer is restricted if the activity would violate core area restriction on noise or light.

4.6 Protective Measures

Summary: This section provides a list of management practices to apply in the AEI.

- No wetland vegetation will be removed outside of developed areas.
- Appropriate erosion and runoff controls should be employed to reduce soil loss.
- Avoid unnecessary disturbance to vegetation (e.g., excessive parking areas or equipment storage areas, off-road travel, materials storage areas, crossing of streams or washes).
- Avoid removal of vegetation along drainage systems and stream channels.
- Avoid all vegetation removals not absolutely necessary.
- Appropriate erosion controls must be put in place and periodically checked throughout the life of any projects.
- All exposed soils must be revegetated as soon as feasible after disturbance to minimize erosion.

5.0 SOUTHWESTERN WILLOW FLYCATCHER AEI DESCRIPTION

5.1 Pajarito Canyon Southwestern Willow Flycatcher AEI

5.1.1 Allowable Habitat Alteration in the Buffer Area

Since the purpose of the buffer area is to help maintain the core area as suitable Southwestern Willow Flycatcher habitat, habitat alteration in the buffer area will be extremely limited. There are two areas in which restrictions on habitat alteration are relaxed.

1. The mesa top of Mesita del Buey. This mesa top can be developed as long as restrictions on impacts to the core area are met.

2. Pajarito Road within the AEI. Mowing of upland vegetation is allowed up to 5 m (15 ft) from Pajarito Road, or to the fence, if the fence is within 9 m (30 ft). Vegetation must cover the roadsides to prevent sediment runoff, so mowed plants should be at least 5 cm (2 in) high. LANL biological resources SMEs encourage the growth of willow throughout the AEI—even the area along Pajarito Road—to enhance habitat. If, within this area, it is absolutely necessary to remove new willow growth (i.e., to improve visibility for human safety), LANL biological resources SMEs recommend that only willows at or above the level of the roadway surface be mowed.

IV. AREA OF ENVIRONMENTAL INTEREST SITE PLAN FOR THE JEMEZ MOUNTAINS SALAMANDER

1.0 SPECIES DESCRIPTION—JEMEZ MOUNTAINS SALAMANDER

1.1 Status

The Jemez Mountains Salamander (*Plethodon neomexicanus*) was listed in New Mexico as endangered under the Wildlife Conservation Act of New Mexico in 2006 (NMDGF 2006). In September 2012 the USFWS proposed the Jemez Mountains Salamander as endangered under the ESA (FR 2012) and the final listing as endangered was on 10 September 2013 (FR 2013a)

1.2 General Biology

The Jemez Mountains Salamander is endemic to the Jemez Mountains of north-central New Mexico and is found in Los Alamos, Rio Arriba, and Sandoval counties (Stebbins and Riemer 1950). It is one of two endemic plethodontid salamanders that occur in New Mexico. It occurs predominantly at elevations between 2,130 to 3,430 m (6,988 to 11,254 ft) in mixed-conifer forest with greater than 50 percent canopy cover consisting mainly of Douglas fir (*Pseudotsuga menziesii* [Mirb.] Franco), blue spruce (*Picea pungens* Engelm.), Engelmann spruce (*Picea engelmannii* Parry ex Engelm.), white fir (*Abies concolor* [Gord. & Glend.] Lindl. ex Hildebr.), limber pine (*Pinus flexilis* James), ponderosa pine, and quaking aspen (*Populus tremuloides* Michx.). The ground surface in forest areas has (a) moderate to high volumes of large fallen trees and other woody debris, especially coniferous logs at least 25 cm (10 in) in diameter, particularly Douglas fir, which are in contact with the soil in varying stages of decay from freshly fallen to nearly fully decomposed; or (b) structural features, such as rocks, bark, and moss mats that provide

the species with food and cover. Underground habitat in forest or meadow areas contains interstitial spaces provided by (a) igneous rock with fractures or loose rocky soils, (b) rotted tree root channels, or (c) burrows of rodents or large invertebrates (Degenhardt et al. 1996; FR 2013b).

Plethodontid salamanders, which lack both lungs and gills, breathe through the mucous membranes in their mouth and throat and through their moist skin. The Jemez Mountains Salamander is completely terrestrial and does not use standing surface water for any life stage (FR 2012). Present in its habitat year-round, the Jemez Mountains Salamander spends most of its life underground, but can be found on the surface when conditions are warm and wet, approximately July through October. During this time, the Jemez Mountains Salamander can be found under rocks, bark, and moss mats and inside and under logs (Ramotnik 1986, Everett 2003). The Jemez Mountains Salamander eats invertebrates, including ants, mites, and beetles, and is thought to lay its eggs underground (FR 2013b).

1.3 Threats

Principal threats to habitat include historical fire exclusion and suppression and severe wildland fires; forest composition and structure conversions; post-fire rehabilitation; forest and fire management; roads, trails, and habitat fragmentation; recreation; and disease (FR 2012).

2.0 IMPACT OF HUMAN ACTIVITIES

2.1 Introduction

Primary threats to the Jemez Mountains Salamander on LANL property are impacts to habitat quality or destruction of individual salamanders caused by LANL or Los Alamos County operations. Forested LANL property is also subject to impacts from severe wildland fire and wildfire suppression.

2.2 Impacts on Habitat Quality

2.2.1 Development

Property at LANL varies from remote isolated land to heavily developed and/or industrialized. Most of the large developed areas at LANL are found on mesa tops, generally in the northern and western portion of LANL. The areas of Jemez Mountains Salamander habitat currently most impacted by development occur in Los Alamos Canyon. There is a secondary paved road (West Road) in the bottom of the canyon that exits the canyon on the north-facing slope through Jemez Mountains Salamander habitat. The canyon bottom also contains a recreational ice rink operated by Los Alamos County on an inholding owned by Los Alamos County. Development that reduces the occurrence of primary constituent elements of Jemez Mountains Salamander in core habitat would likely have a negative impact on the species.

2.2.2 Pedestrians and Vehicles

Many canyon bottoms and mesa tops at LANL have dirt roads traversing them. Most of these roads are gated; however, many of these roads are accessible to LANL employees and the public on foot or by bike. Some areas, such as Los Alamos Canyon, are frequently used by hikers and dog owners on active and historic trails which traverse the canyon, through Jemez Mountains

Salamander habitat in places. Maintenance of roads and trails in the habitat may have a negative impact on the species.

2.2.3 Severe Wildland Fire and Wildfire Suppression

Stand-replacing wildfires significantly change forest composition and structure, and reduce canopy cover. Even ground wildfires may reduce the volume of fallen logs and large woody debris. Large areas of historic Jemez Mountains Salamander habitat have been impacted by stand-replacing wildfires associated with current forest stocking conditions, drought, and high temperatures (FR 2012). Forested habitats on LANL are also subject to severe wildland fires. To mitigate wildfire risks, some areas of LANL have been treated for fuels reduction and creation of fuel breaks both pre-emptively and during active wildfire suppression. Both wildfires and wildfire suppression activities can negatively impact the primary constituent elements of Jemez Mountains Salamander core habitat.

2.3 Impacts on Individual Salamanders

2.3.1 Disease

The amphibian pathogenic fungus *Batrachochytrium dendrobatidis* (Bd) was found in a wild-caught Jemez Mountains Salamander in 2003 (Cummer et al. 2005) on the east side of the species' range and again in another Jemez Mountains Salamander in 2010 on the west side of the species' range (FR 2012). Bd causes the disease chytridiomycosis, whereby the Bd fungus attacks keratin in amphibians. In adult amphibians, keratin primarily occurs in the skin. The symptoms of chytridiomycosis can include sloughing of skin, lethargy, morbidity, and death. Chytridiomycosis has been linked with worldwide amphibian declines, die-offs, and extinctions, possibly in association with climate change (Pounds et al. 2006). Chytridiomycosis may be a threat to the Jemez Mountains Salamander because this disease is a threat to many other species of amphibians and the pathogen has been detected in the Jemez Mountains Salamander (FR 2012).

As part of a cooperative study with the New Mexico Department of Game and Fish between 2007 and 2013, various amphibian species including the canyon tree frog (*Hyla arenicolor*), western chorus frog (*Pseudacris triseriata*), Woodhouse's toad (*Anaxyrus woodhousii*), tiger salamander (*Ambystoma tigrinum*), and Jemez Mountains Salamander were tested for Bd infection at LANL. To date, all sampling has been negative for Bd infection (Fresquez et al. 2013).

2.3.2 Destruction of Individual Salamanders

During periods of the year when Jemez Mountains Salamander are on the soil surface, when conditions are warm and wet (generally July to October), they are vulnerable to injury and mortality from soil-disturbing activities, including operation of heavy equipment in core habitat. They also are at risk to be found and collected by people.

3.0 AEI GENERAL DESCRIPTION FOR JEMEZ MOUNTAINS SALAMANDER

The AEI consists of two areas, a core area and a buffer area. The core habitat is defined as suitable habitat where the Jemez Mountains Salamander occurs or may occur at LANL. The core habitat consists of sections of north-facing slope that contain the required micro-habitat to support Jemez

Mountains Salamander. The buffer area is 100 m (328 ft) wide extending outward from the edge of the core area.

3.1 Method for Identifying a Jemez Mountains Salamander AEI

The first step in identifying potential Jemez Mountains Salamander at LANL was to use a GIS to model habitat. Early modeling efforts by Hathcock (2008) identified areas of potential habitat and that model was further refined. The following parameters were modeled in the GIS:

- Elevation: 7,000 ft (2,150 m) and above
- Slope: Greater than 20 degrees
- Aspect: north-facing +/- 20 degrees
- Land cover: Mixed conifer
- Land use: Undeveloped
- Modeled habitat is only selected if it is greater than five contiguous 30 × 30 m (98 × 98 ft) pixels in size

Once this habitat layer was developed, a second layer was modeled that examined the level of shade in the habitat, also known as an illumination index. Since the Jemez Mountains Salamander needs cool moist conditions, an illumination index model would further highlight areas where this habitat type may occur or further reinforce the areas selected by the GIS modeling. The illumination index describes the amount and extent of solar radiation reaching the Earth's surface at a given point. This takes into account the topography that may cast shadows. The illumination model was developed using the 5 m (16 ft) resolution digital elevation model hillshade and using the Surface toolbox in ArcToolbox (Environmental Science Research Institute, Redlands, California) using the highest height of the sun on June 21 at 1:00 pm, altitude of 74.4 and Azimuth of 178.4, when the sun would be at its maximum height. These procedures were based on work done by Reilly et al. (2009).

Once this modeling was complete, LANL biological resources SMEs performed field validation to verify the suitability of the modeled habitat. The goal was to verify that mixed conifer was still the dominant cover class in the selected area. The GIS analysis used data from a landcover map created by McKown et al. (2003). There have been changes in habitat since this landcover map was published from fire and extreme drought effects. Since LANL is on the extreme edge of Jemez Mountains Salamander lower elevational range, a key component in this part of its range is soil moisture content. During field validation, evidence of a moist mixed conifer habitat versus a dry mixed conifer habitat was noted. One of the key indicators used to delimit areas of moist versus dry mixed conifer during the field validation was the presence of white fir (Evans et al. 2011) combined with a high canopy cover.

Field validation of the model occurred in May 2013, or decisions were based on earlier field visits to the sites from other projects. Each field validation consisted of LANL biological resources SMEs walking down all of the modeled habitat polygons to look for the presence of indictor features. If a polygon of modeled habitat contained white fir, indicating a moist wet conifer type habitat, a high canopy closure, and other signs of high habitat quality such as dead logs, moss or

other areas that could be used as cover by the Jemez Mountains Salamander, then the polygon was marked for retention in the final core habitat. Polygons that did not contain the necessary habitat requirements were omitted.

After the field validation was complete, the final core habitat boundaries that LANL would recognize were hand digitized using ArcGIS (Environmental Science Research Institute, Redlands, California) by LANL biological resources SMEs in and around the validated modeled polygon and areas between polygons if appropriate. The final identified core habitat at LANL occurs on the north-facing slopes of canyons. Toward the rim of the canyon the core boundaries end where the mixed conifer ends. In the canyon bottoms the core boundary extends to the edge of the stream channel. The upstream and downstream core boundaries end where the mixed conifer ends. A buffer habitat was extended around the core to a distance of 100 m (328 ft) outward. The LANL Fenton Hill satellite facility in the Jemez Mountains off of New Mexico Highway 126 is on land leased to DOE by the Santa Fe National Forest. The entire footprint is considered to be developed core habitat for the Jemez Mountains Salamander, since proposed critical habitat is adjacent to the facility.

3.2 Location and Number of Jemez Mountains Salamander AEIs

The identified Jemez Mountains Salamander core habitats were grouped by canyon system into AEIs, which contain contiguous and noncontiguous habitat areas. The largest contiguous section of habitat at LANL is in Los Alamos Canyon. There are two noncontiguous areas of habitat in Two-mile Canyon, four in Pajarito Canyon, one contiguous area in Cañon de Valle, and the entire Fenton Hill facility.

4.0 AEI MANAGEMENT

4.1 Overview

This AEI management section provides guidelines for LANL operations to reduce or eliminate the threats to the Jemez Mountains Salamander from habitat alterations that reduce habitat quality. Habitat alterations are considered for all AEIs and for both core and buffer areas. Developed areas that have ongoing baseline levels of activities and are not suitable habitat for Jemez Mountains Salamander have different restrictions than undeveloped core or buffer areas. AEIs for different species may overlap, and an activity must meet the guidelines of all applicable site plans to be allowable. Protective measures are described as management practices that should be followed when working in AEIs.

4.2 Definition and Role of Occupancy in AEI Management

Occupancy simply refers to whether or not an AEI is occupied by the Jemez Mountains Salamander. The Los Alamos Canyon AEI is known to be occupied based on past surveys. Surveys for the Jemez Mountains Salamander are known to have a very low detection rate for occupied areas, so at LANL all AEIs are assumed to be occupied at all times. If needed, site-specific surveys will be conducted by federally permitted LANL biological resources SMEs.

4.3 Definition and Role of Developed Areas in AEI Management

Developed areas include all building structures, paved roads, improved gravel roads, and paved and unpaved parking lots. The majority of Jemez Mountains Salamander core habitat is in undeveloped areas, except for the satellite facility at Fenton Hill and a small amount of habitat in Los Alamos Canyon where West Road crosses the habitat. Generally, developed areas will not have restrictions; however, some of the undeveloped sections within the footprint of Fenton Hill may have restrictions because they may contain Jemez Mountains Salamanders when they move to the surface between July and October. Any project that occurs within developed core habitat will be evaluated by LANL biological resources SMEs for ESA compliance.

4.4 General Description of Core and Buffer Areas and Allowable Area Development

The purpose of buffer areas is to protect core areas from habitat degradation. The current levels of development in buffer and core areas represent baseline conditions for this site plan. No further development is allowed in the core area under the guidelines of this site plan. Any development in a buffer area will be reviewed by LANL biological resources SMEs to ensure that there are no impacts to the core habitat.

4.5 Emergency Actions

If safety and/or property are immediately threatened by something occurring within an AEI (for example, wildfire, water line breakage, etc.) please contact a LANL biological resources SME (1-505-665-3366) as soon as possible. If the emergency occurs outside of regular business hours, contact the Emergency Management Office (1-505-667-6211). This office will then communicate with the appropriate LANL personnel.

4.6 Introduction to AEI Management Guidelines

Section 4.7 provides the guidelines for habitat alterations and allowable activities in AEI core and buffer areas. It describes what and where habitat alterations are allowed under the guidelines of this site plan. If an activity does not meet the restrictions given in the guidelines, the activity must be individually reviewed for ESA compliance. This site plan only provides guidelines for the Jemez Mountains Salamander AEIs. If an activity is desired in an area with overlapping AEIs, all applicable site plans must be consulted. AEI maps show the location of all AEIs in an area. LANL biological resources SMEs are always available to help interpret site plans and answer questions (http://int.lanl.gov/environment/bio/controls/index.shtml).

4.7 Definition of and Restrictions on Habitat Alterations

4.7.1 Definition of Habitat Alterations

Habitat alteration includes any action that alters the soil structure, vegetative components necessary to the species, water quality, or hydrology in undeveloped areas of an AEI. An actual activity may take place outside of the AEI and will be considered habitat alteration if consequences of the activity have effects inside the AEI core. Habitat alterations would also include soil pits for soil samples deeper than 15 cm (6 in) using either hand or mechanized augers. Any activity that might disturb the soil will need to be reviewed by LANL biological resources SMEs.

The habitat components most important to the Jemez Mountains Salamander include soil structure and vegetative structure. The forest structure within an area designated as a Jemez Mountains Salamander AEI is important because it provides the necessary moist, cool microclimate.

4.7.2 Fuels Management Practices to Reduce Wildfire Risk

One of the primary threats to the Jemez Mountains Salamander is wildfire (FR 2012), but they also require habitat with a high canopy cover which makes fuels reduction challenging. Within undeveloped core areas, thinning trees to a level of 80 percent canopy cover or higher is approved. Trees may not be thinned below 80 percent canopy cover without further ESA review by LANL biological resources SMEs. Large logs on the ground should be left in place and not chipped. Understory thinning that does not reduce total canopy cover below 80 percent is permitted. Large trees that are felled should be left as large logs on the ground. Smaller trees and understory shrubs that may be thinned should be dispersed and left on-site to aid in soil moisture retention. Thinning activities should not occur during the rainy season between July to October (or when freezing temperatures begin, whichever comes first) when the Jemez Mountains Salamander is found on the surface.

In buffer areas, thinning of trees can occur to the current LANL-approved prescription level (LAAO 2000). LANL biological resources SMEs are available to provide guidance and mark trees for thinning (http://int.lanl.gov/environment/bio/controls/index.shtml).

4.7.3 Utility Corridors

Habitat alterations such as cutting down trees that threaten power lines are allowed within 8 m (26 ft) of either side of an existing electrical utility line at LANL under existing guidelines and engineering controls (Hathcock 2013). This level is approved in all areas of an AEI. New utility lines and utility lines requiring clearance of a right-of-way greater than 16 m (52 ft) total in core habitat must be individually reviewed for ESA compliance.

4.7.4 Restrictions on Habitat Alterations

Habitat alterations other than the fuels management practices and utility corridor maintenance described above are not allowed in undeveloped core areas under the guidelines of this site plan. If a project or activity is planned that would alter habitat in an undeveloped core area, it must be individually evaluated for ESA compliance. Habitat alterations in buffer areas must be reviewed by LANL biological resources SMEs to ensure that there are no impacts to core habitat.

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Yong, W. and D.M. Finch. 1997. Migration of the willow flycatcher along the middle Rio Grande. Wilson Bulletin 109:253–68.

APPENDIX

Table A-1. The percentage of each food type found in Mexican Spotted Owl food remains at LANL

Species	Relative Abundance
Neotoma spp.	26.22
Peromyscus spp.	10.22
Microtus spp.	4.44
Gophers	4.89
Bats	5.78
Chipmunks	0.89
Rabbits	12.89
Shrews	1.33
Small Mammal	1.33
Medium Mammal	1.78
Medium Bird	8.00
Small Bird	4.89
Nocturnal Birds	0.89
Reptiles	4.89
Arthropods	11.56

Table A-2. Preliminary light measurements in ftc for Mexican Spotted Owl site plan

		Distance from Source			
	Source (street light)	5 m	10 m	15 m	20 m
ftc	3.70	2.28	1.20	0.62	0.32

Appendix J

Corrective Actions

NPDES MSGP CORRECTIVE ACTION REPORT

Name of Facility: _____**Date of Discovery:**_____

Date of Notification to ENV-RCRA:_____

Responsible FOD (Name & Org):_____

Describe Specific Evaluation Location:_____

Was This Issue Corrected on the Spot?_____

Were Any Corrective Actions Initiated or Completed? (Yes or No w/ explanation):_____

_____

Name of Inspector (name, org, email): _____

D. CORRECTIVE ACTIONS				
Complete this page for each specific condition requiring a corrective action or a review determining that no corrective action is needed. Copy this page for additional corrective actions or reviews.				
Include both corrective actions that have been initiated or completed since the last annual report, and future corrective actions needed to address problems identified in this comprehensive stormwater inspection. Include an update on any outstanding corrective actions that had not been completed at the time of your previous annual report.				
1. Corrective Action #	1	of	?	for this reporting period.
2. Is this corrective action:				
☐ An update on a corrective action from a previous annual report; or				
☐ A new corrective action?				
3. Identify the condition(s) triggering the need for this review:				
☐ Unauthorized release or discharge (e.g., spill, leak or discharge of non-stormwater) (Section 3.1)				
☐ Numeric effluent limitation exceedance				
☐ Control measures (BMPs or other method) inadequate to meet applicable water quality standards (Section 2)				

☐ Control measures (BMPs or other method) inadequate to meet non-numeric effluent limitations (Section 2)			
☐ Control measures (BMPs or other method) not properly operated or maintained (Section 2)			
☐ Change in facility operations necessitated change in control measures (Section 3.2)			
☐ Average benchmark value exceedance (Section 3.2)			
☐ Other (describe): _____			
4. Briefly describe the nature of the problem identified:			
5. Date problem identified:			
6. How problem was identified:			
☐ Comprehensive site inspection			
☐ Quarterly visual assessment			
☐ Routine facility inspection			
☐ Benchmark monitoring			
☐ Notification by EPA or State or local authorities			
☐ Other (describe): _____			
7. Description of corrective action(s) taken or to be taken to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analyses to be conducted, etc.) or if no modifications are needed, basis for that determination:			
8. Will corrective action be completed prior to the next anticipated storm event? Yes/No. If no, list necessary BMPs to be put in place.			
9. Did/will this corrective action require modification of your SWPPP? YES/NO			
10. Date corrective action initiated:			Pending
11. Date correction action completed:	mm/dd/yyyyy	or expected to be completed:	mm/dd/yyyyy

12. If corrective action not yet completed, provide the status of corrective action at the time of the comprehensive site inspection and describe any remaining steps(including timeframes associated with each step) necessary to complete corrective action:

Appendix K

Referenced Documents

This tool cannot establish new requirements; it may only summarize the requirements in federal or state statutes/regulations, DOE Orders, and authorized Laboratory policies.

TO REPORT ERRORS Call 7-6259

This tool summarizes the waste management requirements in 40 CFR Part 266.80.

LEAD ACID/GEL CELL BATTERIES MANAGED BY SALVAGE AS RECYLABLE MATERIAL

Definitions

Battery means a device consisting of one or more electrically connected electrochemical cells that are designed to receive, store, and deliver electric energy. An electrochemical cell is a system consisting of an anode, cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy. The term “battery: also includes an intact, unbroken battery from which the electrolyte has been removed.

Lead Acid Batteries (e.g., automobile batteries) have a core of elemental lead that uses a liquid acid electrolyte. Acid-based batteries often use sulphuric acid as the major component of the electrolyte. These batteries are hazardous wastes that are characteristic for lead and corrosivity.

Gel Cell Batteries are sealed lead acid batteries. A gel cell battery's electrolyte is in a gelatin form and is absorbed into the plates. The battery is then sealed with epoxy. These batteries are hazardous wastes that are characteristic for lead.

General Requirements

Lead Acid/Gel Cell batteries that have no radioactive or chemical contamination should be recycled. Lead Acid/Gel Cell batteries intended for recycling may be managed through salvage. This service is free, but the generator is responsible for correctly packaging and labeling the waste for transport. These batteries may also be managed as Universal Waste (40 CFR Part 273), covered under Lead Acid/Gel-Cell Universal Waste ADESH-Tool 401.

Remove batteries from equipment. Reuse if possible. If they cannot be reused,

- Segregate lead acid/gel cell batteries from other batteries and other materials.
- Ensure that each battery cell is not breached and that it remains intact and closed. If the cell is breached it needs to be placed in a closed plastic container.
- Although it is not recommended, electrolyte may be removed from batteries. Cells that are opened to remove electrolyte must be immediately closed after fluid removal. The electrolyte and other solid waste generated as a result of this process will be newly generated and must be characterized. If hazardous, it must be managed as a hazardous waste (see the Hazardous Waste ADESH-Tool 206).

Generator Training

See Waste Management Procedure P409, Section 6.0.

Characterization

Characterization, other than determining the batteries are lead acid or gel cell and is not radioactive or contaminated with other hazardous wastes, is not required. No Waste Stream Profile is required.

Storage

Store in an area protected from weather. Do not store individual batteries for more than a year.

Labeling

Mark and label lead acid and gel cell batteries as follows:

- Label the outside of the box, pail, or completely wrapped batteries on pallet containing lead acid or gel cell batteries with a 4”x 4” DOT Class 8 corrosive label.
- Mark the outside of all containers or pallets of lead acid or gel cell batteries with the words “ Batteries for Recycle”
- Prior to pickup by Salvage, mark the outside of the of containers or the pallet of
    - lead acid batteries with the words **Batteries wet, filled with acid, UN2794, (Lead-Acid Batteries)**
    - gel cell batteries with the words **Batteries wet, non-spillable, electric storage, UN2800, (Gel Cell Batteries)**

Packaging

Under Department of Transportation regulations (49 CFR 173.159), these batteries are considered “wet” and the generator or Waste Management Coordinator (WMC) , not salvage, must package them as follows:

- Package gel cell batteries separately from lead acid batteries.
- All batteries must be wrapped in a manner to contain any possible/potential leaks.
- Wrap weather-sensitive containers such as fiberboard or cardboard in plastic to protect from the elements. Ensure the plastic wrap will contain potential leaks.
- Protect the batteries against short circuits.
- In any packaging configuration, the batteries cannot be stacked so that the posts of any battery are supporting weight of another battery.
- Do not package batteries in metal containers.
- If one of the following types of “specification” containers is used, the weight of packed batteries must not exceed the maximum allowable by the specification package:

1. 4C1, 4C2, 4D, or 4F wooden boxes.
2. 4G fiberboard boxes.
3. 1D plywood drums.
4. 1G fiber drums
5. 1H2 and 3H2 plastic drums and jerricans.
6. 4H2 plastic boxes.

- If packaged in "non-specification" containers, the following requirements apply:

Number of Batteries	Maximum Weight of Each Battery (lbs)	Type of Container[1]	Total Weight of Batteries and Container (pounds)
1-3	25	Boxes	75
1-4	15	Cushioned in fiberboard or wooden boxes	65
1-5	10	Cushioned in fiberboard or wooden boxes	65
Other		On a pallet, batteries wrapped completely with plastic	1000 pounds of batteries per pallet but not to exceed 1.5 times the width of pallet

If none of the packaging options described above is appropriate for your battery type, contact your WMC.

Shipping

- Complete the generator section of a Lead Acid Battery Transfer and sign the generator certification.
- The generator should retain a copy of the transfer form at his facility for three years following pickup or delivery of the batteries.
- The original form must accompany the batteries to Salvage.
- Send an e-mail to request pick up to salvage@lanl.gov.

ENV-CP-QP-007.9	
Effective Date: July 19, 2013	Next Review Date: June 19, 2015

Environment, Safety, Health Directorate

Environmental Protection – Compliance Programs Quality Procedure

Spill Investigations

Reviewers:

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Derivative Classifier: ☐ **Unclassified** ☒ **DUSA** ____**ENVPRO**__

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Responsible Line Manager:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-CP Group Leader	Signature on file	7/19/13

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History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	12/98	New Document.
1	06/00	Annual review, added Cerro Grande fire hazards
2	07/01	Annual review
3	06/03	Annual review
4	04/04	Annual review, changes to HCPs
5	02/07	Annual review, changes to reflect organizational restructure
6	07/08	Annual review
7	09/10	Biennial Review and revision
8	04/11	Removed prerequisites, added note re: on-call spill reporting.
9	07/13	Biennial review and revision, implemented new procedure format.

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1.0 PURPOSE

This Environmental Protection – Compliance Programs Group (ENV-CP) procedure describes processes and implements requirements for spill investigations.

2.0 SCOPE

This procedure applies to all ENV-CP staff and personnel conducting spill investigations.

2.1 HAZARD REVIEW

The work described in this procedure is field work and has a **LOW hazard** rating as documented by submittal of a completed *ENV Low Hazard Verification form* to the Quality Assurance Specialist.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- ENV-CP staff and contract personnel who perform spill response and investigation require training on this procedure.

Annual re-training to this procedure is required. Specific training requirements will be updated as needed.

The training method for this procedure is part "self-study" and part on-the-job training (OJT). The OJT training is to be conducted by a Team Leader or person designated as Subject Matter Expert (SME) by the ENV-CP Group Leader. The self-study and OJT will be documented in accordance with ENV-DO-QP-115, *Personnel Training*.

Actions specified within this procedure, unless proceeded with "should" or "may," are to be considered mandatory (i.e., "shall", "will", "must").

3.1 PREREQUISITES

- None

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records generated as a result of this procedure are to be submitted in accordance with ENV-DO-QP-110, *Records Management*.

- Field notebook documentation of the release including:
  - time and date of the release
  - time and date of ENV-CP notification
  - location of the release and from where the release occurred (equipment, etc,)
  - type of material released
  - quantity of material released
  - if an impact to a watercourse, SWMU, or PRS occurred

- time release was stopped
- any immediate mitigating actions implemented to contain or control the release

➢ Any written report and verbal notification list generated should the release be deemed reportable.

- Non-Reportable LANL Spill Report (Attachment 2)

5.0 WORK PROCESSES

Responsibility is to assure the immediate mitigation and timely notification of appropriate regulatory organizations in the event of a spill or unplanned discharge that has or may affect the environment. Work requires frequent and unscheduled site visits to any area of the Laboratory during a spill or unplanned release as support staff for the on-scene EO-EM Incident Commander.

Specific activities associated with Spill Response and Investigation:

- Respond to the spill or unplanned release site;
- Report to the On-Scene EO-EM Incident Commander and Site Safety Officer;
- Receive site safety requirements;
- Provide decision support;
- Investigate the nature and extent of the spill or unplanned release;
- Evaluate the potential environmental impact to water quality;
- Report the occurrence to the regulatory agencies, if necessary; and
- Provide support to mitigation plan and implementation.

5.1 FIELD ACTIVITY

If the spill or unplanned discharge is determined to be a non-emergency event by EO-EM response, such as a release of potable water, perform the following steps:

Step	Action
1	Perform a site visit in coordination with the Facility Operations Director designee.
2	Assess potential environmental damage.
3	Provide mitigation measures and requirements.
4	Document the event.
5	Notify regulatory agencies and DOE, if necessary.
6	Facilitate collection of samples, if necessary.

For emergency response, perform the following steps:

Step	Action
1	Report to on-scene commander and await instructions.
2	Perform a site visit in coordination with EO-EM.

3	Adhere to access requirements as developed by the EO-EM Site Safety Officer and Incident Commander.
4	Identify source and cause of release and document.
5	Provide notification and written report if necessary.
6	Facilitate collection of samples if necessary and safe to do so.

If sample collection is required, contact the following sampling personnel:

- ENV-CP
  - NPDES outfall
  - Sanitary treatment solids
  - Wastes and chemical spills (liquid, solid, hazardous)
- ADEP Corrective Actions Program
  - Surface water
  - Storm water runoff
  - Groundwater
  - Sediments

5.2 COMMUNICATION

Take a cellular phone that will transmit from the location to be visited. Also take a contact pager to receive messages.

If cellular service is unavailable, use a portable radio set to the appropriate radio frequency.

If in a secure area where cell phone use is prohibited, use the radio. Be sure to have radio checked and authorized for use within secure areas or within the boundaries of the WFO FOD or WX Division. Government-owned cellular phones, with batteries removed, may be brought into the secure area but used only if approval is given by the EO-EM Incident Commander or FOD or designee. Rules of use for Smartphones and other mobile devices (BlackBerry, iPhones, iPads) can be found on the Computing Communications webpage for mobile devices, http://int.lanl.gov/computing/communications/mobile/index.shtml.

Radio or cellular contact must be established with a designated contact prior to leaving ENV-CP and upon arrival/departure at the site in accordance with ENV-DO-QP-100, *General Field Safety*.

The Incident Commander can make special communication exceptions.

All photography at LANL must adhere to the procedure and P202-5, *Prohibited and Controlled Articles*.

Wastes generated from activities described in the procedure will be properly characterized, managed, and disposed in accordance with P409, *Waste Management*, P930-1, *LANL Waste Acceptance Criteria*, and P403, *Environmental Aspects Identification Requirement*.

5.3 FACILITY MANAGEMENT WORK CONTROL REQUIREMENTS FOR FIELD ACTIVITIES

Most field activities performed by the ENV-CP spill response personnel are impacted by facility management work control requirements. Requirements vary between the respective Facility Operations Divisions (FODs) and therefore necessitate ENV-CP response personnel to acquire FOD approval for site access in advance of starting work activities. The exception to this is in response to emergency situations as support to EO-EM staff.

Should work be required to stop/pause, reference P101-18, *Procedure for Pause/Stop Work*, for guidance.

5.4 FACILITY MANAGEMENT-SPECIFIC ACCESS REQUIREMENTS

TA-16 and TA-11 high explosives areas have specific access requirements. Access inside the security gate requires annual site-specific training. Curricula# 5243 must be assigned and all the training courses completed before arriving at TA-16.

For access to perimeter gates during normal working hours, contact MSS-UI at 665-0106.

For perimeter gates with key core MSS-UI, prior notification for after hours entry is required. Perform the following steps:

Step	Action
1	Call SOC Los Alamos at 667-4437.
2	Identify yourself to the on duty officer or attendant.
3	Provide the following information: Group, color and make of vehicle (s), which perimeter gate you are entering, and approximate time of arrival and finally, length of stay.

Failure to notify security personnel in advance could result in a security violation against the visiting Team Member.

Provide notification to SOC Los Alamos at 667-4437 when leaving area.

For access to WX areas requiring during normal working hours, perform the following steps:

- Ensure the required security clearance (Q clearance) is held, and
- Contact the FOD or designee for entry requirements.

5.4.1 CHEMISTRY METALLURGY RESEARCH FACILITY ACCESS

For access to the Chemistry Metallurgy Research Facility, perform the following:

- Must have the required Q clearance to pass the security gate.
- If access into any of the buildings is necessary, contact the FOD for an escort.
- If responding to an emergency with EO-EM, ENV-CP staff will be considered part of the EO-EM response team, met at the access gate, and escorted to the spill site.

5.4.2 TA-3-66 SIGMA FACILITY ACCESS

For access to the Sigma facility (TA-3-66), perform the following:

- For non-emergency responses, obtain prior site-specific training and authorization or contact the FOD for personnel escort.
- For emergency response with EO-EM, ENV-CP staff will be considered part of the EO-EM response team, met at the access gate, and escorted to the spill site.

5.5 REGULATORY SPILL REPORTING

If a spill is determined to be a threat to the environment or human health, regulatory and DOE notification may be necessary. Contacts and telephone numbers can be found on Attachment 1, Release Notification Phone List.

If a Spill impacts a Solid Waste Management Unit (SWMU) or Area of Concern (AOC), contact ENV-CP and ADEP Corrective Action Program for possible additional notification requirements. See Attachment 1 to this document.

If ENV Division or designated SME personnel determine after a site inspection or verbal notification that a spill is non-reportable to DOE or applicable regulatory agencies, a non-reportable spill report must be completed by appropriate facility designated personnel. See attachment 2 for the spill report form and information to be collected. Once the form has been accurately completed it can be sent to the SME at ENV-CP for required documentation.

For ENV Division designated on-call personnel, follow guidance for spill reporting as described in ENV-DO-QP-101, *Environmental Reporting Requirements for Releases or Events*.

NOTE: On-call representatives are required to follow up in writing (email is sufficient) with the spills program lead regarding all releases during their on-call schedule. If no spills are reported in off-work hours, please confirm in writing with the spills program lead at the end of your on-call schedule.

For additional information concerning spill and unplanned discharge determination and notification requirements, contact the ENV-CP Water Quality Permitting and Compliance Team Leader.

6.0 REFERENCES

None

7.0 DEFINITIONS

Field Work: Performance of Laboratory related activities in areas that are removed or isolated from an established populated base of operation (that is, where emergency support and medical assistance is not readily available.)

NPDES: National Pollutant Discharge Elimination System

EO: Emergency Operations Division

EO-EM: Emergency Management Group (A.K.A. EO-3)

PRS: Potential Release Site

SOC Los Alamos: Security contractor for Los Alamos National Laboratory

SWMU: Solid Waste Management Unit

8.0 ATTACHMENTS

Attachment 1- ENV-CP Release Notification Phone List

Attachment 2- LANL Spill Report Form

ATTACHMENT 1- ENV-CP RELEASE NOTIFICATION PHONE LIST

Los Alamos National Laboratory
ENV-CP
Release notification phone list
March 2013

Los Alamos National Laboratory

(1)	Emergency Management (EO-EM)	667-6211
(2)	ENV-ES Group Office	665-885
(3)	ENV-CP Group Office	667-0666
(4)	ENV-DO	667-2211
(5)	Central Alarm Station	667-4437
	L.A. Fire Dept. dispatch	

New Mexico Environment Department

See Web address below

(1)	NMED Emergency Hotline	827-9329
(2)	NMED Non-Emergency Hotline	476-6000
(3)	Surface Water Quality Bureau	827-0187
	Erin Trujillo	827-0418
(4)	Ground Water Quality Bureau	827-2918
	Robert George	476-3648
	Jennifer Fullem	827-2909
(5)	NMED/HWB	
	Ruth Horowitz	476-6025

U.S Environmental Protection Agency

(1)	USEPA Emergency Hotline	(214) 655-6450
	After Work Hours	(214) 655-6595
(2)	Jan Walker (214) 655-8431	

U.S. Department of Energy

(1)	Gene Turner	667-5794

State Emergency Response Commission (SERC) Notification

New Mexico State Police (Immediate Notification)	(505) 827-9126 (24-hour #)
State and Local Preparedness Bureau (Follow-up Notification)	(505) 476-9600 (daytime # only)

National Response Center

U.S. Coast Guard	1-800-424-8802

See NRC web address below for report form

New Mexico State Police

New Mexico State Police — 1-800-827-9126 (24 hr. #) or 827-9300 (dispatch, 24 hr. #)

Local Emergency Planning Committee (LEPC) LAPD

Philmont Taylor — (505) 663-3511

On Call Environmental Contact for Releases
Group Representatives for Notifications to External Agencies

Name	Group	Work Phone	Pager	Cellular Phone	Email address
Jake Meadows	ENV-CP	606-0185	664-1333	231-0460	jmeadows@lanl.gov
Mike Saladen	ENV-CP	665-6085	664-4226	699-1284	saladen@lanl.gov
Mark Haagenstad	WM-WMP	665-2014	664-5356	699-1733	mph@lanl.gov
Tim Zimmerly	ENV-CP	664-0105	699-7621	664-1237	tzimmer@lanl.gov
Terrill Lemke	ENV-CP	665-2397	664-7082	699-0725	tlemke@lanl.gov

Web addresses:
NMED home page http://www.nmenv.state.nm.us
National Response Center home page http:/www.nrc.uscg.mil/nrchp.html
Reportable Quantities web page http://homer.ornl.gov/rq/

ATTACHMENT 2- LANL SPILL REPORT FORM

LANL SPILL REPORT

Environmental Protection Division (ENV)
Compliance Programs Group (CP)
Los Alamos National Laboratory

Spill Coordinator	Telephone	Mail Stop	Division	Group
Responsible Facility/User Group				
Contact Person	Telephone	Mail Stop	Pager #	

Spill Location	Date of Spill	Time of Spill	Date Discovered	Time Discovered
Date Spill Stopped	Time Spill Stopped	Method used to Stop Spill		

Actions taken to Mitigate Damage

Nearest Water Course Affected? ☐ Yes ☐No ☐ NA *(If yes, please describe.)*

Source and Cause of Spill *(pipeline, tank, truck, overflow, etc.)*

Materials Spilled

Estimated Amount of Material Spilled

Cleanup Started? ☐ Yes ☐ No	Date Started	Time Started	
Cleanup Finished? ☐ Yes ☐ No	Date Finished	Time Finished	

Cleanup Method

Weather Conditions

Comments

Estimate the quantity of waste generated by the spill cleanup procedures, how that waste is packaged and the current disposition of wastes.
Describe any sampling performed during spill cleanup and attach analytical results to this form.
Describe current status of the spill site and the need for further cleanup or monitoring activities.
Describe actions taken to prevent recurrence of such a spill.
Injuries or Exposure? ☐ Yes ☐ No *(If yes, please describe.)*

Did evacuation occur? ☐ Yes ☐ No	Were facilities or equipment damaged? ☐ Yes ☐ No
Did fire/explosion occur? ☐ Yes ☐ No	Was there a potential for fire/explosion? ☐ Yes ☐ No

Did the spill enter sewer drains, streams, or stream beds? ☐ Yes ☐ No *(If yes, give location and ultimate drainage.)*
Who discovered the Spill?

Spill Information

Describe the spill response, in chronological order. Include a call-out response personnel, steps taken to contain the spill, and steps taken to clean it up. Also describe spill control equipment used.

Additional Information

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

Name of certifying official:	Title:	Organization:	Date signed:

ENV-CP-QP-048.1	
Effective Date: September 5, 2013	Next Review Date: August 5, 2015

Environment, Safety, Health Directorate

Environmental Protection – Compliance Programs Quality Procedure

Processing MSGP Stormwater Samples

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ADESH-OIO, QA Specialist	Signature on file	8/28/13

Derivative Classifier: ☐ **Unclassified** ☒ **DUSA____ENVPRO_____**

Name:	Organization:	Signature:	Date:
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Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
Holly Wheeler	ENV-CP	Signature on file	8/29/13
Responsible Line Manager:	Organization:	Signature:	Date:
Michael Saladen	ENV-CP Team Lead	Signature on file	8/29/13
Responsible Line Manager:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-CP Group Leader	Signature on file	9/5/13

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History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	07/11	New Document.
1	09/13	Annual Review and Revision, new format, process change, and new organization name.

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1.0 PURPOSE

This procedure describes the process for preserving stormwater samples for shipment to an offsite analytical laboratory.

2.0 SCOPE

This procedure applies to all LANL personnel and subcontractors who conduct chemical preservation of stormwater samples either in the stormwater Laboratory located in TA-59-1 or out in the field.

2.1 HAZARD REVIEW

The work specified in this procedure is conducted in accordance with the following integrated work documents: IWDs 007, 007a, 007b, 007c, 007d, 007e, 007f, 008, 010, 010b, and 010c. Each IWD is associated with a specific FOD depending on location of sample activity. The hazard level of this procedure is **MODERATE**.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- ENV-CP staff and contract personnel who process Stormwater samples for the MSGP.

The training method for this procedure is "self-study" (reading). For ENV-CP staff, this is documented in accordance with ENV-DO-QP-115, *Personnel Training*. Other participating groups may require training documentation pursuant to local procedures.

Actions specified within this procedure, unless proceeded with "should" or "may," are to be considered mandatory (i.e., "shall", "will", "must").

3.1 PREREQUISITES

In addition to training to this procedure, the following training and data systems access is also required prior to performing this procedure:

- Personnel performing this procedure will be familiar with the most recent version of the ENV-CP MSGP Sampling and Analysis Plan.
- WES-EDA-QP-219, *Sample Control and Field Documentation*
- ENV-RCRA-QP-022, *MSGP Stormwater Corrective Action*

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records are generated as a result of this procedure and are maintained in accordance with ENV-DO-QP-110, *Records Management Program* with the originals on file at ENV-CP records room:

- Copy of the Sample Collection Log/Field Chain of Custody Form

5.0 WORK PROCESSES

The Environmental Protection Agency (EPA) issued the National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit (MSGP) on September 29, 2008. The MSGP requires LANL to monitor stormwater runoff from industrial sites relative to potential pollutants.

Stormwater samples are collected in the field either from refrigerated Avalanche™ or ISCO 3700™ automated samplers. Chemical preservation is conducted in the Stormwater Laboratory (in TA-59-01) immediately following sample collection or in the field.

A LANL Project Leader is the primary person responsible for the steps in this procedure.

The following equipment and tools are required:

- Copy of this procedure
- Copy of Integrated Work Documents (IWDs)
- Copy of the ENV-CP MSGP Sampling and Analysis Plan
- Work Orders (if issued)
- Sample Collection Log/Field Chain of Custody Form (provided by the Sample Management Office (SMO)
- Sample containers
- Sample container labels
- Necessary keys
- Safety glasses with side shields
- Nitrile gloves
- Leather gloves or equivalent work gloves
- Glass and poly bottles appropriate for samples to be collected at the site (reference sampling plan)
- Preservative
- Lids for bottles
- Teflon tubing for intake
- Tygon tubing for exhaust

5.1 PROCESSING SAMPLES

Step	Action
1	Obtain required Sample Collection Log/Field Chain of Custody Form(s) from the SMO. Collect samples and deliver them to the Water Laboratory in coolers containing Blue Ice®.
2	Double check to make sure the Location ID on the Sample Collection Log/Field Chain of Custody Form matches the sample collection station number. If preservation beyond ice is indicated on the form, obtain required preservative and sample containers for identified volume if different from the amount of sample collected. **NOTE:** Specific preservatives and required sample volumes are listed on the Sample Collection Log/Field Chain of Custody Form.
3	Process only one sample set (i.e., samples from one site) at a time. **NOTE:** Sample collection bottles are the bottles used to collect the sample in the field. Sample containers are containers/bottles that the original sample is transferred to after processing. These

	containers are transferred to the Sample Management Office for shipment to the analytical laboratory.
4	Affix appropriate label to sample container.
5	Split up samples into appropriate sample containers.
6	Verify that the sample ID number on the container label matches the sample ID number on the Sample Collection Log/Filed Chain of Custody Form

The following steps should be followed when preserving samples:

Step	Action
1	**IMPORTANT:** Preservation entails the addition of acid or base to a sample. Acids used include hydrochloric acid (HCl), nitric acid (HNO_3), and sulfuric acid (H_2SO_4). Bases used in preservation include sodium hydroxide (NaOH). These are all strong acids and bases that can cause severe burns. Extreme care should be taken when using these acids and bases.
2	Preserve (add acid or base) samples according to the requirements on the Sample Collection Log/Field Chain of Custody Form. **NOTE:** Make sure the pre-measured preservative labeled size matches the sample container size. If you only have one size pre-measured preservative that does not match the sample container size you may need to use more than one. For example, if you have a 1 liter sample container and 500 ml pre-measured preservative vial, you would need to add two preservative vials to the sample container.
3	Mark each container after preservative has been added to designate that the process has taken place.
4	Securely affix lid to sample container. Clean and dry the exterior of sample container, ensure lid is on securely, and check sample container for leakage and breakage.
5	Apply chain-of-custody tape around the mouth and lid of the bottle.
6	Carefully place sample containers in the cooler and package sample containers with Blue Ice®.

5.2 SUBMIT SAMPLES FOR SHIPPING

Submit samples with original Sample Collection Log/Field Chain of Custody Form to SMO for shipping to an offsite analytical laboratory. The person delivering the sample to SMO relinquishes the sample by signing, dating and recording the time under “Relinquished By.” The SMO accepts samples by signing, dating and recording the time under “Received By.” Obtain a signed copy of the Sample Collection Log/Field Chain of Custody Form from the SMO. Make a copy of the Sample Collection Log/Field Chain of Custody Form and provide it to the MSGP Project Leader.

Every attempt will be made to minimize the amount of waste generated. Field personnel will diligently collect only the volumes identified as the minimum or maximum allowable identified on Form. If there is not enough liquid collected to meet these volumes, the Stormwater will be

discharged at the sampler location. Extra Stormwater collected will also be discharged at the sampler location. If waste is generated, contact the Waste Management Coordinator for TA-59-1 or the MSGP Project Leader.

5.3 DATA QUALITY OBJECTIVES

The 2008 MSGP permit requires quarterly and annual Stormwater monitoring to determine if pollutants from industrial activities are migrating into U.S. waters. The permit specifies benchmark parameters that are indicators of potential pollutant sources. In addition, certain impaired water quality standards must be met. Factors which must be considered in making the decision of whether pollutant sources are present or water quality standards have been exceeded are analytical data quality and whether the collected sample is representative of the permitted discharge.

To determine whether the Laboratory is in compliance with all relevant laws and regulations, sample collection and analytical data must be evaluated by the a representatives of ADESH, Operations and Integration Office (OIO) by requesting formal focused validation and/or by the MSGP Project Leader.

Sample collection and submission is conducted under the guidelines found in:

- NPDES Permit Tracking No. NMR05GB21
- 40 CFR Subpart 136 Guidelines establishing the test procedure for the analysis of pollutants.

Sample analysis must use EPA approved methods as set forth in the NPDES permit.

Benchmark levels are identified in the 2008 MSGP. Outfall and sampling locations are identified in the individual facility Stormwater Pollution Prevention Plans (SWPPP).

Monitoring frequencies and reporting requirements are specified in the 2008 MSGP.

<u>Sampling location(s)</u>:

Annual, quarterly, and visual assessments shall be conducted in compliance with the monitoring requirements specified in the 2008 MSGP. As specified previously, specific sampling location(s) are identified in the facility specific SWPPP.

<u>Grab Sample</u>:

A minimum of one grab sample from a discharge resulting from a measurable storm event is required. Samples must be collected within the first 30 minutes of a measurable storm event. If that is not possible, the sample must be collected as soon as practicable after the first 30 minutes and documentation must be kept with the SWPPP explaining why it was not possible to take samples within the required time frame. In the case of snowmelt, samples must be taken during a period with a measurable discharge.

NOTE: A grab sample is defined as a single sample collected at a NPDES outfall (using approved EPA methods) at a particular time that represents the composition of the stormwater at that time and place.

Representative Sampling:

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

MSGP Discharge Monitoring Reports and Other Reports (MDMRS):

Monitoring results must be reported on an MDMR form (EPA Form No. 2040-0004) in accordance with the "Instructions for Completing the MSGP Industrial Discharge Monitoring Report" provided on the form. The permittee shall submit the original MDMR signed and certified to EPA as required by Part 7.1 of the MSGP.

Duty to Comply:

The permittee must comply with all conditions of the 2008 MSGP permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action.

5.4 DEVELOP A DECISION RULE

If analytical results from monitoring activities are above benchmark and/or natural background levels, a corrective action is entered into the ENV-CP Corrective Action Report Database, in accordance with ENV-RCRA-QP-022, *MSGP Stormwater Corrective Actions*. An e-mail is automatically generated and sent to personnel responsible for evaluating and modifying controls to prevent further exceedances. Data validation is conducted under the guidelines of the DOE Statement of Work.

Acceptable analytical error is addressed in the DOE Statement of Work.

The current MSGP monitoring program is based on the 2008 MSGP. Activities that could affect the current or next MSGP permit include:

- Addition or removal of constituents into the 303(b) list,
- Discontinued monitoring based on no detection or constituent levels below benchmark or natural background,
- Specific changes identified by EPA within the next permit,
- DOE Statement of Work requirement for analytical laboratories.

6.0 REFERENCES

None

7.0 DEFINITIONS

None

8.0 ATTACHMENTS

Attachment 1- Example Sample Collection Log/Field Chain of Custody Form

Attachment 2- Sample Container Labels

ATTACHMENT 1- SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY FORM

Los Alamos National Laboratory

Page 1 of 1

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4179 **EVENT NAME:** MSGP - 2013

SAMPLE ID: WTMSGP-13-29841 **WORK ORDER:**

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
DATE COLLECTED (MM/DD/YYYY):		08/18/13	FIELD MATRIX:	WT	OK
TIME COLLECTED (HH:MM):		1334	MEDIA:		
PRS ID:		OK	SAMPLE TECH CODE:	APS	
LOCATION ID:	03-0038W		FIELD PREP:	UF	
LOCATION TYPE:			FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	COMP	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
	MSGP-Zn	1 LITER POLY	1	HNO3	Y	

SAMPLE COMMENTS:

Q3

LOCATION COMMENTS:

FIELD PARAMETERS:

COLLECTED BY (PRINT) MARWIN SHENDO

RELINQUISHED BY (Printed Name) Marwin Shendo (Signature) MSL	Date/Time 8/22/13 11:45	RECEIVED BY (Printed Name) S. Sherwood (Signature) Sherrin Sherwood	Date/Time 8/22/13 11:45
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 08/01/2013

COPY

ATTACHMENT 2- SAMPLE CONTAINER LABELS

AVERY® 5523™ 1-800-GO-AVERY (462-8379) www.avery.com

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29856	
Container: 1 LITER POLY	1 of 1
Preservative: HNO3	
Analysis: Ag+As+Cd+Mg+Pb+Se+Hg	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29856	
Container: 0.5 LITER POLY	1 of 1
Preservative: NAOH	
Analysis: MSGP-CN(TOTAL)	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29856	
Container: 0.5 LITER POLY	1 of 1
Preservative: H2SO4	
Analysis: MSGP-COD	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29856	
Container: 0.5 LITER POLY	1 of 1
Preservative: H2SO4	
Analysis: MSGP-NH3-N	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29858	
Container: 1 LITER POLY	1 of 1
Preservative: HNO3	
Analysis: MSGP-GrossA	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29858	
Container: 1 LITER GLASS	1 of 3
Preservative: ICE	
Analysis: MSGP-PCB(Aroclor)	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29858	
Container: 1 LITER GLASS	2 of 3
Preservative: ICE	
Analysis: MSGP-PCB(Aroclor)	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29858	
Container: 1 LITER GLASS	3 of 3
Preservative: ICE	
Analysis: MSGP-PCB(Aroclor)	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29859	
Container: 1 LITER POLY	1 of 1
Preservative: HNO3	
Analysis: Ag+As+Cd+Mg+Pb+Se+Hg	
Date:	Time:

Los Alamos National Laboratory	
Sample ID: WTMSGP-13-29859	
Container: 0.5 LITER POLY	1 of 1
Preservative: NAOH	
Analysis: MSGP-CN(TOTAL)	
Date:	Time:

Use template for 5163™ Weatherproof Laser Labels

ENV-CP-QAPP-MSGP, R5	
Effective Date: 11/04/2013	Next Review Date: 11/04/2015

Environment, Safety, Health Directorate

Environmental Protection Division – Compliance Programs Group

Quality Assurance Project Plan

Stormwater Multi-Sector General Permit for Industrial Activities Program

Reviewers:

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Derivative Classifier: ☐ **Unclassified** ☒ **DUSA** **ENVPRO**

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Users are responsible for ensuring they work to the latest approved version.

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
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1	12/05	Annual review and revision
2	07/07	Annual review, incorporated organizational restructure changes.
3	07/09	Biennial Review and Revision
4	07/09	Biennial Review and Revision
5	10/13	Biennial Review and Revision. New format implemented.

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1.0 QUALITY PROGRAM

LANL will comply with the monitoring requirements as specified by the 2008 National Pollutant Discharge Elimination System (NPDES) Stormwater Multi-Sector General Permit for Industrial Activities. Compliance will be demonstrated through the successful implementation of this project plan and applicable procedures.

Los Alamos National Laboratory (the Laboratory) has established a comprehensive stormwater program for its industrial activities. Historically, the Laboratory operated under the NPDES Baseline General Permit and then under the NPDES 1995, 2000, and 2008 Multi-Sector General Permits. The Laboratory submitted its NOI for 2008 coverage in December 2008.

The 2008 MSGP was issued on September 22, 2008 and became effective on September 29, 2008.

The purpose of this project plan is to ensure compliance with the following:

- 2008 NPDES Multi-Sector General Permit (MSGP) and the Clean Water Act (CWA)
- DOE Order 450.1, *Environmental Protection Program*, and DOE Order 5400.5, *Radiation Protection of the Public and Environment*, which establish environmental protection program policies, requirements, and responsibilities

The Environmental Protection, Environmental Compliance Programs (ENV-CP) Water Quality Team has been tasked with overseeing institutional stormwater compliance related activities at the Laboratory.

1.1 QUALITY PROGRAM PURPOSE

This Quality Assurance Project Plan (QAPP) describes the policies and requirements that ensure MSGP activities are conducted in a consistent, agreed-upon manner.

This QA Project Plan describes the policies and requirements that ensure the MSGP processes are conducted in a consistent, agreed-upon manner. Drivers for the quality plan include:

- DOE Order 414.1C, *Quality Assurance*
- SD330, *LANL Quality Assurance Program*

This QA Project Plan (QAPP), including implementing procedures, is a sub-tier document to the SD330, *LANL Quality Assurance Program*. The following documents provide requirements to ensure that the MSGP Program is operated in accordance with established plans and procedures:

- SD330, *LANL Quality Assurance Program*
- QA Project Plan for the MSGP (this document)
- Implementing procedures

1.2 ORGANIZATION

ENV-CP is responsible for compliance oversight of the Laboratory's MSGP coverage. The Group is organized by teams under the line management direction of the Group Leader. Teams are cross-functional and focus on specific Laboratory water quality responsibilities, deliverables, or

products. Teams are guided by Team Leaders who have the responsibility to assure the program is completed and properly implemented.

The Team Leader coordinates the project and reports to the ENV-CP Group Leader. The Project Lead implements program oversight, coordinates contractor efforts (if there are any), and reports to the Team Leader. A QA Specialist is assigned to work for the Team Leader to provide quality assurance assistance, advice, and review. In addition, representatives from other groups may participate and contribute to this team as subject matter experts for project activities. The project organization is shown in Attachment 1.

Applicable regulatory drivers include the following:

- Clean Water Act (CWA)
- 2008 NPDES Multi-Sector General Permit (MSGP)
- DOE Order 450.1, *Environmental Protection Program*
- DOE Order 5400.5, *Radiation Protection of Public and Environment*
- P401, *Procedure to Identify, Communicate, and Implement Environmental Requirements*

1.3 RESPONSIBILITIES

The following table lists specific responsibilities:

Who	What
Group Leader	Assure that qualified staff complies with regulatory requirements associated with the MSGP.
Project Lead	Ensure that MSGP-related activities are performed in accordance with the requirements specified in this plan.
ENV-CP Staff	Perform MSGP-related activities as assigned by the Team Leader or Project Leader

2.0 PERSONNEL DEVELOPMENT

Qualified team members will be hired and trained as prescribed in ENV-DO-QP-115, *Personnel Training*. Minimum training requirements for ENV personnel are described in the ENV Division Qualification Standards. The LANL Human Resources Division maintains documentation of education qualification. Required MSGP qualifications and training plans are listed below.

2.1 MSGP CURRICULA

The MSGP Program requires personnel with the following training requirements:

MSGP Inspectors

Curricula 10697 ENV-RCRA MSGP Inspector
Item 43337 ENV-CP-QAPP-MSGP
Item 54892 ENV-RCRA-QP-022 MSGP Stormwater Corrective Actions

Item 42415 ENV-DO-QP-101 *Environmental Reporting Requirements for Releases or Events*
Item 42547 ENV-DO-QP-111 *Reporting Environmental Releases to Pueblo Governments*
Item 40708 ENV-DO-QP-108 *Preparation of External Correspondence for Review and Approval*
Item 43172 ENV-DO-QP-112 *Coordinating Regulatory Inspections*
Item 42891 ENV-DO-QP-113 *Tracking Issues and Actions*
Item 43805 ENV-DO-QP-114 *Logbook Use and Control*
Item 45777 ENV-DO-QP-100 *General Field Safety*

Curricula 131 Field Worker Training Requirements
Item 43562 or 3583 or 16585 CPR/AED: LANL Workplace
Item 3574 or 13264 First Aid

MSGP SWPPP Preparers

Curricula 7814 ENV-RCRA MSGP SWPPP Preparer
Item 43337 ENV-CP-QAPP-MSGP
Item 56593 ENV-RCRA-QP-044 *Preparing Storm Water Discharge Monitoring Reports (MDMRs) for the NPDES Multi-Sector General Permit*
Item 40708 ENV-DO-QP-108 *External Correspondence*
Item 43172 ENV-DO-QP-112 *Coordinating Regulatory Inspections*
Item 42891 ENV-DO-QP-113 *Tracking Issues and Actions*
Item 43805 ENV-DO-QP-114 *Logbook Use and Control*
Item 45777 ENV-DO-QP-100 *General Field Safety*

Curricula 51 ENV-RCRA Design Engineer
Item 44269, COE Review of LANL Produced Design Documents, AP-341-620
Item 44266, COE System Design Descriptions, AP-341-61
Item 44263, COE Engineering Drawings and Sketches, AP-341-608
Item 44261, COE Calculation, AP-341-605
Item 44258, COE Requirements and Criteria Document, AP-341-602
Item 44257, COE Functions & Requirements Document, AP-341-601
Item 43658, CORE Engineering Overview
Item 55428, COE Management Level Determination, AP-341-502
Item 54168, P342 Engineering Standards
Item 47029, COE LANL Review of Design by External Agencies, AP-341-622
Item 43666, Engineering Design Management
Item 43663, Engineering Technical Baseline
Item 44225, COE Evaluation of Vendor Information, AP-341-701

MSGP Visual Assessors

Curricula 10698 ENV-RCRA MSGP Visual Assessor
Item 43337 ENV-RCRA-QAPP-MSGP
Item 50493 ENV-RCRA-QP-064 *MSGP Storm Water Visual Assessments*
Item 42415 ENV-DO-QP-101 *Environmental Reporting Requirements for Releases or Events*
Item 42547 ENV-DO-QP-111 *Reporting Environmental Releases to Pueblo Governments.*
Item 40708 ENV-DO-QP-108 *External Correspondence*

Item 43172 ENV-DO-QP-112 *Coordinating Regulatory Inspections*
Item 42891 ENV-DO-QP-113 *Tracking Issues and Actions*
Item 43805 ENV-DO-QP-114 *Logbook Use and Control*
Item 45777 ENV-DO-QP-100 *General Field Safety*

Curricula 131 Field Worker Training Requirements
Item 43562 or 3583 or 16585 CPR/AED: LANL Workplace
Item 3574 or 13264 First Aid

2.2 MSGP INSPECTOR QUALIFICATIONS

Inspections:

- Post high school education or experience in engineering or environmental science or a related field; or industrial site field experience involving stormwater pollution prevention.
- 2 years experience of completing MSGP inspections or 1 year MSGP inspection experience with the Certified Inspector of Sediment and Erosion Control (CISEC) certification.
- 6 months knowledge of LANL facility operations.
- Demonstrated ability, as determined by the Multi-Sector General Permit Project Lead and/or Water Quality Team Leader, to successfully and effectively evaluate and identify the following at industrial sites:
    - Conditions and activities that could impact stormwater quality at the facility.
    - Inadequate or ineffective BMPs.
    - Required modification or maintenance of existing BMPs.
    - Locations requiring new or additional BMPs.
    - Potential pollutant sources associated with the facility.
    - Appropriate and correct site stabilization measures.
- Demonstrated ability, as determined by the Multi-Sector General Permit Project Lead and/or Water Quality Team Leader, to evaluate the compliance status of each industrial facility and document identified issues during an inspection.
- Demonstrated ability, as determined by the Multi-Sector General Permit Project Lead and/or Water Quality Team Leader, to properly and effectively complete inspection reports, including the ability to perform the following:
    - Prepare reports in a clear, concise manner, identifying site conditions and issues.
    - Write legibly and describe conditions clearly and accurately.
    - Use proper spelling and grammar.
    - Complete the MSGP Routine Inspection Report forms accurately.
    - Accurately enter findings into the Corrective Actions Report database.

- Conduct inspections in a professional manner.
- Be a member of, or contractor supporting, ENV-RCRA or ENV Division.

2.3 MSGP SWPPP PREPARER QUALIFICATIONS

SWPPP Preparation:

One of the 2 criteria below must be satisfied:

- BS degree or experience in engineering, environmental science, or related field, with a background involving stormwater pollution prevention and regulatory compliance relating to MSGP sites and a 1 year minimum of LANL facility operations knowledge and 1 year experience of completing MSGP inspections; or
- Certified Professional in Erosion and Sediment Control (CPESC) or Professional Engineer (PE) with a demonstrated background in stormwater management, sediment and erosion control, and regulatory compliance.

In addition to:

- Demonstrated ability, as determined by the Multi-Sector General Permit Project Lead and/or Water Quality Team Leader, to:
    - Prepare SWPPPs per LANL format and in compliance with NPDES MSGP requirements.
    - Identify and specify appropriate BMPs and stabilization measures.
    - Identify potential pollutant sources associated with the facility.
    - Perform necessary calculations to meet regulatory requirements.
    - Prepare a site map.
    - Be a member of, or contractor supporting, ENV-CP or ENV Division.

5.4 MSGP VISUAL ASSESSOR QUALIFICATIONS

Quarterly Visual Assessments:

- Education or experience in engineering, environmental science, or a related field; or industrial site field experience involving stormwater pollution prevention; and
- Completed ENV-RCRA training on how to collect and evaluate visual assessment; and
- Demonstrated ability, as determined by the Multi-Sector General Permit Program Lead and/or Water Quality Team Leader, to:
    - Collect quarterly visual samples at the designated outfall.
    - Complete the applicable portions of the MSGP Quarterly Visual Assessment Form.
    - Have working knowledge of the regulatory requirements in Section 4.2 of the MSGP.

5.5 TRAINING RESPONSIBILITIES

All personnel performing MSGP project-related work are required to obtain appropriate training prior to performing work governed by a procedure. Training for all project personnel will be performed and documented in accordance with ENV-DO-QP-115, *Personnel Training*.

The following table lists specific responsibilities regarding training requirements.

Who	What
Group Leader	Ensure project personnel meet all Laboratory training requirements.
Program Lead	Establish and document job descriptions for each position within the MSGP Project. Ensure all project personnel have the appropriate level of education,

	experience, and training.

3.0 QUALITY IMPROVEMENT

The MSGP Project subscribes to the principles of problem prevention and continuous improvement. The Project Lead is committed to evaluating improvement opportunities identified by trending and reporting.

The Project Lead provides verbal and written updates, as needed, to the Team Leader and Group Leader to keep group management apprised of the focus of the MSGP Project activities and to address any shortcomings that may be identified.

3.1 CORRECTIVE ACTIONS WITHIN ENV-RCRA

Corrective actions for all ENV-RCRA programs and projects are initiated, tracked, corrected, and documented according to P330-6 *Nonconformance Reporting*, P322-4 *Laboratory Performance Feedback and Improvement Process*, *SD330, Los Alamos National Laboratory Quality Assurance Program*, and Division/Group procedures.

3.3 QUALITY IMPROVEMENT RESPONSIBILITIES

The following table lists specific responsibilities for quality improvement:

Who	What
Project Lead	Monitor program performance and ensure issues are corrected in a timely manner.
ENV-CP Staff	Identify opportunities for process improvement, health and safety enhancement, environmental protection, or other improvements of the program's operations. Discuss the identified opportunities with the Project Lead. Ensure issues are reported and corrected in a timely manner.

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The program lead, at least one reviewer, and the Group Leader will approve all revisions to this plan. Revisions to the plan will be provided to the QA Specialist. This plan will be reviewed and revised (if necessary) biennially.

This document will be controlled under the organization's document control system (ENV-DO-QP-106, *Document Control*). Controlled copies of ENV documents are located on the Internet: http://int.lanl.gov/orgs/env/rcra/qa.shtml, all other copies are uncontrolled.

Procedures will be developed as necessary and in accordance with ENV-DO-QP-105, *Preparation, Review, and Approval of Procedures*.

Phone calls, email, or fax communications will be documented and controlled if the content provides direction or results in decisions.

4.1 PROGRAM RECORDS

The number, type, and detail of all records to be kept will provide sufficient information to allow an individual with equivalent education and training to verify or reconstruct the results. Implementing procedures specify the records, forms, logbook entries, or other information to be kept as documentation of the performance of the procedure.

Records to be kept in the ENV-CP records system include the following:

- Copy of the Multi-Sector General Permit
- Annual Site Compliance Evaluation reports
- Corrective Action Reports
- Reports and certifications required by MSGP
- Records of all data used to complete MSGP Notice of Intent
- Discharge Monitoring Reports

Records to be kept by the Deployed Environmental Professional assigned to the FOD in which the industrial facility resides includes the following:

- Copies of Stormwater Pollution Prevention Plans
- Reports and certifications required by MSGP
- Routine Inspection Forms
- Supporting analytical data reports including Visual Assessment Forms
- Corrective Action Reports
- Discharge Monitoring Reports
    - Annual Site Compliance Evaluation reports

All ENV-CP records will be maintained and available (after the deadline for submittal as given in applicable procedures) for auditing in the records center at ENV-CP (ENV-DO-QP-110, *Records Management*). Records will be archived in compliance with Laboratory and DOE requirements for records retention, storage, and management.

4.2 PROGRAM RECORDS RESPONSIBILITIES

The following table lists specific responsibilities for program records management:

Who	What
Team Leader	Ensure QAPP meets minimum specifications for documentation and records of the SD330, *Los Alamos National Laboratory Quality Assurance Program*
Program Lead	Conduct annual review of records to ensure compliance with project requirements.

4.3 ELECTRONIC MEDIA

The project will utilize electronic means as necessary to maintain data and perform calculations on these data. Electronic means will not however replace paper copies. All records that must be maintained to meet the requirements of the Permit will be kept in hard copy as the official record.

4.4 DATABASES

Analytical data will be maintained in the LANL Water Quality Database (WQDB). Security, verification, and validation of data are maintained in accordance with LANL procedures.

Security -- ENV data will be maintained electronically in a secure manner and will be protected from loss by being maintained as part of an official dataset that is backed up at least weekly.

Verification of data -- All ENV data, either electronic or hardcopy must undergo a verification and validation process that includes the following:

Verification

- Paper deliverables match electronic data that are stored in an official dataset. Paper deliverables include:
    - chain of custody for sample data
    - field log, if applicable, for sample data
    - data packages for analytical data
    - documentation packages for supporting data (e.g., geographic information system)
- All hand-entered data have been verified by a person other than the individual performing the entry
- Electronic uploads of data (e.g., electronic data deliverables) have been spot checked (at least 10%) to ensure the upload performed as expected
- Hard copy supporting information (e.g., data packages, chains of custody, validation reports, etc.) is evaluated for completeness, archived, and available for audit

Validation --analytical data validation is the responsibility of the EP Directorate. The process will include the following:

- Validate that sample and quality assurance/quality control data and information meet contract specifications
- Assign validation flags, as appropriate
- Identify the analytical supplier
- Identify the analytical method

Verification of calculations -- A person other than the person who generated the query will review for accuracy all compliance related calculations performed in a database through queries. This review will be documented and forwarded to the appropriate record series.

Spreadsheets:
Backups -- All spreadsheets used to hold data and generate reports to be used in demonstrating compliance will be maintained in a secure location. The preferred location is on the Group server. Spreadsheets will be backed up at least weekly.

Verification of data -- All compliance-related data uploaded into a spreadsheet will be verified to be accurate against the original paper copy. Data that are uploaded through electronic means will undergo a 10% verification. Data that are uploaded through manual means will undergo a 100% verification. Someone other than the data entry person must perform the 100% review. This review will be documented and forwarded to the appropriate record series.

Verification of calculations -- A person other than the person who generated the spreadsheet will review for accuracy all compliance-related calculations performed in a spreadsheet. This review will be documented and forwarded to the appropriate record series. Modifications to the function of these spreadsheets will also be verified in this manner.

Software control -- The integrity of spreadsheets will be ensured by limiting access to these spreadsheets to only trained, authorized personnel. Additionally, at least once per year, the function of the spreadsheets will be verified by hand calculations. Documentation of this review will be forwarded to the appropriate record series.

4.4 IMPLEMENTATION RESPONSIBILITIES

The following table lists specific responsibilities:

Who	What
Program Lead	Regularly assess data integrity methods used by MSGP personnel.

5.0 PLANNING AND PERFORMING WORK

Work conducted under this program ensures compliance with the 2008 Multi-Sector General Permit; the Clean Water Act; and DOE Orders 450.1, *Environmental Protection Program*, and 5400.5, *Radiation Protection of the Public and Environment*.

Work that contributes to achieving the quality specifications of the MSGP deliverables will be planned and documented as described in this document and implementing procedures.

Work will be performed according to applicable plans and implementing procedures. The team leader will provide first line supervision of personnel assigned to project tasks to ensure work is performed to achieve project quality specifications. Before changing a work process that affects the project quality specifications, the team leader will ensure the same level of planning and review as used in the initial project planning steps.

5.1 WORK PROCESSES

All work should be regarded as a process. Each process consists of a series of actions and is planned and carried out by qualified workers using specified work processes and equipment under administrative, technical, and environmental controls established by management to achieve an end result. Workers are the best resource of contributing ideas for improving work processes and will be involved in work process design, process evaluation, and providing the feedback necessary for improvement.

All work is planned and performed using the principles of Integrated Safety Management and in compliance with P300, *Integrated Work Management for Work Activities*.

5.3 WORK PERFORMANCE

Management should ensure that the following are clearly identified and conveyed to workers prior to beginning work:

- customer and data requirements for the work and final product;
- acceptance criteria applicable to work and final product;
- hazards associated with the work;
- technical standards applicable to work and final product; and
- safety, administrative, technical, and environmental controls to be employed during the work.

The work processes used to meet the regulatory requirements and the requirements of this plan can be divided as follows:

- Stormwater Pollution Prevention Plans (Multi-Sector General Permit Section 5.0)
- Inspections (Multi-Sector General Permit Section 4.0)
- Monitoring (Multi-Sector General Permit Section 6.0)
- Discharge Monitoring Reports (Multi-Sector General Permit Section 7.1 – Reporting Monitoring Data to EPA)
- Best Management Practices (Multi-Sector General Permit Section 2.0 –Control Measures)
  - Reporting and Recordkeeping (Multi-Sector General Permit Section 7.0)

5.4 STORMWATER POLLUTION PREVENTION PLAN

Stormwater Pollution Prevention Plan (SWPPP) development and implementation by the regulated industrial facility is required for MSGP compliance (refer to Section 8.0 of the 2008 MSGP for S*ector-Specific Requirements for Industrial Activity* and Appendix D, *Sectors of Industrial Activity Covered by This Permit*). The SWPPP is intended to document the selection, design, and installation of control measures. Additional documentation requirements are intended to document the implementation (including inspection, maintenance, monitoring, and corrective

action) requirements identified in the 2008 MSGP permit. The SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that will be implemented at the specific industrial facility to minimize the discharge of pollutants in runoff from the site. These control measures include site-specific Best Management Practices (BMPs), inspections, employee training, and reporting. The procedures detailed in the SWPPP must be implemented by the facility and updated as necessary, with a copy of the SWPPP kept on-site.

The SWPPP development process involves evaluating regulated industrial activities and requiring Facility Management support in implementation, improvement, and revision of the Plans.

5.4.1 DISCHARGE MONITORING REPORTS

The Laboratory is required to submit analytical results of stormwater monitoring and to keep the results with the facility specific SWPPP. The Laboratory must certify and submit analytical monitoring results obtained from each facility specific sampling location (i.e., the sampling station located at the monitored outfalls) associated with industrial activity on a Discharge Monitoring Report (DMR) form or use it to report any of the following:

- no discharge for all outfalls for a specific monitoring period;
- the industrial facility status has changed to inactive and unstaffed;
- the facility status has changed to active; or
- no further pollutant reductions are achievable for all outfalls and for all pollutants (see Section 6.2.1.2 of the 2008 MSGP).

5.4.2 ANNUAL SITE COMPLIANCE EVALUATION REPORT

The Laboratory is required to submit an annual report (Attachment 2) to the Environmental Protection Agency (EPA) that includes the findings from the comprehensive site inspection and any corrective action documentation. The documentation must include the following:

- identification of the condition triggering the need for corrective action review;
- date and description of the problem identified;
- summary of the corrective action taken or to be taken;
- notice of whether SWPPP modifications are required as a result of the discovery or corrective action;
- date corrective action was initiated; and
- date corrective action was completed or is expected to be completed.

The following table lists responsibilities:

Who	What
Project Lead	Ensure that SWPPP requirements are performed in accordance with the MSGP.

Facility Management Support	Implement SWPPP requirements as recommended by the Project Lead.
ENV-CP Staff and Deployed Environmental Professionals (DEPs)	Assure SWPPP implementation as required by MSGP.
DEPs	Develop, modify, and update SWPPPs and assist facility personnel with SWPPP implementation.

5.5 INSPECTIONS

The MSGP requires periodic inspection of industrial processes and maintenance of (BMPs) to assure effectiveness of control measures. The Laboratory has implemented a quarterly or monthly inspection process (depending on the industrial facility) to support this determination. A copy of the Routine Inspection Form is provided in Attachment 3.

5.6 STORMWATER MONITORING

Benchmark stormwater monitoring is the required mechanism for determining the effectiveness of corrective actions and meeting the requirements of the MSGP. Refer to Attachment 4, *MSGP Facilities and Stormwater Monitored Outfalls Associated with Industrial Activity 2011***,** for a list of Laboratory sites that have monitoring requirements. Laboratory management has made an investment in time and materials, in addition to a commitment to comply with the 2008 MSGP Permit. All stormwater monitoring is conducted by ENV-CRP personnel. The MSGP Project currently has a network of 23 monitoring stations. Considerations to be used for MSGP stormwater monitoring development decisions will include MSGP requirements, new state water quality standards, Administrative Authority requests, or new permit requirements. Stormwater monitoring will be conducted as specified in the MSGP.

Effluent Limitations stormwater monitoring is required for the following type of facility of LANL:

Regulated Activity	**Parameter**	**Effluent Limit**	**Monitoring Frequency**	**Sample Type**
Discharges from asphalt emulsion facilities	Total Suspended Solids	23.0 mg/L daily max. 15.0 mg/L, 30-day avg.	1/year	grab
	pH	6.0-9.0 s.u.	1/year	grab
	Oil and Grease	10.0 mg/L 30-day avg.	1/year	grab

This determination was made in accordance with Section 1.1.2.4 of the MSGP. The TA-60 Asphalt Batch Plant meets the criteria for effluent limitations monitoring in this section. Exceedances of the effluent limits in this table require immediate action. In addition, if follow-up monitoring after corrective actions also exceeds an effluent limit guideline, an Exceedance Report for Numeric Effluent Limits must be submitted to EPA no later than 30 days after lab results have been received and verified.

Impaired Waters stormwater monitoring is required for discharges made to an impaired water. The canyons within and surrounding Los Alamos National Laboratory are declared as Impaired Waters by the New Mexico Environment Department. The pollutants vary from canyon to canyon and are listed in Attachment 5, *Pollutants Under Impaired Waters Monitoring.* The pollutants may be discontinued in subsequent annual monitoring if the concentration is below background levels in stormwater or if the constituent is not detected.

Visual assessments are also required by the MSGP and are an important tool for collecting information to determine the effectiveness of controls in preventing potential contaminants from migrating off Laboratory property. Accordingly, field personnel must conduct visual assessments for stormwater collected at the monitoring stations or discharged through substantially identical outfalls associated with industrial facilities located throughout the Laboratory. Information recorded will document all observations that are required by the MSGP (see ENV-RCRA-QP-064, *Multi-Sector General Permit Storm Water Visual Inspections*).

The Laboratory's MSGP permit requires stormwater quality monitoring to evaluate compliance with water quality standards and evaluation against benchmarks. Parameters sampled at the monitoring stations are selected based on permit requirements and the results of the previous year.

Four stormwater samples per year are required under the 2008 MSGP, but it is not necessary to collect them in consecutive quarters if climatic conditions that prevented quarterly collection are documented (see *Adverse Weather Conditions* in Section 6.1.5 of the MSGP). Sample locations are listed in Attachment 4, *MSGP Facilities and Stormwater Monitored Outfalls Associated with Industrial Activity 2011*, and collection will be conducted in accordance with LANL and NPDES Permit requirements and the current year MSGP Sampling and Analysis Plan.

Stormwater samples are used to demonstrate compliance with water quality standards and requirements to evaluate results against benchmark parameters (Attachments 5 and 6). Any persons involved in the preparation, retrieval, and analysis must maintain positive control of samples at all times until sample disposal. ENV-RCRA personnel will follow guidance in the Associate Directorate for Environmental Programs (ADEP) document ENV-WQH-QP-029, *Creating and Maintaining a Chain of Custody*, as well as, ENV-RCRA-QP-047, *Inspecting Storm Water Runoff Samplers and Retrieving Samples*, and ENV-RCRA-QP-048, *Processing MSGP Storm Water Samples*.

Chain of custody is maintained during:

Activity	Responsibility
Sample collection and preparation	All persons (other than analytical personnel) performing sample preparation and collection will be trained to sample collection procedures and must adhere to the chain of custody requirements therein.
Analysis	Analytical laboratories performing sample analysis will maintain sufficient procedures to ensure positive control of samples as specified in the existing Statement of Work.
Storage/ disposal	Analytical laboratories will maintain retained samples and/or sample portions under chain of custody until reanalysis, or ultimate disposal.

The LANL Sample Management Office (SMO) will be the central point for all analytical laboratory selection, evaluations, sample submittal, and data return. The SMO will evaluate potential analytical laboratories, prepare analytical statements of work that include requirements, and arrange contracts with selected laboratories for analysis of all samples. The SMO will accept samples from field collection personnel, process the sample, ship the samples to the off-site analytical laboratories, and receive the data packages from the laboratories.

All analytical data will be received from analytical laboratories in electronic format and uploaded into a database. All received data will be checked for completeness and adherence to contract requirements. After uploading, all data will undergo verification and validation (V&V) for evidence of laboratory contamination, improper analytical method, and other analytical issues which could potentially affect data quality.

Field data collected by sample collection personnel will be verified and validated by the SMO when field personnel deliver samples to the SMO.

If significant V&V issues are identified, results will be forwarded to and discussed with the responsible project leads.

Data issues that result from procedural failures, personnel errors, or other failures to follow requirements will be documented as issues and corrected according to ENV-DO-QP-113, *Tracking Issues and Actions*.

The following table lists responsibilities:

Who	What
Project Lead	Ensure that all project monitoring requirements are performed in accordance with the MSGP. Review and update the MSGP Sampling and Analysis Plan annually.

	When complete, communicate findings to the team members for implementation. Make appropriate arrangements with the SMO to accept, process, and submit samples to an analytical laboratory for required analyses as specified in the SAP.
MSGP Water Quality Compliance Personnel	• Implement monitoring program as required by the MSGP Project Lead. • Conduct stormwater sampling in accordance with the MSGP Sampling and Analysis Plan and applicable procedures. • Ensure procedures for sample handling and control during sample preparation and retrieval are followed.
Sample Management Office	• Develop Statements of Work (SOW) for all analytical laboratories that perform analytical work for the MSGP project in accordance with P840-1, *Procurement Quality*. • Ensure analytical laboratories comply with the DOE's SOW. Conduct an annual audit of the laboratory to ensure compliance with the SOW. • Approve Statements of Work for analytical laboratories that are contracted to analyze water samples. • Approve analytical laboratories that are contracted to analyze water samples for regulatory compliance purposes. • Accept samples and submit them to and approved analytical laboratory for analysis. • Track progress of samples at the analytical laboratory and resolve issues with sample analysis. • Receive data packages from the analytical laboratory and enter data into the database. • Provide the MSGP Project Lead with monthly invoice updates. • Perform V&V of field data submitted and uploaded from forms when samples are submitted to the SMO.
Operations Integration Office (OIO), Systems Integration (SI)	Perform V&V of data packages uploaded by the SMO or send data packages to a subcontractor company for independent V&V.

5.7 DISCHARGE MONITORING REPORTS

The Laboratory is required to submit analytical results of stormwater monitoring and to keep the results with the specific SWPPP. The Laboratory must submit analytical monitoring results obtained from each monitoring station associated with industrial activity on a MSGP Discharge Monitoring Report (MDMR) form (one form must be submitted for each storm event from which, a sample was collected).

MDMRs shall be written in accordance with ENV-RCRA-QP-044, *Preparing Storm Water Discharge Monitoring Reports (MDMRs) for the NPDES Multi-Sector General Permit*. MDMRs shall be submitted to EPA within 30 calendar days of receiving validated

analytical results. Refer to the DMR language under the SWPPP Section above for additional requirements.

Site analytical requirements are defined by the industrial activity in the MSGP permit. All MSGP analytes applicable to LANL are consistent with the requirements of 40 CFR Part 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants.*

Sample analytical requirements vary by site depending on the industrial activities performed at the site. Refer to Attachment 5 for a list of analytes by industrial sector. If an insufficient quantity of sample is available, then sample collection will be prioritized at that location for future events. Additional samples may be collected to meet permit requirements.

ENV-RCRA shall refer to the requirements of the 2008 Multi-Sector General Permit, and the most current MSGP Sampling and Analysis Plan to determine the priorities of required analyses.

The following table lists responsibilities:

Who	What
Project Lead	• Ensure implementing procedures for sample analyses are used. • Ensure that MDMRs are submitted to EPA and NMED in accordance with the MSGP.
MSGP Water Quality Compliance Personnel	Assure MDMRs are completed and certified as required by the MSGP and have received a full quality assurance review.

5.8 ADVERSE WEATHER CONDITIONS AND CLIMATES WITH IRREGULAR STORMWATER RUNOFF

Section 4.2.3 of the 2008 MSGP allows the industrial facility to take a substitute sample during the next qualifying storm event when adverse weather conditions prevent the collection of samples during a specific quarter. Adverse weather conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, or electrical storms, or situations that otherwise make sampling impractical, such as drought or extended frozen conditions. Documentation of the rationale for no visual assessment for the quarter must be included in the facility specific SWPPP.

Since LANL is located in an area where limited rainfall occurs during parts of the year (i.e., in a semi-arid climate) and has periods of freezing conditions, LANL has identified an alternative monitoring period of four quarters as follows for each calendar year.

- April 1-May 31

- June 1-July 31
- August 1-September 30
- October 1-November 30

The following table lists specific responsibilities.

Who	What
Project Lead	Ensure that the monitoring schedule is documented in facility specific SWPPPs and provided to EPA on the MDMRs.

5.9 REPORTING AND RECORDKEEPING

All monitoring data shall be collected in accordance with the requirements specified in the 2008 MSGP. LANL will submit monitoring results to EPA within 30 days of receiving validated laboratory results. The address for submittal of monitoring results is as follows.

U.S. Environmental Protection Agency
Office of Water, Water Permits Division
Mail Code 4203M, ATTN: MSGP Reports
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

LANL shall keep copies of the following documentation for a period of at least 3 years from the date that LANL's coverage under the MSGP expires or is terminated.

- SWPPP (including any modifications made during the term of the 2008 MSGP)
- Additional documentation requirements as identified in Section 5.4 of the MSGP
- All reports and certifications required by the MSGP
- Monitoring data
- Records of all data used to complete the NOI.

The following table lists specific responsibilities:

Who	What
Project Lead	Periodically audit MSGP records to ensure documentation of compliance is being retained.
Deployed Environmental Professionals	Retain records as required by the MSGP for industrial facilities located in their FOD.

5.10 BEST MANAGEMENT PRACTICES

It is critical that the Laboratory be able to effectively inspect and maintain the Best Management Practices that have been installed at various locations. Quarterly inspections must be completed and provided to the Project Lead for inclusion into the records system. In addition, the Project Leader conducts a Comprehensive Annual Site Inspection and writes a report to document the status of BMPs and other identified corrective actions. This report is sent to EPA each year. Laboratory management has made an investment in time and materials, in addition to a commitment to minimizing the potential migration of contaminants in stormwater. Report findings are evaluated and in conjunction with facility personnel, BMPs are modified, installed, or removed as necessary.

The following table lists responsibilities.

Who	What
Project Lead	Assist facility personnel and Deployed Environmental Professionals with implementation, inspection, and maintenance of BMPs at MSGP facilities.
Facility Management Support	• Coordinate with Project Lead and provide funding as needed to install, inspect, maintain and implement identified BMPs. • Certify the corrective actions identified by the Project Lead and/or facility personnel (or their representatives) for their individual facilities in the Annual Report.

5.11 INFORMATION MANAGEMENT

The Water Quality Database is a database information system designed in part to support the information management (IM) needs of the Laboratory's MSGP. MSGP support includes stormwater discharge monitoring reporting, Geographic Information System (GIS) development, and other IM activities as needed.

The following table lists responsibilities:

Who	What
Project Lead	Coordinate with IM support personnel to meet regulatory requirements.

5.12 RESPONDING TO WATER QUALITY EXCEEDANCES

The identification of a pollutant source(s) contributing to a water quality exceedance will be addressed through the creation of a corrective action that is entered into the Corrective Acton

Report database in accordance with ENV-DO-QP-113, *Tracking Performance Feedback and Actions* and *ENV-RCRA-QP-022, MSGP Stormwater Corrective Actions*. Federal stormwater regulations implemented under the Laboratory's MSGP (40 CFR 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System) require that corrective action be taken if exceedances of water quality standards or MSGP numeric effluent limits are identified. Corrective actions are typically accomplished by modifying, as appropriate, existing BMPs and SWPPPs.

When a water quality exceedance occurs, the Laboratory will submit the data on the required MDMRs, investigate the occurrence, and document corrective actions.

When an exceedance of the MSGP benchmark parameters is detected, the Project Lead will assure the analytical data is reviewed, notify appropriate SWPPP owners, and recommend and track corrective actions where required.

The following steps lead to corrective actions:

STEP	Action
1	Establish that an analytical result from a location is valid and has exceeded a standard or MSGP benchmark.
2	Evaluate and demonstrate that the analyte is of LANL origin, if possible.
3	Determine the source and assign responsibility for the corrective action.
4	Develop a corrective action plan.

The following table lists responsibilities:

Who	What
Project Lead	• Assure that analytical data is reviewed and accurate. • Notify appropriate SWPPP owners, Laboratory management, and Deployed Environmental Professionals. • Develop a corrective action plan. • Follow up with corrective actions if required. • Track corrective actions.
Facility Management and DEP	• Review analytical data with Project Lead and provide input into a possible corrective action necessary to improve water quality where needed. • Evaluate and improve BMPs in accordance with site conditions, industry standards, and manufacturer

	recommendations.

5.13 INSTRUMENTATION AND EQUIPMENT

Compliance will be tracked by performing inspections of samplers and other associated equipment, inspecting BMPs, and conducting annual site compliance evaluations. Adequate records will be maintained to demonstrate the operating history of essential instrumentation and equipment.

LANL will properly operate and maintain all systems of monitoring and control and related appurtenances which are installed or used to achieve compliance with the MSGP and the SWPPP. Backup instrumentation and equipment will be timely deployed in the event of equipment failure.

Instrument calibration is essential for documenting the quality of data obtained with the instrument. All technical work that depends upon the accuracy of data will be performed using equipment for which the calibration status and limits of accuracy are known and controlled.

Field team personnel will calibrate and perform maintenance procedures on all monitoring and analytical field instruments to ensure accuracy of measurements and will maintain appropriate records of such activities. All field calibrations will be documented as prescribed by procedures or manufacturer's instructions.

The following table lists specific responsibilities.

Who	What
Project Lead	• Ensure data are collected and equipment is operated and maintained in accordance with project requirements. • Provide equipment maintenance and calibration specifications and ensure MSGP Water Quality Compliance Team personnel operate and conduct field activities in accordance with implementing procedures and specific work orders.

6.0 DESIGN

Design activities will be conducted and reviewed in accordance with PD340, *Conduct of Engineering* and P341, *Engineering Process Manual*.

Design standards under this program include, but are not limited to temporary and permanent BMPs, corrective action measures, and stormwater monitoring support.

Design inputs will be specified and approved on a timely basis for making design decisions. Inputs will contain the level of detail required to permit the performance of design activities correctly.

Formal design reviews, including design verifications and evaluation of design changes, will be conducted to ensure that the design input is correctly incorporated into the design output. Changes to design will undergo the same review as the original design.

Verification and validation of the adequacy of designs are conducted before relying on the performance of the design function. Verification and validation are conducted in accordance with implementing procedures.

The following table lists responsibilities.

Who	What
Project Lead	• Provide input to the design process in accordance with appropriate standards, requirements, and implementing procedures. • Determine the qualifications required to perform a review of design documents. • Identify a resource with skills, knowledge, ability, training, and certifications required to complete the review of the facility engineering design documents. • Communicate the results of the review to the requestor.
ENV-CP Staff	Review design documents and requests as assigned. Inform the Project Lead of concerns regarding the facility engineering designs.

7.0 PROCUREMENT

Items and services required for this process are commercial grade in nature and no special procurement requirements or needs are necessary. All procurements will be made in accordance with P840-1, *Procurement Quality*. For items and all services for which special requirements are necessary, the Project Lead and project members will identify such items or services.

The following table lists responsibilities:

Who	What
Group Leader	Ensure all procurements are conducted in accordance with P840-1.
Project Lead	Recommend to Group Leader contracting items and services. Develop acceptance criteria.
ENV-CP Staff	Identify potential suppliers of products or services necessary to complete work activities that must be procured from outside ENV-RCRA.

8.0 INSPECTION AND ACCEPTANCE TESTING

Any materials or services will be inspected and/or tested prior to acceptance for use in this project in accordance with P330-8, *Inspection and Test for Acceptance*. Most supplies used during performance of project activities are commercial grade in nature and require no special acceptance practices or procedures.

The following table lists responsibilities:

Who	What
Group Leader	Ensure procedures for inspection meet SD330, *Los Alamos National Laboratory Quality Assurance Program* requirements.
Project Lead	Verify that all materials and services meet acceptance criteria.
ENV-CP Staff	Follow established procedures for inspection and acceptance testing.

9.0 MANAGEMENT ASSESSMENT

The ENV-CP Group conducts internal management assessments of projects and programs in accordance with the requirements in P328-3, *Management Assessment* and P328-4, *Management Observation and Verification*. Assessments of the program are documented and filed as records.

When violations of requirements are found during a management assessment, a nonconformance report is initiated in accordance with P330-6, *Nonconformance Reporting* for nonconforming items. Nonconforming services or processes are tracked and documented in accordance with P322-4, *Issues and Corrective Action Management*.

The following table lists responsibilities:

Who	What
Group Leader	Ensure management self-assessments for the MSGP program are conducted as specified in implementing procedures.
Project Lead	Ensure program management self-assessments are conducted.

10.0 INDEPENDENT ASSESSMENT

Independent assessments are those assessments conducted by organizations external to ENV-RCRA. As required by the SD330, *Los Alamos National Laboratory Quality Assurance Program*, this program may be assessed by outside organizations in accordance with P328-2, *Independent Assessment*.

Periodically audits/assessments will be conducted, with input from the Project Lead identifying one or more areas of the project to be audited.

The following table lists responsibilities:

Who	What
Project Lead	• Approve audit schedules. • Provide input to the QA Specialist as to the content of audit. • Review audit reports for factual accuracy. Address all findings and implement corrective actions as appropriate.
QA Specialist	• Identify areas to be addressed during internal audits. • Contract with the Quality Management Group to perform annual internal audits. • Review audit procedures to ensure they meet the requirements in this section.
Team Members	Cooperate with auditors by providing information, data, etc. Implement corrective actions as directed by the Project Lead.

11.0 ATTACHMENTS

Attachment 1- MSGP Program Organization

Attachment 2 – Annual Reporting Form

Attachment 3 – Routine Inspection Form

Attachment 4 – MSGP Facilities and Storm Water Monitored Outfalls Associated with Industrial Activity 2011, Permit NMR05GB21

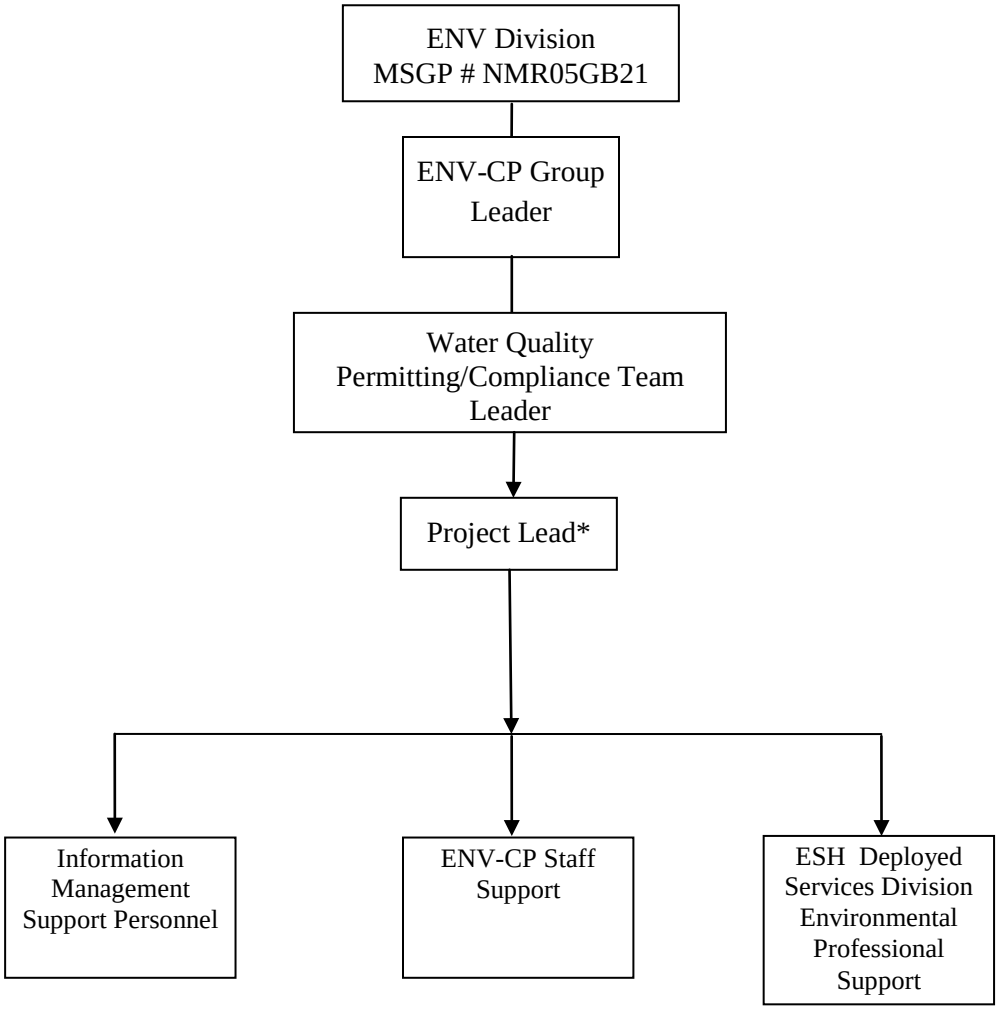
Attachment 5 – Pollutants under Impaired Waters Monitoring

Attachment 6 – Analytes by Industrial Sector

Attachment 7 – References and Guidance Documents

Click here for "Required Read" credit.

ATTACHMENT 1- MSGP PROGRAM ORGANIZATION



*Project Lead acts as liaison and will work directly with Team Leaders for staff assignments.

ATTACHMENT 2 – ANNUAL REPORTING FORM

NPDES Permit Tracking No.:

EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

Annual Reporting Form

A. GENERAL INFORMATION

1. Facility Name:

2. NPDES Permit Tracking No.:

3. Facility Physical Address:

a. Street:

b. City: c. State: d. Zip Code: -

4. Lead Inspectors Name: Title:

Additional Inspectors Name(s):

5. Contact Person: Title:

Phone: - - Ext. E-mail:

6. Inspection Date: / /

B. GENERAL INSPECTION FINDINGS

1. As part of this comprehensive site inspection, did you inspect all potential pollutant sources, including areas where industrial activity may be exposed to stormwater?
☐ YES ☐ NO

If NO, describe why not:

NOTE: *Complete Section C of this form for each industrial activity area inspected and included in your SWPPP or as newly identified in B.2 or B.3 below where pollutants may be exposed to stormwater.*

2. Did this inspection identify any stormwater or non-stormwater outfalls not previously identified in your SWPPP? ☐ YES ☐ NO

If YES, for each location, describe the sources of those stormwater and non-stormwater discharges and any associated control measures in place:

NPDES Permit Tracking No.: ☐☐☐☐☐☐☐☐☐☐

3. Did this inspection identify any sources of stormwater or non-stormwater discharges not previously identified in your SWPPP? ☐ YES ☐ NO

If YES, describe these sources of stormwater or non-stormwater pollutants expected to be present in these discharges, and any control measures in place:

4. Did you review stormwater monitoring data as part of this inspection to identify potential pollutant hot spots? ☐ YES ☐ NO ☐ NA, no monitoring performed

If YES, summarize the findings of that review and describe any additional inspection activities resulting from this review:

5. Describe any evidence of pollutants entering the drainage system or discharging to surface waters, and the condition of and around outfalls, including flow dissipation measures to prevent scouring:

6. Have you taken or do you plan to take any corrective actions, as specified in Part 3 of the permit, since your last annual report submission (or since you received authorization to discharge under this permit if this is your first annual report), including any corrective actions identified as a result of this annual comprehensive site inspection?
☐ YES ☐ NO

If YES, how many conditions requiring review for correction action as specified in Parts 3.1 and 3.2 were addressed by these corrective actions? ☐☐

NOTE: *Complete the attached Corrective Action Form (Section D) for each condition identified, including any conditions identified as a result of this comprehensive stormwater inspection.*

NPDES Permit Tracking No.: | | | | | | | | | | |

C. INDUSTRIAL ACTIVITY AREA SPECIFIC FINDINGS

Complete one block for each industrial activity area where pollutants may be exposed to stormwater. Copy this page for additional industrial activity areas.

In reviewing each area, you should consider:

- Industrial materials, residue, or trash that may have or could come into contact with stormwater;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Offsite tracking of industrial or waste materials from areas of no exposure to exposed areas; and
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas.

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO

3. Have any control measures failed and require replacement? ☐ YES ☐ NO

4. Are any additional/revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO

3. Have any control measures failed and require replacement? ☐ YES ☐ NO

4. Are any additional/revised c necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA _____:

Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO

3. Have any control measures failed and require replacement? ☐ YES ☐ NO

4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

NPDES Permit Tracking No.: | | | | | | | | | | |

NOTE: *Copy this page and attach additional pages as necessary*

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

NPDES Permit Tracking No.: ☐☐☐☐☐☐☐☐☐☐

D. CORRECTIVE ACTIONS

Complete this page for each specific condition requiring a corrective action or a review determining that no corrective action is needed. Copy this page for additional corrective actions or reviews.

Include both corrective actions that have been initiated or completed since the last annual report, and future corrective actions needed to address problems identified in this comprehensive stormwater inspection. Include an update on any outstanding corrective actions that had not been completed at the time of your previous annual report.

1. Corrective Action # ☐☐ of ☐☐ for this reporting period.

2. Is this corrective action:

☐ An update on a corrective action from a previous annual report; or

☐ A new corrective action?

3. Identify the condition(s) triggering the need for this review:

☐ Unauthorized release or discharge

☐ Numeric effluent limitation exceedance

☐ Control measures inadequate to meet applicable water quality standards

☐ Control measures inadequate to meet non-numeric effluent limitations

☐ Control measures not properly operated or maintained

☐ Change in facility operations necessitated change in control measures

☐ Average benchmark value exceedance

☐ Other (describe): _____

4. Briefly describe the nature of the problem identified:

5. Date problem identified: ☐☐/☐☐/☐☐☐☐

6. How problem was identified:

☐ Comprehensive site inspection

☐ Quarterly visual assessment

☐ Routine facility inspection

☐ Benchmark monitoring

☐ Notification by EPA or State or local authorities

☐ Other (describe): _____

7. Description of corrective action(s) taken or to be taken to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analyses to be conducted, etc.) or if no modifications are needed, basis for that determination:

8. Did/will this corrective action require modification of your SWPPP? ☐ YES ☐ NO

9. Date corrective action initiated: ☐☐/☐☐/☐☐☐☐

10. Date correction action completed: ☐☐/☐☐/☐☐☐☐ or expected to be completed: ☐☐/☐☐/☐☐☐☐

11. If corrective action not yet completed, provide the status of corrective action at the time of the comprehensive site inspection and describe any remaining steps (including timeframes associated with each step) necessary to complete corrective action:

NPDES Permit Tracking No.:

E. ANNUAL REPORT CERTIFICATION

1. Compliance Certification

Do you certify that your annual inspection has met the requirements of Part 4.2 of the permit, and that, based upon the results of this inspection, to the best of your knowledge, you are in compliance with the permit? ☐ YES ☐ NO

If NO, summarize why you are not in compliance with the permit:

2. Annual Report Certification

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.

Authorized Representative Printed Name: Title:

Signature: Date Signed:

ATTACHMENT 3 – ROUTINE INSPECTION FORM

Name of Facility:	**Responsible FOD (Name & Organization):**	
Qualified Inspector(s): **Others Present:**	**Inspection type:** □ **Quarterly** □ **Other**	**Date of inspection (MM/DD/YYYY):** **Time of inspection:**

Weather: ❑ **Clear** ❑**Cloudy** ❑ **Rain** ❑ **Sleet** ❑ **Fog** ❑ **Snow** ❑ **High Winds** ❑ **Other:**
Temperature: **° F** **Is Inspection Being Conducted During a Storm Water Discharge?** ❑**Yes** ❑**No**

#	Structural Control Measures (BMP)s	Location	Operating Effectively (Yes or No)?	If No, Need to Maintain (M), Repair (R) or Replace (RP)?	**Corrective Action Needed and Notes** (identify needed maintenance and repairs, or any failed control measures that need replacement)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12					

Were additional BMPs or Control Measures implemented? □ **Yes** □ **No Describe:**

Were previously identified conditions corrected before the next anticipated storm event? □ **Yes** □ **No If No, describe reason:**

Area/Activity (Areas of Industrial Materials or Activities Exposed to Storm Water)	**Inspected ?**	**Controls Adequate?**	**Corrective Action Needed and Notes (List area letter with comments below)**
A. Material loading/unloading & storage areas			
B. Equipment operations & maintenance areas			
C. Fueling Areas			
D. Outdoor vehicle & equipment washing areas			
E. Waste Handling & disposal areas			
F. Erodible areas / construction			
G. Non-storm water / illicit connections			

H. Salt storage piles or pile containing salt			
I. Dust generation & vehicle tracking			
Are the SWPP Plan maintenance, schedules and procedures being implemented at the facility? □ Yes □ No			
Were any Corrective Actions initiated or completed? □ Yes □ No Describe:			
Are there any conditions requiring Corrective Action? □ Yes □ No If Yes, List Number of Corrective Actions Required _____ **(Note – You need enter a Corrective Action in the MSGP Corrective Action Report database for each listed)**			

ATTACHMENT 4 -- MSGP FACILITIES AND STORM WATER MONITORED OUTFALLS ASSOCIATED WITH INDUSTRIAL ACTIVITY 2011, PERMIT NMR05GB21

Location	Permitted Facility	Operation	Activity	Sector	Monitored Outfall	• Canyon
TA-15-185	TA-15-185 PHERMEX	Vehicle Maintenance Shop	Vehicle Maintenance	P	15-PHRMX-1	• Water
TA-3-0034	TA-3-0034 Metal Shop	Fabricated Metals	Fabricated Metals	AA	3-MST-1	• Mortandad
TA-3-22	TA-3-22 Power & Steam Plant	Power Plant	Steam Electric Power	O	3-PSP-1 3-PSP-5 3-PSP-8	• Sandia • •
TA-3-38	TA-3-38 Metals Fab Shop	Metal Shop	Fabricated Metals	AA	3-MFS-1	• Sandia
TA-3-39	TA-3-39 & 102 Metal Shop	Metal Shop	Fabricated Metals	AA	3-TS-1	• Pajarito
TA-3-66	TA-3-66 Sigma Complex	Sigma Foundry	Primary Metals	F	3-Sigma-6	• Sandia
TA-54	TA-54 Area G	Area G - South Side	TSD	K	54-G-1	• Pajarito
TA-54	TA-54 Area G	Area G -North Side	TSD	K	54-G-2	• Canada del Buey
TA-54	TA-54 Area G	Area G - South Side	TSD	K	54-G-3	• Pajarito
TA-54	TA-54 Area G	Area G - South Side	TSD	K	54-G-4	• Pajarito
TA-54	TA-54 Area L	Area L	TSD	K	54-L-1	• Canada del Buey
TA-54-38	TA-54 RANT	RANT	TSD	K	54-RANT-1	• Canada del Buey
TA-60	TA-60 Asphalt Batch Plant	Asphalt Batch Plant	Asphalt Paving	D	60-ABP-1	• Mortandad
TA-60	TA-60 MRF	Materials Recycling Facility	Scrap Recycling	N	60-MRF-1	• Sandia
TA-60-250	TA-60 Roads and Grounds	Roads & Grounds Facility	Vehicle Maintenance & Storage	P P P	60-RG-1 60-RG-3 60-RG-8	• Mortandad • Sandia • Sandia
TA-60-1	TA-60-1 Heavy Equipment Yard	Motor pool	Vehicle Maintenance	P	60-HEY-2	• Sandia
TA-60-2	TA-60-2 Warehouse	Motor pool	Vehicle Maintenance	P	60-WH-1	• Sandia
TA-9-28	TA-9-28 Heavy Equipment Maintenance	Motor pool	Vehicle Maintenance	P	9-HEM-1	• Pajarito

ATTACHMENT 5 – POLLUTANTS UNDER IMPAIRED WATERS MONITORING

Permitted Facility	Monitored Outfall	Assessment Unit	Canyon	Pollutant
TA-54 Area G TA-54 Area L TA-54-RANT	54-G-2 54-L-1 54-RANT-1	NM-128.A_00	Canada del Buey (within LANL)	PCBs Aluminum Gross Alpha
TA-54 Area G TA-54 Area G TA-54 Area G	54-G-1 54-G-3 54-G-4	NM-128.A_08	Pajarito Canyon (within LANL below Arroyo de la Delfe)	PCBs Aluminum Copper Gross Alpha
TA-15-185 PHERMEX	15-PHRMX-1	NM-128.A_13	Water Canyon (within LANL below Area-A Canyon)	PCBs Aluminum Gross Alpha
TA-3-39 & 102 Metal Shop	3-TS-1	NM-128.A_15	Two Mile Canyon (Pajarito to headwaters)	PCBs Aluminum Gross Alpha
TA-9-28 Heavy Equipment Maintenance	9-HEM-1	NM-128.A_16	Arroyo de la Delfe (Pajarito Canyon to headwaters)	Aluminum Mercury Gross Alpha
TA-60 Asphalt Batch Plant TA-3-0034 Metal Shop TA-60 Roads and Grounds	60-ABP-1 3-MST-1 60-RG-1	NM-9000.A_042	Mortandad Canyon (within LANL)	Aluminum Copper Gross Alpha
TA-3-38 Metals Fab Shop TA-3-22 Power & Steam Plant TA-3-22 Power & Steam Plant TA-3-22 Power & Steam Plant TA-3-66 Sigma Complex TA-60-1 Heavy Equipment Yard TA-60 MRF TA-60 Roads and Grounds TA-60 Roads and Grounds TA-60-2 Warehouse	3-MFS-1 3-PSP-1 3-PSP-5 3-PSP-8 3-Sigma-6 60-HEY-2 60-MRF-1 60-RG-3 60-RG-8 60-WH-1	NM-9000.A_047	Sandia Canyon (Sigma Canyon to NPDES outfall 001)	PCBs Aluminum Copper Gross Alpha Mercury

ATTACHMENT 6 – ANALYTES BY INDUSTRIAL SECTOR

Permitted Facility	Monitored Outfall	Sector	Activity	Analyte	Monitoring Requirement
TA-3-0034 Metal Shop TA-3-38 Metals Fab Shop TA-3-39 & 102 Metal Shop	3-MST-1 3-MFS-1 3-TS-1	AA	Fabricated Metals	Aluminum Iron Nitrate plus Nitrite Nitrogen Zinc	Quarterly Benchmark Monitoring (QBM) QBM QBM QBM
TA-60 Asphalt Batch Plant	60-ABP-1	D	Asphalt Paving	Oil and Grease pH Total Suspended Solids	Effluent Limitations Guidelines (ELG) ELG QBM and ELG
TA-3-66 Sigma Complex	3-Sigma-6	F	Primary Metals	Copper Zinc	QBM QBM
TA-54 Area G TA-54 Area G TA-54 Area G TA-54 Area G TA-54 Area L TA-54 RANT	54-G-1 54-G-2 54-G-3 54-G-4 54-L-1 54-RANT-1	K	Treatment, Storage or Disposal Facility (TSD)	Ammonia Arsenic Cadmium Chemical Oxygen Demand Cyanide Lead Magnesium Mercury Selenium Silver	QBM QBM QBM QBM QBM QBM QBM QBM QBM QBM
TA-60 MRF	60-MRF-1	N	Scrap Recycling	Aluminum Chemical Oxygen Demand Copper Iron Lead Total Suspended Solids Zinc	QBM QBM QBM QBM QBM QBM QBM
TA-3-22 Power & Steam Plant	3-PSP-1 3-PSP-5 3-PSP-8	O	Steam Electric Power	Iron	QBM

ATTACHMENT 7 – REFERENCES AND GUIDANCE DOCUMENTS

- 40 CFR 122, *EPA Administered Permit Programs*
- 40 CFR 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants.*
- Clean Water Act, Title 33 U.S.C. 1251
- DOE O 414.1C, *Quality Assurance*
- DOE Order 450.1, *Environmental Protection Program*
- DOE Order 5400.5, *Radiation Protection of Public and Environment*
- EPA QA/G-4, *Guidance for the Data Quality Objectives Process*

LANL Documents:

- P322-4, *Laboratory Performance, Feedback, and Improvement*
- P328-3, *Management Assessments*
- P328-4, *Management Observation and Verification*
- P330-6, *Nonconformance Reporting*
- P330-8, *Inspection and Test for Acceptance*
- P340, *Conduct of Engineering*
- P341, *Engineering Process Manual*
- P401, *Procedure to Identify, Communicate, and Implement Environmental Requirements*
- P407, *Water Quality*
- P840-1, *Procurement Quality*

ENV Documents:

- ENV-DO-QP-105, *Preparation, Review, and Approval of Procedures*
- ENV-DO-QP-106, *Document Control*
- ENV-DO-QP-113, *Tracking Performance Feedback and Actions*
- ENV-DO-QP-115, *Personnel Training*
- ENV-CP-QP-022, *MSGP Storm Water Corrective Actions*
- ENV-CP-QP-044, *Preparing Storm Water Discharge Monitoring Reports (MDNRs) for NPDES MSGP*
- ENV-CP-QP-047, *Inspecting Storm Water Runoff Samplers and Retrieving Samples*
- ENV-CP-QP-048, *Processing MSGP Storm Water Samples*
- ENV-CP-QP-064, *Multi-Sector General Permit Storm Water Visual Inspections*
- ENV-WQH-QP-029, *Creating and Maintaining a Chain of Custody*
- Surface Water Monitoring Plan, October 2001, Rev. 0.0

WM-PROG-QP-210	Revision: 0	Los Alamos NATIONAL LABORATORY EST. 1943
Effective Date: 11-6-2014	Next Review Date: 11-6-2017	

Environment, Safety, Health Directorate

Waste Management Services

Quality Procedure

Sampling and Analysis Procedure

Quality Assurance Reviewer:

Name:	Organization:	Signature:	Date:
Larry Maassen	QPA-IQ	Signature on File	11-5-2014

Derivative Classifier: ☒ **Unclassified** ☐ **Classified**

Name:	Organization:	Signature:	Date:
Larry Maassen	QPA-IQ/WM	Signature on File	11-5-2014

Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
Terrence Garcia	WM-SVS	Signature on File	11-5-2014
Responsible Line Manager:	**Organization:**	**Signature:**	**Date:**
Steven Singledecker	WM-SVS	Signature on File	11-6-2014

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REVISION HISTORY

Document Number and Revision *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
ENV-RCRA-QP-30, Rev. 0	05/2009	This quality procedure consolidates ENV-RCRA-QP-103, *RCRA Compliance Sampling*, and ENV-RCRA-QP-115, *Sample Analysis for RCRA Characterization*.
ENV-RCRA-QP-30, Rev. 1	04/2011	Biennial review and revision.
WM-PROG-QP-210	11/06/2014	This document supersedes ENV-RCRA-QP-030. Some references to “RCRA” have been deleted; organizational changes have been updated.

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1.0 PURPOSE

This Waste Management Waste Acceptance Services Group (WM-SVS) procedure describes the procedures for processing sample requests, planning and executing field sampling, and sample submittal for analysis.

2.0 SCOPE

This applies to all WM-SVS personnel who plan or conduct field sampling, process samples for submittal to the Sample Management Office or the Sample Analysis Laboratory (TA-59-1-135/137).

3.0 HAZARD REVIEW

Some portions of the work described in this procedure may have a hazard rating greater than "Low" depending upon the nature of the work, site-specific hazards, FOD requirements, and other factors. **It is the worker's responsibility to determine if an IWD is required and to ensure that an IWD is prepared prior to beginning any work with a hazard rating above "Low."**

4.0 PRESAMPLING ACTIVITIES

	Step	Action
Request for Analysis	1.	WM-SVS Compliance Sampling personnel receive, via email, a Request for Analysis Form (RFA) when a Laboratory operating group (waste generator) requires sampling and analysis for RCRA characterization. **Note:** *A Request for Analysis (RFA) must be generated prior to any RCRA characterization sampling event.*
	2.	Review the RFA for completeness
	3.	Request additional information as necessary from the RFA point of contact (POC).
	4.	Complete a Low Hazard Verification Form (LHVF) if the work has a "Low" hazard rating. Otherwise prepare an IWD.
Site Specific Safety Plan	5.	Complete a Site Specific Safety Plan (SSSP).
	6.	If necessary, contact the POC for additional information and/or conduct a pre-sampling site visit if necessary to complete the SSSP.
IWD	7.	If required by the host facility or ENV Management, even if the work is Low Hazard, complete an Integrated Work Document, and have it signed by the RLM and sampling site IWD signature authority.
Data Quality Objectives	8.	Develop the Data Quality Objectives for the sampling event.
Radiation Work Plan	9.	Contact the Radiological Control Technician indicated on the RFA for guidance in obtaining an RWP if required.
Pre-Sampling Questionnaire	10.	Complete a pre-sampling questionnaire and, if required by the RFA, request pollution prevention plans or waste management plans.

	Step	Action
Preparation of Sample Containers	11.	Assemble a set or sets of appropriate sample containers and apply labels. If analyses include chemical preservation, add preservatives to each container in a hood after the sample has been taken. **Note:** *Wear appropriate gloves, lab coat, eyewear, and use engineering controls as appropriate.*

5.0 FIELD SAMPLING, PACKAGING, AND TRANSPORT

	Step	Action
	1.	Upon arrival at the host facility, conduct an orientation meeting with appropriate site personnel.
Site Personnel Conduct Sampling	2.	If site personnel are to conduct the sampling: A. Conduct a pre-sampling meeting to agree upon objectives and procedures. B. Be prepared to call a pause to work if unsafe conditions are observed. C. Provide the site samplers with sample equipment and containers. D. Observe and direct the sampling process in accordance with appropriate sampling procedures, and note any irregularities. E. Record details of the sampling event in the sample collection logbook.

Accepting Radiation-Free Samples

The Compliance Sampling Professional will only accept samples that have been deemed free of radiation on the outer container.

If samples need a volume radiological analysis (i.e., are a suspect or known radioactive), samples are taken to American Radiation Services or a gamma spec is done on site.

The RCT must provide the Sampling Professional or Associates with either a free release tag or a potentially contaminated release tag for transporting limited quantity material.

Review the Radioactive Material Survey Tags completed by RCTs to ensure that samples shipped off-site for radiological analyses have been screened for radiological contaminants. Reference the ENV-RCRA Sampling and Analysis Plan for RCRA Characterization for additional information.

	Step	Action
RCRA Personnel Conduct Sampling	3.	If the WM-SVS Sampling Professional is to conduct the sampling: **Hazard:** Contamination of skin, eyes, and lungs; unknown radiation dose. **Control:** Follow steps A, B, and C, below. A. If radioactive contamination is suspected, arrange for proper personnel monitoring. B. Have a local RCT generate a Radiation Work Permit, as appropriate. C. Don PPE. D. Stage sample containers. E. Collect samples in accordance with appropriate procedures. F. Place packaged samples in the appropriate transport containers and package them in adherence to compatibility issues G. Place samples of unknown material in individual transport containers H. Use only containers that are in good condition and EPA certified. I. Record details of the sampling event in the sample collection logbook. J. If LANL is at SECON Level 2, compliance sampling professionals will adhere to the SECON 2 waste shipping requirements in accordance with P151-1, *LANL Packaging and Transportation Program Procedure*.

Transport

Samples should not exceed the 30 ml or 30 gram limit prescribed by 49 CFR for transportation exemptions.

Note: WM-SVS Sampling Professionals will only transport limited quantity radioactive material or small quantity radioactive material according to 49 CFR 173.4.

Non-Radiological Samples

Compliance sampling professionals will transport samples in proper containers in the bed of a truck, never in the cab of the truck. Transport in accordance with DOT regulations.

Samples under 30 mL or 30 g may be tentatively classified as a “small quantity exception” shipment based on 49 CFR 173.4.

Packaging and Transportation (OS-PT) may be requested to provide technical guidance and support for packaging and transportation of hazardous materials.

	Step	Action
Radiological Samples	**Compliance sampling professionals** will perform the following steps if transporting samples that an RCT has identified as radiological:	
	1.	Transport to the American Radiation Services (ARS) screening laboratory in White Rock for radiological volume counting if this has not been done on site.
	2.	Leave the transport container at ARS. Do not open the transport container.
	3.	Follow proper chain of custody procedures as in accordance with OIO-QP-219, *Sample Control and Field Documentation*, or similar. **Note:** The data must be obtained before samples can leave the radiological sample holding area.
	4.	If samples exceed the limited quantity requirements and are to be transported to an off-site analytical laboratory, contact LANL OS-PT.

6.0 PROVIDING SAMPLE CONTAINERS TO SMO FOR ANALYSIS

6.1 Chain of Custody

When samples are packaged and labeled and the chain of custody is completed, the samples are taken to the LANL Sample Management Office (SMO).

At the time of sample turnover, the Sampling Professional signs the chain of custody to relinquish the samples to SMO.

7.0 TRANSMISSION OF ANALYTICAL DATA

7.1 Receive Analytical Data

SMO will send preliminary analytical data and final analytical data (hard copy and CD) to the Compliance Sampling Professional.

7.2 Send Analytical Data to Customer

Compliance Sampling Professional will send analytical data to the customer as follows:

- Fax or email the preliminary analytical data
- Mail a copy of the final analytical data with a copy of the relevant logbook page(s)

8.0 SAMPLE ANALYSIS IN THE TA- 59-1-135/137 LABORATORY

8.1 Sample Types

Samples of materials and media to be analyzed may include the following:

- Toxic, ignitable, reactive, and/or corrosive materials

  PCB items and PCB-contaminated waste materials
- Asbestos
- Petroleum hydrocarbons
- High explosives
- Nonhazardous chemicals
- Hazardous chemicals
- Unknown constituent materials

9.0 TRAINING

The following personnel require training and documented completion before independently implementing this procedure:

- Sampling Professional
- Sampling Associate

9.1 Prerequisites for the Sampling Professional and Sampling Associate

9.1.1 Sampling Professional

The following training is required prior to performing this procedure independently:

- Training Plan 131, *Field Worker Training Requirements*
- Training Plan 7559, *RCRA Waste Characterization*
- ENV-RCRA Sampling and Analysis Plan
- ADESH Quality Assurance Plan
- Site-specific training as required, or performing sampling under escort
- 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) as required by OSHA at 29 CFR and 1910.120
- Radiological Worker (RADWORKER) II
- Basic Hazardous Materials Transportation (every three years)
- Basic Radioactive Materials Transportation (every three years)
- Respirator training (as required)

- Resource Conservation and Recovery Act (RCRA) Personnel Training
- Training on the Laboratory's Emergency Management Plan
- Training for spill prevention, including P407, *Water Quality*, and P322-3, *Performance Improvement from Abnormal Events*.
- Training on the Laboratory's hazard communication program
- American Red Cross approved Standard First-Air and CPR/AED
- Beryllium Awareness, Lead Awareness, Confined Space, Lockout/Tagout, Electrical Safety, Asbestos Awareness, Hearing Conservation, Bloodborne Pathogens (as required)
- EPA's 165.9, Sampling for Hazardous Materials
- McCoy's RCRA 5-day seminar or equivalent
- EPA DQO training (compliance sampling coordinator)
- Hepatitis vaccination (as required)

9.1.2 Sampling Associate

The following training is required for the Sampling Associate prior to performing this procedure independently:

- Training Plan 131, *Field Worker Training Requirements*
- Site-specific training for each Laboratory location or technical area as required, or perform sampling under escort
- 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) as required by OSHA at 29 CFR and 1910.120
- Radiological Worker (RADWORKER) II
- Resource Conservation and Recovery Act (RCRA) Personnel Training
- Training on the Laboratory's hazard communication program

10.0 RECORDS

Records generated by this document will be submitted to the Operations Integration Office (OIO) Records Management designated Point of Contact for document management in accordance with P1020-1, *Laboratory Records Management* and with the ADESH-AP-006, *Records Management Plan*. Records generated as a result of implantation of this procedure are:

- Request for Analysis Form
- Sampling and analysis plan
- Field logbook
- Chain of Custody Form

11.0 REFERENCES

12.0 ATTACHMENTS

Attachment 1: *Request for Analysis Form*

ATTACHMENT 1 – REQUEST FOR ANALYSIS FORM

Page 1 of 1

LOS ALAMOS NATIONAL LABORATORY
WM-SVS'S
Request For Analysis Form

Note: Fields flagged with an '*' are required. Incomplete forms will be rejected.

REQUEST FOR ANALYSIS FORM

Charge Code Information:

Cost Center: | Program Code: | Cost Account: | Work Package:

Turn Around Time: 28 Calendar Days (std. cost) Other:

*Requestor's Z-No

*Is requestor a **WMC** ◯ or **Waste Generator** ◯ : If Waste Generator, **who is your WMC** ?

Location of material to be sampled:

*TA: BLDG: Room: Other Location:

*How long has waste been at this location ?

*Who is the Facility Operations Directory (FOD) at this site:

*Who is the Industrial Hygienist for this site (first and last name):

*What group does the sample belong to:

If material is radioactive, suspect radioactive, or Unknown, these fields are required:

If the waste is radioactive or suspect, name the Radiation Control Technician (RCT) assigned to the area.

RCT Name:

Is an RWP required ? ◯Yes ◯No

Was the waste generated or stored in an area controlled for radioactive contamination (RCA) ◯, in an area with the potential for activation ◯, or in an area with airborne radioactive contamination ◯?

Will the analytical be used for a specific purpose? If yes, explain or check the appropriate box.

◯Meet TA50 WAC ◯Offsite Treat/Disp. ◯Meet TA54 WAC ◯Other

Chemical and Physical Characteristics
Provide as much information as possible for the material being sampled:

***Matrix of Material:** (check as many as apply, and at least one)

Liquid:
☐Multi-Phased ☐Organic
☐Aqueous ☐Non-Aqueous ☐Inorganic

Solid:
☐Soil ☐Solid ☐Sludge
☐Powder/Ash ☐Absorbed Liq. ☐Unknown

***Waste Classes:** (check as many as apply, and at least one)
☐Radioactive ☐Sus. Rad ☐Wastewater ☐PCBs ☐Orphaned/Leg. Waste
☐Non-Radioactive ☐Gas ☐Oils ☐Unknown ☐Corrosive
☐Engineered NanoMaterial

***Container Size:** (check only one)
◯ < 500 ml ◯ 30 gallons
◯ 1 liter ◯ 55 gallons
◯ 5 gallons ◯ > 55 gallons
◯ Other Specify Size:

***Container Type:** (check only one)
◯Plastic Cont. ◯Fiber or Plastic Drum ◯Other
◯Glass Cont. ◯___Tank
◯Metal Drum ◯Wood/Metal box

***Material description, known waste constituents, and comments:**

Submit or Reset Form

PERSONNEL TRAINING

Purpose

The purpose of this Environmental Protection Division (ENV) procedure is to describe the process for obtaining and documenting self-study (reading), classroom, and OJT training within the division and describes how training needs are determined and reviewed.

Scope

This procedure applies to all ENV personnel and subcontractors who must receive or provide training.

Hazard review

The work described in this procedure is generally office work although some field work associated with OJT may occur. In either case, the work described in this procedure has a **LOW hazard** rating as documented by submittal of a completed *ENV Low Hazard Activity Verification* form to the Quality Assurance Specialist.

Signatures

Prepared by: Signature on File Melanie Lamb, ENV Quality Assurance Specialist	Date: 9/21/11
Approved by: Signature on File Joanna Foster, QA-IQ/ENV Quality Assurance Specialist	Date: 10/26/11
Authorized by: Signature on File Anthony Grieggs, ENV-RCRA Group Leader	Date: 9/28/11
Authorized by: Signature on File Patricia Gallagher, ENV-ES Group Leader	Date: 10/26/11
Authorized by: Signature on File Dennis Hjeresen, ENV Division Leader	Date: 10/31/11
Classification Review by Signature on File Anthony Grieggs , Derivative Classifier	Date: 11/8/11 ☒ Unclassified

**Effective Date

General information about this procedure

In this procedure

This procedure addresses the following major topics:

Topic	Page
General information about this procedure	2
Who requires training to this procedure?	2
Training implementation - responsibilities	4
Work authorization	6
Determining employee training needs	7
Determining training level for work to be performed	8
Obtaining training	9
Training documentation	10
Records resulting from this procedure	11

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	OJT Performance Evaluation	2
2	Work Authorization & Worker Acknowledgement Form	1

History of revision

This table lists the revision history of this procedure:

Revision	Date	Description of Changes
0	4/09	New division-level document as the result of merging ENV-RCRA-QP-024 with ENV-EAQ-007.1. This document supersedes and rescinds all group-level training procedures.
0	5/11	Document reviewed-no changes required. To be replaced 7/11 by U-Train Procedure.
1	9/11	Document updated to reflect LANL's new training system, UTrain, which replaced the EDS system.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- ENV personnel, contactors, and students who receive or provide training in the course of conducting ENV work.

Prerequisites

In addition to this document, the following course is required for OJT trainers only:

- 17663 *TSQP: On-The-Job Training*

General information about this procedure, continued

Training method

Training to this procedure will be by "self-study" (reading).

Definitions

Training: A formal, documented process of instruction designed to develop or improve job performance.

Classroom Training: Structured training which is led by an instructor and where there is active trainee participation. Classroom training may include lectures, demonstrations, discussions, or step-by-step review of procedures. Training is presented by a qualified instructor in accordance with developed curricula.

Curricula: A listing of items assigned to a user that must be completed. All current or anticipated training requirements identified for the employee to perform his/her specific job function/assignment will be included. A curricula is based on (1) federal or state regulations, (2) Laboratory requirements, or (3) division, group-specific requirements.

Item: An assignable unit whose assignment and completion can be tracked. It may be a learning or non-learning item.

On-The-Job Training: Activity-level training that is a systematically designed instructional experience in which hands-on training is conducted and evaluated in the work environment.

Qualified OJT Instructor: An individual who has been qualified in accordance with the Training Staff Qualification (TSQ) program to design and develop training within the OJT setting. The OJT Instructor may or may not be the trainee's supervisor.

Self-Study (Reading): Self-contained training materials provided from a central source (such as a controlled document) to trainees as needed. Self-study includes required reading.

Note

Actions specified within this procedure, unless preceded with "should," or "may," are to be considered mandatory (i.e., "shall," "must," "will").

References

The following documents were referenced in preparing this procedure:

- P781-1.0 *Conduct of Training Manual*

Training Implementation

Responsibilities

The following personnel shall:

Who	Actions
Group Leader and Team Leaders	• Assure that employees receive required training and are qualified before performing work. • Review and update employee curricula and development plans annually. • Assure that formal systems are in place to identify job positions, train, evaluate, and/or test workers for the positions. • Document Group core competencies. • Take action when a worker does not meet qualifications or certification requirements for the work to be performed. • Provide resources, allow work time for training, and hold workers accountable for meeting training requirements.
Training Coordinator	• Implement training policies, processes, and standards in accordance with the LANL Conduct of Training Manual. • Develop, maintain, and provide assistance on administering the Group's training needs. • Facilitate job task analysis process (training needs assessment) with Subject Matter Experts (SMEs) and supervisors. • Facilitate OJT development with qualified OJT instructors. • Develop, maintain, and document Group training records and curricula. • Complete and maintain course and trainee documentation records in the LANL UTrain System database. • Suggest, revise and update training materials based on SME review, regulatory compliance, changes in training setting, new content, new activities, Laboratory requirements, lessons learned, course test results, course evaluation, and other pertinent information.

Training Implementation, continued

Who	Actions

Training Coordinator, continued	• Notify Group Leader, Team Leader, and employee
	  o when an employee's training is incomplete, expired, or due to expire (employees can also check their own training in UTrain).
	  o when an employee fails a course, if this failure could result in revoked or expired authorization.
	• Be point-of contact for training activities such as curricula development and records.
	• Be Group Liaison to the ENV Division Office.
	• Facilitate or conduct training needs and gap analyses, as required.
	• Respond to critical training issues and support audit and/or assessment activities.
	• Track, evaluate, and implement changing training requirements.

Qualified OJT instructor	• Conduct and document job task analyses. • Develop performance objectives. • Develop OJT Performance Evaluation (Attachment 1). • Conduct and document OJT.

Employees	• Perform work only if
	  o work authorization is granted and
	  o all training as specified in relevant Integrated Work Documents, curricula, and procedures is complete and current.
	• Attend and participate in required training in accordance with assigned curricula, and/or supervisory directives.
	• Maintain qualification status and participate in approved development activities as stated in development plans or as directed by Group management

Work Authorization Process

Policy

All work must be authorized by the Group Leader and/or Team Leader prior to commencement of work. Work must be reauthorized annually or as work assignments change.

How to authorize work

Who	What
Team Leaders	Determine employee training needs (reference Determining Employee Training Needs section of this document). In consultation with the training coordinator, indicate training requirements on a Work Authorization & Worker Acknowledgement (WA) form, Attachment 2, and provide to employee.
Employees	Complete required training. When all training specified on the WA form is complete, sign the WA form and return to the Team Leader. Do not conduct any work unless authorized to do so by Team Leader and/or Group Leader.
Team Leaders	After employee completes training and his/her portion of the WA form, sign the completed WA form and forward to the Group Leader for authorized signature.
Group Leaders	Submit completed WA forms to the Group-Level Training Coordinator.

Determining Employee Training Needs

How to determine training requirements

For each employee in the organization:

Who	Actions
Team Leaders	At least once a year or whenever job assignments are changed: • Determine the documents, implementing procedures, and/or items to which each employee will be trained for the specific project or work activity. Base the determination upon the job assignments and job duties of the employee. For major changes in training requirements, consult the Training Coordinator to ensure inclusion of any procedures and items required for new employees or employees in similar job assignments. Ensure that employees understand the need to obtain required training as necessary and always *before* performing work that requires training. Employees must understand the need to retrain whenever revised procedures are issued.
Group Leader	Receive WA form for each employee from the Team Leaders and review overall needs of each employee. Integrate the combined training needs as necessary and forward the WA forms to the Training Coordinator.
Training coordinator	Enter the information into the UTrain system and file the Work Authorization form. Periodically (for example, after a controlled document distribution), send a list of required training (curricula) to employees.
Employees	Be aware of applicable procedures that have been revised and obtain appropriate training *before* performing work that requires the training.

Determining Training Level for Work to be Performed

Background

A systematic and graded approach to training is used based on tasks to be performed and workers' knowledge, skills, and abilities required for job performance. Employees shall have met one of the following three levels of training to obtain work authorization.

Level 1 – Worker Competency

When the hazard grade for the work to be performed is LOW, based on P300, *Integrated Work Management* – Worker Competency training is required.

Employees shall complete all assigned training in the curricula:

- Required institutional training
- Other required training identified by a job task analysis as required by the employee's supervisor.

Training requirements shall be identified in Section 2 of the appropriate Quality Assurance Program Plans (QAPPs) and derivative procedures for that work.

This level of training shall have the least degree of rigor. Reference P781.1, *Conduct of Training Manual*, for additional direction in training development.

Level 2 – Qualification

When the hazard grade for the work to be performed is MODERATE, based on P300, Integrated *Work Management*, Level 2 – Qualification training is required.

The **ENV Division Leader** shall establish qualification standards as outlined in P781.1, which specify training, retraining, and performance requirements based on analyzing the work to be performed and the worker's knowledge, skills, and abilities.

Employees shall complete all assigned training in the curricula

- Required institutional training
- Other required training identified by the employee's supervisor
- Required facility-training requirements as identified following facility requirements.
- Required on-the-job training

Training requirements shall be identified in Section 2 of the appropriate Quality Assurance Program Plans (QAPPs) and derivative procedures for that work.

Reference P781.1, *Conduct of Training Manual*, for additional direction in training development.

Level 3 – Formal Qualification

Work to be performed that is HIGH hazard, based on P300, requires Level 3 – Formal Qualification.

ENV division does not perform high hazard work and does not have Level 3-Certification programs as defined by DOE Order 426.2. Reference P781.1, *Conduct of Training Manual*, for additional direction in training development.

Obtaining Training

Self-study training

For procedures that require self-study (reading) training:

Who	What
Employees	Read the required QAPPs, procedure(s), or training material. All ENV Division QAPPs and procedures can be found on the ENV Division Quality Website. Submit for credit on-line (by clicking the link at the end of each procedure) or send an e-mail to the Training Coordinator stating completion of self-study training. Employees are encouraged to maintain documentation of completed training in their personal files.

Classroom training

For required classroom training:

Who	What
Employees	Contact the Training Coordinator to notify of the need for training. Sign up for the training. After attending the course, either • Sign a class attendance list (including date, course title, course objective, and instructor signature) for the course; or • Forward the course certificate, if available, to the training coordinator. Ensure appropriate credit was granted for course(s) completed.

Obtaining Training, continued

On-the-job training

For procedures or courses that require on-the-job training:

Who	Actions
Employee	Contact supervisor to notify of need for training.
Supervisor	Arrange for the training to be given by a qualified OJT instructor.
Qualified OJT Instructor	Ensure lesson plan, or Performance Evaluation form (Attachment 1), for the OJT instruction has been developed and an Item # assigned (consult with the Training Coordinator). • Verify prerequisites. • Discuss learning objectives with employee. • Instruct and/or demonstrate the procedure/process to the employee following guidance provided in the OJT Performance Evaluation form. • Emphasize the safety aspects of the process and review the hazards and their mitigation in relevant Integrated Work Documents. • Instruct the employee on actions to take in the event of off-normal occurrences or accidents. • Encourage questions (not during the performance evaluation). • Complete the OJT Performance Evaluation form (Attachment 1) to document that the trainee can perform the process properly and safely.
Employee	After receiving the training, sign the OJT Performance Evaluation form (Attachment 1), keep a copy for your records, and turn the original in to the Training Coordinator.

Training Documentation

Policy

LANL requires that all training be documented to record the assignment and completion of training for each worker.

Note: The LANL UTrain system is the only official repository of LANL training records.

Recording training

The Training Coordinator shall:

- Obtain completed and signed Work Authorization/Worker Acknowledgement forms (Attachment 2) and OJT Performance Evaluation forms (Attachment 1).
- Enter the training information from the OJT Performance Evaluation forms or from class attendance lists into the UTrain database.
- Retain the forms as records in the employee's training file.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be filed within one month of generation with the Training Coordinator:

- Work Authorization/Worker Acknowledgement form (Attachment 2)
- OJT Performance Evaluation form (Attachment 1)
- Classroom Training Attendance List or course Certificate (when used)

The major sponsoring organization providing classroom instruction shall:

- Document and maintain course content and assessments/evaluation data
- Document UTrain record entry of individual training completions
- Document and maintain qualification/certification records and requirements for certification

Click to Acknowledge

OJT Performance Evaluation

Knowledge Questions (Safety Related Questions are indicated below [example only])

		Response Satisfactory (Initial)	Response Unsatisfactory (Initial)
1.	**Acceptable Response:**		
2.			
	Acceptable Response:		
3.	**Acceptable Response:**		
4.	**Acceptable Response:**		
5. **Safety Related**	**Acceptable Response:**		
6.	**Acceptable Response:**		
7.	**Acceptable Response:**		
8.	**Acceptable Response:**		
9.	**Acceptable Response:**		
10.	**Acceptable Response:**		
11.	**Acceptable Response:**		

Performance Evaluation

CAUTION
DO NOT ALLOW THE WORKER TO MAKE AN ERROR THAT WOULD PUT PERSONNEL, EQUIPMENT, THE ENVIRONMENT, OR THE FACILITY IN JEOPARDY AT ANY TIME DURING THIS TRAINING.

Perform each task in accordance with ***IWD or PROCEDURE NAME***. Performance is a preferred method of evaluation; however, if performance is not possible a simulation is acceptable.

Worker must successfully respond to 80%, or better, of all knowledge questions and correctly perform all critical steps. Failing to correctly respond to a *safety related* knowledge question is an automatic failure of this evaluation. Additionally, incorrectly performing any single critical step or two (2) non-critical steps constitutes a failure of this evaluation.

Any error serious enough to warrant discontinuing the training session or failure of the evaluation MUST be recorded in detail in the space provided at the end of this evaluation document.

Task/Activity	**Indicate Mode** **P-Perform O-Observe** **S-Simulate D-Discuss**	**Critical steps will be indicated with "C". Non-critical steps will be indicated with "NC".**	**Performance satisfactory (Initial)**	**Performance unsatisfactory (Initial)**
PD 1	**P**	**NC**		
PD 2	**P**	**C**		
PD 3	**P**	**C**		
PD 4	**P**	**NC**		
PD 5	**P**	**C**		
PD 6	**P**	**C**		
PD 7	**P**	**C**		
PD 8	**P**	**C**		

The candidate's overall performance and demonstration of knowledge and skills for these tasks were satisfactory

Item Title:		Item #:	
Worker Name (printed)		Z#	
Signature		Date	
Instructor/Evaluator Name (print)		Z#	

ENV-DO Work Authorization / Worker Acknowledgement

A Completed UTrain Curricula Must Be Attached

Worker Acknowledgement Statement: I have read the relevant documents, completed (or will complete) the relevant courses, (See attached UTrain Printout) and accept responsibility for my implementation of requirements including training.

Print Employee Name & Z No.	Signature	Date

Work Authorization Statement: I authorize the above noted employee to perform activities or operations covered by the training plans identified on the attached UTrain printout and have reviewed with the employee the training requirements.

Example

Supervisor Name and Z No.

Supervisor Signature	Date

ENV-RCRA-QP-022.2	
Effective Date: February 28, 2013	Next Review Date: January 28, 2015

Environment, Safety, Health Directorate

Environmental Protection – Water Quality and RCRA Quality Procedure

MSGP Storm Water Corrective Actions

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ENV-QPMO QA Specialist	Signature on file	1/4/13

Derivative Classifier: ☒ **Unclassified**

Name:	Organization:	Signature:	Date:
Catherine Hayes	ENV-RCRA	Signature on file	2/8/13

Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
Holly Wheeler	ENV-RCRA	Signature on file	1/28/13
Responsible Line Manager:	Organization:	Signature:	Date:
Terrill Lemke	ENV-RCRA Team Lead	Signature on file	2/8/13
Responsible Line Manager:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-RCRA Group Leader	Signature on file	2/28/13

CONTROLLED DOCUMENT

This copy is uncontrolled. The controlled copy can be found on the ENV Division Web page.

Users are responsible for ensuring they work to the latest approved version.

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	08/10	New Document.
1	11/10	Incorporated ENV-RCRA-QP-062 *MSGP Routine Inspections* into this document.
2	01/13	Biennial revision, new template implemented.

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1.0 PURPOSE

This procedure is written to provide requirements for identifying, documenting and entering corrective actions into the ENV-RCRA MSGP Corrective Action Report Findings database.

2.0 SCOPE

Requirements set forth in this document apply to Los Alamos National Laboratory industrial facilities covered by the National Pollutant Discharge Elimination System (NPDES) Storm Water Multi-Sector General Permit (MSGP). This "general permit" requires identification, documentation, tracking and reporting of corrective actions in accordance with sections 2.2.1, 3, 4.1.2, 4.2.2, 4.3.2, 5.0, 5.2, 5.4, 6.2.1, 6.2.1.2, 7.2 and Appendices B and I.

2.1 HAZARD REVIEW

The work described in this procedure is office work only and has a **LOW hazard** rating as documented by submittal of a completed *ENV Low Hazard Verification form* to the Quality Assurance Specialist.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- Group and Team Leader
- ENV-RCRA MSGP Storm Water compliance personnel
- Deployed Environmental Professionals (DEPs)
- Other LANL or subcontract personnel identified as being required to conduct storm water assessments as part of their job duties.

In addition to training to this procedure, the following training is also required prior to performing this procedure:

- ENV-RCRA QAPP-MSGP *Quality Assurance Project Plan for the Storm Water Multi-Sector General Permit for Industrial Activities*

The training method for this procedure is "self-study" (required read). For ENV-RCRA staff, this is documented in accordance with ENV-DO-QP-115, *Personnel Training*. Other participating groups may require training documentation pursuant to local procedures.

Actions specified within this procedure, unless preceded with "should" or "may", are to be considered mandatory (i.e., "shall", "will", "must").

3.1 ROLES AND RESPONSIBILITIES

3.1.1 ENV-RCRA MSGP STORM WATER TEAM

ENV-RCRA MSGP Storm Water Team members will be fully knowledgeable of the specific regulatory requirements identified in the 2008 MSGP and are responsible for ensuring compliance with these requirements and entering corrective actions. Team members will evaluate corrective actions that the DEPs enter into the ENV-RCRA MSGP Corrective Action Report Findings database and modify them as needed for quality assurance. This team will also periodically review open corrective actions and follow up with the DEPs, ES&H Managers, or Upper Management, as deemed necessary, to ensure close out of the corrective action. The team members will notify upper management of instances of non-compliance with the permit. A team member may also be responsible for responding to the regulatory authority (EPA) regarding identified storm water issues and/or negotiate settlement of any identified issues.

3.1.2 DEPLOYED ENVIRONMENTAL PROFESSIONALS

DEPs will be fully knowledgeable of the site specific Storm Water Pollution Prevention Plan (SWPPP) and corrective action requirements identified in the MSGP for the facilities they are deployed to. In addition, they shall be appropriately trained to meet the job qualifications identified in the *Quality Assurance for Storm Water Multi-Sector General Permit for Industrial Activities Program* (ENV-RCRA-QAPP-MSGP) and shall be familiar with the regulatory requirements identified in the 2008 MSGP. Further, they shall be familiar with facility operations so that potential pollution discharge sources can be determined and corrective actions can be identified.

The DEPs are responsible for identifying and entering corrective actions observed at their industrial facilities into the ENV-RCRA MSGP Corrective Action Report Findings database. They are also responsible for updating corrective actions in a timely manner that cannot be implemented immediately. They will work with the ES&H Manager and ENV-RCRA storm water personnel to ensure identified corrective actions are implemented by overseeing repairs and/or improvements or instituting additional controls. If it is determined that corrective actions are necessary following an assessment, any modification to the control measures must be made before the next storm event if possible, or as soon as practicable following that storm event.

NOTE: These time intervals are not grace periods, but are schedules considered reasonable for documenting your finding(s) and for making repairs and improvements. They are included in the MSGP Permit to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely (see Section 3.3 of the 2008 MSGP). In no instance will the corrective action remain open indefinitely.

3.1.3 ENV-RCRA STORM WATER TEAM LEADER

The ENV-RCRA Storm Water Team Leader is responsible for compliance oversight relative to the 2008 MSGP. The Team Leader will ensure costs needed to implement the regulatory requirements identified in the 2008 MSGP are identified and environmental risks are assessed. Upper management will be notified of these costs or environmental risks, as deemed necessary. In the event there is a dispute regarding the regulatory requirements contained in the MSGP, the Team Leader will make the final determination of the required action. The Team Leader will notify upper management of instances of non-compliance with the permit.

3.1.4 ENV-RCRA GROUP LEADER

The ENV-RCRA Group Leader or designee is responsible for ensuring there is adequate funding to implement the regulatory requirements identified in the 2008 MSGP. The Group Leader also acts as the duly authorized signatory that certifies the reports. The Group Leader will notify upper management of instances of non-compliance with the permit or other identified environmental risk.

3.1.5 ES&H MANAGER

The ES&H manager shall identify funding for their industrial facilities to ensure compliance with the 2008 MSGP. The ES&H Manager is also responsible for ensuring that industrial facilities are complying with the 2008 MSGP permit and notifying upper management of instances of non-compliance with the permit or other identified environmental risk.

3.1.6 FACILITIES OPERATIONS DIRECTOR

The Facilities Operations Director (FOD) provides organizational leadership to ensure that all facility and programmatic activities under their authority are performed in compliance with the 2008 MSGP. The FOD is also responsible for establishing an environmental compliance envelope. It is the FOD's responsibility to maintain trained and qualified Environmental Professionals and Waste Management Coordinators on staff.

3.1.7 COMPUTER PROGRAMMER

Maintains and updates the ENV-RCRA MSGP Corrective Action Report Findings database as requested by MSGP storm water personnel.

3.2 PREREQUISITES

In addition to training to this procedure, the following training is also required prior to performing this procedure:

- *ENV-RCRA QAPP-MSGP, Quality Assurance Project Plan for the Storm water Multi-Sector General Permit for Industrial Activities Program*

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records generated as a result of this procedure are to be submitted to the designated RM-POC in accordance with ENV-DO-QP-110, *Records Management* and filed in project files.

- MSGP Comprehensive Site Inspection Annual Report
- Completed Routine Inspection Forms
- Electronic records within the ENV-RCRA MSGP Corrective Action Report Findings database.
- Copies of automated e-mail notifications

5.0 WORK PROCESSES

5.1 IDENTIFYING CORRECTIVE ACTIONS

If any of the following conditions occur, the DEP or ENV-RCRA storm water team member must review and revise the selection, design, installation, and implementation of control measures to ensure that the condition is eliminated and will not be repeated in the future:

- An unauthorized release or discharge (e.g., spill, leak, or discharge of non-storm water not authorized by the 2008 MSGP);
- You become aware, or EPA determines, that your control measures are not stringent enough for the discharge to meet applicable water quality standards;
- An inspection or evaluation of the facility by an EPA official and/or local or State entity, determines that modification to the control measures are necessary to meet the non-numeric effluent limits in the 2008 MSGP;
- You find in the routine facility inspection, quarterly visual assessment, or comprehensive site inspection that the control measures are not being properly operated and maintained;
- Construction or a change in design, operation, or maintenance at the facility significantly changes the nature of pollutants discharged in storm water from the facility, or significantly increases the quantity of pollutants discharged; or
- The average of four quarterly sampling results exceeds an applicable benchmark. If less than four benchmark samples have been taken, but the results are such that an exceedence of the four quarter average is mathematically certain, (i.e., if the sum of quarterly sample results to date is more than four times the benchmark level) this is considered a benchmark exceedence, triggering this review;
- If effluent limitation guidelines are exceeded at the Asphalt Batch Plant (Sector D); or
- If impaired water quality standards are exceeded.

5.2 ROUTINE INSPECTIONS

Routine inspections shall be conducted by the DEP (or a qualified member if the DEP is not trained and qualified) at all areas of the facility where industrial materials or activities are exposed to storm water, and of all storm water control measures used to comply with the effluent limits contained in the 2008 MSGP. Routine inspections shall be conducted at least quarterly; however, some facilities conduct monthly inspections (as specified in the facility specific SWPPP). Routine inspections shall be conducted during periods when the facility is in operation. A certified copy of completed Routine Inspection Forms shall be maintained in the facility's SWPPP.

At least once each calendar year, the routine facility inspections must be conducted during a period when a storm water discharge (either rain or snow) is occurring. The DEP(s) or storm water personnel from ENV-RCRA are responsible for identifying and entering corrective actions observed during the routine inspections into the ENV-RCRA MSGP Corrective Action Report Findings database. The database is set up to allow access for all identified DEPs associated with a particular FOD if the FOD has more than one DEP. Contact a member of the ENV-RCRA storm water team if you do not have access to this database and the FOD has assigned you responsibility for MSGP corrective actions.

NOTE: If the industrial facility is inactive and unstaffed and there are no industrial materials or activities exposed to storm water, routine inspections may not be required. A determination of whether a facility is inactive or unstaffed shall be made in coordination with storm water personnel from ENV-RCRA as there are specific documentation and certification requirements that have to be met prior to discontinuing routine inspections.

5.3 COMPREHENSIVE INSPECTIONS

Qualified ENV-RCRA storm water personnel will conduct one comprehensive inspection of all industrial facilities and those that meet the "no exposure" criteria subject to the 2008 MSGP before September 29th of each year. At least one member of the facility's storm water pollution prevention team shall participate in this inspection. This is usually the DEP.

This inspection must cover all areas of the industrial facility affected by the requirements in the 2008 MSGP including the areas identified in the SWPPP as potential pollutant sources where industrial material or activities are exposed to storm water, areas where control measures are used to comply with the effluent limits, and areas where spills and leaks have occurred in the past 3 years. The inspector must include review of the monitoring data (analytical results from benchmark and impaired waters and visual assessments) collected that calendar year as part of the comprehensive inspection. Inspectors must examine the following at a minimum:

- Industrial materials, residue, or trash that may have or could come into contact with storm water;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;

- Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site;
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas; and
- Control measures needing replacement, maintenance, or repair.
- Storm water controls measures required by the 2008 MSGP must be observed to ensure that they are functioning correctly.

NOTE: The annual comprehensive site inspection may also be used as one of the routine inspections, as long as all components of both types of inspections are included.

ENV-RCRA will then enter all identified corrective actions into the ENV-RCRA MSGP Corrective Action Report Findings database. It is the responsibility of the DEP to update the database to reflect updates to these corrective actions.

Information compiled during the comprehensive inspection is used to complete the Annual Report. This report shall be submitted to EPA (postmarked) within 45 days of the last facility inspection completed in September of each year. For example, if the last facility was inspected (as part of the comprehensive site inspection) on September 22, the report shall be postmarked before or on November 6th. A complete certified copy of the Annual Report shall be maintained in the facility's SWPPP.

5.4 SPILLS

All leaks or spills shall be cleaned up immediately and entered into the ENV-RCRA MSGP Corrective Action Report Findings database. This can be done by either the DEP or an ENV-RCRA MSGP storm water team member. If the spill is immediately cleaned up, and controls are put in place to prevent further leakage, the corrective action can be closed.

5.5 ALLOWABLE NON-STORM WATER DISCHARGES

The following are allowable non-storm water discharges authorized by the 2008 MSGP:

- Discharges from fire-fighting activities;
- Fire hydrant flushing;
- Potable water, including water line flushings;
- Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
- Irrigation drainage;
- Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
- Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous material have occurred (unless all spilled material has been removed);

- Routine external building washdown that does not use detergents; and
- Uncontaminated ground water or spring water.

Any person authorized to conduct work at LANL can identify a potential storm water issue. If this occurs, they should contact the DEP or an ENV-RCRA MSGP storm water team member who will determine if a corrective action is needed.

5.6 ENTERING CORRECTIVE ACTIONS

To enter a corrective action into the ENV-RCRA MSGP Corrective Action Report Findings database, perform the following steps:

NOTE: Be clear and concise, use correct grammar and punctuation, and correct any spelling errors. This information will be used to populate a report that will be submitted to the EPA. Therefore, it is critical that all information entered into the ENV-RCRA MSGP Corrective Action Report Findings database is correct and meets these criteria.

Step	Action
1	From this web page: http://int.lanl.gov/environment/water/guidance/swmgp.shtml, under the heading "Compliance Tools". Click on the link "MSGP Corrective Action Report Findings Database" Click on "Enter New Corrective Action."
2	Under the "Corrective Action Header" tab, enter the following: • Facility Name by clicking on the "List" tab and selecting a facility. • Date Problem was Identified (mm/dd/yyyy) • Date of Notification to ENV-RCRA (mm/dd/yyyy) • FOD Responsible for CA (Name & Org) by clicking in the box. FOD designations (for example "STO") and the associated name will come up. Just select the appropriate FOD. **NOTE:** Contact the MSGP Project Leader at 667-1312 or hbensen@lanl.gov if the FOD name or organization is incorrect, so this can be corrected. • Describe Specific Evaluation Location (for example "Northeast corner of Building TA-3-66") • Inspector Z-Number by clicking in the box, which will populate it with your Z number. In most instances, the DEP should be identified as the inspector. Note: If you are entering the CA and are not the DEP, you will have to enter the DEP's Z number or they will not have the ability to update the corrective action. Once all of the above information is entered correctly, click "Save" and go

	to Step 3. All boxes identified with a red asterisk are "required fields" and shall be filled out. Note: The system will automatically assign a Corrective Action Report ID number.
3	Click "Go To Corrective Action Details" in the middle of the screen. Under the "Corrective Action Details" tab, enter the following: • Identify the condition triggering the need for this review by clicking on the "List" tab and selecting an option or selecting "Other" and entering a description of the condition. • Briefly describe the nature of the problem identified during the inspection (e.g., erosion, damage to a BMP, trash, spill, etc.) and the specific evaluation location. **NOTE:** Spills or other emergency situations may identify the need for a corrective action that was not identified during an inspection. • How the problem was identified by clicking on the "List" tab and selecting an option or selecting "Other" and entering a description of the problem. • Description of the corrective action taken, or to be taken, to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analyses to be conducted, etc.) or if no modifications are needed, the basis for that determination. • Did/will the corrective action require modification of your SWPPP. Type in "Y" for yes and "N" for no. • Date Corrective action was initiated (mm/dd/yyyy) • Date corrective action was completed **OR** expected completion date (mm/dd/yyyy) **NOTE:** If the corrective action has not been completed, enter an expected completion date. Do not put a date in both locations. If the corrective action has not been completed, provide the status of the corrective action and describe any remaining steps (including timeframes associated with each step) necessary to complete the corrective action. **NOTE:** This should only be filled out if the corrective action has not been completed. If the corrective action has been completed, enter "N/A." Make sure to hit the "save" tab in the bottom right hand corner so the corrective action information is retained. If you want to enter more corrective actions, go back to the "Corrective Action Header" tab and press the "Enter New Corrective Action" button in the lower left hand corner of the screen (see step #2). Hitting the "Exit" button will cause you to exit from the system.

	All boxes identified with a red asterisk are "required fields" and shall be filled out. If a date is not included or identified as an expected completion date, ENV-RCRA storm water compliance personnel will enter a completion date of 30 days after the corrective action was identified.

5.7 UPDATING CORRECTIVE ACTIONS

To update a corrective action in the ENV-RCRA MSGP Corrective Action Report Findings database, perform the following steps:

Step	Action
1	From this web page: http://int.lanl.gov/environment/water/guidance/swmgp.shtml, under the heading "Compliance Tools". Click on the link "MSGP Corrective Action Report Findings Database" to access the database and tab down to the corrective action number you want to edit. Click on "Edit."
2	Navigate to the blank that you will be changing and input the updated information. It is anticipated that most changes will occur relative to updating the status of corrective actions. Save all changes to the information. Remember, you should only have a date under "Date corrective action completed **OR** the "expected to be completion," but not both.

5.8 VALIDATING CORRECTIVE ACTIONS

ENV-RCRA storm water personnel will periodically validate the information contained in the ENV-RCRA MSGP Corrective Action Report Findings database. To validate a corrective action in the ENV-RCRA MSGP Corrective Action Report Findings database, perform the following steps:

Step	Action
1	From this web page: http://int.lanl.gov/environment/water/guidance/swmgp.shtml, under the heading "Compliance Tools". Click on the link "MSGP Corrective Action Report Findings Database" to access the database.

2	Check all entered fields for a corrective action to ensure that all information is clear, correct, and concise. If not, correct the information by navigating to the information that needs to be changed and making the change. Save all changes to the information. All information shall be validated before running the final annual report.
3	For ENV-RCRA storm water personnel only, under "status" select "void" if the corrective action is a repeat of a previous corrective action or if it is determined not to be a corrective action. This will delete the corrective action from the annual report.

5.9 INSTITUTIONAL PERFORMANCE FEEDBACK AND IMPROVEMENT TRACKING SYSTEM (PFITS)

PFITS is the institutional performance and tracking system for identified issues. A corrective action that meets any of the following criteria will be entered into the PFITS system, as deemed necessary.

- Corrective action was not completed by the expected completion date entered into the database.
- No action was taken to remedy an identified issue with a control measure within 14 days of discovery or before the next storm event or as soon as practicable following that storm event (Section 3.3 of the 2008 MSGP).
- Repeat corrective actions or trends identified by ENV-RCRA MSGP storm water personnel.
- Conditions requiring immediate action, where failure to take action would result in pollutants being released to water of the state or an immediate non-compliance with the 2008 MSGP.
- Violations identified by the regulatory authority.
- Other issues as deemed necessary by MSGP storm water personnel.

Once every month, ENV-RCRA storm water personnel will evaluate a summary of open corrective actions in the ENV-RCRA MSGP Corrective Action Report Findings database and using the above criteria will determine which corrective actions, if any, should be transferred into PFITS. When the monthly notification of outstanding corrective actions is sent out, evaluate whether any of the outstanding corrective actions meet the above conditions. Send those that do to the Environmental Protection Division's Improvement Management Coordinator (IMC) so that she can enter the information into PFITS. The summary report will contain the following information, at a minimum:

- Date the corrective action was identified;
- Person that identified the corrective action;

- A description of the nature of the problem identified and what needs to be done to address the corrective action.
- Whether the corrective action was identified internal to LANL or External to LANL.

5.10 NOTIFICATIONS FOR NEW AND OVERDUE CORRECTIVE ACTIONS

When a new corrective action is entered into the ENV-RCRA MSGP Corrective Action Report Findings database, the FOD, ESH&Q Manager, Operations Manager, inspector (usually the DEP) and ENV-RCRA MSGP storm water personnel are notified automatically by e-mail (unless the corrective action is closed the same day it is entered). This will assist the FOD, ESH& Q Managers, Operations Managers and the DEPs with keeping track of new corrective actions.

An automatic e-mail is sent the first of each month notifying the FOD, ESH&Q Manager, Operations Manager and DEPs of all overdue corrective actions for their industrial facilities. The Environmental Protection Division Leader and ENV-RCRA Group Leader receive a web link that contains a bar graph showing corrective actions 30 to 60 days overdue, 60 to 90 days overdue, 90 days to 1 year overdue, and those greater than a year overdue. In addition, they receive a link with summary information on each corrective action overdue sorted by FOD.

6.0 REFERENCES

- Federal Register: *Final National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Industrial Activities*. Federal Register: September 29, 2008, Volume 73, Number 189.
- P300, *Integrated Work Management*
- P315, *Conduct of Operations Manual*
- PD103, *Worker Safety and Health Policy*
- SD100, *Integrated Safety Management System Description Document with Embedded 10 CFR 851 Worker Safety and Health Program*
- P101-18, *Procedure for Pause/Stop Work*
- PD410, *Los Alamos National Laboratory Environmental ALARA Program*
- P121, *Radiation Protection*
- ENV-DO QP-106, *Document Control*
- ENV-DO-QP-115, *Personnel Training*
- ENV-DO-QP-104, *Work Safety Review*

In addition to these documents, please read any site specific requirements before proceeding with work.

7.0 DEFINITIONS

Best Management Practice (BMP): Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. (*40 CFR Part 122.2)*

Control Measure: Any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

CA: Corrective Action

DEP: Deployed Environmental Professional

EPA: Environmental Protection Agency

FOD: Facility Operations Director

MSGP: Multi-Sector General Permit

SWPPP: Storm Water Pollution Prevention Plan

8.0 ATTACHMENTS

Attachment 1- Annual Reporting Form

Attachment 2- NPDES Multi-Sector General Permit Routine Inspection Form

Click here for "Required Read" credit.

ATTACHMENT 1- ANNUAL REPORTING FORM

NPDES Permit Tracking No.:

EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

Annual Reporting Form

A. GENERAL INFORMATION

1. Facility Name:
2. NPDES Permit Tracking No.:
3. Facility Physical Address:
   a. Street:
   b. City: c. State: d. Zip Code: -
4. Lead Inspectors Name: Title:
   Additional Inspectors Name(s):
5. Contact Person: Title:
   Phone: - - Ext. E-mail:
6. Inspection Date: / /

B. GENERAL INSPECTION FINDINGS

1. As part of this comprehensive site inspection, did you inspect all potential pollutant sources, including areas where industrial activity may be exposed to stormwater?
   ☐ YES ☐ NO

   If NO, describe why not:

NOTE: *Complete Section C of this form for each industrial activity area inspected and included in your SWPPP or as newly identified in B.2 or B.3 below where pollutants may be exposed to stormwater.*

2. Did this inspection identify any stormwater or non-stormwater outfalls not previously identified in your SWPPP? ☐ YES ☐ NO

   If YES, for each location, describe the sources of those stormwater and non-stormwater discharges and any associated control measures in place:

NPDES Permit Tracking No.:

3. Did this inspection identify any sources of stormwater or non-stormwater discharges not previously identified in your SWPPP? ☐ YES ☐ NO

If YES, describe these sources of stormwater or non-stormwater pollutants expected to be present in these discharges, and any control measures in place:

4. Did you review stormwater monitoring data as part of this inspection to identify potential pollutant hot spots? ☐ YES ☐ NO ☐ NA, no monitoring performed

If YES, summarize the findings of that review and describe any additional inspection activities resulting from this review:

5. Describe any evidence of pollutants entering the drainage system or discharging to surface waters, and the condition of and around outfalls, including flow dissipation measures to prevent scouring:

6. Have you taken or do you plan to take any corrective actions, as specified in Part 3 of the permit, since your last annual report submission (or since you received authorization to discharge under this permit if this is your first annual report), including any corrective actions identified as a result of this annual comprehensive site inspection?
☐ YES ☐ NO

If YES, how many conditions requiring review for correction action as specified in Parts 3.1 and 3.2 were addressed by these corrective actions? ☐☐

NOTE: *Complete the attached Corrective Action Form (Section D) for each condition identified, including any conditions identified as a result of this comprehensive stormwater inspection.*

NPDES Permit Tracking No.:

C. INDUSTRIAL ACTIVITY AREA SPECIFIC FINDINGS

Complete one block for each industrial activity area where pollutants may be exposed to stormwater. Copy this page for additional industrial activity areas.

In reviewing each area, you should consider:

- Industrial materials, residue, or trash that may have or could come into contact with stormwater;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Offsite tracking of industrial or waste materials from areas of no exposure to exposed areas; and
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas.

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised c necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA _____:

Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

NPDES Permit Tracking No.: ☐☐☐☐☐☐☐☐☐☐

***NOTE:** Copy this page and attach additional pages as necessary*

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

INDUSTRIAL ACTIVITY AREA _____:

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised BMPs necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form)

NPDES Permit Tracking No.: ☐☐☐☐☐☐☐☐☐☐

D. CORRECTIVE ACTIONS

Complete this page for each specific condition requiring a corrective action or a review determining that no corrective action is needed. Copy this page for additional corrective actions or reviews.

Include both corrective actions that have been initiated or completed since the last annual report, and future corrective actions needed to address problems identified in this comprehensive stormwater inspection. Include an update on any outstanding corrective actions that had not been completed at the time of your previous annual report.

1. Corrective Action # ☐☐ of ☐☐ for this reporting period.

2. Is this corrective action:
   - ☐ An update on a corrective action from a previous annual report; or
   - ☐ A new corrective action?

3. Identify the condition(s) triggering the need for this review:
   - ☐ Unauthorized release or discharge
   - ☐ Numeric effluent limitation exceedance
   - ☐ Control measures inadequate to meet applicable water quality standards
   - ☐ Control measures inadequate to meet non-numeric effluent limitations
   - ☐ Control measures not properly operated or maintained
   - ☐ Change in facility operations necessitated change in control measures
   - ☐ Average benchmark value exceedance
   - ☐ Other (describe): _____

4. Briefly describe the nature of the problem identified:

5. Date problem identified: ☐☐/☐☐/☐☐☐☐

6. How problem was identified:
   - ☐ Comprehensive site inspection
   - ☐ Quarterly visual assessment
   - ☐ Routine facility inspection
   - ☐ Benchmark monitoring
   - ☐ Notification by EPA or State or local authorities
   - ☐ Other (describe): _____

7. Description of corrective action(s) taken or to be taken to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analyses to be conducted, etc.) or if no modifications are needed, basis for that determination:

8. Did/will this corrective action require modification of your SWPPP? ☐ YES ☐ NO

9. Date corrective action initiated: ☐☐/☐☐/☐☐☐☐

10. Date correction action completed: ☐☐/☐☐/☐☐☐☐ or expected to be completed: ☐☐/☐☐/☐☐☐☐

11. If corrective action not yet completed, provide the status of corrective action at the time of the comprehensive site inspection and describe any remaining steps (including timeframes associated with each step) necessary to complete corrective action:

NPDES Permit Tracking No.:

E. ANNUAL REPORT CERTIFICATION

1. Compliance Certification

Do you certify that your annual inspection has met the requirements of Part 4.2 of the permit, and that, based upon the results of this inspection, to the best of your knowledge, you are in compliance with the permit? ☐ YES ☐ NO

If NO, summarize why you are not in compliance with the permit:

2. Annual Report Certification

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.

Authorized Representative Printed Name: _____ Title: _____

Signature: _____ Date Signed: _____

ATTACHMENT 2- NPDES MULTI-SECTOR GENERAL PERMIT ROUTINE INSPECTION FORM

Los Alamos National Laboratory
ENV-RCRA

NPDES Multi-Sector General Permit Routine Inspection Form
(rev. 03/2009) Page 1 of __ (use additional sheets if necessary)

Name of Facility:	**Responsible FOD (Name & Organization):**	
Qualified Inspector(s): **Others Present:**	**Inspection type:** ☐ Quarterly ☐ Other	**Date of inspection (MM/DD/YYYY):** **Time of inspection:**

Weather: ☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snow ☐ High Winds ☐ Other:
Temperature: ° F **Is Inspection Being Conducted During a Storm Water Discharge?** ☐ Yes ☐ No

#	Structural Control Measures (BMP)s	Location	Operating Effectively (Yes or No)?	If No, Need to Maintain (M), Repair (R) or Replace (RP)?	Corrective Action Needed and Notes (identify needed maintenance and repairs, or any failed control measures that need replacement)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12					

Were additional BMPs or Control Measures implemented? ☐ Yes ☐ No **Describe:**

Were previously identified conditions corrected before the next anticipated storm event? ☐ Yes ☐ No **If No, describe reason:**

Area/Activity (Areas of Industrial Materials or Activities Exposed to Storm Water)	Inspected?	Controls Adequate?	Corrective Action Needed and Notes (List area letter with comments below)
A. Material loading/unloading & storage areas			
B. Equipment operations & maintenance areas			
C. Fueling Areas			
D. Outdoor vehicle & equipment washing areas			
E. Waste Handling & disposal areas			
F. Erodible areas / construction			
G. Non-storm water / illicit connections			
H. Salt storage piles or pile containing salt			
I. Dust generation & vehicle tracking			

Are the SWPP Plan maintenance, schedules and procedures being implemented at the facility? ☐ Yes ☐ No

Were any Corrective Actions initiated or completed? ☐ Yes ☐ No **Describe:**

Are there any conditions requiring Corrective Action? ☐ Yes ☐ No **If Yes, List Number of Corrective Actions Required** _____
(Note – need a Corrective Action Form for each listed)

Non-Compliance

Describe any incidents of non-compliance and/or need for corrective action observed and not described above:

Additional Control Measures

Describe any additional control measures needed to comply with the permit requirements:

Notes

Use this space for any additional notes or observations from the inspection:

Inspector's Signature and date:_____

CERTIFICATION STATEMENT

"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."

Print name and title: _____

Signature:_____**Date:**_____

ENV-RCRA-QP-047.1	
Effective Date: May 14, 2013	Next Review Date: April 14, 2015

Environment, Safety, Health Directorate

Environmental Protection – Water Quality and RCRA Quality Procedure

Inspecting Storm Water Runoff Samplers and Retrieving Samples for the MSGP

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ENV-QPMO QA Specialist	Signature on file	3/7/13

Derivative Classifier: ☒ **Unclassified** ☐ **DUSA**_____

Name:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-RCRA	Signature on file	5/14/13

Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
Holly Wheeler	ENV-RCRA	Signature on file	3/20/13
Responsible Line Manager:	Organization:	Signature:	Date:
Terrill Lemke	ENV-RCRA Team Lead	Signature on file	5/3/13
Responsible Line Manager:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-RCRA Group Leader	Signature on file	5/14/13

CONTROLLED DOCUMENT

This copy is uncontrolled. The controlled copy can be found on the ENV Division Web page.

Users are responsible for ensuring they work to the latest approved version.

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	03/11	New Document.
1	02/13	Annual Review and Revision

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1.0 PURPOSE

This procedure describes the process for inspecting ISCO storm water runoff samplers and retrieving storm water runoff samples from all locations where the Los Alamos National Laboratory (LANL) conducts storm water sampling activities for the Multi-Sector General Permit (MSGP).

2.0 SCOPE

This procedure applies to the ENV-RCRA technical staff and subcontractor personnel conducting activities at single stage stations used for monitoring under the MSGP.

2.1 HAZARD REVIEW

Hazards in the work described in this procedure are controlled thorough site specific IWDs. The hazard level of the activities in this procedure is **moderate**.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- ENV-RCRA technical staff and subcontract or other personnel who inspect storm water samplers and retrieve storm water samples for the MSGP.

The training method for this procedure is "self-study" (reading). For ENV-RCRA staff, this is documented in accordance with ENV-DO-QP-115, *Personnel Training*. Other participating groups may require training documentation pursuant to local procedures.

Actions specified within this procedure, unless proceeded with "should" or "may," are to be considered mandatory (i.e., "shall", "will", "must").

3.1 PREREQUISITES

Personnel performing this procedure will be familiar with the most current versions of the following procedures and operation manuals:

- ENV-RCRA MSGP Sampling and Analysis Plan for the current monitoring year.
- Manual for Teledyne ISCO Sampler model 3700.
- Manual for Teledyne ISCO Avalanche sampler

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records are generated as a result of this procedure and are maintained in accordance with ENV-DO-QP-110, *Records Management Program* with the originals on file at ENV-RCRA offices:

- Completed work order for ISCO Sampler Inspection and Sample Retrieval and Collection forms (example in Attachment 2).

5.0 WORK PROCESSES

ISCO samplers are used to collect storm water runoff for Multi-Sector General Permit (MSGP) Program stations. ISCOs are designed to automatically collect water when the water surface is high enough to trigger the actuator and fill the sample bottles. Field personnel are required to inspect the sampling station while retrieving water samples and at other intervals determined by the project or as directed by work orders issued by project personnel.

A LANL Project Leader is the primary person with responsibility for the steps in this procedure. ENV-RCRA personnel will be appointed with responsibility for a subset of sampling stations.

If subsequent rain events occur before all sampler locations have been visited after the first rain event, finish the route to collect the first-event samples (safety permitting).

Inspections may be discontinued during periods or conditions that make sites dangerous for worker safety or prevent personnel from safely accessing sites (e.g., weather-related events such as flash floods, flooding, lightning, wildfires, hail, icy roads, deep snow, and LANL operations such as shots or burns at the OBOD sites).

5.1 EQUIPMENT AND TOOLS

Ensure the following equipment is available in the field vehicle:

- Copy of this procedure
- Copy of the Integrated Work Documents (IWDs)
- Charged spare battery(ies)
- Battery voltage tester
- Spare tubing (pump, suction, discharge types, sampler specific)
- Spare/replacement sample bottles (glass and poly)
- Shovel
- Wooden stakes
- Plastic wire “zip” ties
- Cell phone (only government cell phones with batteries removed are allowed in secure areas)
- Appropriate tools in tool box
- Issued Work Orders and associated forms
- Necessary access and station keys
- Coolers with ice or Blue Ice®
- Expanded Site Field Maps
- Nitrile gloves
- Paper Towels
- Marker pen (permanent, waterproof)
- Ball point pen
- Zip lock bags
- Safety glasses with side shields
- Chain of custody seals
- Sturdy hiking boots or steel toed shoes with soles that grip

5.2 PREPARING FOR FIELDWORK

Once the work orders have been approved, the following steps should be followed to prepare for fieldwork:

Step	Action
1	Receipt of a work order indicates that sampler inspections have been approved by the LANL Project Leader. Schedule work to be completed by the target date appearing on the work order(s).
2	Distribute work order(s) to field personnel. A sample Work Order form is provided in Attachment 1, ISCO Sampler Inspection and Sample Retrieval Form.
3	Inform (e.g., by e-mail) the Field Operations designee, as specified in the IWD, of the schedule for sampler inspection work and locations up to a week (preferred) before but no later than the day before (for minor changes) to be added to the appropriate plan of the day.
4	For work at sites operated by Weapons Facility Operations or Nuclear Environmental Sites, notify the appropriate access control before traveling to those sites. The IWD Part II (2101 Form) addresses specific requirements and training for these sites.
5	Obtain any necessary additional paperwork before conducting this work, including IWD's, and excavation permits (if necessary).
6	Gather the required equipment (see section above) for the work to be done.
7	Set watch(s) to the precise Mountain Standard (not daylight saving) Time. This can be done by logging on to the time page at www.time.gov (or click on the clock icon on the lab's internal home page). When at the site, the clock time on the ISCO sampler needs to be verified. Clocks must be set to Mountain Standard Time at all times, with no daylight saving time adjustment.

5.3 INSPECTING THE SAMPLER

The following table details the inspection requirements for the sampler:

Step	Action
1	If conditions prevent a sampler inspection, document the conditions on the work order and notify the Project Lead or designee within 24 hours. Multiple attempts can be documented on the original inspection work order up to the target date. After the target date, return work order to the ENV-RCRA Storm Water Data Stewards Team for reissuance (if necessary).
2	Item 1: on work order (see example in attachment 2): Enter the date and time inspection and water retrieval is performed and the name(s) and Z number(s) of the field personnel performing the work in the upper right corner of the work order.
3	Item 2: Verify and document the sampler is ON and its condition upon arrival by checking the "Yes" or "No" box. Explain any non-functional status in third column.
4	Item 3: Verify and document the ISCO programming displays by checking the "Yes" or "No" box in second column. • For ISCO 3700 samplers = "Sampler Inhibited"

	OR • For Avalanche samplers = “Program Disabled” If No, repair or describe (e.g., “Done X samples”, or “sampler off”, etc). If more space is needed, continue notes in the “Additional Notes” section at the bottom of the page.
5	Don nitrile gloves and safety glasses.
6	Remove the lid from the sampler.
7	Item 4: If water was collected, check “Yes” and collect the water according to the steps in “Retrieving Storm Water Runoff Samples” below. Note: Complete the required MSGP Visual Assessment form to document the water appearance (foam, sheen, etc.). Ensure this form is submitted to the appropriate MSGP project personnel (see item 11). If No, describe (e.g., “no water collected”, “sampler off”) in the third column; check “No” for Item 4.
8	Item 5: Verify and document the sampler is set to the correct Mountain Standard Time +/- no more than 1 minute by checking the “Yes” or “No” box in the second column. If the sampler is set incorrectly, reprogram for the correct Mountain Standard Time. Describe the work performed and correction applied (e.g., “ISCO clock was X minutes slow”) in the third column.
9	Item 6: Review the Sampling Results report and document any error messages from the sampler display by checking the “Yes” or “No” box. If a message is displayed, record the message in the “Comments” section on page 2 next to the sample bottle being filled when the problem occurred. If there is no indication of flow and the sampler triggered due to a non-flow event (e.g., animal, tumbleweed), indicate this in the third column.
10	Item 7: For the Avalanche sampler equipped with an ISCO 701 pH Module, record the pH measurement taken at the time of Bottle 1 from the Combined Results report.
11	Item 8: For Avalanche samplers only, and if water was collected, check “Yes” and record the refrigerator temperature (°C) upon arrival. If no water was collected, or unable to review temperature, check “No” and describe in column 3 (e.g., no sample, dead battery).
12	Item 9: Verify and document whether sample volumes were retrieved by checking the “Yes” or “No” box. Refer to the volume retrieval instructions on page 2 of work order. Record the volume retrieved in third column.
13	Item 10: If water was collected, perform a visual assessment of the water using the MSGP program visual assessment form (not included in this procedure). Document whether a visual assessment was performed by checking the “Yes” or “No” box.
14	Item 11: Verify and document sample station equipment, model, serial number, actuator height, sampler program, and bottle configuration match the header on the work order page 1 by checking the “Yes” or “No”. If they do not match the data on the work order, ensure you are at the correct location. If the location is verified, check “No” and update inaccurate information.
15	Item 12: Verify and document power supply function. Use the voltage tester to check the voltage of the battery and record the voltage. Check “Yes” or “No” to indicate if battery voltage is acceptable (≥11.7 V for non-floating charged batteries at ISCO 3700 samplers and ≥11.0 for floating-charged batteries at Avalanche samplers as described in ENV-RCRA-QP-045).
16	Item 13: Verify and document the sampler passed the diagnostics test by checking the “Yes” or “No” box. Directions for running the diagnostics test is provided in ENV-RCRA-QP-045)

	If maintenance is necessary and can be performed at the time of inspection, perform the work and describe in third column. If maintenance cannot be completed at the time of inspection, then describe the condition and work needed in the third column.
17	Item 14: Verify and document the sample tubing passed a suction test by checking the "Yes" or "No" box. Check the condition of sample tubing and vent tubing. If maintenance (e.g., clearing the tube, replacing the tube) is necessary and can be performed at the time of inspection, perform the work and describe in third column. If maintenance cannot be completed at the time of inspection, then describe the condition and work needed in third column.
18	Item 15: Verify all cable and electrical connections are attached and secure by checking the "Yes" or "No" box. If maintenance (e.g., tightening connection, replacing cables) is necessary and can be performed at the time of inspection, describe the work performed in the third column. If more space is needed, continue notes in the "Additional Notes" section. If maintenance cannot be completed at the time of inspection, then describe the condition and work needed in the third column.
19	Item 16: Verify and document sampler is ON prior to departing the site by checking the "Yes" or "No" box. If the sampler is not on, document the reason.
20	Item 17: If the sampler tripped and requires reset of the sampling program, reset the actuator by toggling the switch to "Reset" then back to "Latch" • Verify and document the ISCO programming displays the following by checking the "Yes" or "No" box in column 2, page 1. • ISCO 3700 stand-alone samplers = "Sampler Inhibited" OR • Avalanche samplers = "Program Disabled" If an error occurs, reconfigure the sampler (see ENV-RCRA-QP-045 for settings)
21	Item 18: Verify and document any maintenance completed while on site. Describe the work performed or indicate "none completed" in third column. Maintenance items may include (but are not limited to) battery replacement, tubing clearing or replacement, site clearing, securing electrical connections, or sampler diagnostics or repair.
22	Item 19: Verify and document any follow-on maintenance needed that could not be completed while on site. Describe the needed maintenance in the third column. If more space is needed, continue notes in the "Additional Notes" section. A separate work order for the station maintenance will be issued. If no follow-on maintenance is required, indicate "none required" in third column. Maintenance items may include (but are not limited to) battery replacement, tubing clearing or replacement, site clearing, securing electrical connections, or sampler diagnostics or repair.
23	Item 20: If no storm water samples were collected by the sampler, draw a line through page 2 of the work order, initial, and date. If storm water samples were collected by the sampler, skip to "Retrieving storm water runoff

	samples" section.
24	Replace and secure the sampler lid and secure the sampler shelter (if sampler is in a shelter).
25	Review the completed work order(s) for accuracy and completeness and sign and date "Review by Signature" line on page 2 of work order.
26	Item 21: Review the work order(s) for accuracy and certify that the information submitted is "true, accurate, and complete" by signing and dating "Lead Signature" line on page 1.
27	Return completed original work orders to the Project Leader the same day following completion of field work. If original work orders must remain with collected samples, return photocopies of incomplete work orders to the Project Leader the same day field work is completed. Stamp or write "Copy" on the work order returned.

5.4 RETRIEVING SAMPLES

The following steps should be followed when retrieving samples:

Step	Action
1	Don nitrile gloves and safety glasses.
2	See flow chart in Attachment 1. Item 5: Refer to the "Earliest Sample Collect Date" on work order. If the "Earliest Sample Collect Date" field is empty OR the ISCO sample collection date is ON or AFTER that date, samples may be retrieved per the volume requirements given on the work order. Continue with next step below. If the ISCO sample collection date is BEFORE the "Earliest Sample Collect Date": • Indicate "non-qualifying storm event" in Item 5 third column. • Discard the collected sample water on the ground. • Skip to Step 10 below.
3	Remove filled and partially-filled bottles from the carousel.
4	Add up the total volume of water collected and check that the collected volume of water in glass and poly matches the required volume in the header of the work order page 2. The volume of water required to complete a sample set may vary. Retrieval of partial volume is allowed as long as the minimum specified volume is met. For "Partial Volume Retrieval Allowed, Minimum Volume NOT Met" samplers: If sample volume was sufficient, continue with next step 5 below. If sample volume was NOT sufficient: • Record the date and time the ISCO collected water in each glass and poly bottle by the position number in the carousel in Item 21. • Record total volume retrieved as "0" in Item 22. • Pour out all water on the ground. • Skip to step 11 below. For "Partial Volume Retrieval Allowed, Minimum Volume Met" samplers: • Record the date and time the ISCO collected water in each glass and poly bottle by the position number in the carousel on Item 21 of page 2

	• Record the specific ISCO displayed message for each bottle, if present, in the "Comments" column on Item 21. • Record total volume retrieved in Item 22. • Skip to step 11 below.
5	For samples retrieved, place lids onto the sample bottles with storm water.
6	Write the date and time collected, Station Number, and the corresponding carousel number on each retrieved sample bottle. Obtain the sample collection date and time from the ISCO sampler.
7	Item 21: Record the date and time the ISCO collected water in each glass and poly bottle by the position number in the carousel. Record the specific ISCO displayed message for each bottle, if present, in the "Comments" column.
8	Item 22: For "Partial Volume Retrieval Allowed, Minimum Volume NOT Met" samplers, if sample volume was NOT sufficient, record the total volume retrieved as "0" and discard sample water on ground. For "Partial Volume Retrieval Allowed" samplers, record the total volume retrieved.
9	Place retrieved sample bottles in a cooler with blue ice (or equivalent).
10	Return any excess water or collected volume that exceeded the amount required to the ground.
11	Install new sample bottles in the carousel for the next sampling event. The number and type of bottles may vary. Ensure bottles match the configuration specified on page 1 of the work order.
12	Item 23: Document any additional notes or site information in the "Additional Notes" section.
13	Return to steps in "Inspecting the Sampler" above.

5.5 DELIVERING SAMPLES

The following steps should be followed when delivering samples:

Step	Action
1	If samples were collected, deliver the samples, and completed, reviewed, and signed work order to the Storm Water Program Laboratory.
2	Item 25: Relinquish samples to MSGP personnel by signing "Relinquished By" or if self processed, refer to ENV-RCRA-QP-048, Processing MSGP Storm Water Samples.
3	Place samples in the refrigerators in the laboratory within the basement of TA-59-1 and lock the refrigerator to prevent tampering.

6.0 REFERENCES

None

7.0 DEFINITIONS

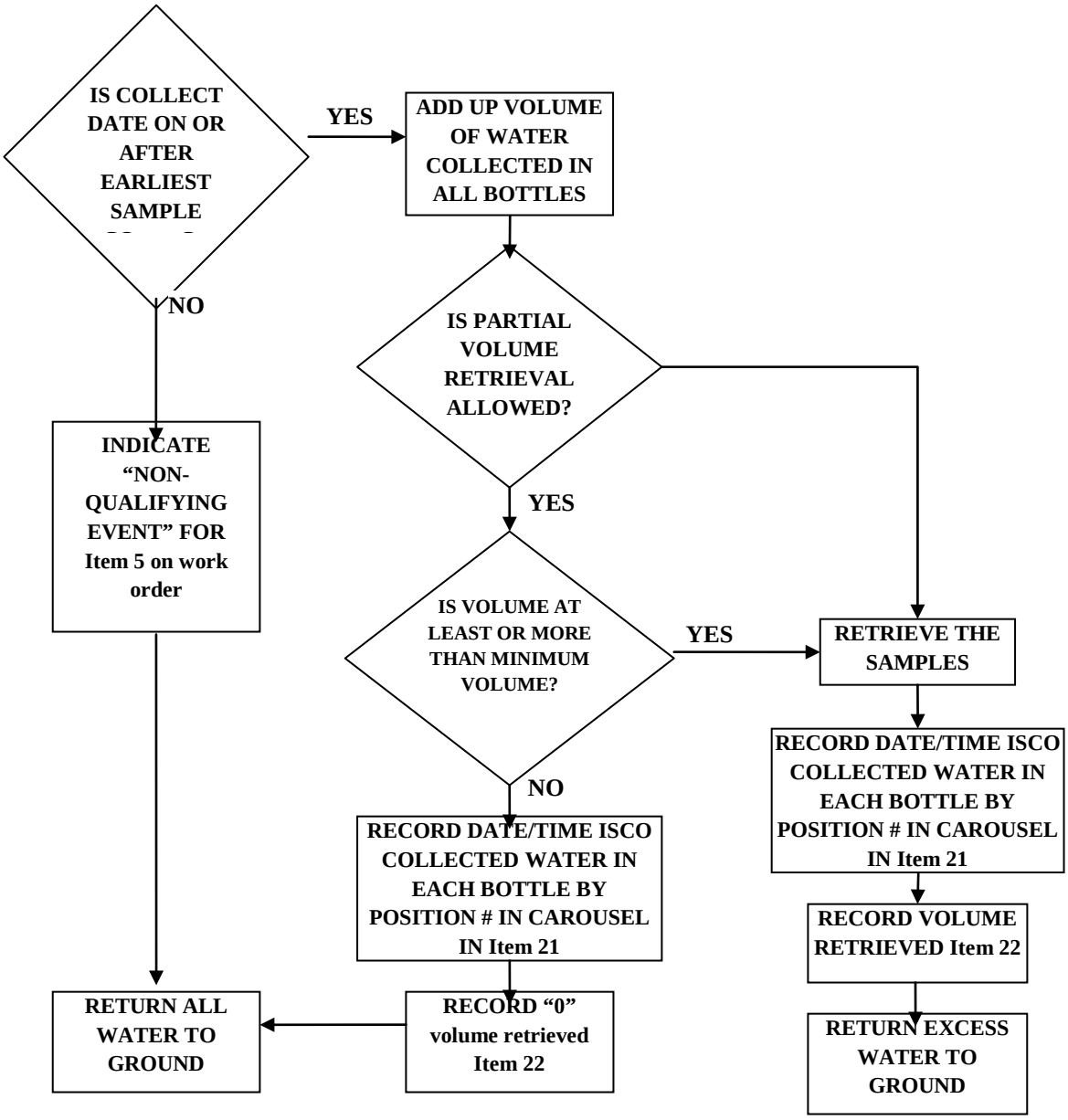
None

8.0 ATTACHMENTS

Attachment 1- Flow Chart for Sample Retrieval

Attachment 2- ISCO Sampler Inspection and Sample Retrieval Form

ATTACHMENT 1- FLOW CHART FOR SAMPLE RETRIEVAL



ATTACHMENT 2- ISCO SAMPLER INSPECTION AND SAMPLE RETRIEVAL FORM

ENV-QP-047.0

LANL Multi-Sector General Permit
ISCO Sampler Inspection and Sample Retrieval Form

Form 047-1 (3/2011)

Outfall: **3-MFS-1 : 03-0038W** Project ID: **P-MSGP-2046** Work Order ID: **MSGP-26090**

Target Date: **9/30/2012**

Project: MSGP Q3 Sampler Inspection & Retrieval

Reason: MSGP ISCO Sampler Inspection - Sample Retrieval

Earliest Sample Collect Date: 8/1/2012

Date:_____ Time:_____

Name/Z#:_____

Name/Z#:_____

Lead Signature:_____

"I confirm the information as recorded is true, accurate and complete."

Equipment	Manufacturer	Model	Serial No.	Specification	Configuration
Actuator	ISCO	1640	210J01655	Actuator Height	2"
ISCO 3700 Sampler	Teledyne	3700	209H01284	Bottle Set	12c- 1 1L Glass, 11 1L Poly
ISCO 3700 Sampler	Teledyne	3700	209H01284	Program	Storm / Multiplex 10 min delay
Pb-Acid Battery	MK Powered	110 A-h	MSGP-110-0310-06	Voltage	> 11.7 V

ISCO Sampler Inspection Tasks		Note: If "No", provide explanation and/or correct information.
ON ARRIVAL		
Is sampler ON and functioning properly upon arrival?	❒ Yes ❒ No	
Does ISCO display either "Sampler Inhibited" or "Program Disabled" ?	❒ Yes ❒ No	
Is ISCO time delta < 1 min (MST)? If NO, record adjustment.	❒ Yes ❒ No	
Is any water collected? If YES, complete Page 2.	❒ Yes ❒ No	
Does the Sampling Results report indicate any error messages(s)? If YES, record error message(s) in the applicable Bottle Comment field on Page 2.	❒ Yes ❒ No	
Is any water collected on or after the "Earliest Sample Collect Date"?	❒ Yes ❒ No	
Was sample volume retrieved?	❒ Yes ❒ No	
Was a Visual Assessment performed? If YES, complete the MSGP Visual Assessment form (ENV-RCRA-QP-064.0 Att. 1).	❒ Yes ❒ No	
ON DEPARTURE		
Is the equipment information listed above, including specifications, correct?	❒ Yes ❒ No	
Are electrical connections secure?	❒ Yes ❒ No	
Record battery voltage(s). Voltage(s) > 11.7 V ?	❒ Yes ❒ No	
Does the ISCO diagnostics test pass?	❒ Yes ❒ No	
Does sample tubing pass suction test?	❒ Yes ❒ No	
Is sampler ON upon departure?	❒ Yes ❒ No	
Has the actuator swtich been reset to "Latch"?	❒ Yes ❒ No	
Does ISCO display either "Sampler Inhibited" or "Program Disabled"?	❒ Yes ❒ No	
If any maintenance completed during inspection, check YES and describe.	❒ Yes ❒ No	
If any follow-on maintenance is required, check YES and describe.	❒ Yes ❒ No	

Page 1 of 2 for MSGP-26090

ENV-QP-047.0

LANL Multi-Sector General Permit
ISCO Sampler Inspection and Sample Retrieval Form

Form 047-1 (3/2011)

Outfall: **3-MFS-1 : 03-0038W** Project ID: **P-MSGP-2046** Work Order ID: **MSGP-26090**

Complete if sample bottles contain water OR to to record ISCO message

Sample Volume Requirements		
Bottle Type: Poly or Glass bottles	**Minimum Volume (L):** 0.5	**Maximum Volume (L):** 1

Bottle #	Bottle Type	Date:	Time (MST):	Comments
1	❒P ❒G	/ /2012		
2	❒P ❒G	/ /2012		
3	❒P ❒G	/ /2012		
4	❒P ❒G	/ /2012		
5	❒P ❒G	/ /2012		
6	❒P ❒G	/ /2012		
7	❒P ❒G	/ /2012		
8	❒P ❒G	/ /2012		
9	❒P ❒G	/ /2012		
10	❒P ❒G	/ /2012		
11	❒P ❒G	/ /2012		
12	❒P ❒G	/ /2012		
13	❒P ❒G	/ /2012		
14	❒P ❒G	/ /2012		

Total Volume Retrieved (liters):	**Poly**	**Glass**

Relinquished by Signature	Date:	Time:	Received by Signature	Date:	Time:

Additional Notes:

LANL PERSONNEL USE ONLY (Initials and dates)		
Accepted	Tech QC	ENV-RCRA Review

MSGP STORM WATER VISUAL INSPECTIONS

Purpose

This procedure is written to provide requirements for conducting visual monitoring under the 2008 National Pollutant Discharge Elimination System (NPDES) Storm Water Multi-Sector General Permit (MSGP) for industrial facilities.

Scope

Requirements set forth in this document apply to Los Alamos National Laboratory industrial facilities covered by the MSGP. These facilities include, a warehouse, several metal fabrication areas/shops, a heavy equipment yard, an asphalt batch plant, roads and grounds, a foundry, a power plant, a material recycling facility and several hazardous waste treatment, storage or disposal (TSD) facilities. Inspection waivers may be granted by ENV-RCRA for adverse weather conditions and unstaffed or inactive sites.

Hazard review

The work described in this procedure is field work and consists solely of visual evaluations, and has been documented to have a **LOW hazard** rating by submittal of a completed *ENV Low Hazard Verification* form to the Quality Assurance Specialist.

Signatures

Prepared by: Signature on File Holly Wheeler, ENV-RCRA	Date: 02/22/12
Approved by: Signature on File Melanie Lamb, ENV Quality Assurance Specialist	Date: 02/14/12
Authorized by: Signature on File Terrill Lemke, ENV-RCRA Team Leader	Date: 02/27/12
Authorized by: Signature on File Anthony Grieggs, ENV-RCRA Group Leader	Date**: 03/06/12
Classification Review by Signature on File Anthony Grieggs, Derivative Classifier	Date: 03/06/12 ☒ Unclassified

**Effective Date

General information about this procedure

In this procedure

This procedure addresses the following major topics:

Topic	Page
General information about this procedure	2
Who requires training to this procedure?	2
Roles and responsibilities	5
Visual examinations	5
Completing the MSGP storm water visual inspection form	6
Guidance	8
Records resulting from this procedure	9

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	MSGP Visual Inspection Form	1
2	Example MSGP Visual Inspection Form	1
3	Facilities and Storm Water Stations Associated With Industrial Activity	1

History of revision & review

This table lists the revision history, reviews, and effective dates of this procedure:

Revision	Date	Description of Changes or Review
0	7/09	New document.
1	3/10	Clarifications and added attachments.
2	2/12	Biennial review/revision.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- Group and Project Leader
- MSGP Visual Assessors
- ENV-Deployed Environmental Professional (DEP)
- ENV-RCRA Sampling Team

Training method

Training to this procedure will be by **"self-study" (reading)** and will be documented in accordance with ENV-DO-QP-115 *Personnel Training*.

General information about this procedure, continued

Prerequisites

In addition to training to this procedure, the following training is also required prior to performing this procedure:

- ENV-RCRA-QAPP-MSGP *Multi-Sector General Permit Quality Assurance Project Plan*

Definitions specific to this procedure

Adverse weather conditions: Weather that prohibits collection of samples such as local flooding, high winds, hurricanes, tornadoes, electrical storms, etc. Could also include drought, extended frozen conditions, etc.

Best Management Practices (BMPs): Schedules of activities, practices, prohibitions of practices, structures, vegetation, maintenance procedures, and other management practices to prevent or reduce pollution. BMPs can also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Clarity: Clearness or cleanness of appearance. This includes the visual observation of suspended sediment.

Color: Unpolluted water will be clear and colorless. Color should not be confused with clarity.

Floating solids: Particulate material floating on the surface of the water. Examples include: leaves, pinecones, pine needles, dead grass, twigs, branches, and common trash.

Foam: An accumulation of fine frothy bubbles formed in or on the surface of water. A mass of bubbles of air in a matrix of liquid film.

Odor: The property or quality of waters that affects or stimulates the sense of smell. Examples of odors that may be present are burnt oil, sewage, diesel, sulfuric, or detergent odors.

Oil sheen: The presence of rainbow-like colors glistening on the surface of a liquid. The color of oil sheen will vary dependent on thickness and consistency.

Settled solids: Settled particulate material i.e. heavier than water. Examples include sand, gravel, metal turnings, and glass.

Suspended solids: Particulate materials that are floating between the bottom of the sample and the surface of the water.

Unstaffed and Inactive Sites: A facility maintaining certification with the SWPPP that it is inactive and unstaffed and visual examinations are not required.

General information about this procedure, continued

References

- Federal Register: *Final National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Industrial Activities.* Federal Register: September 29, 2008, Volume 73, Number 189.
- P300, *Integrated Work Management for Work Activities*
- P315, *Laboratory Institutional Operations Program*
- PD103, *Worker Safety and Health Policy*
- SD100, *Integrated Safety Management System Description*
- P101-18, *Procedure for Pause/Stop Work*
- PD410, *Los Alamos National Laboratory Environmental ALARA Program P121 Radiation Protection*
- ENV-DO-QP-106, *Document Control*
- ENV-DO-QP-102, *Office Safety and Security*
- ENV-DO-QP-104, *Work Safety Review*
- ENV-DO-QP-115, *Personnel Training*

In addition to these documents, please read any site specific requirements before proceeding with work.

Note

Actions specified within this procedure, unless preceded with “should,” or “may,” are to be considered mandatory (i.e., “shall,” “must,” “will”).

Roles and Responsibilities

Deployed Environ-mental Professionals	Deployed environmental professionals (DEPs) are responsible for collecting quarterly visual samples at substantially identical outfalls and completing required documentation, unless arrangements are made to use ENV-RCRA resources. DEPs will be fully knowledgeable of the site specific SWPPP. Whenever practicable the same person should carry out the inspection and examination of the discharges throughout the life of the permit to ensure consistency in interpretation of results. Further, DEPs shall be familiar with facility operations so that potential pollution discharge sources can be determined.
ENV-RCRA MSGP storm water compliance personnel	MSGP storm water compliance personnel are responsible for filling out a visual assessment form if requested by work order for MSGP monitored outfalls. Storm water compliance personnel are also responsible for evaluating the quality of completed visual assessments, retaining a record of QA'd forms on the server and distributing these forms to the DEPs for inclusion into the appropriate facility SWPPP.

Visual Examinations

Visual examinations	Visual examinations of storm water discharge shall be conducted quarterly for each discharge point covered by the MSGP and the site specific SWPPP.
Grab samples	A grab sample will be collected during daylight hours in a 1 liter wide mouth clear glass bottle or plastic container within 30 minutes of discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes. The sampler will document the reason a sample could not be collected within 30 minutes. If no samples are collected because the sampler was not triggered (or for some other reason), documentation shall be kept in the facility's SWPPP explaining why visual examinations were not conducted.

Completing the MSGP Storm Water Visual Inspection Form

Location, date & time, inspector, etc.	Complete the top section of form including location as indicated on site map, date and time, outfall ID (i.e. the monitored outfall), person collecting and examining the sample and signature, and inspection quarter. **NOTE:** See Attachment 2 for an example of a filled-out MSGP Visual Inspection form. **NOTE:** See Attachment 3 for facility name, location, and station numbers. Include the date and time the discharge began, sample collection date and time and visual assessment date and time for each sample. Identify the nature of the discharge (i.e., rainfall or snowmelt). Determine whether it has been greater than 72 hours from the last storm event. If "No", explain when the last storm event occurred.
Sample document-ation	Provide documentation if sample is not collected within 30 minutes of discharge.

Completing the MSGP Storm Water Visual Inspection Form, continued

Describe sample parameters

Refer to section 3.0, Definitions. See attachment 2 for an example of a filled-out MSGP Visual Inspection form.

Parameter	Description
Color	Describe the color of the discharge.
Odor	Describe any odors that may be observed in the discharge. Caution: any unusual odors should be documented.
Clarity	Clarity can be described as the depth in which you can look into or through water. For example an individual can see through a clear glass of clean water in daylight. Generally the clarity of the water is a good visual indicator of the purity of water. If the water is poor in clarity there is most likely suspended solids throughout the water.
Floating Solids	Note any floating solids in the sample. Careful examination should determine whether the solids are raw or waste materials (i.e. vegetative materials).
Settled Solids	Note any settled solids in the sample. Settled solids may be an indicator of unstable ground cover combined with a high intensity storm water runoff event.
Suspended Solids	Note any suspended solids in the sample. Most often suspended solids include fine sediment. This may be an indication of an unstable channel that may have eroding banks. Some water appears to be colored because of relatively coarse particulate material in suspension such as sediment.
Foam	Note an accumulation of fine frothy bubbles formed in or on the surface of water. Describe the color of the foam.
Oil Sheen	Note if there is an oil sheen present, the thickness, and consistency. If yes, contact the ENV-RCRA Project Leader for MSGP **immediately**. Follow-up action is required within 24 hours.
Other	Describe any other indicators of storm water pollution in addition to the descriptions mentioned above.

Completing the MSGP Storm Water Visual Inspection Form, continued

ENV Deployed Environ-mental Professional

Place completed and signed form into the facility SWPPP. Provide a copy to the MSGP Project Leader or other designee at ENV-RCRA.

Site observations

Note if there are any potential sources of pollutants on site. If yes, contact an MSGP representative of ENV-RCRA and document the following:

- potential sources;
- indicate if there are any BMPs on site and evaluate and note effectiveness;
- if no BMPs, determine if installation could correct future pollutant migration; and
- the nature of discharge (i.e., runoff or snow melt).

Source of pollutants

While conducting the visual examinations, personnel should constantly be attempting to relate any pollutant that is observed in the samples to the sources of pollutants that are on the site.

Guidance

Clean up

A clean up of the site should be conducted if the pollutant source is known and well defined. The FOD, ESH Manager, and MSGP representative of ENV-RCRA should also be contacted and made aware of the situation. A design change could also be incorporated into the storm water pollution prevention plan to eliminate or minimize the contaminant source from occurring in the future. Personnel should evaluate whether or not additional BMPs should be implemented in the pollution prevention plan to address the observed contaminant, and if BMPs have already been implemented, evaluate whether or not these are working correctly or need maintenance. Corrective actions must be taken if BMPs are not performing effectively. Actions should be taken as soon as practicable from the discovery of any pollutants.

NOTE: This time frame (and those listed below) is not a grace period. Rather, it is a schedule considered reasonable for documenting your findings and for making repairs and improvements. The time frame is to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely. Failure to take prompt action can result in fines and penalties for non-compliance.

Guidance, continued

Corrective action

If storm water contamination is identified through visual assessment, a corrective action must be entered into the ENV-RCRA MSGP Corrective Action Report database within 24 hours of the observation. A corrective action plan must be identified within 14 days of the observation.

NOTE: If possible, the corrective action must be implemented before the next anticipated storm event.

Follow up

A date for completion of implementation must be entered into the database to ensure that appropriate actions are taken in response to the examinations.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted to an MSGP representative of ENV-RCRA in accordance with ENV-DO-QP-110 *Records Management*.

- MSGP Quarterly Visual Assessment Form

Click here to record "self-study" training to this procedure.

MSGP Quarterly Visual Assessment Form

Complete a separate form for each outfall you assess. When adverse weather conditions prevent the collection of a sample during the quarter, a substitute sample must be taken during the next qualifying storm event. Maintain this document in your SWPPP).

Name/Location of Facility:	Permit Number: NMR05GB21	Inspection Quarter: ☐Apr-May ☐Jun-Jul ☐Aug-Sep ☐Oct-Nov
Outfall ID:	"Substantially Identical Outfall"? ☐ Yes ☐ No	If YES identify other Outfalls in the Group:
Person(s) collecting sample (PRINT): PPT Member? ☐ Yes ☐ No	Signature :	
Person(s) examining sample (PRINT): PPT Member? ☐ Yes ☐ No	Signature :	
Date & Time Discharge Began:	Date & Time Sample Collected:	Date & Time Sample Examined:
Substitute Sample? ☐ Yes ☐ No	If YES, identify quarter/year when sample was originally scheduled to be collected:	
Was the sample collected in the first 30 minutes? ☐ Yes ☐ No If No, explain why not:		
Nature of Discharge: ☐ Rainfall. Amount_____inches ☐ Snowmelt. Amount_____inches		
Previous Storm Ended > 72 hours Before Start of This Storm? ☐Yes ☐ No	If No, Explain: *	

PARAMETERS

Color ☐ None ☐ Other	If Other describe:
Odor ☐ None ☐ Musty ☐ Sewage ☐ Sulfur ☐ Sour ☐ Solvents ☐Petroleum/Gas ☐ Other	If Other, describe the odor:
Clarity: ☐ Clear ☐ Slightly Cloudy ☐ Cloudy ☐ Opaque ☐ Other (describe):	
Floating Solids: ☐ Yes ☐ No	If YES, describe if raw or waste materials(s):
Settled Solids:** ☐ Yes ☐ No	If YES, are solids Fine ☐ Coarse ☐ If Other describe:
Suspended Solids: ☐ Yes ☐ No	If YES, are solids Fine ☐ Coarse ☐ If Other describe:
Foam (gently shake sample): ☐ Yes☐ No	If YES, on the surface ☐or ☐ in the water. Describe color:
Oil Sheen ☐ Yes ☐ No ☐ Color of Sheen:	Thickness: Flecks ☐ Globs ☐ Describe if other:
Other Obvious Indicators of Pollution Present in the sample? Yes☐ No☐	If YES describe:

SITE OBSERVATIONS

Potential pollutants found during visual examination? ☐ Yes ☐ No If Yes, list pollutant(s)and if possible indicate the source: If source is identified during collection of sample, please notify Tim Zimmerly @ 699-7621 or 664-0105

Pollutant	Source	Pollutant	Source

NOTE: A clean up of the site should be conducted if the pollutant source is known. Was proper Notification made? ☐ Yes ☐ No
If Yes, indicate who was notified:

CORRECTIVE ACTION

If storm water contamination was identified in this sample through visual assessment, was a Corrective Action Form filled out within 24 hrs of observation? Yes☐ No☐ If No, explain why not:

Was a Corrective Action Plan identified within 14 days of the observation? Yes☐ No☐ If No, explain why not:

Other Relevant Information: Yes☐ No☐
Use the back of this form to list any concerns, comments, and/or descriptions of pictures taken, (attach additional sheets as necessary).

* The 72-hour interval can be waived when the previous storm did not yield a measurable discharge or if you are able to document (attach applicable documentation) that less than a 72-hour interval is representative of local storm events during the sampling period.

** Observe for settled solids after allowing the sample to sit for approximately one-half hour.

Example of Filled-Out MSGP Quarterly Visual Assessment Form

MSGP Quarterly Visual Assessment Form

Complete a separate form for each outfall you assess. When adverse weather conditions prevent the collection of a sample during the quarter, a substitute sample must be taken during the next qualifying storm event. Maintain this document in your SWPPP).

Name/Location of Facility: TA-3-66 Sigma Foundry	Permit Number: NMR05GB21	Inspection Quarter: ☒ Jan-Mar ☐ Apr-Jun ☐ Jul-Sep ☐ Oct-Dec
Outfall ID: 3-Sigma-1	"Substantially Identical Outfall"? ☒ Yes ☐ No	If **YES** identify other Outfalls in the Group: 3-Sigma-2, 3-Sigma-3, 3-Sigma-4, 3-Sigma-5, 3-Sigma-6 and 3-Sigma-7
Person(s) collecting sample (PRINT): PPT Member? ☐ Yes ☒ No Joe Doe	Signature : Joe Doe	
Person(s) examining sample (PRINT): PPT Member? ☐ Yes ☒ No Joe Doe	Signature : Joe Doe	
Date & Time Discharge Began: 1/14/2010 at 3:00 P.M.	Date & Time Sample Collected: 1/14/2010 at 3:25 P.M.	Date & Time Sample Examined: 1/14/2010 at 4:30 P.M.
Substitute Sample? ☐ Yes ☒ No	**If YES**, identify quarter/year when sample was originally scheduled to be collected:	
Was the sample collected in the first 30 minutes? ☒ Yes ☐ No If No, explain why not:		
Nature of Discharge: ☐ Rainfall. Amount_____inches ☒ Snowmelt. Amount___0.25 inches		
Previous Storm Ended > 72 hours Before Start of This Storm? ☒ Yes ☐ No	**If No**, Explain: *	

PARAMETERS

Color ☐ None ☒ Other	**If Other** describe: light brown
Odor ☒ None ☐ Musty ☐ Sewage ☐ Sulfur ☐ Sour ☐ Solvents ☐ Petroleum/Gas ☐ Other	**If Other,** describe the odor:
Clarity: ☐ Clear ☒ Slightly Cloudy ☐ Cloudy ☐ Opaque ☐ **Other (describe)**:	
Floating Solids: ☐ Yes ☒ No	**If YES,** describe if raw or waste materials(s):
Settled Solids:** ☐ Yes ☒ No	**If YES,** are solids Fine ☐ Coarse ☐ If Other describe:
Suspended Solids: ☒ Yes ☐ No	**If YES,** are solids Fine ☒ Coarse ☐ If Other describe:
Foam (gently shake sample): ☐ Yes ☒ No	**If YES,** on the surface ☐ or ☐ in the water. Describe color:
Oil Sheen ☐ Yes ☒ No ☐ **Color of Sheen**:	**Thickness**: Flecks ☐ Globs ☐ Describe if other:
Other Obvious Indicators of Pollution Present in the sample? Yes ☐ No ☒	**If YES** describe:

SITE OBSERVATIONS

Potential pollutants found during visual examination? ☐ Yes ☒ No **If Yes,** list pollutant(s)and if possible indicate the source: If source is identified during collection of sample, please notify Tim Zimmerly @ 699-7621 or 664-0105

Pollutant	Source	Pollutant	Source

NOTE: A clean up of the site should be conducted if the pollutant source is known. Was proper Notification made? ☐ Yes ☐ No
If Yes, indicate who was notified:

CORRECTIVE ACTION

If storm water contamination was identified in this sample through visual assessment, was a Corrective Action Form filled out within 24 hrs of observation? Yes ☐ No ☐ **If No**, explain why not:

Was a Corrective Action Plan identified within 14 days of the observation? Yes ☐ No ☐ **If No**, explain why not:

Other Relevant Information: Yes ☐ No ☒
Use the back of this form to list any concerns, comments, and/or descriptions of pictures taken, (attach additional sheets as necessary).

* The 72-hour interval can be waived when the previous storm did not yield a measurable discharge or if you are able to document (attach applicable documentation) that less than a 72-hour interval is representative of local storm events during the sampling period.

** Observe for settled solids after allowing the sample to sit for approximately one-half hour.

Los Alamos National Laboratory
FACILITIES AND STORM WATER STATIONS ASSOCIATED WITH INDUSTRIAL ACTIVITY

2008 MSGP PERMIT #NMR05GB21

LOCATION	OPERATION	Activity	Sector	STATION	DRAINAGE
TA-3-22	POWER PLANT	STEAM ELECTRIC POWER	O	E121.9, 03-0022N, 03-0022S	Sandia
TA-3-38	METAL SHOP	FABRICATED METALS	AA	03-0038W	Sandia
TA-3-39, 102	METAL SHOP	FABRICATED METALS	AA	03-0039E	Pajarito
TA-3-66	SIGMA FOUNDRY	PRIMARY METALS	F	E122.3	Sandia
TA-60	ASPHALT BATCH PLANT	ASPHALT BATCH PLANT	D	E200.5	Mortandad
TA-54	AREA G - South Side	TSD	K	54-PAD10E, E248.5, E248	Pajarito
TA-54	AREA G - North Side	TSD	K	E227	Canada del Buey
TA-54	AREA L	TSD	K	E223	Canada del Buey
TA-54-38	RANT	TSD	K	E220	Canada del Buey
TA-15-185	VEHICLE MAINTENANCE SHOP	VEHICLE MAINTENANCE	P	E262.4	Water
TA-60-1	MOTORPOOL	VEHICLE MAINTENANCE	P	60-0001	Sandia
TA-60	MATERIALS RECYCLING FACILITY	RECYCLING	N	E122.35	Sandia
TA-60-250	ROADS & GROUNDS FACILITY	VEHICLE MAINTENANCE & STORAGE	P	E123.4, 60-00RG, 60-00RGE	Sandia
TA-3-0034	METAL SHOP	FABRICATED METALS	AA	03-0034	Sandia
TA-9-28	HEAVY EQUIPMENT MAINTENANCE OPERATIONS	VEHICLE MAINTENANCE AND STORAGE	P	09-0028W	Upper Pajarito
TA-60-2	WAREHOUSE	WHAREHOUSE	P	60-002E	Sandia

ENV-RCRA-QP-066.3	
Effective Date: April 4, 2013	Next Review Date: March 4, 2015

Environment, Safety, Health Directorate

Environmental Protection – Water Quality and RCRA Quality Procedure

Chemical Preservation of Water Samples

Reviewers:

Name:	Organization:	Signature:	Date:
Melanie Lamb	ENV-QPMO QA Specialist	Signature on file	4/1/13

Derivative Classifier: ☒ **Unclassified** ☐ **DUSA**_____

Name:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-RCRA	Signature on file	4/4/13

Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
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Responsible Line Manager:	Organization:	Signature:	Date:
Mike Saladen	ENV-RCRA Team Lead	Signature on file	4/4/13
Responsible Line Manager:	Organization:	Signature:	Date:
Anthony Grieggs	ENV-RCRA Group Leader	Signature on file	4/4/13

CONTROLLED DOCUMENT

This copy is uncontrolled. The controlled copy can be found on the ENV Division Web page.

Users are responsible for ensuring they work to the latest approved version.

History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	03/07	New Document.
1	03/09	ENV SOPs converted at this time to QPs; revision tracking numbers set to next in sequence. Procedure ownership passed from the Water Quality Team to the Technical Support and Compliance Assurance Team.
2	03/11	Biennial review and revision.
3	04/13	Biennial review and revision, new format implemented.

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1.0 PURPOSE

This Environmental Protection Division–Water Quality & RCRA Group (ENV-RCRA) procedure describes the process for the chemical preservation of water samples.

2.0 SCOPE

This procedure applies to ENV-RCRA personnel, contract personnel, and students conducting chemical preservation of water samples either in the field at time of sample collection or in the TA-59-1-Basement Lab.

2.1 HAZARD REVIEW

The hazard level of the work specified in this procedure results from the sample preservation steps is considered **moderate** and is controlled by application of IWD 005, *NPDES Outfall Compliance Sampling*, Part I, Step 7.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- ENV-RCRA personnel, contractors, and students conducting chemical preservation of water samples.

The training method for this procedure is "self-study" (required reading) and demonstration of proficiency depending on the experience of the personnel. All training is documented in accordance with ENV-DO-QP-115, *Personnel Training*.

Actions specified within this procedure, unless proceeded with "should" or "may," are to be considered mandatory (i.e., "shall", "will", "must").

3.1 PREREQUISITES

In addition to training to this procedure, the following training is also required prior to performing this procedure:

- UTrain Curricula 131, *Field Worker Training*
- UTrain Curricula 7579, *ENV-RCRA NPDES Compliance Sampling*
- UTrain Curricula 2810, *Hazardous Waste Generator*

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records generated as a result of this procedure are to be submitted in accordance with ENV-DO-QP-110 *Records Management*. Copies should also be submitted to the Storm Water Sampling Team Leader.

- Copy of Sample Collection Log/Field Chain of Custody form(s)
- Completed sampling field sheets
- Log Book entries

5.0 WORK PROCESSES

5.1 CHEMICAL PRESERVATION

Effluent samples are collected in the field. Chemical preservation is conducted in the field immediately (within 15 minutes) following sample collection. Preservation may also be conducted in the TA-59-1 Basement Lab if it is practicable to do this within 15 minutes of sample collection. The personnel processing the samples shall refer to Sample Collection Log/Field Chain of Custody form for sample container and preservation requirements for the collected samples.

Preserved samples shall be placed, along with the chain of custody documentation, inside the truck refrigerator or in the field sample receiving refrigerator in the TA-59-1 Basement Lab.

Warning: Preservation entails the addition of acid or base to a sample. Acids used include hydrochloric acid (HCl), nitric acid (HNO_3), and sulfuric acid (H_2SO_4). The base used in preservation is sodium hydroxide (NaOH). These are all strong acids and bases that can cause severe burns and are particularly dangerous to the eyes. Extreme care should be taken when using these acids and bases. Follow the precautions for sample preservation in Step 7 of IWD 005, Part I, NPDES Outfall Compliance Sampling.

To preserve samples in the field or in the TA-59-1 Basement Lab, perform the following steps:

Step	Action
1	Don gloves, protective eyewear, and lab coat or long sleeve shirt.
Note: Open-toed shoes are not allowed during preservation.	
2	Verify two 500-ml containers of Neutra-Sol are readily available for use.
3	Preserve (add acid or base) samples according to the requirements on the sample container label. Preservation vials are labeled with the type of preservative as well as the volume of sample each vial will preserve.
4	Securely affix lid to sample container. Clean and dry the exterior of sample container, ensure lid is on securely, and check sample container for leakage and breakage.

5	Apply chain-of-custody tape to the lid/bottle.
6	Carefully place sample containers in the sample truck refrigerator or cooler with frozen "blue ice."
7	Complete the sampling field sheet and the Sample Collection Log/Field Chain of Custody form (Attachment 1).
8	Following the Environmental Protection –Environmental Data and Analysis Group (ENV-EDA) Sample Management Office (SMO) requirements for accepting samples (WES-EDA-QP-219), submit samples to SMO for shipment to the appropriate analytical laboratory.
9	Retain a copy of the Sample Collection Log/Field Chain of Custody form when relinquishing custody of samples to the ENV-EDA SMO.
10	Provide a copy of the Sample Collection Log/Field Chain of Custody form to the Program Lead or DMR Data manager.

Rinse all used sample collection bottles and preservation vials at the sink in the TA-59-1 Basement Lab and dispose in the trash accordingly: Place plastic/poly containers/vials in the trash. Place unbroken used glass bottles/vials in a cardboard box, close the box with tape, and dispose of the box in the dumpster. Carefully place any broken glass in the Broken Glass Box in the TA-59-1 Basement Lab.

Note: Only non-hazardous wastes are generated by this operation. Clean the area where the samples have been preserved.

6.0 REFERENCES

None

7.0 DEFINITIONS

None

8.0 ATTACHMENTS

Attachment 1- Sample Collection Log/Field Chain of Custody Form

Click here for "Required Read" credit.

ATTACHMENT 1- SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY FORM

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: **EVENT NAME:**

SAMPLE ID: **WORK ORDER:**

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
DATE COLLECTED (MM/DD/YYYY):			FIELD MATRIX:	WOE	
TIME COLLECTED (HH:MM):			MEDIA:		
PRS ID:			SAMPLE TECH CODE:	DC	
LOCATION ID:			FIELD PREP:	UF	
LOCATION TYPE:			FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	COMP	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

NOTE: Use these buttons to print or save the form. DO NOT use the browser tool bar.

Los Alamos NATIONAL LABORATORY EST. 1943

Form 1893

Excess/Salvage Equipment Request Form

Date:

Custodian Name	Z Number Get	Telephone	Group	
Description	Bar Code Number Get	Manufacturer	Serial Number	Model Number
Condition: ☐ Operable ☐ Repairable ☐ Not Repairable		Property's Current Location (TA, Bldg., Room)		

Please fill in all applicable boxes

Property with Memory Retention Capability

Classified: ☐ All magnetic media (including internal hard disks) have been removed and handled according to P204-2 *Classified Matter Protection and Control Handbook.*

Non-Classified: ☐ Hard-drive/memory removed ☐ Hard-drive/memory not removed

Signature _____ Z # _____ Date _____ Organization _____

Environment, Safety, and Health (ES&H) Information

Radiological contamination possible?

☐ Not contaminated; history of use known.

☐ Contamination possible; history of use not known*

☐ Contamination known or possible; history of use known*

*Released by RCT (*Name, Signature, Date)*

If property contains any of the following hazards, contact your organization's Waste Coordinator for assistance.

☐ Chemicals/Liquids ☐ Lead

☐ Asbestos ☐ Oil

☐ Explosives ☐ Biological

High Risk Certification

If you have a question, contact the Disposition Office at 665-8079 or e-mail disposition@lanl.gov.

1. Is this item routinely sold to the general public through a scientific supply store or Wal-Mart, Note: Do not answer yes if this item was modified or enhanced.	☐ Yes ☐ No
2. Is this item on the U.S. Munitions List (22 CFR 121)? Examples of items on the Munitions List include: firearms, ground control equipment, navigation equipment, satellites and related equipment, high-power radio-frequency systems, nuclear weapons design and test equipment. If yes, list category below. Category:	☐ Yes ☐ No
3. Is this item found on the Nuclear Supplier's Group Trigger List (IAEA Infcirc/254/Part 1)? Examples of items on the Trigger List include: reactor equipment and parts, nuclear grade graphite, reprocessing equipment and parts, uranium isotope separation equipment and parts, heavy water production equipment and parts, uranium conversion equipment and parts. If yes, list category below. Category:	☐ Yes ☐ No
4. Is there any reason why this item should not be released to the general public?	☐ Yes ☐ No
5. Could the release of this item result in bad publicity for the Laboratory?	☐ Yes ☐ No

I certify that the information provided above is correct and that this property is safe for release to the general public.

Signature _____ Z #_____ Date _____

Property will be relocated and stored while it is pending pickup by the excess crew? ☐ Yes ☐ No New Location: _____

Copy of this 1893 form was provided to the customer as a receipt for their property? ☐ Yes ☐ No

Property Specialist Signature: _____ Z # _____ Date _____ EPIS # _____

Property Custodian should retain a copy of this 1893 form for his or her records

CLEAR FORM

LA-UR-11-10371
Approved for public release; distribution is unlimited.

Title: Los Alamos National Laboratory Storm Water BMP Manual

Author(s): Lemke, Terrill W.

Intended for: Internal Guidance Document

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Los Alamos National Laboratory

Storm Water BMP Manual

LAUR-

Revision 0: March 2011

Prepared by:
ENV-RCRA

Los Alamos NATIONAL LABORATORY EST. 1943

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ACRONYMS

AOC	Area of Concern
BFM	Bonded Fiber Matrix
BMP	Best Management Practice
CGRP	Cerro Grande Rehabilitation Project
DOE	Department of Energy
ECB	Erosion Control Blanket
EM&R	Emergency Management & Response
ENV-RCRA	LANL Water Quality Group
EPA	Environmental Protection Agency
FGM	Flexterra or other Flexible Growth Medium
HDPE	High Density Polyethylene
IECA	International Erosion Control Association
LANL	Los Alamos National Laboratory
MgCl	Magnesium chloride
MSGP	Multi-Sector General Permit
MSS	Maintenance and Site Services
NM	New Mexico
NMED	New Mexico Environment Department
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PAM	Polyacrylamide
RECP	Rolled Erosion Control Product
SPCC	Spill Prevention Control and Countermeasure
SWMUs	Solid Waste Management Units
TRM	Turf Reinforcement Mat
TSD	Triangular Silt Dike
UV	Ultraviolet
WMC	Waste Management Coordinator

INTRODUCTION

This guidance document was developed to provide information on the selection, function, installation, inspection, and maintenance of Best Management Practices (BMPs) for storm water management, sediment and erosion control and the management of other potential surface water pollutants at Los Alamos National Laboratory (LANL). Its intent is to provide a consistent approach in the selection and use of BMPs at LANL. The information provided in this document is not intended to replace an engineering design where such designs may be applicable, but should be used in support of and in conjunction with the LANL Engineering Standards and specifications. This document is also not inclusive of all the BMPs that may be applicable at LANL.

WHAT IS A BMP?

BMP stands for Best Management Practice.

BMPs can be procedures, practices, or physical structures or controls.

BMPs minimize the potential for pollutant transport.

BMPs can be either temporary or permanent.

HOW TO USE THIS GUIDANCE DOCUMENT

The BMPs identified in this manual are common industry practices, are types or categories that can be utilized with a variety of “off the shelf” products, and are those that have proven effective for LANL conditions and climates. However, the BMP industry is dynamic. New products and innovations are continually being introduced. If new or modified BMPs not identified in this guidance document are identified or desired for use, the LANL Water Quality & RCRA Group (ENV-RCRA) should be consulted for guidance and approval. Installation of manufactured BMPs should follow installation guidance and recommendations as provided by the manufacturer.

This manual is organized in the following sections:

Section	Purpose
1 - LANL Considerations	Local and State standards, specifications, and concerns
2 - Good Housekeeping and Scheduling Practices	Practices and administrative controls to minimize potential pollutant contact with storm water
3 - Sediment Controls	Retain sediment onsite
4 - Runon/Runoff Control	Minimize erosion and sediment transport by reducing runoff velocity and minimizing potential pollutant contact with storm water
5 - Erosion Controls	Prevent erosion from starting

1. Start by looking at the BMP Use Matrix in Section 1.2, to help you select appropriate BMPs.
2. Go to the detailed BMP information to see information on proper usage, useful combinations and alternatives.
3. Use the detailed BMP information to learn more about installation and maintenance requirements.

INTRODUCTION

Construction Sites/Activities

- Use this manual to help choose BMPs when a design is not available.
- Use this manual to supplement information provided in the LANL Engineering Standards and construction specifications.
- Use this manual to ensure BMPs are properly installed and maintained.

MSGP Facilities

- Use this manual to help select additional BMPs if current controls are not adequate.

Individual Storm Water Permit / Solid Waste Management Units (SWMUs)

- Use this manual to select new BMPs based on site conditions and needs.
- Use this manual to provide guidance on how to install new BMPs, and inspect and maintain existing BMPs.

Best Management Practice Use Matrix

		Location					Purpose					Properties		
BMP	**Page(s)**	**Drainage Area Size (Acre)**	**Slopes > 3:1**	**Use on Flat Terrain/ Slopes <3:1**	**Impervious Surface**	**Use in Channels**	**Erosion Control**	**Sediment Retention**	**Dust Control**	**Divert Flow**	**Reduce Flow Velocities**	**Longevity**	**Installation/ Design**	**Cost**
Silt Fence	17	≤ 1	Y	Y				Y				1 Season	Easy	Low
Floc Logs	23	≤ 1		Y		Y		Y				Temporary	Moderate	Med
Gravel bags	23	≤ 1	Y	Y	Y	Y		Y		Y	Y	1 to 2 Years	Easy	Low
Wattles/Coir logs	23	≤ 1	Y	Y				Y		Y	Y	1 to 2 Years	Easy	Low
Triangular Silt Dike	27	≤ 1		Y		Y		Y		Y	Y	1 to 2 Years	Easy	Low to Med
Construction Entrance/Exit	35			Y	Y		Y	Y				Temporary	Easy	Med
Log Berm and Brush Barriers	39, 49	≤5		Y				Y		Y	Y	Temporary	Easy	Low
Inlet Protection	43	≤ 1		Y	Y	Y		Y			Y	Temporary to Permanent	Easy	Low
Sand Bags	43	≤ 1	Y	Y	Y	Y		Y		Y	Y	Temporary	Easy	Med
Berms	49	≤5		Y			Y	Y		Y		Temporary to Permanent	Easy	Low to Med
Rock Check Dams	57	≤ 10		Y		Y		Y			Y	Temporary or Permanent	Easy	Low
Waterbars and Runouts	61			Y		Y		Y		Y	Y	Temporary to Permanent	Easy	Low
Terracing	65		Y	Y		Y	Y				Y	Temporary to Permanent	Easy	Low
Surface roughening	71		Y	Y		Y	Y				Y	Temporary to Permanent	Easy	Low
Sediment Traps	77	≤ 1		Y		Y		Y			Y	Temporary to Permanent	Moderate to difficult	Med
Storm water detention basin	81		Y			Y	Y	Y			Y	Temporary to Permanent	Difficult	Med to High
Flexterra (FGM)	87		Y	Y			Y		Y			Temporary	Moderate	Med
Hydromulch	87		Y	Y			Y		Y			Temporary	Moderate	Med
Seeding	87		Y	Y		Y	Y		Y			Temporary to Permanent	Moderate	Low
Mulch	87			Y			Y		Y			Temporary	Easy	Low
Tackifiers	91		Y	Y			Y		Y			Temporary	Easy	Med
Turf Reinforcement Mats	95		Y	Y		Y	Y		Y		Y	Permanent	Can be difficult on Steep Slopes	Med
Erosion Control Blankets	95		Y	Y			Y		Y			1-2 years	Can be difficult on Steep Slopes	Med
Gabions	101	≤ 10	Y	Y		Y	Y				Y	Permanent	Difficult	Med to High
Rip Rap	105	≤ 10	Y	Y		Y	Y				Y	Permanent	Moderate	Med
Outlet Protection	101, 105	≤ 5	Y	Y		Y	Y				Y	Temporary to Permanent	Easy to Moderate	Low
Permanent Capping	109			Y			Y					Permanent	Difficult	High

LANL CONSIDERATIONS

LANL ENGINEERING STANDARDS

The Los Alamos National Laboratory Engineering Standards are comprised of several mandatory Functional Series documents including the Engineering Standards Manual (ESM), master guide specifications, standard details, example drawings, and a drafting manual. The purpose of the Engineering Standards is to define the minimum technical requirements for the design and construction of new and existing structures at LANL.

This Manual should supplement and support use of the Engineering Standards. As specified in their respective sections, storm water detention basins, riprap, and permanent capping must be designed using the Engineering Standards to ensure proper function of these BMPs. The Engineering Standards are also to be used in the design and construction of berms and check dams in excess of two feet in height.

Additionally, if the failure of a BMP has the potential to cause injury, loss of life, or property damage, the Engineering Standards would supersede the use of this document and the Standards should then be applied in the design and specification of the BMP. The Engineering Standards would provide design procedures and criteria associated with but not limited to:

- The sizing of controls for management or conveyance of storm water.
- Sizing or specifying material suitable for the applicable forces and stresses exerted on a BMP.
- Proper construction requirements to ensure a safe and functioning BMP.

When utilizing the LANL Engineering Standards for BMP design, the ESM and the master guide specifications should both be used. The ESM can be found at http://engstandards.lanl.gov/ESM_Chapters.shtml#esm3, and the master guide specifications are found at http://engstandards.lanl.gov/specs.shtml. For additional guidance on the applicability of the Engineering Standards for BMP design, contact the LANL Water Quality Group (ENV-RCRA).

SWMUs and AOCs

- Do not direct storm water to a Solid Waste Management Units (SWMU), Area of Concern (AOC).
- Water should not be encouraged to pond on a SWMU or AOC.
- Based on the site constituents, environmental media (e.g. soil, sediment, surface and ground water) may constitute solid waste and/or hazardous waste. If there is any potential for accumulated sediment or other media to be considered waste, a waste determination must be made and documented. For guidance, see the Laboratory's procedures on Waste Management.
- BMPs used on SWMUs or AOCs may be considered waste based on site constituents and BMP use. Consider the use of biodegradable or permanent BMPs that can be left on site.

SPCC Plans

As per the LANL procedures and EPA Regulations, any facility or Project with a total aboveground storage capacity greater than 1,320 gallons with a minimum container size of 55 gallons must have a Spill Prevention Control and Countermeasures (SPCC) Plan. This includes not only diesel storage tanks, but also equipment such as compressors and drill rigs.

Contact the LANL Water Quality Group (ENV-RCRA) for guidance and support.

STATE REQUIREMENTS

Velocity Dissipation

For soil disturbing activities subject to NPDES Construction General Permit coverage, State requirements mandate that runoff velocity from a construction project cannot increase from pre-development rates. Pre-development is defined as prior to any original disturbance. Install velocity dissipation devices such as check dams and detention ponds. Sites over 10 acres must install storm water detention ponds.

Sediment Yield

For soil disturbing activities subject to NPDES Construction General Permit coverage, State requirements mandate that sediment yield from a construction project cannot increase from pre-development rates. Stabilize disturbed areas and utilize appropriate erosion controls.

Liquid Discharges onto the Ground

Request assistance from the LANL Water Quality Group (ENV-RCRA) to gather and submit information for preparation of a NMED Notice of Intent to Discharge (NOI) or LANL Un-permitted Liquid Discharge Log Report.

Examples: planned potable water, storm water drainage from secondary containment units, fire suppression test/flush, steam condensate, fire hydrant flush, pothole water, waterline disinfect/flush, land application of groundwater.

REFERENCES

LANL ENGINEERING STANDARDS AND CONSTRUCTION SPECIFICATIONS	http://engstandards.lanl.gov/
LANL CONSTRUCTION ACTIVITIES COMPLIANCE	http://int.lanl.gov/environment/h2o/cw_npdes.shtml
EPA CONSTRUCTION BMP MENU	http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4
EPA NPDES CONSTRUCTION GENERAL PERMIT (2008)	http://www.epa.gov/npdes/pubs/cgp2008_finalpermit.pdf
EPA NPDES MULTI-SECTOR GENERAL PERMIT (MSGP) (2008)	http://www.epa.gov/npdes/pubs/msgp2008_finalpermit.pdf
EPA NPDES INDIVIDUAL PERMIT – NM0030759 (2010)	ftp://ftp.nmenv.state.nm.us/www/swqb/NPDES/Permits/NM0030759-LANLStormwater.pdf
INDUSTRY ORGANIZATIONS	Land and Water Magazine http://www.landandwater.com/ Stormwater Magazine http://www.stormh2o.com/ IECA http://www.ieca.org/ The International Erosion Control Association (IECA) is devoted to helping solve the problems caused by erosion and its byproduct—sediment.

Good Housekeeping

Options and Alternatives

- Waste and Material Storage and Transport
- Vehicle and Equipment BMPs
- Street Sweeping
- Washout Areas

Objectives

- Reduce or eliminate runoff pollutants

Description

Good housekeeping includes controls that are practices (as opposed to structural controls) that are used to reduce or prevent pollutants.

Applications

Low cost alternative to structural BMPs.

Limitations

Only prevents the initial migration of pollutants from the source.

Performance and Longevity

In general, use of practices to prevent pollutants from contact with storm water is extremely effective.

Good housekeeping practices are implemented before project activities begin and throughout project activities. These practices are temporary in nature and are only meant to last through the construction activity process.

Performance	Poor or N/A	Good	Excellent
Erosion Prevention	x		
Sediment Control	x		
Runoff Control	x		
Good Housekeeping			x

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Good housekeeping	x			

Design and Construction Guidance

Material storage

- Designate material storage areas away from the nearest watercourse and in locations that do not receive a substantial amount of upslope run-on.
- Store soils uphill of BMPs or the excavation.

- Hazardous materials, fluids, and chemicals should be placed within covered storage, or a lined berm or other appropriate secondary containment.
- Drums containing liquids or hazardous materials should be stored on secondary containment pallets that minimize storm water accumulation.

Wastes

- Designate a waste collection site that does not drain to a watercourse and that does not receive a substantial amount of upslope run-on.
- Refuse containers should have lids that will remain closed to prevent rain exposure. Bins should be leak proof.
- Waste collection should be scheduled to prevent overflow of refuse.
- Trash, material cuttings, and any other waste should be managed or disposed of at the end of each workday and prior to an anticipated storm event.
- Portable lavatories should be used and maintained in accordance with manufacturer's recommendations; staked to the ground to prevent being knocked over by wind; and lavatory waste must be treated off-site.

Material Transport or Movement

- Material should be transported in appropriate containers or vehicles so that facility locations outside the project boundaries and public roadways will not be adversely impacted through sediment tracking or waste spillage.
- Spill control equipment should be present during any transfer operations.
- Movement of liquid filled containers or transfers of oil or chemicals will not occur during precipitation events
- Containers must be upright and secured to the vehicle/hand truck it is being transported on
- Drums are not to be rolled or tipped, even while empty, to prevent damage to containers
- Containers will be inspected before and after they are transported for leaks or damage.
- Storm drain covers will be used at adjacent storm drains if necessary to prevent a potential spill from entering the storm drain before it would be controlled.
- Transfers from portable containers to equipment occur away from storm drains. Spigots or pumps should be used, do not pour directly from drums. Consider placing absorbent mats before a transfer occurs.

Vehicle and Equipment Refueling & Maintenance

Vehicle and equipment control techniques include:

- Properly covering and providing secondary containment for fuel drums and other similar materials.
- Refueling of equipment shall be conducted at least 100 feet from any storm drain, drainage, or wetland, including dry arroyos.
- Refueling operations will be completed such that head space is provided within fuel tanks to allow for fuel expansion.
- Develop and implement spill prevention and cleanup plan.

- Maintain a spill kit on site.
- Use a covered, paved area dedicated to vehicle maintenance.
- Wash vehicles and equipment only at facilities approved for washing activity.
- All vehicles and equipment will be observed for leaks and if found drip pans will be used until fixed.
- Leaks will be fixed as soon as practicable and leaking vehicles and equipment will be removed from service and repaired.
- Spills of all products will be cleaned up and managed per applicable state and federal regulations.

Potholing

- Spoils must be properly disposed of.
- Discharge spoils only in approved designated areas.
- Do not discharge to the environment any glycol treated water.

Concrete Washouts

Concrete washouts should be used to contain concrete and liquids when rinsing equipment used for mixing or delivering concrete, or for excess concrete. They consolidate solids for easier disposal and prevent contaminated water from mixing with runoff.

- Washouts should be located a minimum of 100’ from a watercourse or storm drain and in a location that allows convenient access for concrete trucks and equipment.
- Containment areas will not be constructed in areas designated as Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), or Treatment Storage and Disposal Facilities (TSDFs).
- Washouts are typically built below grade to prevent breaches and reduce runoff.
- Washouts should be sized to manage both concrete washout and storm water accumulation from precipitation events.
- Use appropriate control measures that act as a continuous line barrier to prevent the runoff of discharges and the co-mingling of discharges with storm water.
- Prefabricated washout containers must protect against spills and leaks, be watertight, and should be used in accordance with manufacturer specifications.
- Inspect washout area for damage and repair as necessary to ensure structure integrity.
- Once a washout facility has reached 75% capacity the materials should be removed and properly disposed of.

Street Sweeping

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways.

- Vacuuming is essential because sweeping alone may cause dust pollution and off-site sediment transport.
- Points of site egress are especially vulnerable to off-site sediment tracking.

- A proper construction entrance/exit may be needed if street sweeping efforts are not sufficient to prevent sediment from leaving the site.
- Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).
- Sweeping should be performed at a frequency necessary to minimize visible sediment tracking from the site.

Inspection and Maintenance

- Check that materials are properly stored.
- Check that washout areas are being used.
- Check for vehicle leaks and proper maintenance.
- Check for tracking of sediment from site.

What not to do…

Sweeping without vacuuming causes severe dust migration leading to sediment transport offsite.

Improper waste disposal and storage of waste products. Containerize and separate waste items for proper disposal.

Scheduling Practices

Options and Alternatives

- Preservation of Existing Vegetation
- Timing Considerations
- Spill Prevention

Objectives

- Reduce or eliminate runoff pollutants

Description

Scheduling practices are controls that are practices (as opposed to structural controls) that are used to reduce or prevent pollutants.

Applications

Low cost alternative to structural BMPs.

Limitations

Only prevents the initial migration of pollutants from the source.

Performance and Longevity

In general, use of practices to prevent pollutants from contact with storm water is extremely effective.

Scheduling practices are implemented before project activities begin. These practices are temporary in nature and are only meant to last through the construction activity process.

Performance	Poor or N/A	Good	Excellent
Erosion Prevention	x		
Sediment Control	x		
Runoff Control	x		
Good Housekeeping			x

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Scheduling Practices	x			

Design and Construction Guidance

Downstream Impacts
Consider ways to ensure that runoff from your project does not affect sensitive locations downstream of your project such as wetlands, archaeological sites, Threatened and Endangered Species habitat, or SWMUs.

Timing Considerations
The timing and sequencing of soil disturbing activities can also be utilized as a BMP.

Construction site phasing involves disturbing only part of a site at a time to minimize erosion and runoff from inactive parts.

- Some projects may have timing restrictions for biological restrictions.
- Complete grading activities and stabilize disturbed areas on one part of the site before grading and construction commence at another part.
- Begin stabilizing the site or portions of the site as early as possible in the construction project.
- Consider installing permanent storm water management BMPs as early as possible in the construction project.
- Utilize permanent BMPs in place of temporary BMPs where possible.
- Plan to do construction outside of the rainy season (July-Sept) when possible.
- When working during monsoon season (July-Sept) recognize that sudden intense storms may occur and arrange your project so that pollutants are not left exposed to storm water and so that water does not run into excavations.
- In late February the ground starts to thaw and freeze.
- Do not drive heavy equipment on saturated soil.
- Plan revegetation efforts to coincide with the monsoon season.
- Re-seed prior to or at the beginning of the monsoon season to take advantage of seasonal rains.
- Schedule stabilization of disturbed areas as soon as possible.

Preservation of Existing Vegetation

- Existing vegetation includes low-growing vegetation classified as grasses and shrubs; and piñon-juniper, ponderosa pine and mixed conifer vegetation is classified as forested.
- Existing vegetation provides erosion control and storm water infiltration.
- Plan the project to disturb as small amount of existing vegetation as possible.
- Use paved areas for staging of equipment and waste bins.
- Preserve trees when possible.
- Stockpile topsoil from clearing and grubbing operations for reuse as soil conditioning to improve outcome of vegetative stabilization.
- Reuse brush from clear and grub operations as brush barriers or chop it into mulch.

Reusable BMPs
Reduce waste at the Lab by utilizing reusable BMP products such as S-Fence,

Eco-Blok, Gravel Bags, Triangular Silt Dike, and construction entrance tracking devices. These products can be re-used over and over again and moved between jobs.

Spill Prevention, Response and Reporting

Spill Prevention includes inspecting equipment regularly for safety, cleanliness and leaks; and implementation of appropriate controls. Equipment found to be leaking should be removed from service and repaired. When possible, park equipment on asphalt or concrete to minimize generation of waste materials caused by spills on soil.

If a spill occurs, the following procedures shall be followed:

WHO	Contact Responsibilities	Response Duties
Onsite workers	**Contact EM&R at 7-6211 or 911** if necessary	Qualified workers may, but are not required to, clean up simple/small spills
EM&R	If EM&R is notified of a spill event, they will contact all additional applicable parties including ENV-RCRA	Respond per contingency plan
ENV-RCRA Water Quality	Completion of spill reports that are reportable to federal and state agencies. Provide oversight for spill mitigation activities.	Provide information to federal and state agencies.

Disposal occurs by the Waste Management Coordinator (WMC) per LANL Procedure P409 Waste Management http://policy.lanl.gov/pods/policies.nsf/MainFrameset?ReadForm&DocNum=P409&FileName=P409.pdf.

ENV-RCRA will complete required state, federal, and DOE Order 231.1A ORPS reporting requirements, in accordance with Laboratory and DOE policies and federal and state regulatory reporting requirements per P 322-3 Manual for Communication, Investigation, and Reporting Abnormal Events https://policy.lanl.gov/pods/policies.nsf/MainFrameset?ReadForm&DocNum=P322-3&FileName=P322-3.pdf.

Inspection and Maintenance

- Check for spills.

Silt Fence and S-Fence™

Product Types

- Silt fence
- S-Fence™

Alternatives

- Depending on surface and site conditions; gravel bags, wattles, or Triangular Silt Dike may be used.

BMP Objectives

- Sediment Control
- Sheet Flow Runoff Control
- Wind Erosion Control

Description

Silt fences are typically used as temporary perimeter controls around sites where construction activities will disturb the soil. They can also be used within the interior of a site. A silt fence consists of a length of woven, permeable geotextile, stretched between anchoring posts spaced at regular intervals along the site at low/downslope areas. The filter fabric should be entrenched in the ground between the support posts. When installed correctly, silt fences create ponding of runoff from the site, allowing transported sediment to settle out. Silt fences can be an effective barrier to sediment leaving the site.

The S-Fence is made from HDPE material and is much stiffer than the silt fence material. It is buried 3 inches in the ground and can be secured to an existing chain link fence or can be installed by itself and fastened to wood stakes. Each section is 7 feet long and comes in two heights: 10 inch and 14 inch. S-Fence is designed to allow water to flow through it and significantly reduces erosive energy and provides particle filtering.

Applications

Silt fences apply to construction sites with relatively small drainage areas. They are appropriate in areas where runoff will occur as sheet flow. The drainage area for silt fences should not exceed 0.25 acre per 100-foot fence length. Silt fence should not be used for runoff velocity control or placed in areas of concentrated runoff such as drainage channels and storm drain inlets and outlets. Silt fence should be installed along the contour to minimize channeling of runoff. They may also be placed perpendicular to prevailing winds at staggered intervals to address wind erosion. The same applications apply to S-Fence.

Limitations

- Do not install silt fences along areas where rocks or other hard surfaces will prevent uniformly anchoring the fence posts and entrenching the filter fabric. Improper installation prevents proper function.
- Silt fences are not suitable for areas where large amounts of concentrated runoff are likely. Do not install silt fences across streams, ditches, or waterways.
- High winds can make the filter fabric deteriorate faster, so installing fences in open, windy areas should be avoided.
- When the pores of the fence fabric become clogged with sediment, pools of water are likely to form on the uphill side of the fence. Siting and design of the silt fence should account for this. Take care to avoid unnecessarily diverting storm water from these pools, causing further erosion damage.
- UV exposure degrades silt fence filter fabric, causing separation of the fabric strands which leads to greater potential for holes and wind damage.

Performance and Longevity

Studies have approximated the following effectiveness ranges for silt fences constructed of filter fabric that are properly installed and well maintained:

- Average total suspended solids removal of 70 percent
- Sand removal of 80 to 90 percent
- Silt-loam removal of 50 to 80 percent
- Silt-clay-loam removal of 0 to 20 percent.

Removal rates are highly dependent on local conditions and installation.

Silt fence in the LANL area will typically experience the onset of degradation due to UV exposure over a period of 6 to 12 months and will need to be maintained or repaired due to damage from wind and runoff.

S-Fence can also be used as a perimeter control but is made from an HDPE material and has a functional life greater than 4 years. It can also be reused. The product will stand up to winds and UV exposure and can be recycled at the end of its life.

Performance	Poor or N/A	Good	Excellent
Erosion Prevention	x		
Sediment Control			x
Runoff Control		x	
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Silt Fence	x			
S-fence	x			x

Design and Construction Guidance

Materials

Silt Fence

- The material for silt fences should be a pervious sheet of synthetic fabric such as polypropylene, nylon, polyester, or polyethylene yarn.
- Choose the material based on the minimum synthetic fabric requirements shown in Table 1.

Table 1. Minimum requirements for silt fence fabric

Physical property	Requirements
Filtering efficiency	75%-85% (minimum): highly dependent on local conditions
Tensile strength at 20% (maximum) Elongation	Standard strength: 30 lb/linear inch (minimum) Extra strength: 50 lb/linear inch (minimum)
Ultraviolet radiation	90% (minimum)
Slurry flow rate	0.3 gal/ft^2/min (minimum)

S- Fence Product Characteristics

- Unit weight, 10” / 14” (Lbs/ft) (max) 0.35 / 0.48
- Reusable YES
- Functional life (minimum)(years) 4+
- Filter capability – AOS (ASTM D4751) (microns) 250
- Dimension – length per module (ft) 7
- Percentage Open Area (COE 22125-86) (min %) 20%
- Dimension (freeboard height in inches) 10.0 / 14.0
- Tensile Yield ASTM D-638 (lb/in2) 1800 - 2800
- Installed freeboard height (inches) 7.0 / 11.0
- Ultimate Tensile Strength: ASTM D-638 (lb/in2) 2000 - 2800
- Recyclable Post consumer #2 YES

  Service temperature (deg F) -30 to 160

Installation

- Standard-strength fabric can be reinforced with wire mesh behind the filter fabric to increase the effective life of the fence.
- Attach the filter fabric to wood or metal stakes at least 4 feet long. Stakes should have a minimum diameter of 2 inches if a hardwood like oak is used or at least 4 inches in diameter if soft woods such as pine are used. When using metal posts in place of wooden stakes, they should weigh at least 1.00 to 1.33 lb/linear foot. If metal posts are used, attachment points are needed for fastening the filter fabric with wire ties.
- Erect silt fence in a continuous fashion from a single roll of fabric to eliminate gaps in the fence. If a continuous roll of fabric is not available, overlap the fabric from both directions only at stakes or posts. Overlap at least 6 inches in a shingle pattern in the direction of runoff flow.

- Excavate a trench to anchor the bottom of the fabric fence at least 6 inches below the ground surface. The trench should be backfilled and the soil compacted over the toe of the filter fabric. Alternatively use a slicing machine to install the filter fabric.
- Install posts along the length of the fence at a height of 18 to 36 inches above the original ground surface. Posts should be driven into the ground a minimum of 12 inches. If standard-strength fabric is used with wire mesh, space the posts no more than 10 feet apart. If extra-strength fabric is used without wire mesh reinforcement, space the posts no more than 6 feet apart. Attach the filter fabric to the posts.
- The ends of the silt fence should be turned uphill to prevent flow from running around the ends of the fence.
- Install silt fence at least 6 feet from the toe of a slope.
- Once installed, silt fence should remain in place until all areas upslope have been permanently stabilized by vegetation or other means.

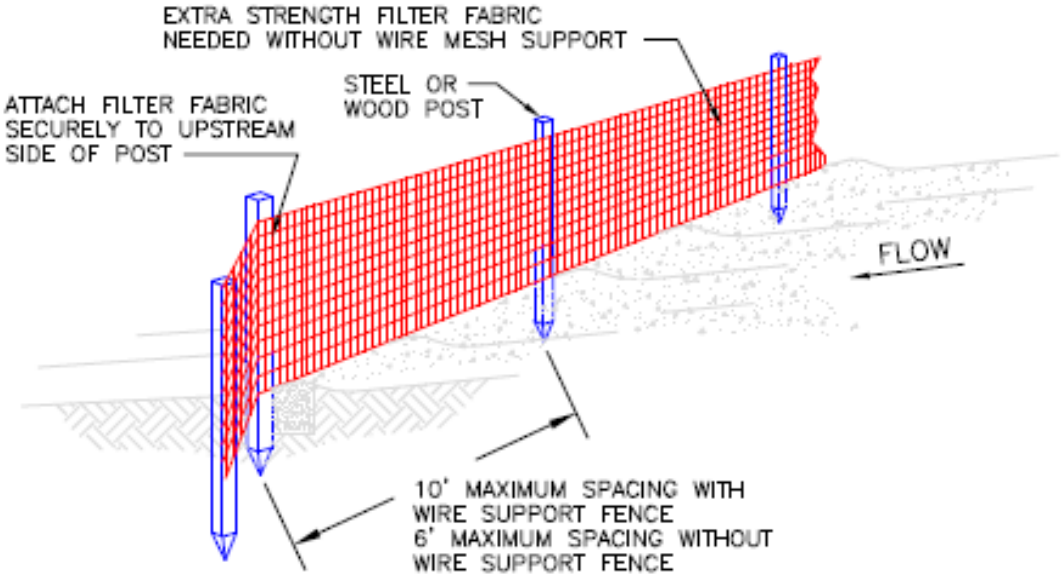
Inspection and Maintenance

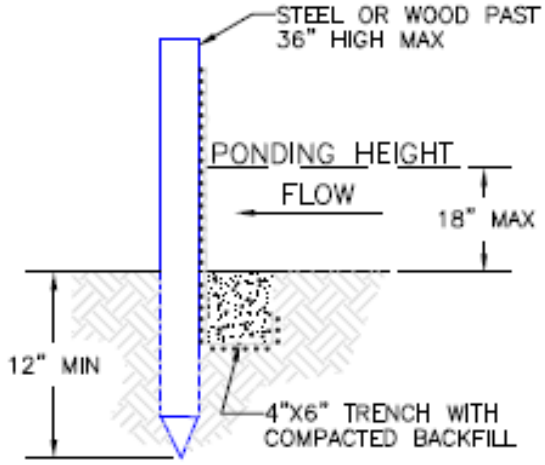
- Inspect fences to make sure that they are intact and that there are no gaps where the fence meets the ground or tears along the length of the fence.
- If gaps or tears are found, repair or replace the fabric immediately.
- Remove accumulated sediments from the fence base when the sediment reaches one-third to one-half the fence height.
- Remove sediment more frequently if accumulated sediment is creating noticeable strain on the fabric and the fence might fail from a sudden storm event.
- When removing the fence, remove the accumulated sediment as well.

What not to do…

Silt fence should be properly entrenched for proper operation.

SILT FENCE



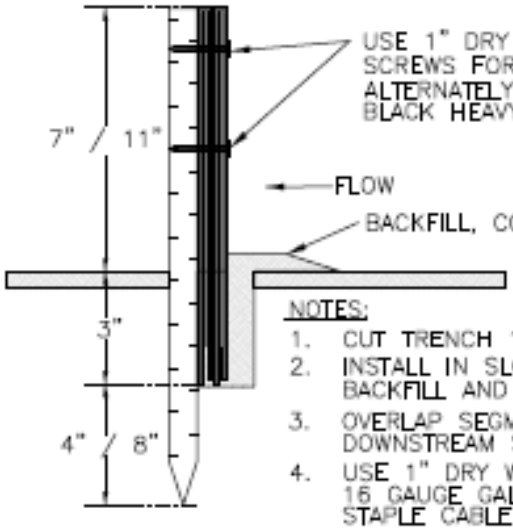


TRENCH DETAIL

NOTES:

1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. WHEN USING WIRE MESH SUPPORT, EXTEND WIRE INTO TRENCH A MINIMUM OF 2 INCHES AND NO MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
3. THE ENDS OF THE SILT FENCE SHALL BE TURNED UPHILL.
4. PLACE SILT FENCE AT LEAST 6 FEET FROM THE TOE OF A SLOPE.
5. PONDING HEIGHT SHALL BE A MAXIMUM OF 18 INCHES WITH TRENCH INSTALLATION AND 9" WITHOUT TRENCHING.

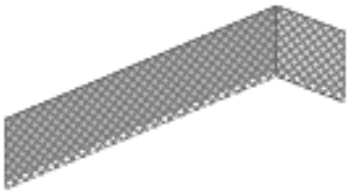
ERTEC S-FENCE ™



USE 1" DRY WALL SCREWS: 2 OR 3 PLACES. 3 SCREWS FOR 14", 2 SCREWS FOR 10". OR ALTERNATELY 16 GAUGE GALVANIZED WIRE OR 7" BLACK HEAVY DUTY UV RATED CABLE TIES.

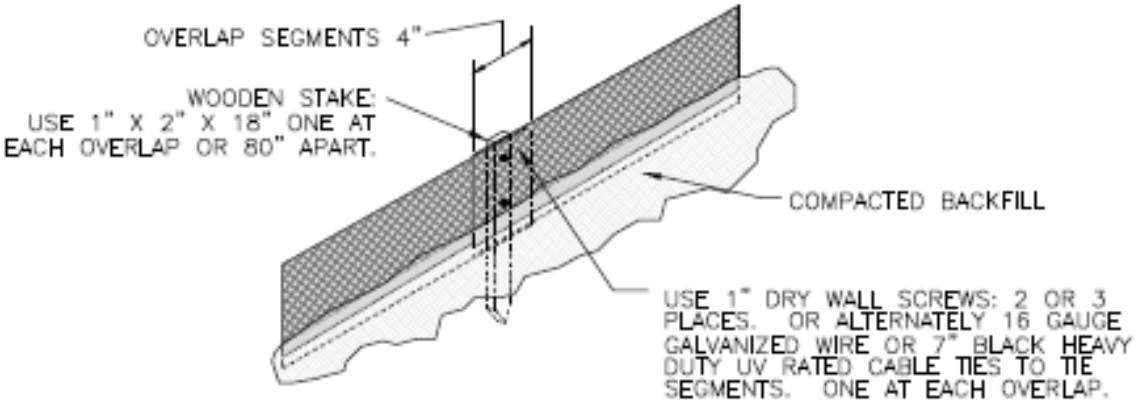
NOTES:

1. CUT TRENCH 1½" TO 2" WIDE, 3" TO 4" DEEP.
2. INSTALL IN SLOT AGAINST DOWNSTREAM SIDE OF TRENCH WALL, BACKFILL AND COMPACT TRENCH TO GRADE LEVEL.
3. OVERLAP SEGMENTS BY AT LEAST 4". INSTALL STAKES ON DOWNSTREAM SIDE OF SEGMENT OVERLAPS.
4. USE 1" DRY WALL SCREWS: 2 OR 3 PLACES. OR ALTERNATELY 16 GAUGE GALVANIZED WIRE OR 7" BLACK HEAVY DUTY UV STAPLE CABLE TIES (ZIP TIES) TO TIE SEGMENTS TOGETHER.



NOTES:

1. DOG-LEG AT END-OF-RUNS TO CONTAIN SEDIMENT.
2. INSTALL ON SAME CONTOUR TO LIMIT SCOUR AND FLOW CONCENTRATION. DOG-LEG PERIODICALLY IF ON DOWN-HILL RUN TO MINIMIZE VELOCITY SCOUR.



Fiber Rolls

Product Types
- Straw Wattles
- Terra-Tubes®
- Coir Logs
- Compost Socks
- Gravel Bags

Alternatives
- Silt fence
- Triangular Silt Dike

BMP Objectives
- Sediment Control
- Reduce Runoff Velocity
- Inlet Protection

Description

Fiber rolls are tube-shaped erosion-control devices filled with straw, flax, rice, coconut fiber material, gravel, or composted material. Common types of this BMP include: straw wattles, coir logs, compost socks, gravel bags, and Terra-Tubes®. Straw wattles are wrapped with UV-degradable polypropylene netting for longevity or with 100% biodegradable materials like burlap, jute, or coir. Coir logs are very similar to straw fiber rolls but are comprised of long lasting coconut fiber. They are also resistant to being consumed by wildlife. Compost socks and gravel bags are three dimensional tubular devices comprised of woven mesh fabric or other similar material and filled with gravel, rock or compost material. Terra-Tubes® are similar to fiber rolls except they are treated with special polymers that react (flocculate) with suspended soil particles, increasing the ability of the suspended solids to settle.

These devices can be used to break up a slope length, reducing the effects of runoff on long or steep slopes. They also help reduce sediment loads to receiving waters by filtering runoff or capturing sediments. Fiber roll BMPs can be used as check structures to reduce runoff velocity and can be placed around storm drain inlets for velocity and sediment control.

Applications

- Along the toe, top, face, and at-grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- Along the perimeter of exposed soil areas.
- Gravel bags only can be used as check dams in unlined ditches.
- Around temporary stockpiles (on dirt).
- Around storm drain inlets (see Section 3.5).

Limitations

- They have a limited sediment capture zone.
- Some may have problems with ice buildup.
- Must be trenched in to function properly.
- Straw and rice fiber rolls are susceptible to damage and consumption by wildlife.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention	x		
Sediment Control			x
Runoff Control		x	
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Straw, Coir logs	x	x		
compost socks	x			x
gravel bags/snakes	x			x

Design Criteria and Construction Specifications

Materials

- Most will come prefabricated. Some may require filling onsite, such as gravel bags and compost socks.
- Straw fiber rolls must be at least 8” diameter. To be effective, fiber rolls at the toe of slopes must be at least 20 inches in diameter. An equivalent installation, such as stacked smaller-diameter fiber rolls, can be used to achieve a similar level of protection.
- Compost socks: the compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Non-composted products will not be accepted. Filter socks used for erosion control are usually 12 inches in diameter.
- Gravel bags: filled with clean 3/4” crushed or 1/4” pea gravel. If subject to impact from equipment or vehicles, fill bags only ½ to ¾ full with non-angular rock.
- Terra-Tubes® can be used where additional reductions in turbidity are required.
- Stakes installed per manufacturer recommendations.

Installation.

- On projects with slopes, install fiber rolls along the contour with a slight downward angle at the end of each row to prevent ponding at the midsection. Turn the ends of each fiber roll upslope to prevent runoff from flowing around the roll.
- Install fiber rolls in shallow trenches dug 3 to 5 inches deep for soft, loamy soils and 2 to 3 inches deep for hard, rocky soils.
- Determine the vertical spacing for slope installations on the basis of the slope gradient and soil type. General Guidance is as follows:
    - 1:1 slopes = 10 feet apart
    - 2:1 slopes = 20 feet apart
    - 3:1 slopes = 30 feet apart
    - 4:1 slopes = 40 feet apart

- Fiber rolls can be anchored in the following ways:
  1. Drive the stakes through the middle of the fiber roll and deep enough into the ground to anchor the roll in place. About 3 inches of the stake should stick out above the roll, and the stakes should be spaced 3 to 4 feet apart.
  2. Stakes may be placed on each side of the roll tying across with a natural fiber twine or staking in a crossing manner ensuring direct soil contact at all times.
- Gravel bags do not require staking.
- Terminal ends of fiber rolls may be dog legged up slope to ensure containment and prevent channeling of sedimentation.
- Backfill the length of the fiber roll with the excavated soil and compact.

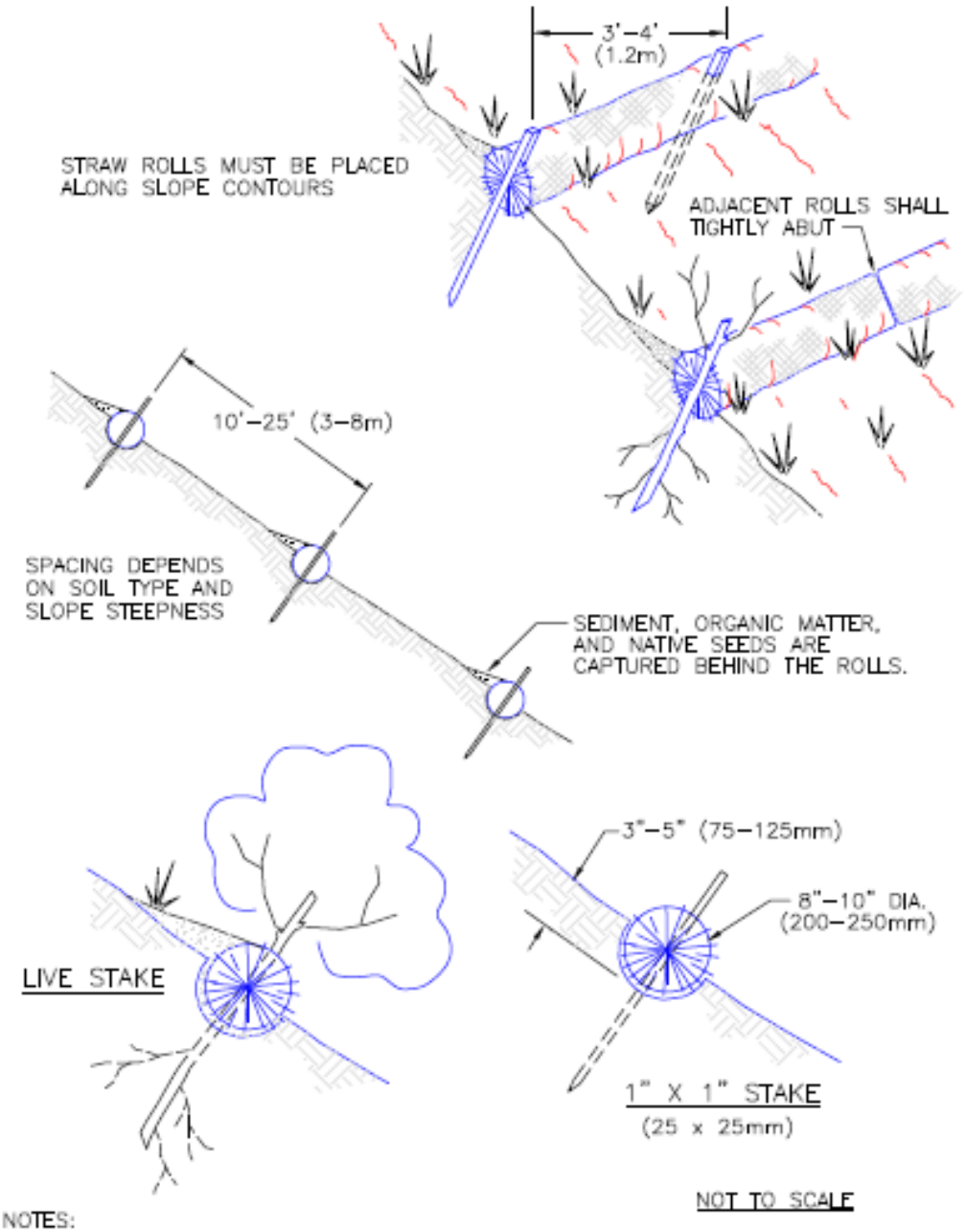
Inspection and Maintenance

- Ensure that the rolls remain firmly anchored in place and are not crushed or damaged by equipment traffic.
- Check that fiber rolls are trenched in and no gaps exist under the rolls.
- Check that fiber rolls are adequately aligned with the next roll. Either overlapped uphill of the next or doglegged.
- Check that fiber rolls are securely anchored.
- Repair or replace split, torn, unraveled, or slumping fiber rolls.
- Rills or gullies upslope of the rolls and any undercutting is to be repaired.
- Sediment deposits shall be removed when the sediment reaches one-third of the fiber rolls functional freeboard height. Removed sediment shall be deposit within the project in such a way that the sediment is not subject to erosion by wind or water.
- Additional fiber rolls can be placed on top of existing ones to increase sediment capacity.

What not to do…

A rill is forming under the fiber roll. The rill should be filled in. The fiber roll should be properly entrenched into the soil so that water velocity is decreased and water is forced to pool behind to promote sedimentation and flow over the fiber roll.

STRAW ROLLS



NOTES:

1. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" (75-125mm) DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.

Triangular Silt Dike

Alternatives

- Silt fence (perimeter control)
- Gravel bags
- Rock check dams
- Berms (flow diversion)

BMP Objectives

- Velocity Dissipation
- Sediment Trapping
- Perimeter Sediment Control

Description

A Triangular Silt Dike (TSD) is a prefabricated triangular shaped piece of foam encased in filter fabric with built in aprons on both sides of the foam body. It is typically used as a temporary control to help reduce the velocity of storm water in a channel or swale or as a perimeter sediment control. A TSD can also be used as a diversion berm to divert storm water around a site or direct the storm water within a site. TSDs can withstand light vehicle traffic.

Applications

- Use in channels and swales as a temporary check dam.
- Use as a diversion berm to divert water within or around the site, or as a temporary lined channel.
- Use as inlet protection.
- Use as a sediment control around disturbed areas and soil stockpiles.

Limitations

- Ends of TSD sections must be tightly joined to prevent storm water from bypassing the control.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention		x	
Sediment Control			x
Runoff Control			x
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Triangular Silt Dike	x	x		x

Design Criteria and Construction Specifications

Locate TSD as you would other similarly used BMPs.

- Tuck the ends of adjacent flaps on the dike together to ensure there are no gaps between TSD sections and secure with U-shaped staples, pressing the staples through the fabric and foam material.
- Trench in and staple the leading edge (apron) on the uphill sides to prevent undercutting.
- Staple the apron to the ground at the base of the dike on the downhill side.
- Ensure that the dikes are placed appropriately for the specific use (see check dam and silt fence sections)
- When used as a check structure, ensure that the center of the TSD is lower than the outside edges. This can be done at any point by driving one or more U-shaped staples into the TSD and compressing the foam.

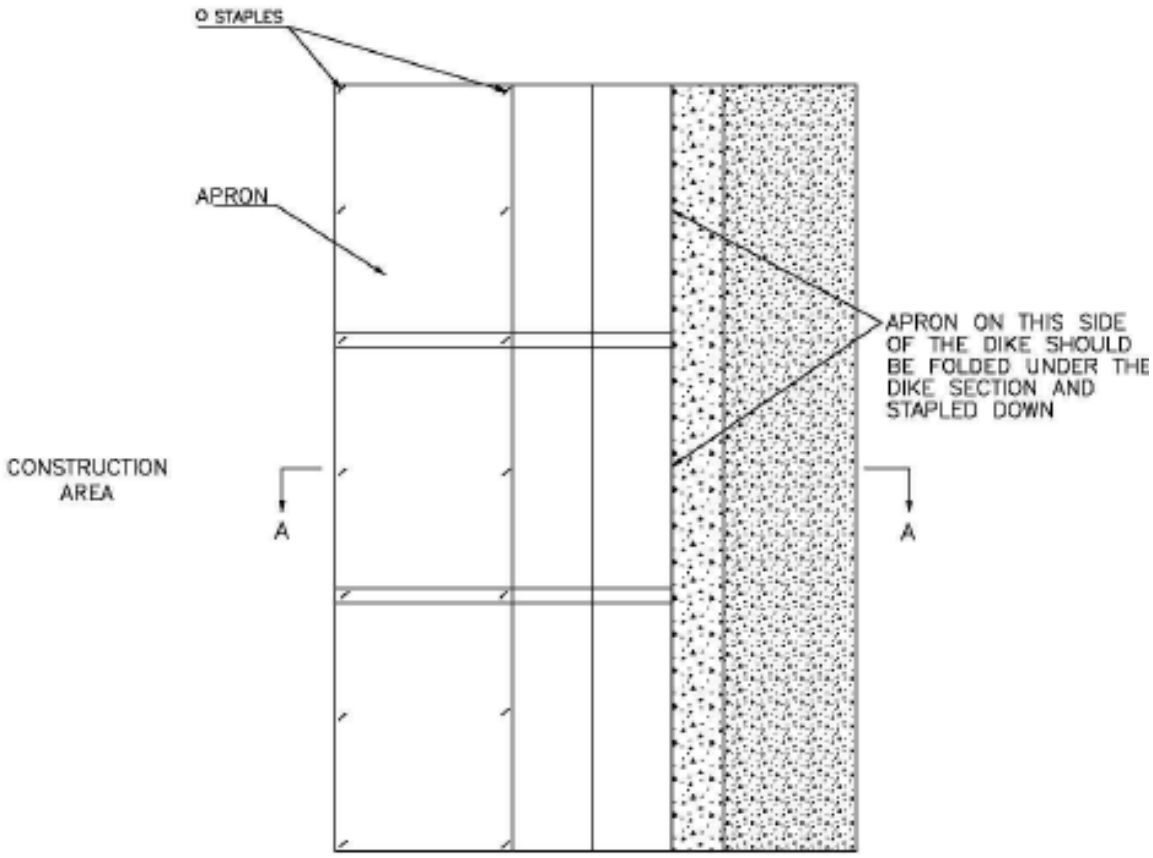
Inspection and Maintenance

- Evidence of erosion, undercutting, bypassing, or other damage in the surrounding area.
- Removed sediment accumulations shall not be placed within any drainage, either above or below the BMP. Removed sediment shall be stabilized to prevent future migration from storm water runoff.

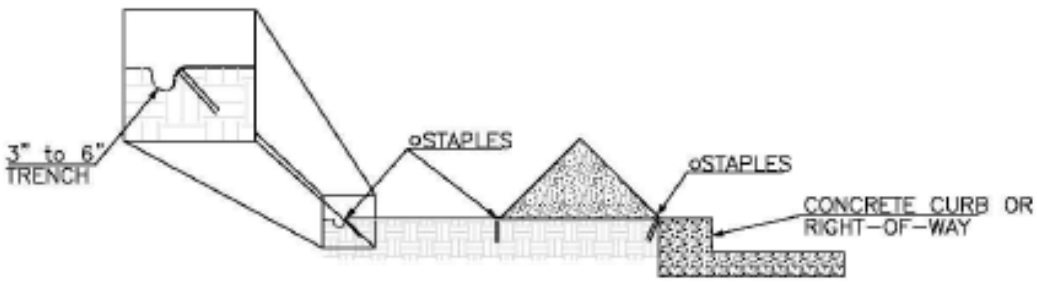
What not to do…

Note that the Triangular Silt Dike sections are not properly joined together and that cinder blocks have been utilized to fill the gap. Sediment accumulations need to be removed from the Triangular Silt Dike.

TRIANGULAR SILT DIKE INSTALLATION FOR CONTINUOUS BARRIER



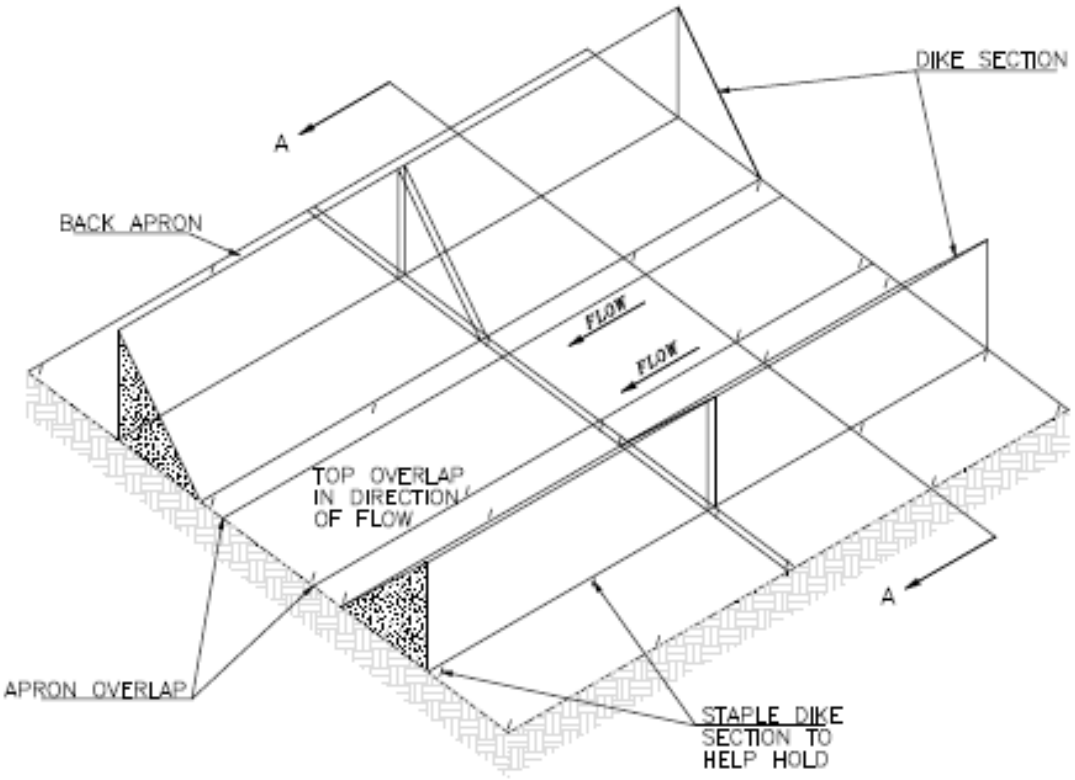
DIKE SECTION



DETAIL A–A

STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP AND IN THE CENTER OF THE 7' UNIT AS SHOWN ON THE DIAGRAMS.

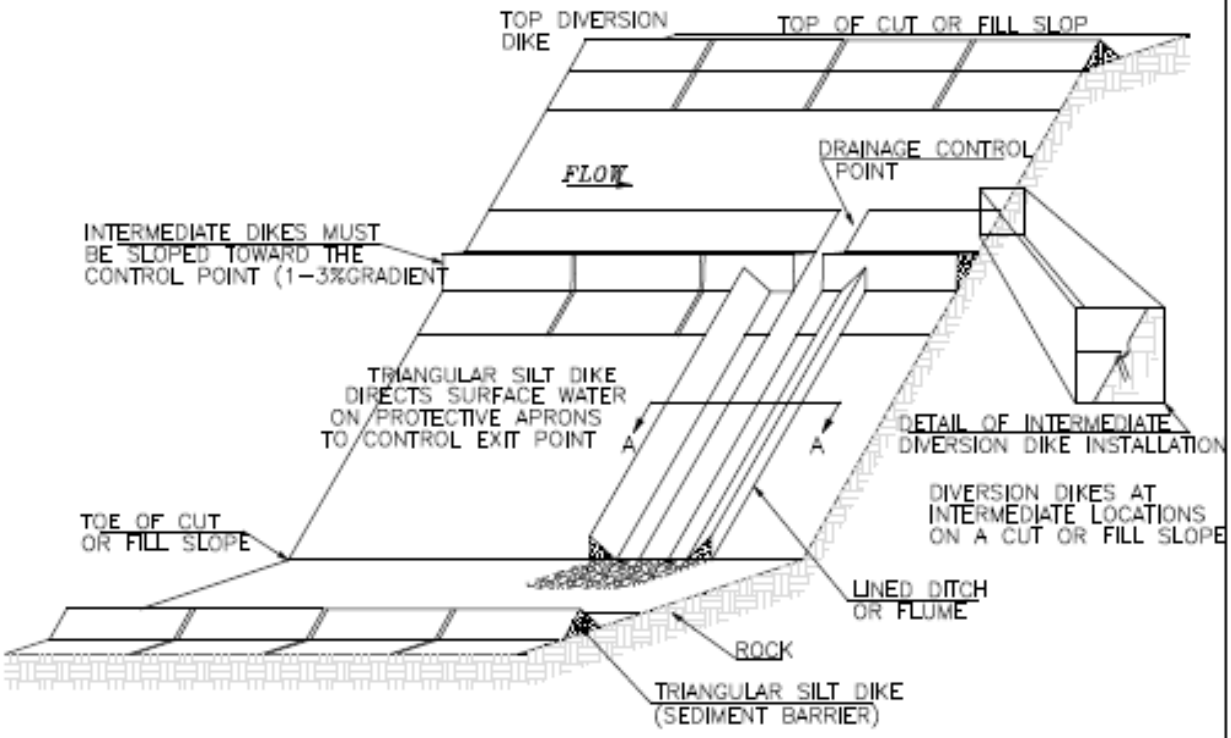
TRIANGULAR SILT DIKE INSTALLATION FOR TEMPORARY DITCH LINER

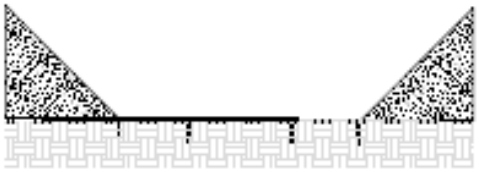


DITCH LINER

DETAIL A–A

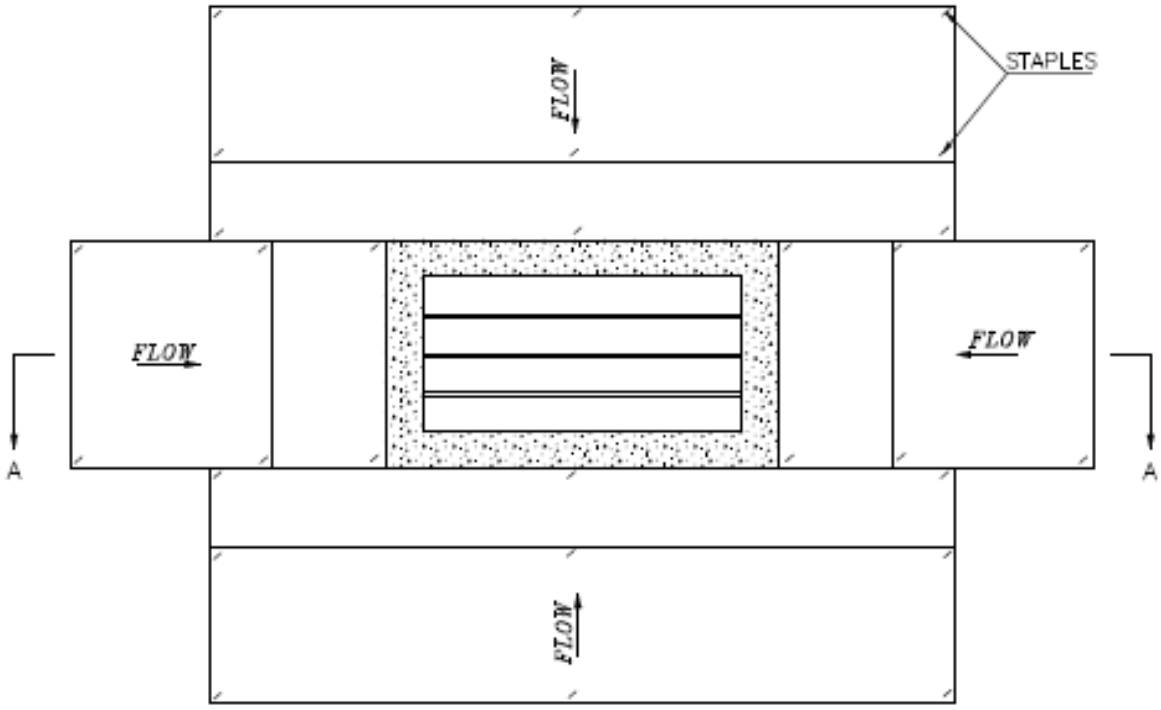
TRIANGULAR SILT DIKE INSTALLATION FOR DIVERSION DIKES



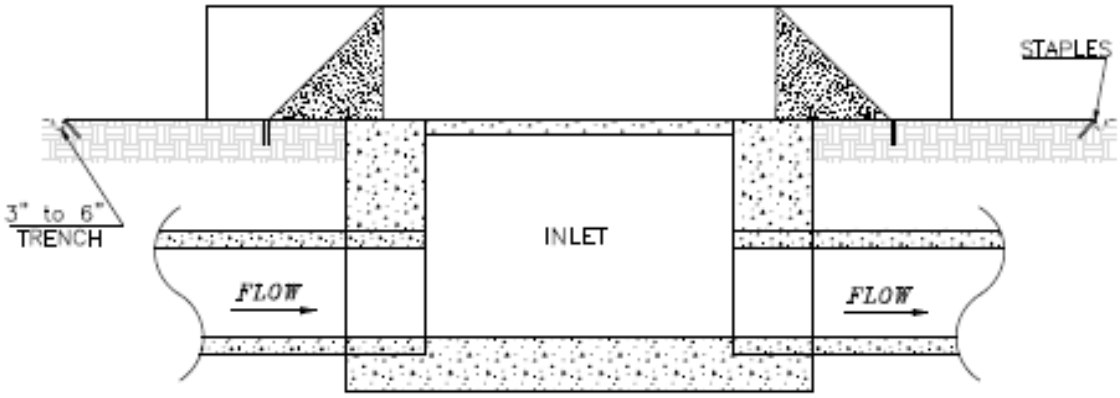


TEMPORARY DITCH LINER
DETAIL A–A

TRIANGULAR SILT DIKE INSTALLATION FOR DROP INLETS

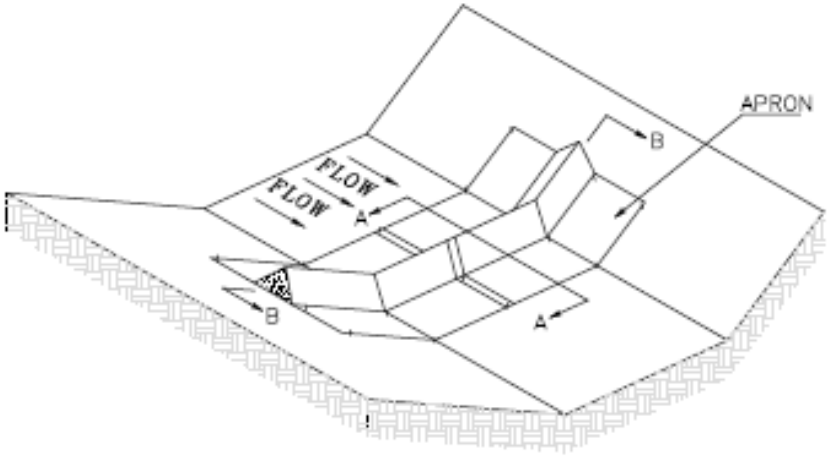


DROP INLET
PLAN VIEW

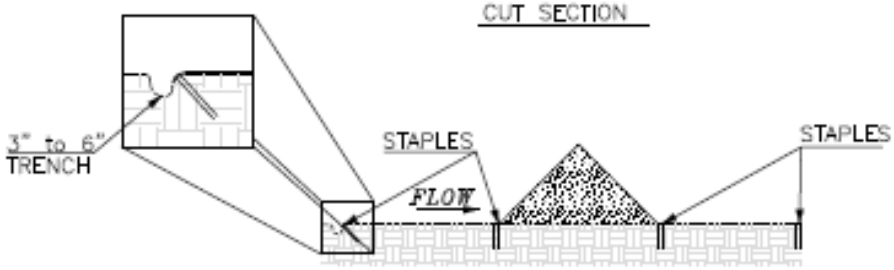


DETAIL A–A

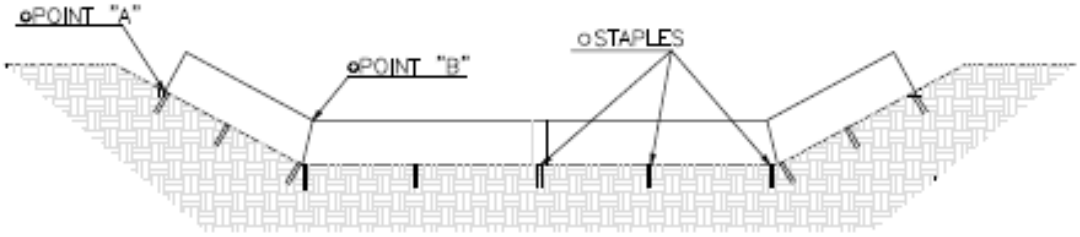
TRIANGULAR SILT DIKE INSTALLATION FOR ROADWAY DITCH OR DRAINAGE DITCH



SILT DIKE UNIT
CUT SECTION



DETAIL A–A



DIKE SECTION
DETAIL B–B

- POINT "A" MUST BE HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUNT THE ENDS.

- STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP AND IN THE CENTER OF THE 7' UNIT AS SHOWN ONTHE DIAGRAMS

Construction Entrance/Exit

Product Types
- Rock
- Grizzly Tracker® or similar
- Tire washer

Alternatives
- Sweeping

BMP Objectives
- Good Housekeeping
- Sediment Control

Description

A temporary construction entrance/exit is an area with a singular or series of controls established to manage and reduce off-site tracking of sediment from equipment and vehicles. It reduces the sediment that collects on vehicle tires and minimizes off-site tracking of sediment.

Applications

- Locations where mud tracking is a problem during wet weather or where dust is a problem during dry weather.
- Locations where construction activities are adjacent to roadways.

Limitations

- May require replacement of rock during project.
- Requires a large entrance space.
- Can be high maintenance when rock is the only material used.
- Must be used in conjunction with sweeping for optimal performance.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention	x		
Sediment Control		x	
Runoff Control	x		
Good Housekeeping			X

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Gravel/Rock	x			
Grizzly Tracker®		x		x

Design Criteria and Construction Specifications

- Ensure that entrance cannot be bypassed by vehicles and equipment.

Rock entrance

- The rock used for pad construction shall be 4-6 inch maximum size aggregate. Do not use base course.
- Geo-textile fabrics must be used to improve the stability of the pad foundation.
- Rock shall be spread to a minimum thickness of 6 inches.
- Rock placement shall conform to the grade and dimensions shown on the design drawings.
- The pad shall extend the full width of the entrance/exit. Minimum pad width shall be 10 feet.
- Minimum pad length shall be 50 feet.

Grizzly Tracker® or similar

- Install per manufacturers recommendations, typically a minimum of 16'.

Wheel Wash Stations

- Use per manufacturers recommendations.

Inspection and Maintenance

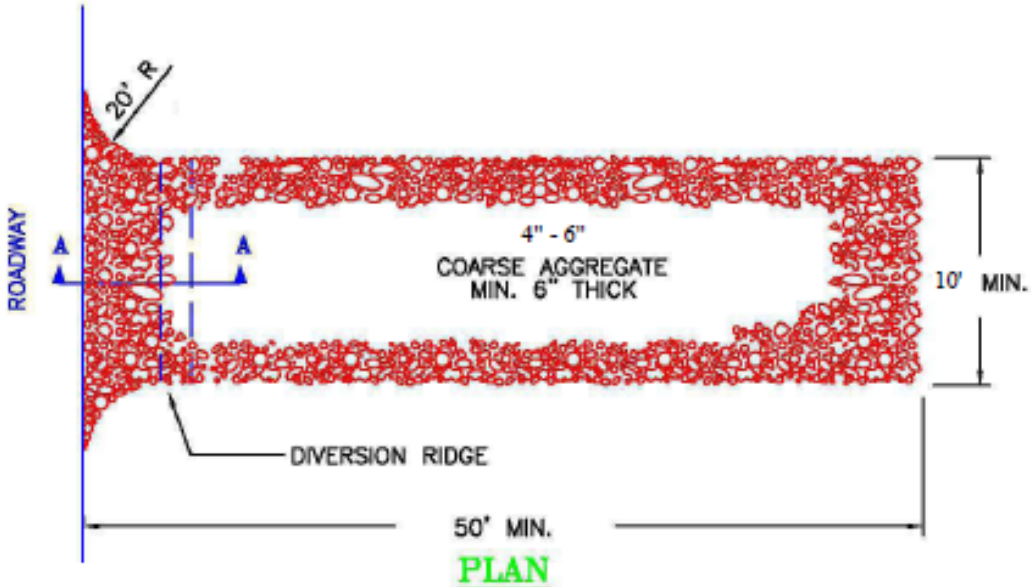
- Inspect for sediment accumulations and the need to remove the accumulations or replace gravel.
- Inspect for compaction of the rock into the surrounding ground, creating a surface that does not adequately shake vehicles as they pass over the entrance. As required, add additional layers of rock to the pad to prevent off-site tracking of sediment.
- Inspect for signs of vehicles bypassing the entrance and block off alternate egress routes.

What not to do…

Failure to install a construction entrance has lead to sediment transport offsite.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

SECTION A – A



PLAN

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL MINIMIZE SEDIMENT TRACKING OR TRANSPORT ONTO PUBLIC ROADWAYS. THIS MAY REQUIRE ADDING ADDITIONAL LAYERS OF GRAVEL, REPAIR AND/OR CLEANOUT OF MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC ROADWAYS.

Brush Barrier

Product Types
- Logs
- Brush
- Felled Trees
- Prefabricated Juniper Bales

Alternatives
- Silt fence
- Fiber Rolls
- Berms

BMP Objectives
- Sediment Retention

Description

Branches, limbs, and brush are piled at the downhill edge of the site to provide minor runoff pooling to reduce offsite sediment transport.

Applications

- Place below the toe of exposed and erodible slopes and at low points of site perimeter.
- Downslope of exposed soil areas.
- Linear construction projects.

Limitations

- Adequate brush may not be readily available.
- Cannot be used on steep slopes (>3:1).
- Only applicable for sheet flow runoff and minor concentrated flow.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention	x		
Sediment Control		x	
Runoff Control		x	
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
brush barrier	x	x		

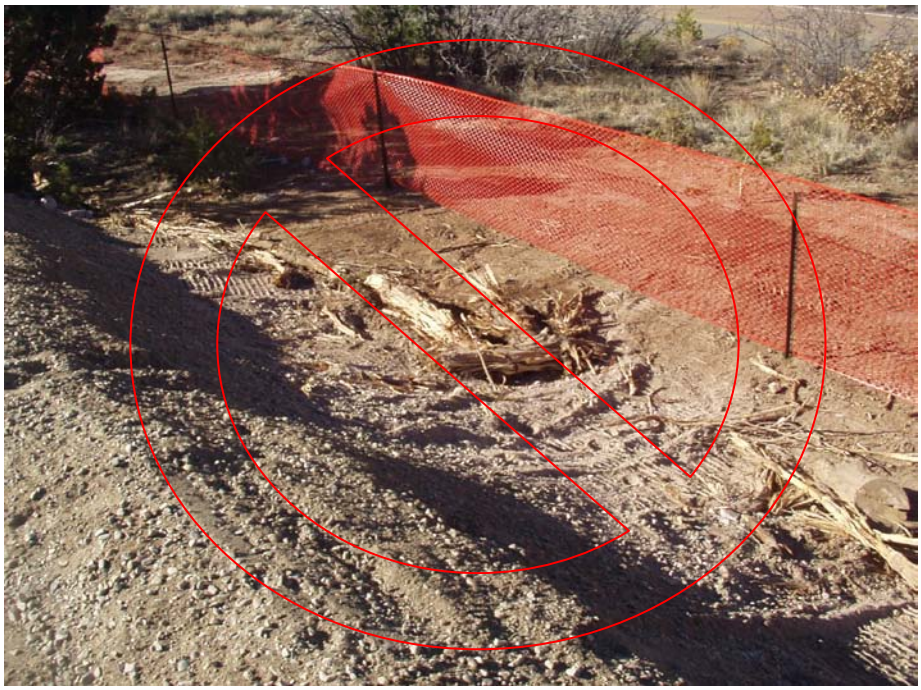
Design Criteria and Construction Specifications

- Barriers can be constructed of cleared and grubbed materials such as brush and logs.
- Brush barriers can be covered with a filter cloth to stabilize the structure and improve barrier efficiency if fabric can be entrenched and anchored on the upslope side.
- Ensure that brush and tree limbs are not removed from an area of contamination.
- Juniper Bales are premade in bound form.
- When placed at the toe of a slope, the barrier should be installed a minimum of 5-6 feet away from the toe of the slope.
- Pile barrier material uniformly in a row, minimizing voids. Minimize the amount of top soil included with the barrier material. Fill gaps with appropriate loose material. To anchor the barrier, place wooden stakes along the downhill edge.
- Logs shall be entrenched into the ground in order to capture sediment. Soil berms may used to help entrench logs where extreme rock areas are encountered.
- Juniper bales should be embedded in a trench that has been excavated to a minimum depth of 4 inches. Backfill material shall be firmly compacted. Bales should tightly abut one another. Anchor the bales in place with 2 x 2 inch stakes or rebar through each bale.
- Ensure barriers are only located in areas with sheet flow runoff or minor concentrated flow.

Inspection and Maintenance

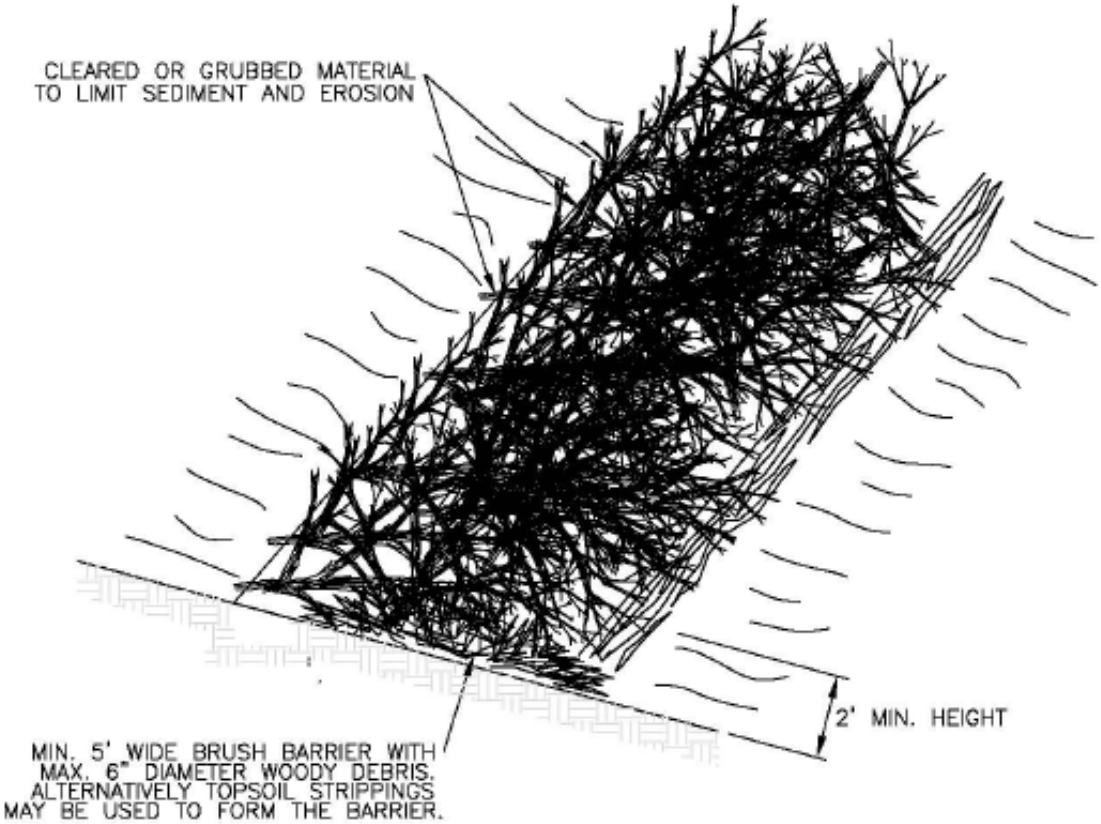
- Ensure logs and bales are entrenched into ground or have adequate berming to capture sediment.
- Look for gaps in brush barriers
- Barriers can be left in place throughout final stabilization as final site conditions allow or barriers can be shredded and used as mulch on the site.
- Closely inspect juniper bales for deterioration.
- Remove accumulated sediment when it reaches 1/3 to 1/2 the height of the barrier. Removed sediment accumulations shall not be placed within any drainage, either above or below the BMP. Removed sediment shall be stabilized to prevent future migration
- If channels form through or around the barrier, the barrier should be reconstructed to eliminate the channels.
- If barriers are subject to concentrated runoff, or are undermined or overtopped, replace with a more appropriate BMP or add additional controls to the site.

What not to do…



Notice how the down slope perimeter is unprotected with minimal brush, insufficient for adequate sediment control.

BRUSH BARRIER



NOTES:

1. BARRIER MAY BE CONSTRUCTED WITH CLEARED OR GRUBBED MATERIAL SUCH AS BRUSH, TREE LIMB, ROOT MATERIAL, SOIL, AND ROCK.
2. PONDING HEIGHT SHALL NOT EXCEED 2/3 OF THE HEIGHT OF THE BARRIER.
3. BARRIER SHALL BE INSTALLED A MINIMUM OF 5 TO 6 FEET FROM THE TOE OF A SLOPE.

Storm Drain Inlet Protection

Product Types
- Block and Gravel
- Gravel bags
- Prefabricated Inserts and Pop-ups
- Prefabricated Inlet Filters
- Eco Blok

BMP Objectives
- Sediment Control
- Runoff Control

Description

The purpose of inlet protection is to filter sediment while still allowing storm water to drain to the inlet or to create ponding around an inlet to allow transported sediment to settle out. These measures are temporary and are implemented before a site is disturbed.

Applications

Where sediment laden surface runoff may enter an inlet.

Limitations

- Typically requires additional upstream controls for optimal performance.
- Most effective only when placed in a sump condition.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention	x		
Sediment Control			x
Runoff Control	x		
Good Housekeeping			x

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Block and gravel	x			
Gravel bags, prefabricated inserts, pop ups, and inlet filters	x			x

Design Criteria and Construction Specifications

- Choose the BMP appropriate for the location and type of inlet. Some hold up to traffic or are low profile, and some are suitable for use in sites still under construction that require higher ponding levels.
- *Block and Gravel:* Block and gravel inlet barriers should be at least 1 foot high (2 feet maximum). Lay the bottom row of blocks at least 2 inches below the soil surface, flush against the drain for stability. Place one block in the bottom row on each side of the inlet on its side to allow drainage. Place 1/2-inch wire mesh over all block openings to prevent gravel from entering the inlet. Place gravel (3/4 to 1/2 inch in diameter) outside the block structure at a slope no greater than 2:1.
- Install in a sump condition
- Ensure BMP does not divert flow and create downstream flooding.
- Ensure BMP placed in locations subject to traffic have overflow capabilities to minimize potential for upstream flooding and traffic hazards.
- *Pre-manufactured devices:* Install per manufacturer's instructions.

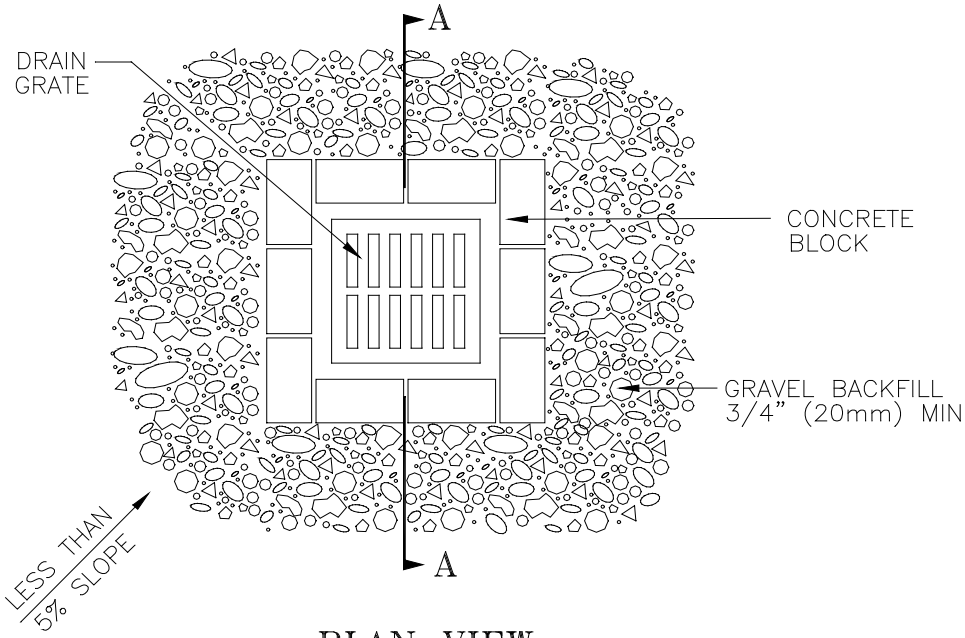
Inspection and Maintenance

- Ensure there is a spillway
- Accumulated sediment shall be removed when it reaches 1/3 to 1/2 the height of the inlet protection.
- Storm drain inlet protections shall be removed when the area has been finally stabilized.
- Removed sediment accumulations shall not be placed within any drainage, either above or below the BMP. Removed sediment shall be stabilized to prevent future migration from storm water runoff.
- Ensure there are no gaps under or between elements of the inlet protection.
- Check materials for tears.

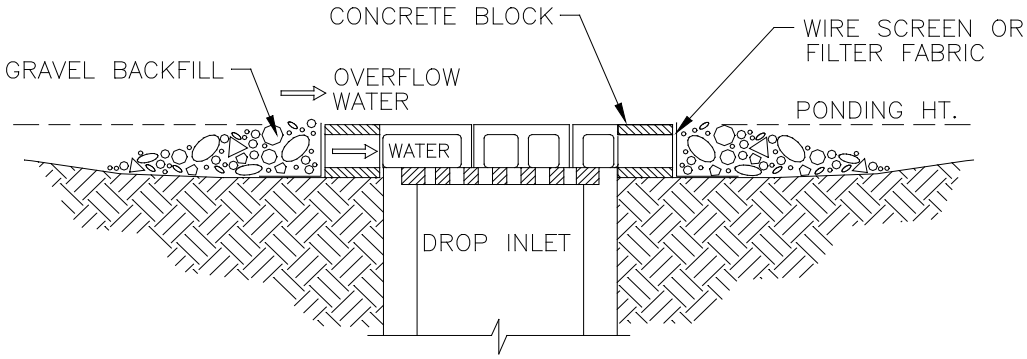
What not to do…

Remove sediment and debris in a timely manner from storm drains.

BLOCK AND GRAVEL DROP INLET SEDIMENT BARRIER



PLAN VIEW

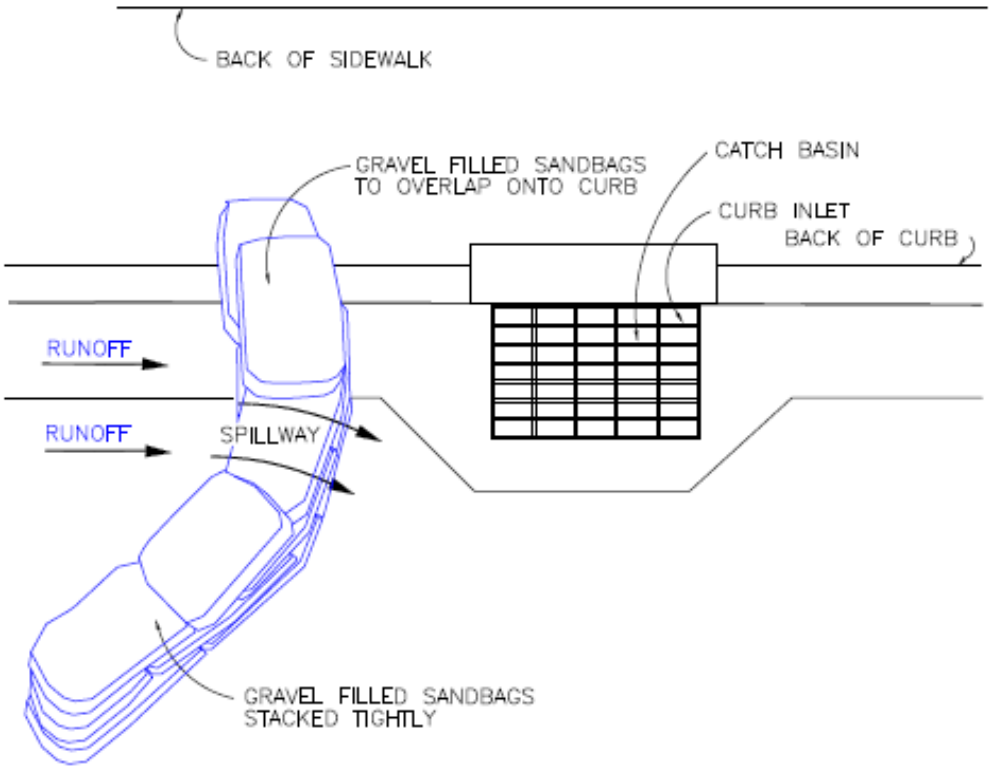


SECTION A – A

NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL (LESS THAN 5%) DRAINAGE AREAS.
2. BLOCKS SHALL BE EMBEDDED IN A TRENCH AROUND THE INLET TO A MINIMUM DEPTH OF 3", WITH THE ENDS TIGHTLY ABUTTING.
3. BACKFILL THE BLOCKS WITH GRAVEL TO ASSIST IN SEDIMENT RETENTION.
4. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET.

CURB AND GUTTER SEDIMENT BARRIER

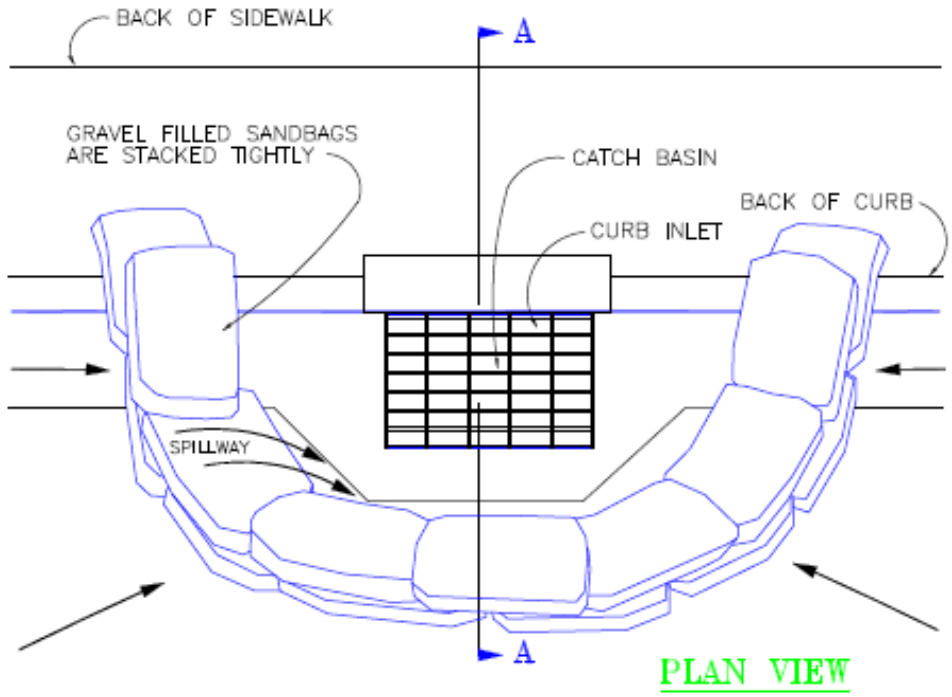


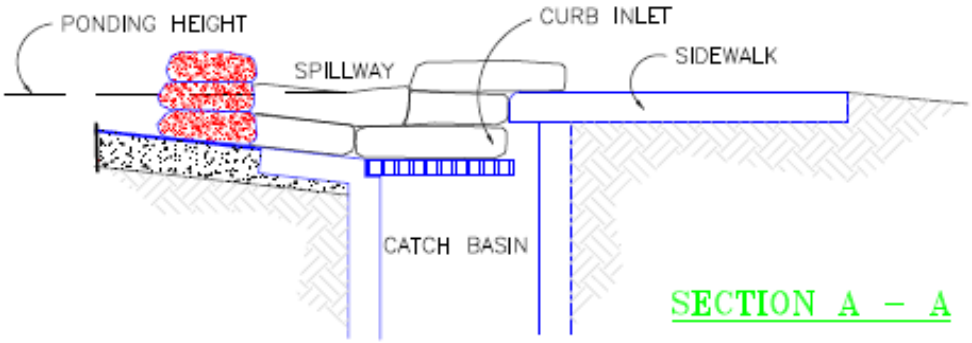
PLAN VIEW

NOTES:

1. PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING SEGMENTS WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS SHOULD BE FILLED WITH 3/4" DRAIN ROCK OR 1/4" PEA GRAVEL LAYERED AND PACKED TIGHTLY.
3. ENSURE THAT SANDBAG MATERIAL SHALL BE A TYPE OF GEOTEXTILE THAT WILL NOT RAPIDLY DETERIORATE.
4. LEAVE ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.

CURB INLET SEDIMENT BARRIER (SANDBAGS)





NOTES:

1. PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREET SEGMENTS WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS SHALL BE FILLED WITH 3/4" DRAIN ROCK OR 1/4" PEA GRAVEL LAYERED AND PACKED TIGHTLY.
3. ENSURE THAT SANDBAG MATERIAL SHALL BE A TYPE OF GEOTEXTILE FABRIC THAT WILL NOT RAPIDLY DETERIORATE.
4. LEAVE ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.

Berms and Channels

Options and Alternatives

- Swale/berm combination
- Rock berms
- Log berms
- Triangular Silt Dike®

BMP Objectives

- Runoff Control
- Run-on Diversion

Description

Berms and channels are most often used to prevent run-on from eroding an exposed or disturbed area, and to divert sediment-laden runoff to a sediment trap, sediment basin or other suitable, stabilized discharge outlet. When used as a temporary control, berms are most often constructed from compacted soil or loose gravel, stone, or crushed rock. Berms may serve as a permanent structural control when constructed from asphalt, concrete, or other similar material. Channels can be incorporated into a berm design or function as a stand-alone BMP, and are typically constructed from compacted soil or lined with a suitable material.

Applications

Effective in diverting run-on away from unprotected areas and reducing flow velocities; effective to retain small amounts of runoff and sediment onsite.

Limitations

- A berm with a height of over 2 feet or located in an area where failure of the berm would result in damage to facilities, the environment or other safety issues requires an engineered design.
- Increased potential for failure if the upslope gradient is too great, resulting in high velocity flows.
- Earth berms may require vegetative stabilization to prevent erosion of the berm itself.
- Excessive sediment accumulation on upslope side of berm needs frequent clean-out.
- Channels may require engineering calculations to ensure the channel material is adequate to withstand flow velocity and shear stress.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention		x	
Sediment Control		x	
Runoff Control			x
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Earth and base course	x	x		
Asphalt and concrete			x	
Prefabricated channels and culverts	x	x	x	x
Prefabricated barriers	x			x

Design and Construction Guidance

- Berms should be constructed during initial land-disturbing activities and must be operational prior to upslope land disturbance.
- A shallow trench or swale to contain the diverted run-on/runoff can be incorporated into the berm design.
- Where applicable, on-site material should be used for berm construction.
- Berm material needs to meet requirements for gravelly clay or sandy clay. Do not use gravelly sand or gravelly loam to construct berms.
- When used as a perimeter or down slope control, berms should divert runoff to a sediment trapping control such as a sediment trap or basin.
- Berms should be located so as to minimize damage by construction operations and traffic.
- Triangular Silt Dike® berms can be used in locations subject to minor traffic flow.
- Earth berms must be adequately compacted to prevent failure.
- Logs must be delimbed, trenched in and backfilled. If necessary, secure with wooden stakes on either side of the log.
- Rock berms must be constructed of large angular rock. Height and depth of the berm is dependent on the expected storm water flow. Ends of berm should be brought forward to help contain the flow.
- Channel material must be adequate to withstand flow velocity and shear stress.
- Ensure channels are designed and constructed with a defined flow line adequate to convey flows.
- Spillways on berms should be at least 6 inches in depth and should be protected against scour. Use rock or TRM for stabilization of the spillway.

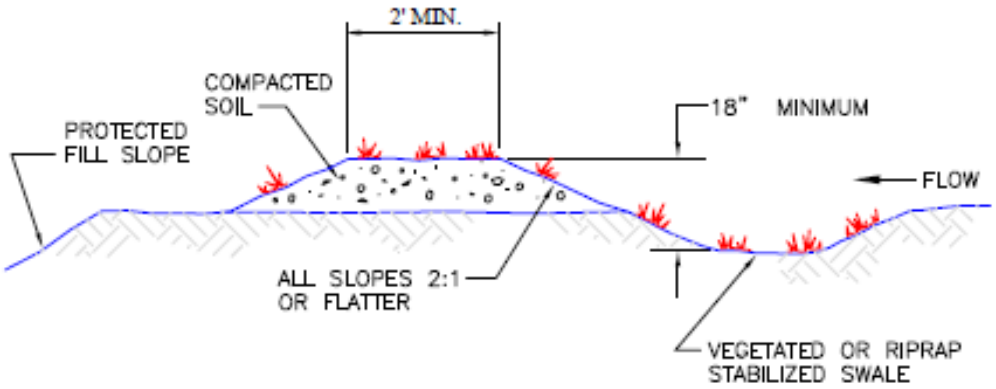
Inspection and Maintenance

- Seeded areas which fail to establish a vegetative cover shall be reseeded as necessary.
- Damage from vehicle or construction traffic shall be repaired prior to the end of each working day or prior to the next storm event, whichever is sooner.
- Conduct required repairs immediately.
- Temporary berms may be removed when the site has been finally stabilized or when drainage patterns changed so that the berms are no longer functional.
- Berms that are designed to trap sediment should be cleaned out as necessary or after each storm event.
- Inspect for erosion or other damage, and repair.

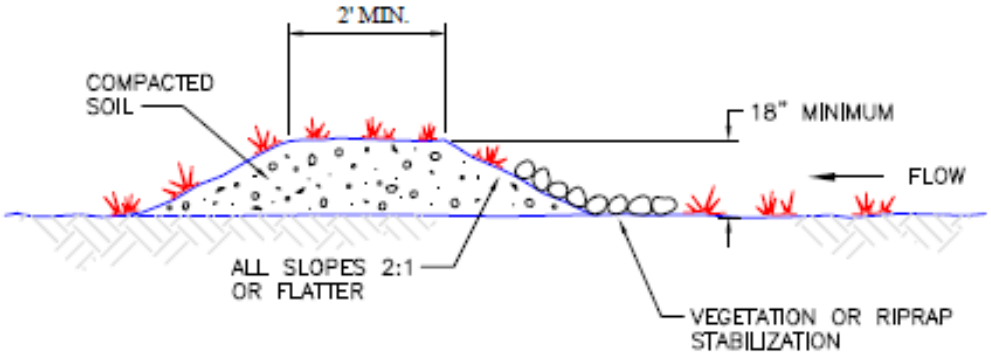
What not to do…

Berm was not well stabilized and could not stand up to run-on flows. Berms and swales should be designed and constructed to handle site specific run-on or run-off flows.

EARTH BERM



TYPICAL FILL DIVERSION

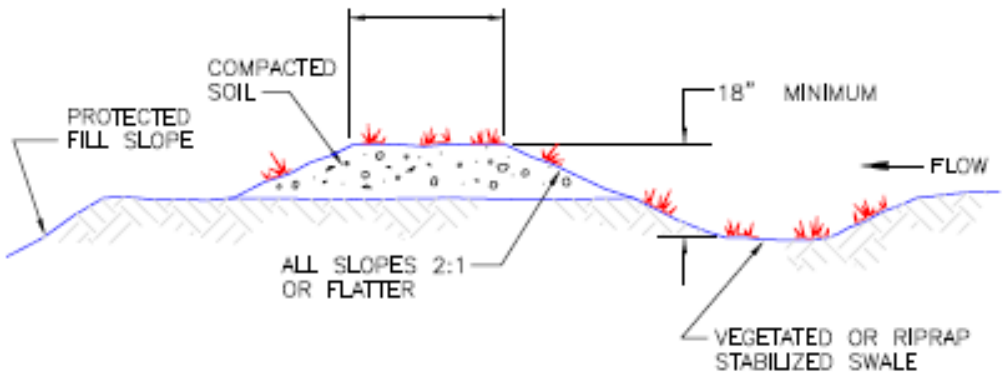


TYPICAL TEMPORARY DIVERSION DIKE

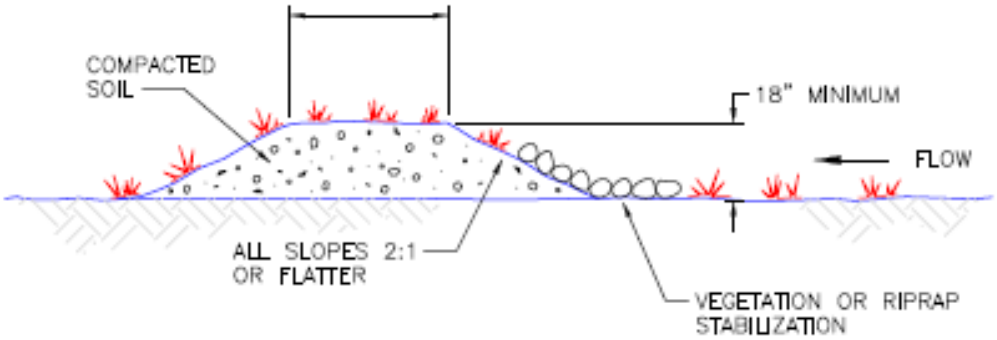
NOTES:

1. THE CHANNEL BEHIND THE BERM SHALL HAVE A POSITIVE GRADE TO A STABILIZED OUTLET.
2. THE BERM SHALL BE ADEQUATELY COMPACTED TO PREVENT FAILURE.
3. THE BERM SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT SEEDING, MATTING, OR OTHER APPLICABLE MEASURES.
4. THE TOP OF THE BERM SHALL HAVE A MINIMUM WIDTH OF 2 FEET AND ALL SIDE SLOPES SHALL BE 2:1 OR FLATTER.

EARTH BERM



TYPICAL FILL DIVERSION



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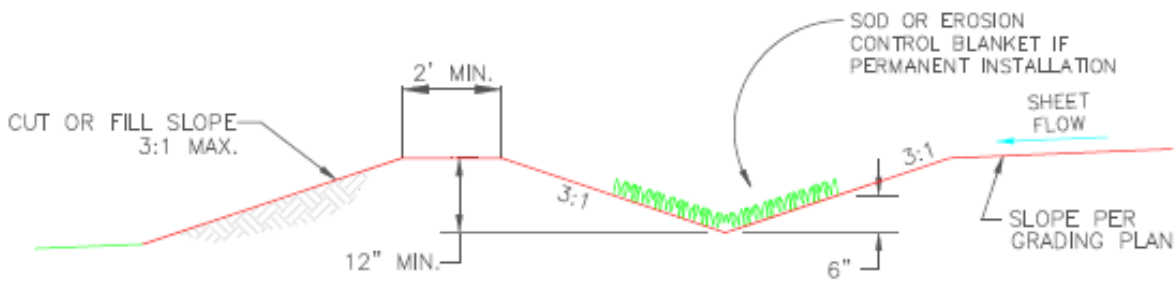
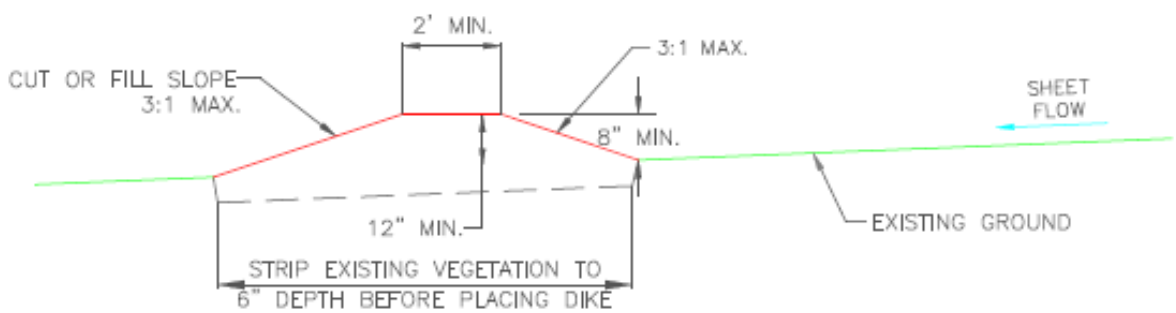
EARTH BERMS & SWALES



SWALE

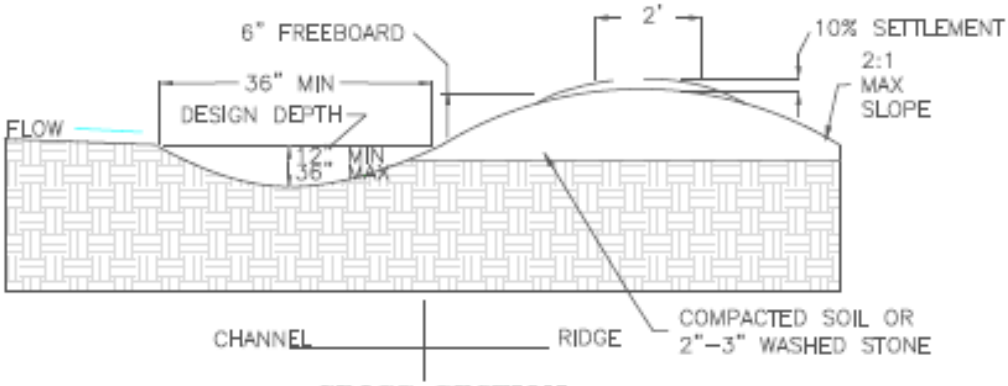


DIKE

NOTES:

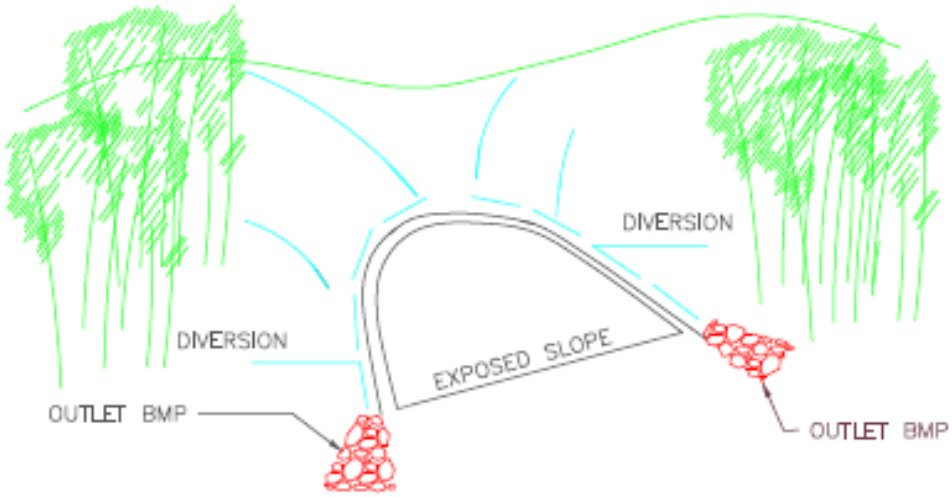
1. DIKE SHALL BE COMPACTED TO DENSITY EQUAL TO THAT SPECIFIED FOR ADJOINING AREA (90% STANDARD PROCTOR DENSITY, MINIMUM).
2. MINIMUM 1% GRADE MUST BE PROVIDED FOR SWALE OR ALONG UPSLOPE SIDE OF DIKE FOR PROPER DRAINAGE.

EARTH BERMS & SWALES

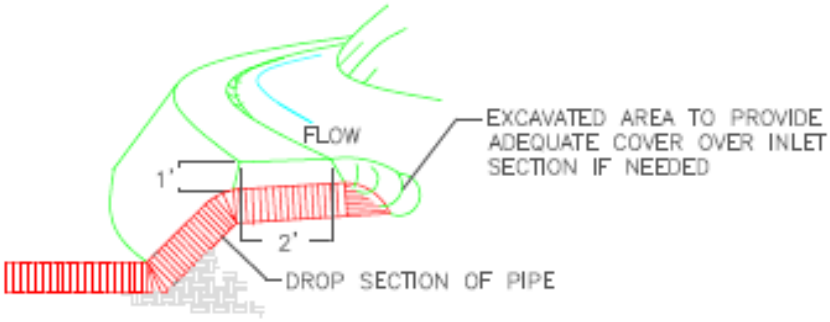


CROSS SECTION

ALL SURFACE STABILIZED WITH MULCH, SEED OR GRAVEL

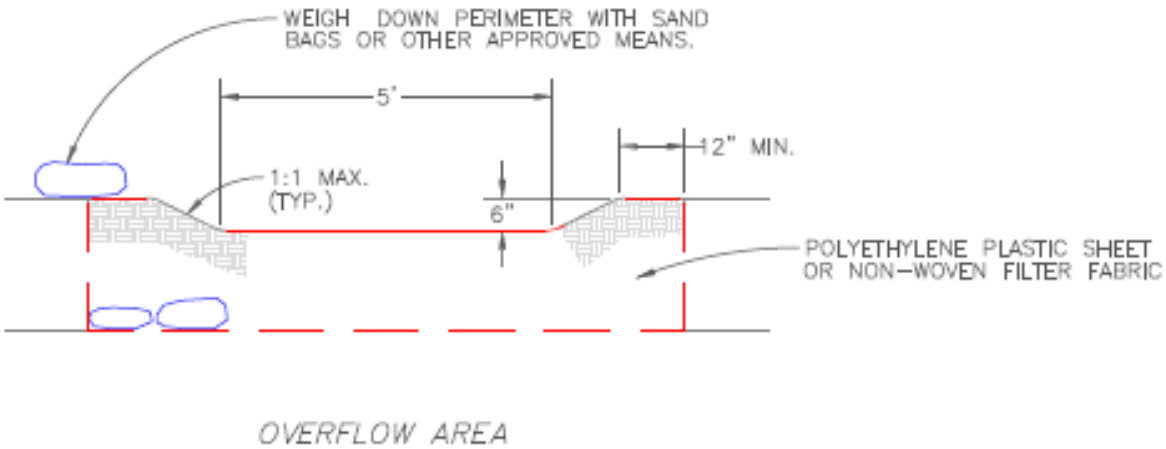


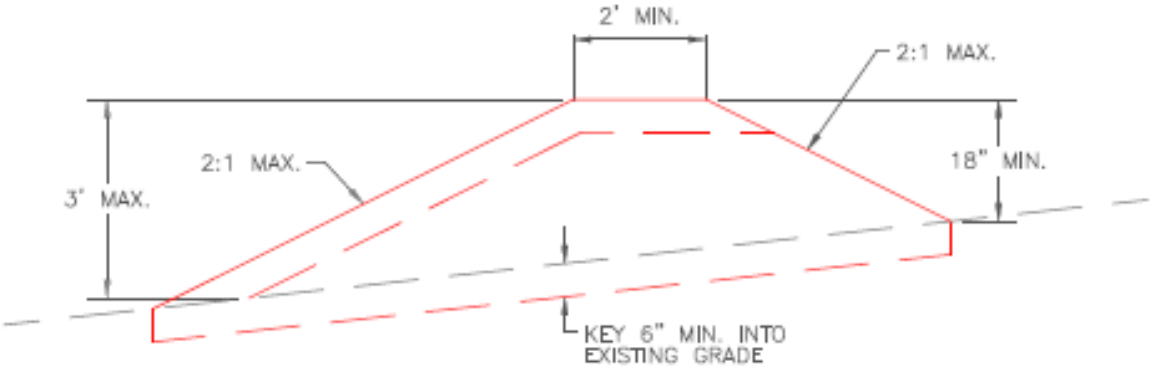
TYPICAL PERIMETER PROTECTION



TYPICAL TOP OF SLOPE INSTALLATION

TEMPORARY SILT CONTAINMENT BERM





NOTES:

1. SOIL IN BERM SHALL BE FIRMLY COMPACTED.
2. AT EACH END OF BERM, TURN BERM UPSLOPE AND EXTEND UNTIL GROUND SURFACE RISES TO TOP OF BERM ELEVATION.
3. PROVIDE OVERFLOW AREAS AT 200 FT. MAX. INTERVALS.

Check Dams

Alternatives

- Stabilize channel with TRM, asphalt or concrete.

Options

- Gravel bags
- Rock
- Logs
- Prefabricated Juniper Bales
- Triangular Silt Dike®
- Other prefabricated products

BMP Objectives

- Sediment Retention
- Reduction in runoff velocity
- Erosion Control

Description

A check dam is a small dam constructed across a channel, drainage ditch or other area of concentrated flow. Check dams reduce erosion and promote sedimentation by reducing runoff flow velocity and encouraging sediment to settle out. Check dams are usually constructed of rock, gravel bags, sandbags or other proprietary products and may either be a temporary or permanent structural control.

Applications

- Use to minimize down cutting in channels, retain sediment, and reduce velocity.
- Useful in temporary ditches that will be removed after construction.

Limitations

- A check dam with a height of over 2 feet or located in an area where failure of the check dam would result in damage to facilities, the environment or other safety issues requires an engineered design.
- Significant sediment accumulations behind the check structure may destroy vegetation lining the channel.
- Requires regular maintenance and sediment removal.
- May not be used in a drainage that is a perennial stream.
- May cause increased erosion if not installed correctly.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention		x	
Sediment Control			x
Runoff Control			x
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Rock, logs, juniper bales		x	x	
Gravel bags, Triangular Silt Dike	x			x

Design and Construction Guidance

- Check dam must be located in a defined channel to reduce runoff velocity or retain sediment.
- If high flows are expected, ensure scour protection has been installed on the downstream of the check dam.
- Check dams should be spaced at a distance to allow the elevation of the ponded water from the downstream check dam to match the elevation of the toe of the upstream dam.
- Flows must be directed over the check dam.
- When using rock, ensure the material diameter is appropriate to create ponding.
- Straw bales and wattles should not be used as check dams.
- The center of a check dam must always be lower than its outside edges and the channel bank height to allow proper flow over the check structure.

Installation:

- Should be installed as soon as possible while construction activities are occurring.
- The center of the dam should be at least six-inches lower than its edges.
- Check dam material should be entrenched into the sides and bottom of the channel to ensure flow does not go around or under the check dam.
- Rock should be placed individually by hand or by mechanical methods (no dumping of rock).

Inspection and Maintenance

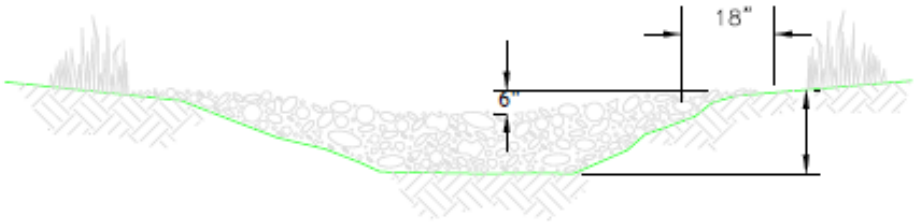
- Check for damage and erosion caused by flows around or under the dam structure. Repair erosion around a check dam and lower the center if required.
- Remove any debris that would impede flow over the check dam.
- When the sediment has reached a height of approximately one-half the original height of the dam (measured at the center), remove accumulated sediment from the upstream side of the dam.
- Remove check dams made from temporary materials when the adjacent site is stabilized.
- Before removing a check dam, remove all accumulated sediment from the channel. If sediment is placed on adjacent slopes, stabilize it with native vegetation.

What not to do…

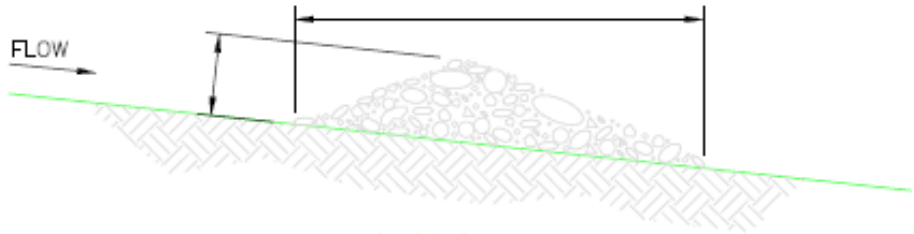
Silt fence cannot be used as a check structure and is not designed for concentrated flow.

Notice how runoff bypassed the check structures. Channel banks must be sufficient to withstand flows and the dam center must be lower to allow flow over the check dam.

ROCK CHECK DAM

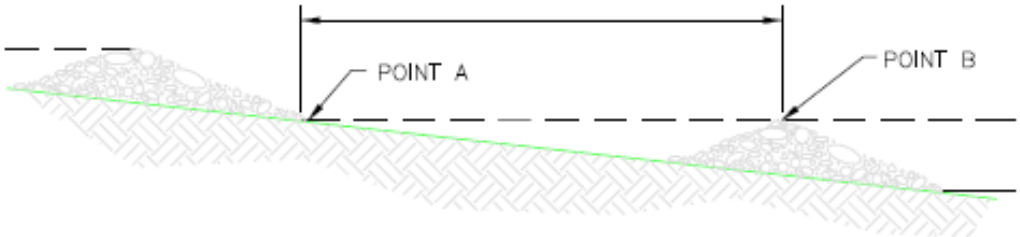


VIEW LOOKING UPSTREAM



SECTION A

X = THE DISTANCE SUCH THAT POINT A AND B ARE OF EQUAL ELEVATION.



SPACING BETWEEN CHECK DAMS

NOTES:

1. ROCK CHECK DAMS SHALL BE CONSTRUCTED WITH 2–15 INCH MAXIMUM SIZE AGGREGATE ROCK.
2. WHERE APPLICABLE, KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW AROUND DAM.
3. PROVIDE AN ENERGY DISSIPATOR ON THE DOWNSTREAM SIDE OF THE DAM TO REDUCE DOWNSTREAM EROSION.

Waterbars and Runouts

Options and Alternatives

- Paved roads
- Culverts
- Grade road with a high center

BMP Objectives

- Runoff Control
- Erosion Control

Description

Features that are used on sloping roads or other linear projects to reduce flow length and to direct runoff from a disturbed area into stabilized areas. **Waterbars** are constructed at an angle across the road or disturbed area to prevent water from running a long distance and causing erosion, and to direct runoff into stabilized areas.

Runouts or **Turnouts** are breaks in a roadside ditch to allow water to exit the ditch and discharge into a stabilized area. This reduces erosion potential and sediment accumulation in the ditch.

Applications

Use on dirt or gravel roads, or other longer disturbed areas with a slope, to prevent rills from forming.

Limitations

May require rebuilding after large storms or if driven over while soil is saturated.

Performance and Longevity

- Good results for spreading out runoff flows and thereby reducing erosion.
- Longevity is good, dependent on traffic and storm events.

Performance	Poor or N/A	Good	Excellent
Erosion Prevention			x
Sediment Control	x		
Runoff Control			x
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
waterbars and turnouts		x		

Design and Construction Guidance

Spacing between waterbars and runouts should be based upon site conditions and surface material. General spacing guideline is as follows:

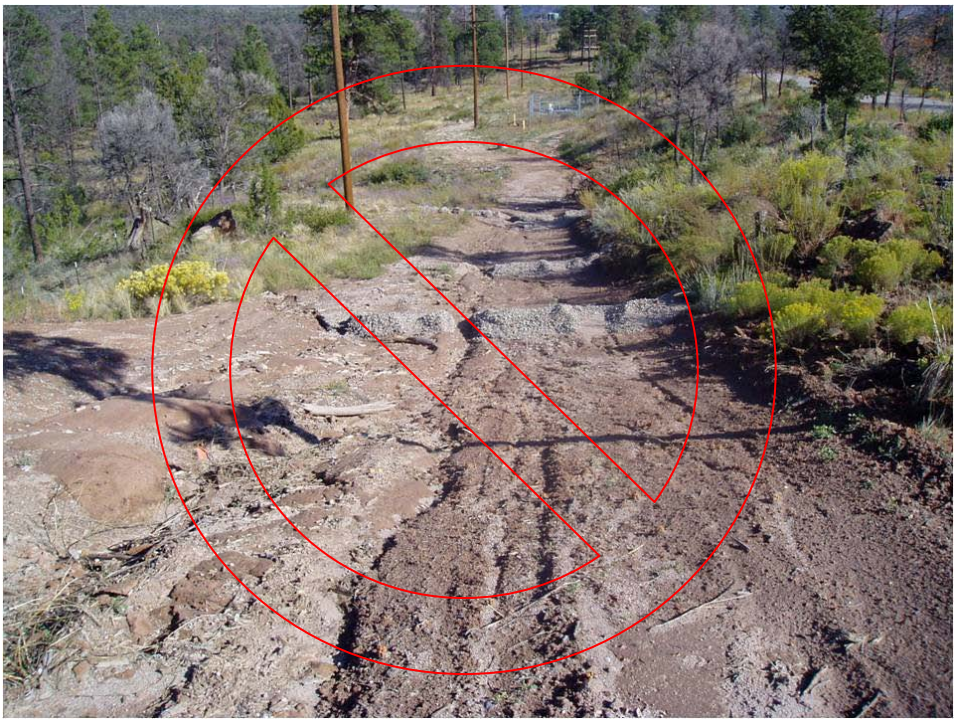
Slope	Distance between waterbars or runouts
3%	200’
5-10%	100’
>10%	50’

- Waterbars should have a small dip on the uphill side to convey runoff along the base of the waterbar. They should cross the road at a 30 degree angle to the road. This angle prevents excess sediment buildup and reduces the chances of the water jumping the bar.
- Runouts – construct at a frequency to allow water to leave the roadway at regular intervals (see above). Cut an exit in the roadside channel and stabilize the exit as below if needed. When possible, flatten out the outflow area rather than channelizing it.
- If needed install rock or TRM stabilized outlet or other method per design.

Inspection and Maintenance

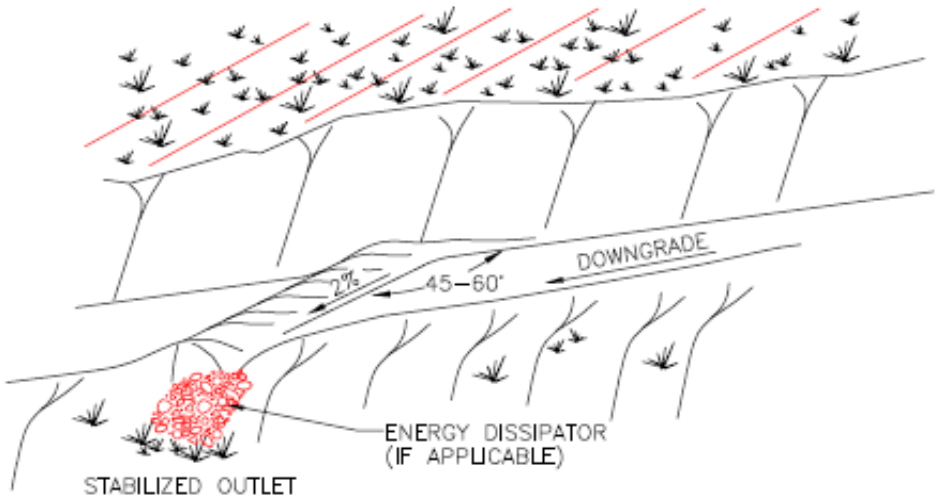
- Check that runouts and waterbars are graded properly to drain towards a stabilized outlet, and are the proper size and distance apart.
- Inspect for erosion blowouts after rainfall. Backfill and compact any rills that may form.

What not to do…

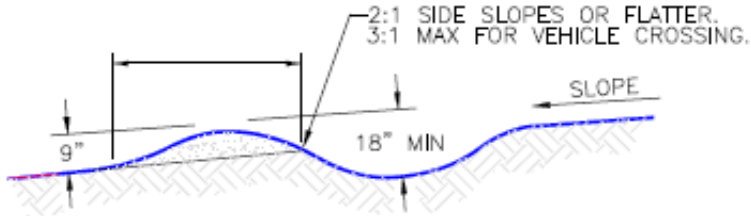


Notice how waterbars are ineffective in diverting and reducing erosive velocity of water. Loose uncompacted soil was used and waterbars were not installed at an approximate 30 degree angle to the road. Water jumped the bars and was not diverted.

WATERBAR



WATERBAR



SECTION

NOTES:

1. FOR AREAS OF SIGNIFICANT VEHICULAR TRAFFIC, WATERBARS SHALL BE STABILIZED WITH GRAVEL.
2. DIVERSION BERMS SHOULD HAVE A MINIMUM POSITIVE GRADE OF 2%.
3. WATERBARS SHALL BE CONSTRUCTED AT AN ANGLE OF 46 TO 60 DEGREES FROM THE CENTERLINE.
4. WATERBARS SHALL OUTLET ONTO AREAS STABILIZED BY EITHER NATURAL OR CONSTRUCTED MEANS.

Terracing

Options and Alternatives

- Can be constructed solely by grading
- Can be constructed or reinforced with logs or fiber rolls
- May require storm drain piping or other stabilized rundown
- Retaining walls
- If terracing is not possible, increased slope stabilization is required

BMP Objectives

- Runoff Control
- Erosion Control

Description

Gradient Terracing is a term used to describe a ridge and channel arrangement constructed across the face of a slope at regular intervals. This break in grade shortens slope lengths. Each “step” catches material which sloughs from above, and provides a level site where vegetation can become established. Storm water runoff is captured and redirected to a stable outlet. Terracing slopes reduces erosion by decreasing runoff velocities, trapping sediment, increasing water infiltration and promoting vegetative cover.

Applications

- Gradient terracing is useful on longer, steeper slopes that have been cleared and are prone to erosion problems.
- Stair-step grading is useful in areas containing rock.
- Should be used when there is a need for reduction in water flow velocity.

Limitations

- Terracing is not suitable for use on sandy or thin cover soils, or on excessively steep slopes, and may cause sloughing if too much water infiltrates the soil.
- Terracing requires stable runoff outlets.
- Soils should be stabilized with vegetation post construction
- Terracing for long slopes may require an engineered slope stabilization design.

Performance and Longevity

Terraces are generally meant to be permanent, though they can be used in soil staging piles as well.

Performance	Poor or N/A	Good	Excellent
Erosion Prevention		x	
Sediment Control	x		
Runoff Control		x	
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
terracing	x	x		

Design and Construction Guidance

- Terraces can be simple breaks in the slope or an engineered design with rundowns.
- Stair steps should be wide enough to work with standard earth moving equipment. Though in some cases narrow terraces and the use of hand tools may be sufficient.
- Make the vertical cut distance less than the horizontal distance.
- Slightly slope the horizontal step slightly inclined back towards the hill.

Terrace spacing

Average slope	Horizontal spacing	Vertical spacing
2%	125 ft	2.5 ft
6%	60 ft	3.5 ft
10%	45 ft	4.5 ft
14%	40 ft	5.5 ft

- Terraces should not be constructed completely along the contour, they should slope slightly downhill to direct water towards the stabilized rundown.
- Place fill slopes with a gradient steeper than 3:1 in lifts not to exceed 8 in. and make sure each lift is properly compacted.
- Install slope drain piping or rock or TRM stabilized rundown per design.
- If desired to further slow runoff, roughen the face of the slopes using tracking or create shallow grooves using normal tilling, disking, or harrowing to create a series of ridges and depressions that run across the slope and on the contour. Make grooves formed by such implements close together, less than 10 in. and not less than 1 in. deep.
- Apply seed, fertilizer, and mulch according to LANL Construction Specifications.

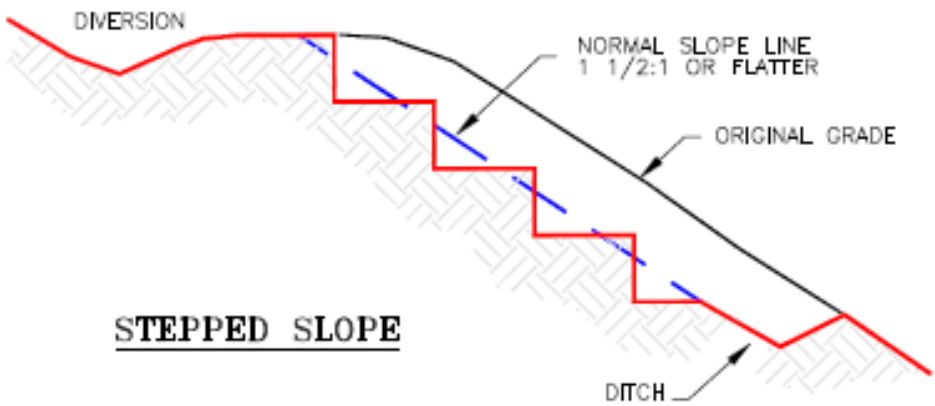
Inspection and Maintenance

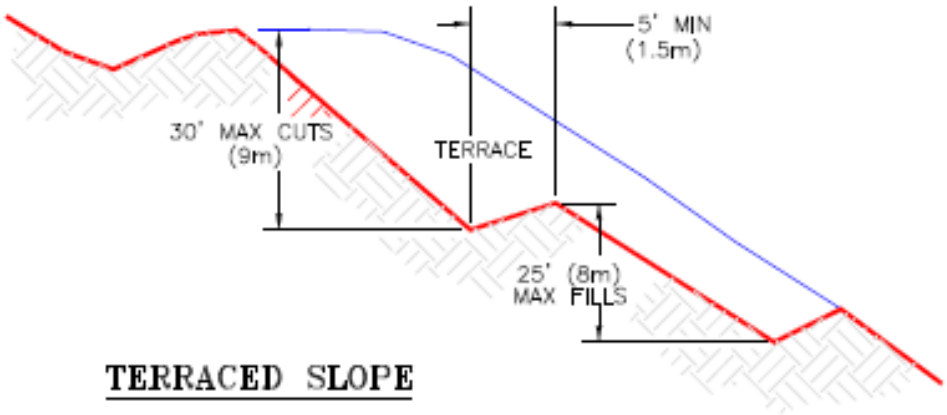
- Check that terraces are graded properly to drain backwards into the hill and to run towards a stabilized outlet.
- Inspect that stabilization measures such as vegetation are installed and functioning.
- Inspect slopes for erosion blowouts after rainfall.
- Take action as necessary to ensure proper drainage and slope stability. Backfill and compact any rills that may form.

What not to do…

Water must run along the contour and not jump the terraces.

STEPPED OR TERRACED SLOPE

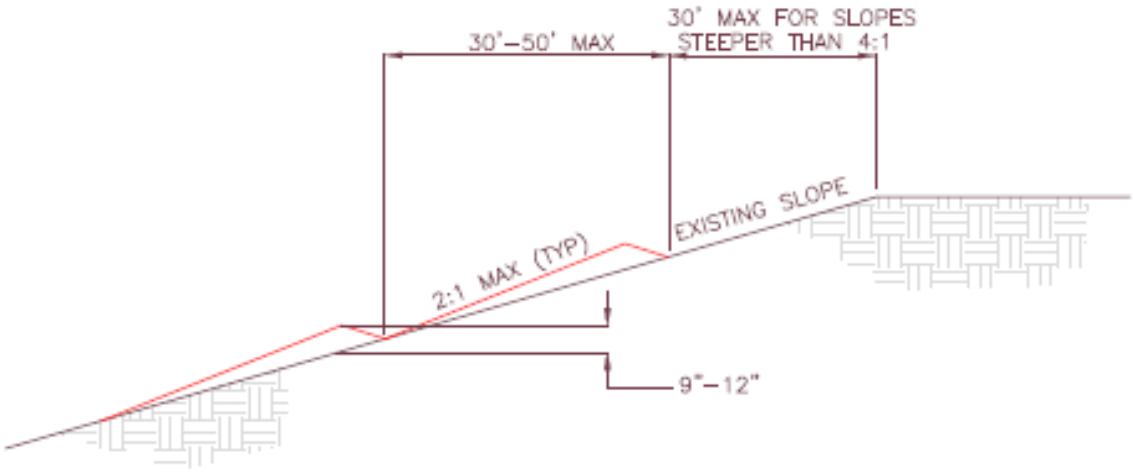




NOT TO SCALE

NOTES:
1. VERTICAL CUT DISTANCE SHALL BE LESS THAN HORIZONTAL DISTANCE.
2. VERTICAL CUT SHALL NOT EXCEED 2 FT. (0.6m) IN SOFT MATERIAL AND 3 FT. (0.9m) IN ROCKY MATERIAL.

GRADIENT TERRACES



NOTES:

1. MAXIMUM CONTINUOUS LENGTH OF 2:1 SLOPE SHALL BE 15'.
2. TERRACE SHALL SLOPE AT 1%–3% AND DRAIN TO AN ADEQUATE OUTLET.
3. TERRACES MAY ONLY BE FORMED BY CONSTRUCTION OF A BERM.

Surface Roughening

Options and Alternatives

- Use a grader or tiller
- Use a soil stabilizer like Gorilla Snot or Durasoil

BMP Objectives

- Temporary soil stabilization
- Reduce erosion potential & trap sediment
- Aid in establishing vegetative cover

Description

The use of mechanized equipment to provide a rough texture to soil surfaces.

Applications

Used on bare soil surfaces on a slope. Surface roughening or scarification is a technique used for creating unevenness on bare soil to help prevent slope erosion and formation of rills.

Limitations

Does not permanently stabilize area.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention		x	
Sediment Control	x		
Runoff Control		x	
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Surface roughening	x			

Design and Construction Guidance

- Roughening methods with agricultural equipment include tilling, disking, and harrowing.
- Tracking with equipment MUST BE DONE UP AND DOWN THE SLOPE.
- Factors to be considered in choosing roughening or tracking include slope steepness, long term slope maintenance and mowing requirements, type of soil, and whether the slope is formed by cutting or filling.
- Roughening can be performed during any stage of grading activity.

- Grooves should be less than 10 inches apart and not less than one inch deep.
- Apply fertilizer, mulch, top soil, or other soil amendments as necessary after surface roughening.

Inspection and Maintenance

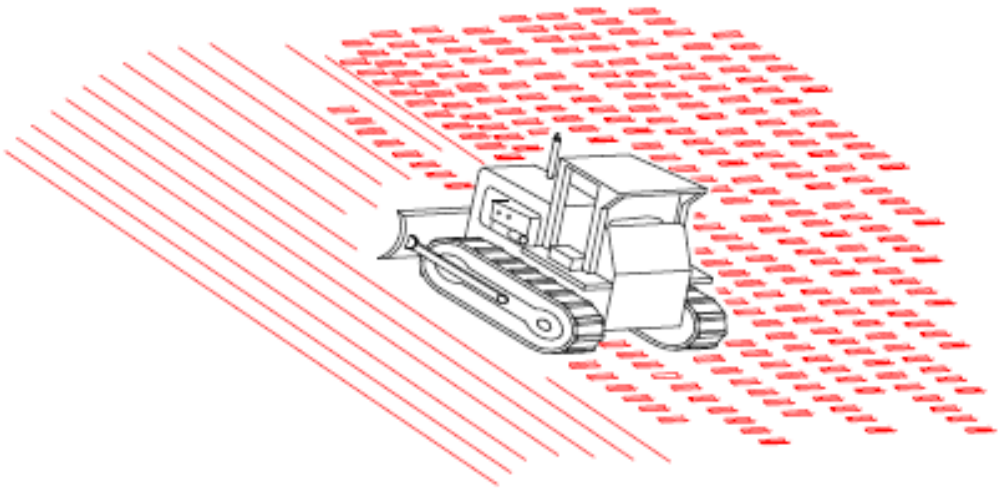
- Check that roughening was performed in the correct direction.
- Check for erosion and rilling to be repaired.

What not to do…

Note that the exposed slope was graded with no tracking. This allowed storm water runoff to concentrate and form rills in the soil.

Note that the slope was track-walked in the wrong direction. This will cause rills to form as water will be allowed to follow the grooves in the soil and gain velocity causing erosion. Track walking with machinery up and down the slope creates grooves that will catch seed and fertilizer and will promote mulch cover to stay on the slope. It will also slow water velocity and reduce runoff and erosion.

SURFACE ROUGHENING

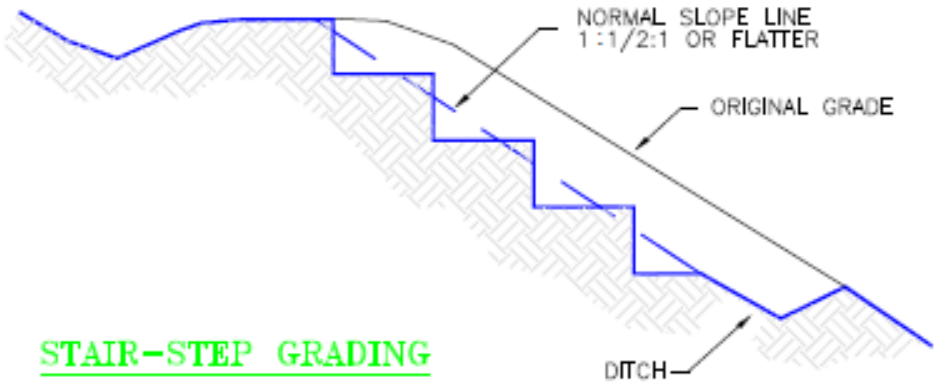


TRACKING

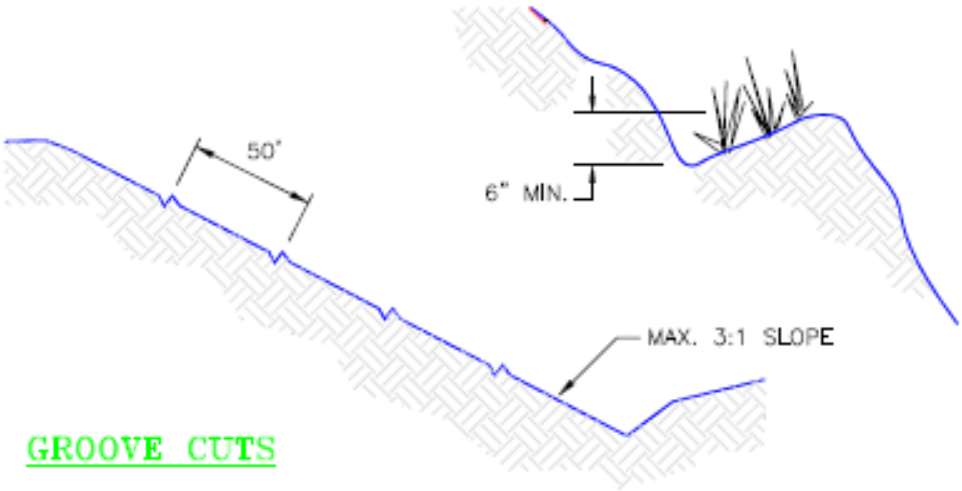
NOTES:

1. USE OF TRACKED MACHINERY SHOULD BE LIMITED TO SANDY SOILS THAT DO NOT EASILY COMPACT.
2. AVOID TRACKING ON CLAY SOILS.
3. OPERATE TRACKED MACHINERY PERPENDICULAR TO THE CONTOURS.
4. SEED AREA FOLLOWING ROUGHENING.

SURFACE ROUGHENING



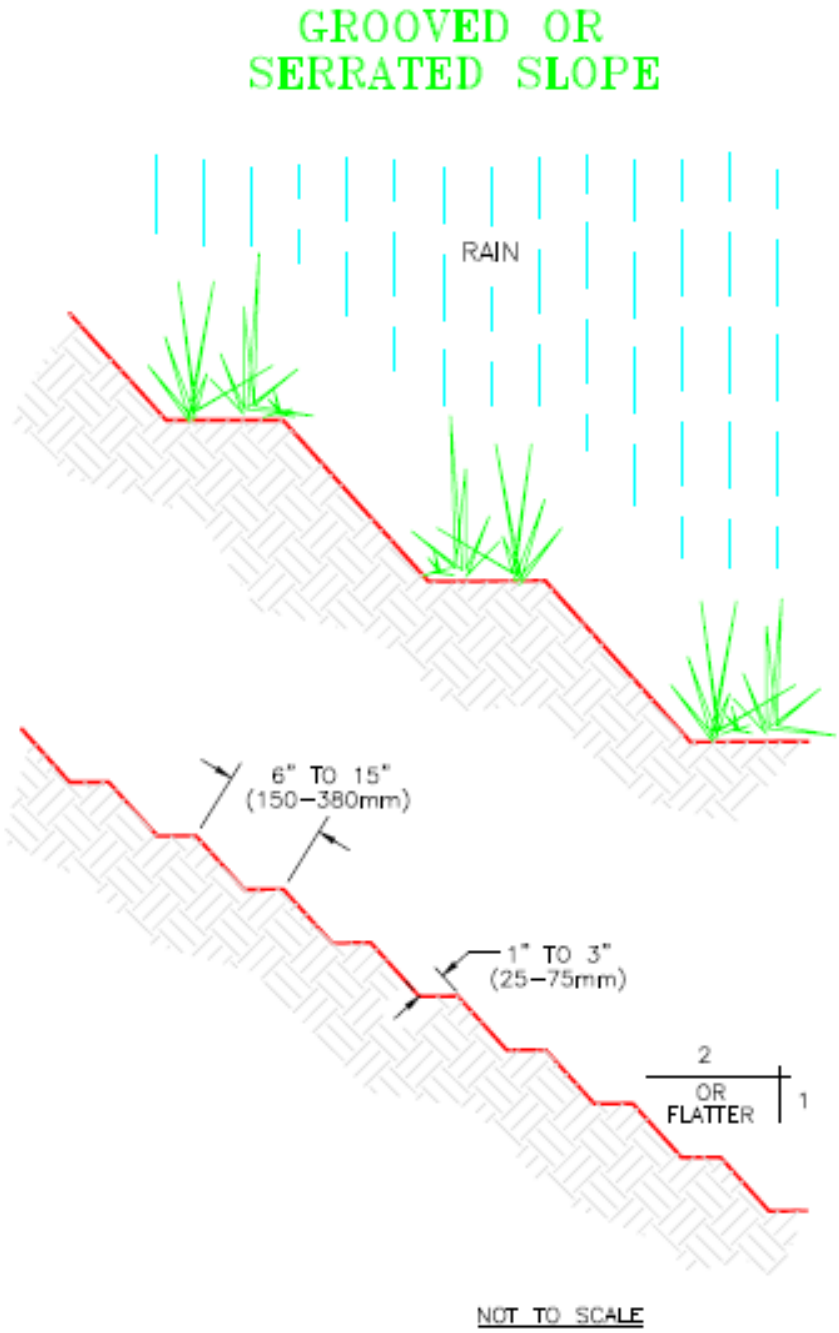
STAIR-STEP GRADING



GROOVE CUTS

NOTES:

1. STAIR-STEP GRADING SHALL BE USED FOR SLOPES GREATER THAN 2:1.
2. GROOVE CUTS SHALL BE USED ON SLOPES OF 3:1 OR LESS.
3. CONSTRUCT STAIRS WIDE ENOUGH TO WORK WITH STANDARD EARTH MOVING EQUIPMENT.
4. CONSTRUCT CUTS PARALLEL TO THE CONTOURS.
5. VERTICAL CUTS SHALL NOT EXCEED 2 FT IN SOFT MATERIAL AND 3 FT IN ROCKY MATERIAL.


GROOVED OR
SERRATED SLOPE
RAIN
6" TO 15"
(150–380mm)
1" TO 3"
(25–75mm)
2
OR
FLATTER
1
NOT TO SCALE

Sediment Traps

BMP Objectives

- Sediment retention
- Runoff velocity reduction
- Controlled release (flowrate) at outlet

Description

Sediment traps are typically excavated depressions or naturally low areas with earthen embankments, or other similar structures, surrounding all or a portion of the trap footprint. They are used to detain storm water runoff to facilitate the settling of suspended sediment prior to release of the runoff. Sediment is deposited and retained in an area of specified size identified as a settling zone. The amount of sediment retained, as well as the particle size of the retained sediment, is dependent upon soil characteristics and runoff detention time. Traps also help to reduce runoff velocity through detention, and runoff is generally released from a sediment trap via a spillway that functions similar to a weir and through infiltration into the soil. Sediment traps are most commonly used as temporary BMPs.

Sediment traps are used to detain storm water runoff to facilitate the settling of suspended sediment and to release it at a reduced rate through a controlled outlet structure. The ponding of storm water allows sediment to drop out. Sediment accumulations must be removed periodically. Sediment traps are typically smaller in size than basins and do not have pipe outlets.

Applications

- At locations where runoff velocity or sediment deposition is a concern.
- At locations of concentrated flow.
- At locations where site runoff, either during or after construction, must be released at a specified rate.

Limitations

- A single sediment trap should only be used for small drainage areas.
- Use of sediment traps for large drainage areas will require the construction of a series of coordinated traps.
- Sediment traps are typically temporary BMPs. Use of traps as permanent structures will require regular and frequent inspection and maintenance.
- Water cannot be ponded on SWMUs at LANL and must be released within 96 hours.

Performance and Longevity

Performance	Poor or n/a	Good	Excellent
Erosion Prevention	x		
Sediment Control			x
Runoff Control			x
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Sediment trap	x			

Design and Construction Criteria

- Sediment trap cut and fill slopes should have a maximum slope of 3:1.
- Sediment traps shall not be located within a natural watercourse.
- Traps shall not be used as permanent structures.
- Sediment trap outflow must discharge through a stabilized low point.
- Spillways should be designed to provide the trap with a minimum 1.5 foot settling zone and 1 foot sediment storage zone.
- Embankment fill material should be placed in 6 inch lifts and compact each lift with a compactor or the appropriate earth moving equipment.
- Stabilize the trap embankment, with seed and erosion control blankets, seed and hydromulch, or other appropriate stabilization.
- The basin entrance should be as far as practicable from the outlet to maximize time for runoff detention and sediment settling.
- Ensure drainage basins fully discharge within 96 hours by releasing runoff through a control structure or through infiltration into the soil.

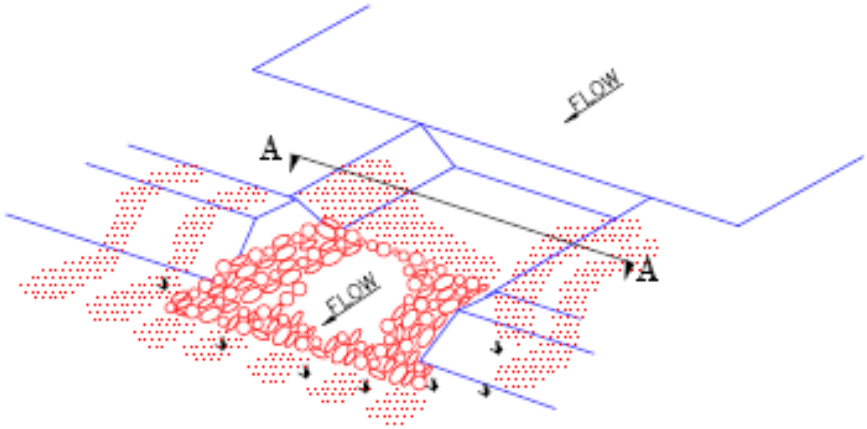
Inspection and Maintenance

- Ensure that outlet and spillway are lower than pond edges and are adequately stabilized
- Inspect for effectiveness in controlling storm water runoff and sediment settling.
- Inspect inlet, outlet and embankment slopes for damage such as vegetation loss, bank stability, debris build-up, erosion, and rock displacement.
- Remove accumulated sediment when it exceeds 25% of the design sediment storage volume.
- Removed sediment accumulations shall not be placed within any drainage, either above or below the trap to prevent future migration from storm water runoff.
- Removed sediment shall be stabilized to prevent future migration from storm water runoff.
- Potentially contaminated sediment may require disposal.

What not to do…

There is no defined/armored pathway for water to flow in and out of the pond.

SEDIMENT TRAP



PERSPECTIVE VIEW

SECTION A – A

NOTE:

1. CUT AND FILL SLOPES IN TRAPS SHALL BE 3:1 OR FLATTER.
2. ENSURE THAT FILL MATERIAL FOR EMBANKMENTS IS FREE OF ROOTS, WOODY VEGETATION, AND LARGE STONES.
3. STABILIZE EMBANKMENTS WITH SEED, MULCH, MATTING, OR OTHER APPLICABLE MEASURE.
4. LINE THE TRAP OUTLET AREA WITH FILTER FABRIC PRIOR TO PLACEMENT OF STONE OR GRAVEL.
5. SEDIMENT TRAPS SHALL NOT BE USED FOR DRAINAGE AREAS EXCEEDING 5 ACRES IN SIZE.

Storm Water Detention Basins

Useful combinations

- PAM application

BMP Objectives

- Sediment retention
- Runoff velocity reduction
- Controlled release (flowrate) at outlet

Description

Storm water detention basins are typically excavated depressions or naturally low areas with earthen embankments, or other similar structures, surrounding all or a portion of the basin footprint. They may also be underground systems located beneath asphalt or concrete surfaces. Underground systems can be comprised of concrete, corrugated metal pipe, or high density polyethylene material in various geometric configurations.

Detention basins are used to detain storm water runoff to facilitate the settling of suspended sediment and to release runoff at a reduced rate through a controlled outlet structure. The ponding of storm water allows sediment to drop out. Sediment accumulations must be removed periodically.

Applications

- At locations where runoff velocity or sediment deposition is a concern.
- At locations of concentrated flow.
- At locations where site runoff, either during or after construction, must be released at a specified rate.

Limitations

- Required basin size is highly dependent upon the ground cover and associated runoff characteristics of the surrounding drainage area. If areas surrounding the basin are developed after the basin is constructed the basin may not be adequate in size to handle increased flows.
- Basins can require a significant area to accommodate the runoff storage area, maintenance access, and the control structure.
- Basins will require an engineered design.
- If areas surrounding the basin are developed after the basin is constructed the basin may not be adequate in size to handle increased flows.
- Water cannot be ponded on SWMUs at LANL and must be released within 96 hours.

Performance and Longevity

Performance	Poor or n/a	Good	Excellent
Erosion Prevention	x		
Sediment Control			x
Runoff Control			x
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
detention basin		x	x	

Design and Construction Criteria

- Detention basins should be designed by a qualified engineer.
- Basins should be located where loss of containment would not cause loss of life or property damage, and shall not be located in a natural watercourse.
- Consider, based on site conditions, the installation of a trash rack on the top of control structure standpipes to minimize the potential for entry of debris into the pipe.
- Provide an emergency spillway with the crest elevation being a minimum of six inches lower than the top of the basin berm. Ensure that the emergency spillway is stabilized with concrete, filter fabric and rock, turf reinforcement mat, or other appropriate material.
- Embankment fill material should be placed compacted prior to stabilization.
- Ensure that fill material for embankments is free of roots, woody vegetation, and large stones.
- Stabilize the basin and basin embankment, with seed and erosion control blankets, seed and hydromulch, or other appropriate stabilization.
- Design the basin configuration to facilitate future maintenance.
- Ponding depth should be based on settling zone size and projected fall velocity of the minimum sediment size.
- The basin entrance should be as far as practicable from the outlet to maximize time for runoff detention and sediment settling.
- Ensure drainage basins fully discharge within 96 hours by releasing runoff through a control structure or through infiltration into the soil.
- The lowest drain hole on the riser pipe should be a minimum of 6” above the ground surface to facilitate settling of suspended sediment.
- Provide appropriate BMPs at the outlet of basin control structure.
- Basins shall be constructed prior to the start of any major land disturbing activities.

Inspection and Maintenance

- Closely inspect embankments for undermining, erosion, or other damage.
- Ensure that outlet and spillway are lower than pond edges and are adequately stabilized
- Inspect for effectiveness in controlling storm water runoff and sediment settling.
- Inspect inlet, outlet and embankment slopes for damage such as vegetation loss, bank stability, debris build-up, erosion, and rock displacement.

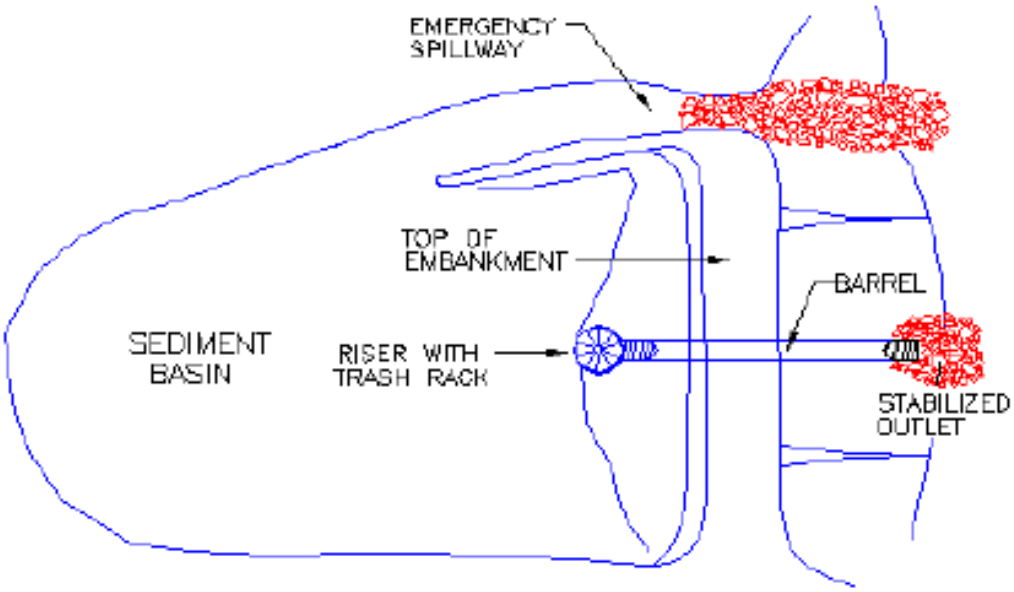
- Ensure standpipe drain holes are clear of debris or other matter that would restrict flow.
- Remove accumulated sediment when it exceeds 25% the design sediment storage volume.
- Removed sediment accumulations shall not be placed within any drainage, either above or below the basin to prevent future migration from storm water runoff.
- Removed sediment shall be stabilized to prevent future migration from storm water runoff.
- Potentially contaminated sediment may require disposal.

What not to do…

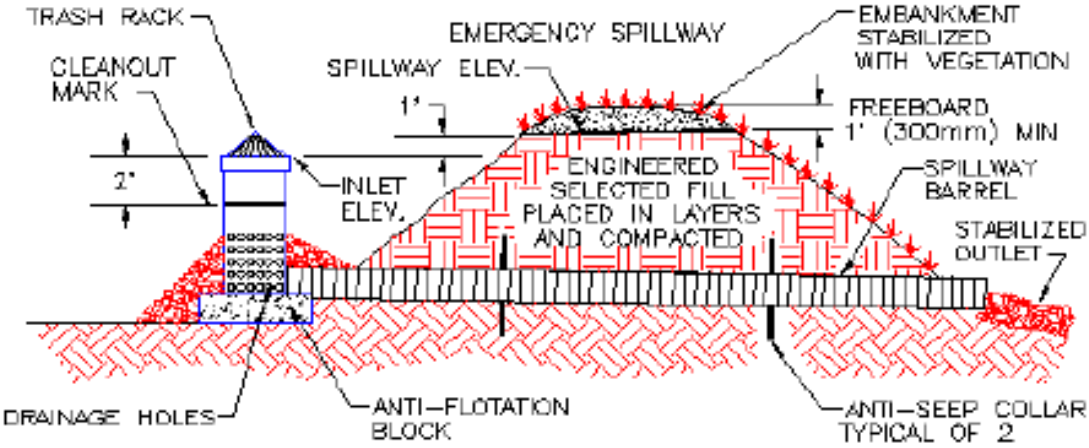
Embankments of pond should be stabilized following initial grading of pond.

Standpipe overflow height is higher in elevation than the basin spillway.

TYPICAL SEDIMENT BASIN



PLAN



SECTION

NOTES:

1. BASINS SHALL BE USED FOR AREAS GREATER THAN 5 ACRES IN SIZE.
2. ENSURE THAT FILL MATERIAL FOR EMBANKMENTS IS FREE OF ROOTS, WOODY VEGETATION, AND LARGE STONES.
3. LINE THE BASIN OUTLET AREA WITH FILTER FABRIC PRIOR TO PLACEMENT OF STONE OR GRAVEL.
4. ENSURE THAT THE EMERGENCY SPILLWAY IS NOT CONSTRUCTED FROM FILL MATERIAL.
5. STABILIZE EMBANKMENTS AND EMERGENCY SPILLWAY WITH SEED, MULCH, MATTING, OR OTHER APPLICABLE MEASURES.

Revegetation

Options

- Seed in conjunction with hydromulch
- Seed in conjunction with erosion control blanket installation
- Seed in conjunction with other types of mulch products

Alternatives

- Use Turf Reinforcement Mat
- Preservation of existing vegetation

BMP Objectives

- Temporary or permanent soil stabilization
- Increase infiltration and reduce erosion and sediment transport

Description

Revegetation is the establishment of short-term or long-term vegetative cover, through seeding, on disturbed surfaces or other areas that pose a high risk of erosion. Seeding can provide temporary or permanent stabilization with reduced erosion, runoff, and sediment transport. Temporary seeding can be used on any temporary earthen structure, construction sites, topsoil stockpiles, etc. Typical areas appropriate for permanent seeding include denuded areas where long-term vegetative cover is desired, buffer areas, steep slopes, stream banks, and areas where soils are unstable.

Applications

- Temporary or permanent stabilization at construction sites, topsoil stockpiles, etc.
- Denuded areas where long-term vegetative cover is desired, buffer areas, steep slopes, stream banks, and areas where soils are unstable.

Limitations

- Establishment of vegetation can take one or more growing seasons and is dependent upon growing conditions (temperature, rainfall, soils, etc.).
- May require ongoing irrigation and maintenance to establish vegetation.
- Incorrect revegetation methods may inhibit growth and may not be fully evident until after the growing season.
- Effectiveness can be greatly reduced if rills or gullies are allowed to form underneath blankets, or if hydromulch is subject to concentrated flows.
- Soil may require agronomic evaluation and/or amendment before revegetation can be successfully implemented or established.

Performance and Longevity

Performance	Poor	Good	Excellent
Erosion Prevention			x
Sediment Control		x	
Runoff Control	x		
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Revegetation		x		

Design Criteria and Construction Specifications

Design Criteria: Use LANL Master Specification 32 9219 for detailed guidance on seedbed preparation, applicable seed mixes, seeding operations, application rates, and mulch cover products. (http://engstandards.lanl.gov/specs/32_9219R3.doc)

- Seeding should be initiated as soon as practicable following completion of soil disturbing activities.
- Permanent seeding should be applied prior to seasonal rains or freezing weather.
- If soil is compacted, loosen soil with disking, raking or harrowing. Remove large clods and stones, or other foreign material that would interfere with seeding equipment and installation of erosion control blankets (ECB).
- If seeding requires harrowing, tracking, or furrowing, these activities shall be conducted horizontally across the face of the slope.
- Native species appropriate to site conditions should be used wherever possible.
- Seed shall be applied uniformly using calibrated broadcast spreaders, mechanical drills, or hydroseeders.
- Do not seed during windy weather, or when topsoil is dry, saturated or frozen.
- Apply slow-release organic fertilizers in accordance with manufacturer recommended rates.
- The application of mulch shall immediately follow seeding.
- Apply hydromulch and soil amendments in accordance with manufacturer's specifications.
- Select appropriate mulch material or erosion control blanket based on slope, required longevity, irrigation or non-irrigation, and site and soil conditions.
- If hydraulically applying mulch as part of the broadcast seeding process, use a 2-step process. Apply seed with a tracer. Once seed is applied, apply full complement of mulch. This will allow seed to be in good contact with soil surface and not suspended in the mulch matrix.
- Mix hydromulch slurry in a tank with an agitation system and spray, under pressure, uniformly over soil surface.
- Lay ECBs loosely and maintain direct contact with the soil. Do not place over protruding objects; rocks, bushes, etc.
- Install storm water diversion and conveyance controls as needed to divert concentrated flows away from seeded areas.

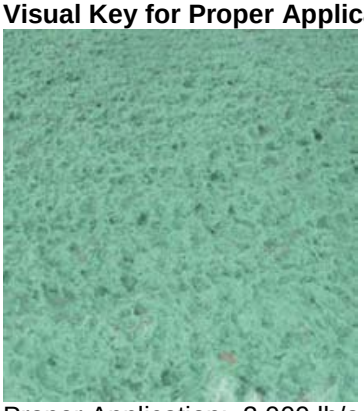
Inspection and Maintenance

ECB and Hydromulch Usage Table

	slopes steeper than 1:1	slopes flatter than 1:1	slopes flatter than 2:1	slopes flatter than 3:1	channels
Permanent blankets (TRM)	x	x	x	x	x
BFM, FGM hydromulch	x	x	x	x	
Wood fiber hydromulch, compost mulch			x	x	
Straw/coir ECBs			X	x	
Coir ECBs		x	X	X	

- Ensure seed and mulch is applied at the specified rate.
- Inspect seeded area for uniform application of seed and mulch.
- For hydromulch applications on slopes, inspect the mulch application from multiple directions (i.e., looking both up and down the slope) to ensure uniform application and no “shadowing” (absence of mulch on the back side of a furrow caused by spraying hydromulch from only one direction).
- Ensure ECBs are properly trenched, overlapped, and anchored. Check that rocks, sticks, or vegetation are not interfering with the blanket’s contact with the ground.
- Ensure that ECBs have been placed such that they maintain contact with the ground surface.
- Inspect seeded area for evidence of erosion (rills, gullies).
- Check for erosion and undermining. Backfill and compact any rills. Install storm water diversion and conveyance controls as needed to divert concentrated flows away from seeded areas.
- Repair torn or windblown blankets.
- Inspect reseeded areas for uniform growth of vegetation. Check for areas for damage by vehicles or other equipment.
- Install storm water diversion and conveyance controls as needed to divert concentrated flows away from seeded areas.

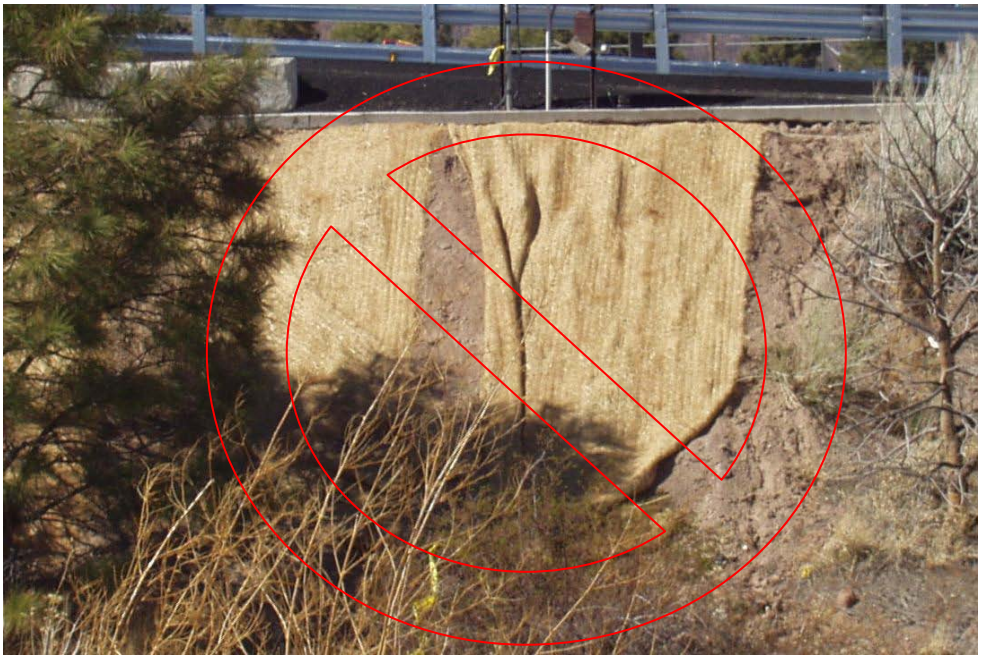
Visual Key for Proper Application (Flexterra-FGM shown)



Proper Application: 3,000 lb/acre - 4.1 mm thick

Improper Application (thin)

What not to do…



Properly prepare seed bed and ensure mulch or blanketing is installed correctly in order to promote vegetation growth and control erosion.

Temporary Stabilization

Options and Alternatives

- Rock mulch
- Base course
- Recycled wood mulch
- Hydromulch (without seed)
- Temporary seeding - with annual cover crops
- For dust control (see Section 3.5)

BMP Objectives

- Erosion Control

Description

Temporary stabilization is used for short-term stabilization; when it is known that the area will be disturbed again or when stabilization methods such as seeding are out of season. The use of rock or recycled wood chip mulch can break up raindrop impact. Hydromulch can be used without seed to provide short-term erosion protection. Dust control additives such as gorilla snot bind the clay particles to provide short-term erosion protection.

Applications

- Efficient method of providing immediate, temporary erosion control.
- Use to stabilize a site during winter until seeding can begin.
- Stabilize a portion of a site or soil piles until final grading occurs.

Limitations

- Not a permanent control; re-application may be required throughout the season to achieve effective erosion control.
- Not appropriate during all seasons.

Performance and Longevity

Performance is not as good as permanent stabilization for erosion control; temporary stabilization generally only lasts for a season. Rock and wood mulch last longer but should not be used alone as permanent stabilization.

Performance	Poor	Good	Excellent
Erosion Prevention			x
Sediment Control		x	
Runoff Control	x		
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Revegetation with Annuals/cover crops	x			
Mulch	x	x		
Base course	x	x		x

Design Criteria and Construction Specifications

- Rock mulch should be applied in a thin layer if it is meant to be used in conjunction with seeding in the future.
- Install hydromulch per manufacturer's recommendations. Select a type of mulch based on longevity needs.
- Temporary seeding can be done with cover crops (e.g., annual barley, oats, winter rye, etc.) or sterile, non-invasive annual species such as Quickguard sterile triticale hybrid or Regreen. See Revegetation Section 5.1 for seeding guidelines.
- Recycled wood mulch (MSS has equipment) can be applied as temporary stabilization in areas that do not receive concentrated flows.

Inspection and Maintenance

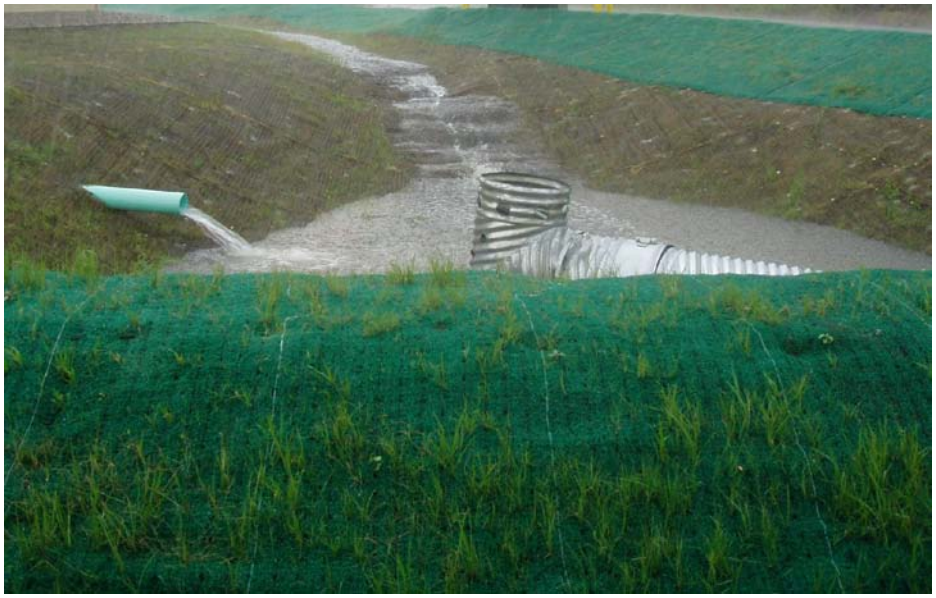
- Check for erosion and undermining.
- Backfill and compact any rills.
- Storm water diversion and conveyance controls may be installed to divert concentrated flows away.
- Reapply hydromulch or dust suppression substances as necessary if temporary stabilization period is extended.

What not to do…

Base course should not be used for stabilization in areas of high flow.

Hydromulch should not be applied too lightly or in areas of high flow.

Rolled Erosion Control Products



Options and Alternatives

- Turf Reinforcement Mats
- Erosion Control Blankets
- Riprap
- Gabions
- Engineered Stabilization

BMP Objectives

- Erosion control

Combinations and Alternatives

Turf reinforcement mats (TRMs) may be used in conjunction with temporary or permanent sediment and erosion control BMPs to promote vegetation growth. Areas where TRMs are applied should be seeded prior to installation.

Erosion Control Blankets (ECBs) may be used in conjunction with temporary or permanent sediment and erosion control BMPs to promote vegetation growth. Areas where ECBs are applied should be seeded prior to installation.

Description

Turf reinforcement mats are a long term non-degradable rolled erosion control product (RECP) comprised of UV stabilized, non-degradable, synthetic fibers or nettings. TRMs are especially useful in areas such as channels that receive higher velocity flows and on slopes requiring immediate permanent soft stabilization. TRMs can enhance the natural ability of vegetation to protect soil from erosion.

Erosion control blankets are generally a machine produced mat of organic, biodegradable mulch such as straw, curled wood fiber (excelsior), coconut fiber or a combination thereof, evenly distributed on or between photodegradable polypropylene or biodegradable natural fiber netting. ECBs are used to temporarily stabilize and protect disturbed soil from raindrop impact and surface erosion, to increase infiltration, decrease compaction and soil crusting, and to conserve soil moisture. Mulching with erosion control blankets will increase the germination rates for grasses and legumes and promote vegetation establishment. Erosion control blankets also protect seeds from predators; reduce desiccation and evaporation by insulating the soil and seed environment.

Applications

TRMs:

- TRMs may be used in areas where hard armoring or impervious lining would be required.
- Excellent for stabilizing soil in high shear stress/velocity channels or any area exposed to high volume or high velocity storm water runoff such as drainage ditches and runoff conveyance systems. TRMs may be used in channels where shears are up to 11 lbs/ft^2 and velocities range up to 20 ft/sec.

- May be used on slopes requiring immediate permanent soft stabilization.
- Remain in place as permanent stabilization.
- Helps establish and maintain vegetative cover.

Limitations

- The slopes must be uniform and relatively smooth before installation to ensure complete contact with the soil.
- Should not be used when anticipated hydraulic conditions are beyond the limits of TRMs.
- ECBs will often mask slope failures from all but the most intense scrutiny until erosion is too far along to effectively treat the slope with spot methods.
- Erosion control blankets are generally more expensive than hydroseeding.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention			x
Sediment Control	x		
Runoff Control	x		
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
TRM			x	

Design Criteria and Construction Specifications

Site preparation is essential to ensure that RECPs perform as intended and remain in close contact with the soil. Ensure soil amendments are applied as necessary and seed according to LANL Master Specifications Section 32 9219 Seeding. Choose the appropriate turf reinforcement mat for a channel based on the calculated shear stress and water velocities.

Anchoring:

- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats to the ground surface. Wire staples should be a minimum of 11 gauge. Metal stake pins should be 3/16 inch diameter steel with a 1 1/2 inch steel washer at the head of the pin. Wire staples and metal stakes should be driven flush to the soil surface. All anchors should be 6-8 inches long and have sufficient ground penetration to resist pullout. Longer anchors may be required for loose soils.

Installation of TRM or ECB on Slopes:

- Begin at the top of the slope and anchor the RECP in a 6 inch deep x 6 inch wide trench. Backfill trench and tamp earth firmly.
- Unroll RECP downslope in the direction of the water flow.
- The edges of adjacent parallel rolls should be overlapped 2-3 inches and be stapled every 3 feet.
- When RECP must be spliced, place mats end over end (shingle style) with 6 inch overlap. Staple through overlapped area, approximately 12 inches apart.
- Lay RECP loosely and maintain direct contact with the soil - do not stretch or allow “tenting” of the material.

- RECP should be stapled sufficiently to anchor mat and maintain contact with the soil.
- Staples should be placed down the center and staggered with the staples placed along the edges.

Installation of TRM in channels:

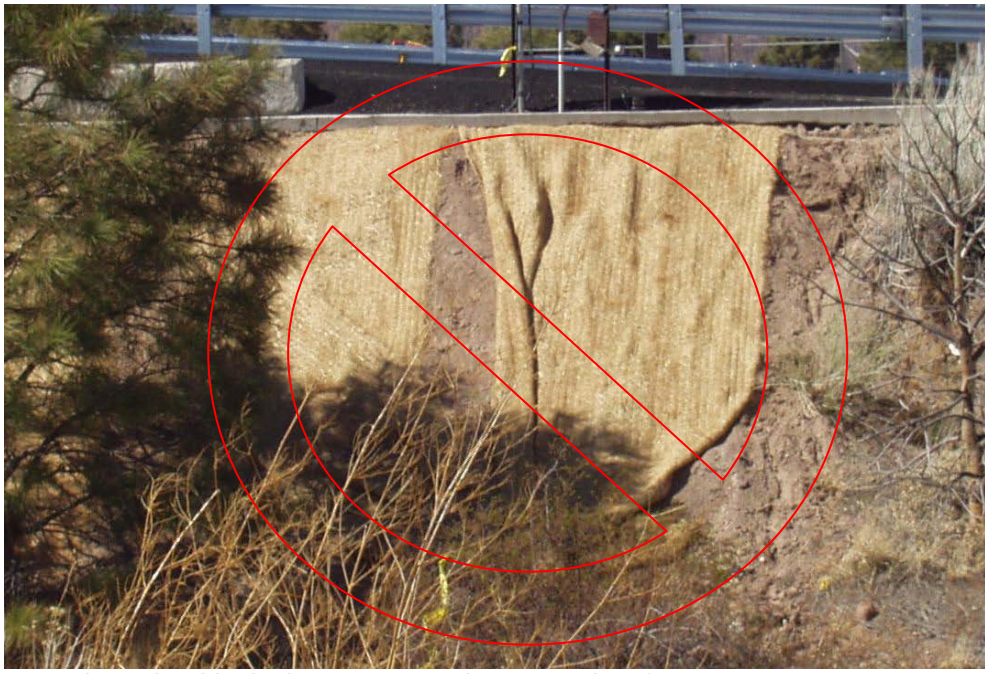
- Dig initial anchor trench 12 inches deep and 6 inches wide across the channel at the lower end of the project area.
- Excavate intermittent check slots, 6 inches deep and 6 inches wide across the channel at 25-30 foot intervals along the channel.
- Cut longitudinal channel anchor slots 4 inches deep and 4 inches wide along each side of the installation to bury edges of matting. Whenever possible extend matting 2-3 inches above the crest of channel side slopes.
- Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 1 foot intervals.
- In the same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 3 inches.
- Secure these initial ends of mats with anchors at 1 foot intervals, backfill and compact soil.
- Unroll center strip of matting upstream.
- Unroll adjacent mats upstream in similar fashion, maintaining a 3 inch overlap.
- Shingle-lap spliced ends by a minimum of 1 foot with upstream mat on top to prevent uplifting by water
- Anchor overlapped area by placing two rows of anchors, 1 foot apart on 1 foot intervals.
- Place edges of outside mats in previously excavated longitudinal slots, anchor and backfill and compact soil.
- Anchor, fill and compact upstream end of mat in a 12 inch x 6 inch terminal trench.
- Secure mat to ground surface using U-shaped wire staples, geotextile pins, or wooden stakes.

Inspection and Maintenance

- All mats should be inspected periodically following installation.
- Inspect mats after significant rain events to check for erosion and undermining. Any failure should be repaired immediately.
- If washout or breakage occurs, re-install the material after repairing the soil damage

What not to do…

TRM installation was not continued along swale where water flow is concentrated, causing erosion.



Properly anchor blanketing on a properly prepared surface.

Dust Suppression

Options and Alternatives

- Stabilize with vegetation, or paving (see Sections 5.1, 5.7)
- Cover stockpiles with plastic

BMP Objectives

- Erosion Control
- Sediment Control

Description

Dust control measures are implemented to prevent the soil from leaving the site. Dust control practices include minimization of soil disturbance, water application, mulching, establishing vegetation, and using soil stabilizers or tackifiers.

Applications

Apply dust suppression techniques on any site subject to wind erosion and off-site tracking, especially at construction sites and on roads.

Limitations

Some temporary dust controls must be reapplied and/or maintained frequently.

Performance and Longevity

- *Mulch* - Can reduce wind erosion by up to 80 percent.
- *Tillage* - Roughening the soil can reduce soil losses by approximately 80 percent in some situations.
- *Soil Stabilizers* - Effectiveness of polymer stabilization methods range from 70 percent to 90 percent.

Performance	Poor or N/A	Good	Excellent
Erosion Prevention			x
Sediment Control			x
Runoff Control	x		
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
water and soil stabilizers	x			

Design Criteria and Construction Specifications

- *Water Application:* Sprinkling the ground surface with water is an effective dust control method for roads. If this method is to be employed at a construction site, it is recommended that a proper construction entrance/exit be created to prevent tracking sediment off-site.

- Apply water in a manner that does not result in runoff from the site.
- *Soil Stabilizers:* select product and application based on site conditions and required longevity*. Apply in accordance with manufacturer's recommendations.*
- *MgCl* should not be used at LANL.
- *Tillage:* This practice roughens the soil and brings clods to the surface. Plowing should begin on the windward side of the site using chisel-type plows spaced about 12 inches apart, spring-tooth harrows, or similar plows.

Inspection and Maintenance

- If dust is blowing, reapply.
- Temporary dust control measures, such as water, require frequent renewal.

What not to do…

Dust control was not applied sufficiently.

Gabions

Options and Alternatives

- Use riprap (see Section 5.5) or RECP (see Section 5.3) for lower flows

BMP Objectives

- Sedimentation control
- Slope stabilization

Description

A gabion is wire enclosed riprap that forms a pervious structure designed to stabilize and protect channels and slopes subject to erosion. By trapping sediment between the stones, gabions also facilitate vegetative growth. The traditional gabion is a rectangular basket used as a building block for retaining walls and grade control structures. Gabion mattresses, which are not as thick as traditional gabions, are used to line storm drain outlets and channel side slopes and bottoms. The wire used in gabion construction is typically double-twist, hexagonal mesh or welded wire.

Applications

In channels for permanent stabilization.

Limitations

- Proper design is essential.
- Expensive and difficult to install.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention			x
Sediment Control			x
Runoff Control	x		
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Gabion			x	

Design Criteria and Construction Specifications

Gabion installation should be designed and specified by qualified personnel in accordance with engineering specifications. Installation shall be completed in accordance with the design requirements and manufacturers' standards and specifications. Additional general information on gabion installation follows:

- Stones are usually rounded river rock and are well graded to promote interlocking.
- Gabions should be filled with minimum of 3-5 inch stone.
- Gabion mattresses should be filled with 4-8 inch stone.
- Baskets shall be constructed of wire mesh specified for this purpose and baskets are attached to each other with proper fasteners.
- Filter fabric must be used underneath the gabions.
    - Connect joints of the filter fabric with a minimum overlap of 1 foot and space anchor pins approximately every 3 feet along the overlap.
    - The ends of the filter fabric shall be buried to a minimum depth of 12 inches.
- Use steel railroad rails, standard weight galvanized steel pipe or steel angles minimum 4” × 4” × 3/8 in. for stakes to anchor to the ground.
- Gabion installation should be done in accordance with the design.
- For channel stabilization place in a trench excavated to 24 in below the toe of the slope of the Embankment or side of channel. Brush, trees, stumps, and other objects that would interfere with placement should be removed. Excavate loose material as necessary to establish a stable foundation for each structure.
- Gabions and gabion mattresses shall be secured to the stream bank or stream bed.
- Place riprap stones in lifts a maximum of 12 inches thick forming a continuous blanket. Some hand placement is necessary to fill in gaps and voids and avoid bulging.
- When gabions are assembled, corners should be first joined together. Untied edges shall be assembled by tying with lacing wire or approved fasteners. Gabion baskets should be joined to each other along adjacent edges, both horizontally and vertically.

Inspection and Maintenance

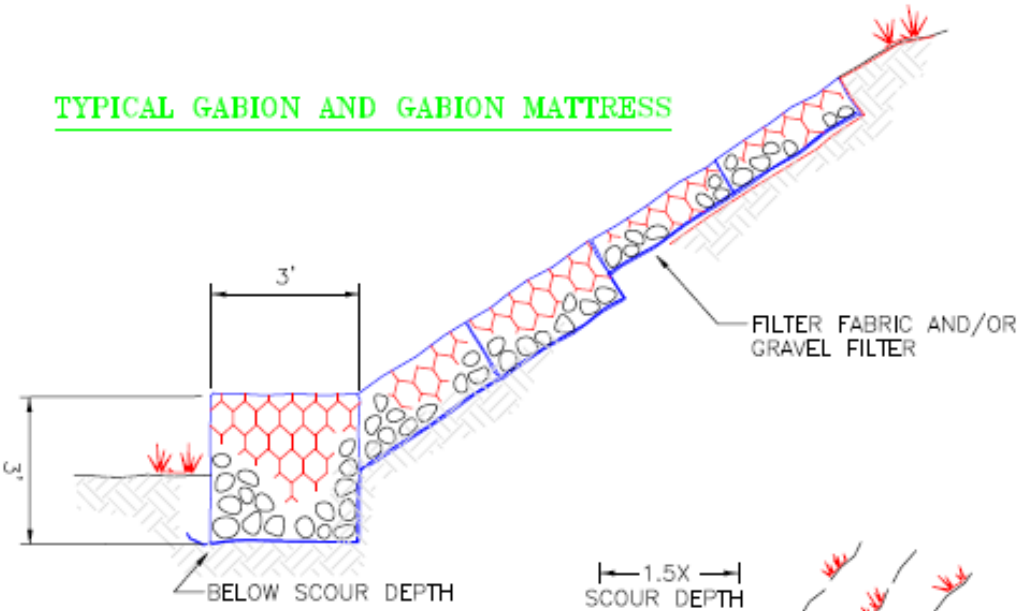
- Check that filter fabric was used under the gabion.
- Check that gabion is anchored to the ground.
- Check that gabions are fastened to each other.
- Check that baskets are adequately filled with no voids or bulges.
- Check that adjacent slopes have been filled adequately to prevent erosion and scour around the edges of the structure.
- Inspect for erosion and scour around and beneath the gabions.
- Check for excessive slumping, gabions are flexible and minor settling can be accommodated.
- Check for corroding wire mesh.
- Check for excessive growth of bushes, trees and other vegetation that may damage gabions.

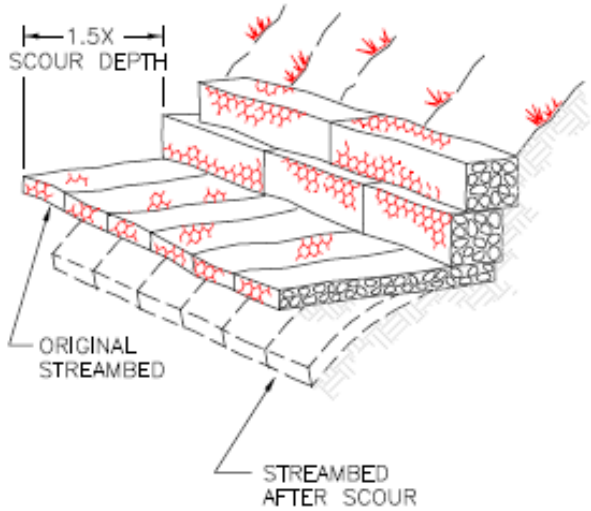
What not to do…

Obstructions not removed from channel before gabion was installed. No filter fabric under the gabions. Scour under the gabions.

GABIONS

TYPICAL GABION AND GABION MATTRESS





TYPICAL GABION APRON

NOTES:

1. WHEN ASSEMBLING GABIONS, FASTEN CORNERS TOGETHER FIRST.
2. SECURE GABIONS TO STREAMBANK OR STREAMBED TO MINIMIZE SCOUR BENEATH OR AROUND THE STRUCTURES.
3. EXCAVATE LOOSE MATERIAL TO ESTABLISH A STABLE FOUNDATION.
4. MINIMIZE VOIDS AND BULGES IN THE GABIONS.

Riprap

Options
- Can be wire enclosed or loose

Alternatives
- Use TRM for channel install (see Section 5.3)
- Vegetation and terracing on slopes

BMP Objectives
- Erosion control

Description

Riprap is a permanent, erosion-resistant layer made of stones. It is intended to protect soil from erosion in areas of concentrated runoff. Riprap generally consists of crushed rock and for added effectiveness may be placed on filter fabric on a prepared surface. The individual stones are typically angular in shape and well graded to promote interlocking.

Applications

- Riprap is effective in protecting culvert inlets and outlets and preventing scouring and undercutting.
- Useful in the stabilization of stream or channel banks and drainage channels.
- Can be used to stabilize cut and fill slopes, storm drains and slope drains.
- Should be considered where perennial flows or frequent ponding would drown a vegetated lining.

Limitations

- Proper design and stone selection for expected flow velocity is essential.
- Should not be placed on slopes greater than 1.5:1.
- Cost may be a prohibitive factor in large scale applications.
- Difficult to remove sediment accumulations.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention			x
Sediment Control			x
Runoff Control		x	
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Riprap		x		

Design Criteria and Construction Specifications

- Riprap installations should be designed and specified by qualified personnel in accordance with the LANL ESM Section G10 6.0.E.7.a.
- Use stones angular in shape and well graded to promote interlocking.
- Filter fabric must be used underneath.
    - Connect filter fabric joints with a minimum overlap of 1 foot and space anchor pins approximately every 3 feet along the overlap.
    - The ends of the filter fabric shall be buried to a minimum depth of 12 inches.
- Brush, trees, stumps, and other objects that would interfere with riprap placement should be removed.
- Place riprap stones forming a continuous blanket to minimum thickness of 12 inches.
- Place the riprap in a trench excavated to 24 inches below the toe of the slope of the embankment or side of channel.

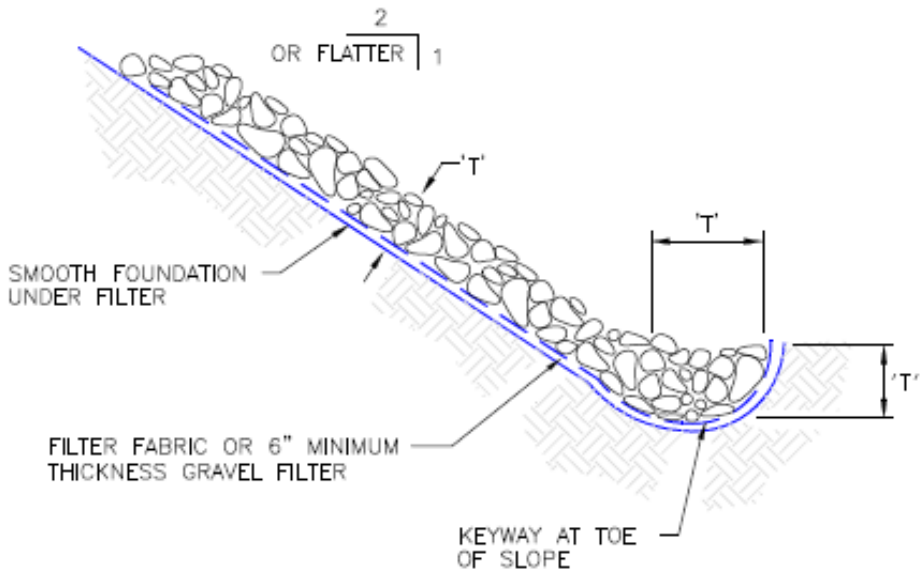
Inspection and Maintenance

- Check that filter fabric was used under the riprap.
- Check that riprap installed in a channel has a low point in the center to prevent flows from going around the rock.
- For riprap aprons, inspect for erosion around the riprap and dislodgment of stones.
- Check for slumping on hillsides.
- Check for scour or undermining – replace or reposition riprap as necessary.

What not to do…

Properly installed riprap at culvert outlet will control erosion.

RIPRAP



TYPICAL SECTION

NOTES:

1. REMOVE BRUSH, TREES, STUMPS, AND OTHER OBJECTS THAT WOULD INTERFERE WITH RIPRAP PLACEMENT.
2. RIPRAP SHALL BE A MIXTURE OF WELL GRADED STONES.
3. RIPRAP THICKNESS 'T' SHALL BE DETERMINED BY THE ENGINEER. REFER TO SECTION 602 OF THE NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS OF HIGHWAY AND BRIDGE CONSTRUCTION FOR STONE CLASSIFICATIONS.
4. PLACEMENT SHOULD FORM A WELL GRADED MASS OF STONE WITH A MINIMUM OF VOIDS.
5. ENSURE THAT THE FILTER AND UNDERLYING LAYERS ARE NOT DISTURBED DURING RIPRAP PLACEMENT.

Permanent Capping

Options and Alternatives

- Covering exposed areas with vegetation, stone, or concrete
- Diverting water away from the site

BMP Objectives

- Erosion control

Description

Permanent capping can be achieved using asphalt, concrete, geotextile, clay or soil with vegetative cover. Permanent caps are used when no other alternative is available to prevent pollutants at a site from leaving. Permanent capping is used to isolate areas of potential soil contamination from storm water. Used when no infiltration or erosion is allowed.

Applications

Permanent capping is used when no other alternative is available to prevent pollutants at a site from leaving.

Limitations

Expensive engineered control.

Performance and Longevity

Performance	Poor or N/A	Good	Excellent
Erosion Prevention			x
Sediment Control	x		
Runoff Control	x		
Good Housekeeping	x		

Longevity	Temporary (must be removed)	Long term (may need maintenance)	Permanent	Re-useable
Permanent capping			x	

Design Criteria and Construction Specifications

Permanent Caps will be designed and inspected by an engineer at the time of installation.

Materials:

- Material used for capping must be obtained from an uncontaminated source.

Installation:

- Earthen caps must be at least 24 inches thick and should be vegetated or covered with rock or gravel to protect the cap from erosion.
- Asphalt caps should be a minimum of 4 inches thick.

Inspection and Maintenance

- Are there areas of potential damage on the cap? - Look for scour, cracks, trees or large bushes.
- Are run on and run off controls in good condition? – Caps should be constructed with diversions and runoff erosion controls. Look for cracks, missing sections that could allow water to cross the site or get under the cap.
- Are there areas of erosion within 50 feet of the capped area that could migrate towards the cap?
- Any new human caused impacts to the area? - Fences, signs, damage from vehicles, new run on sources.
- Any animal impacts to the area, such as burrows or ant hills?

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Performance Improvement from Abnormal Events

1.0 PURPOSE

This document defines the process for responding to and notifying others of abnormal events at Los Alamos National Laboratory (LANL or the Laboratory). The abnormal event process is part of the LANL Contractor Assurance System (CAS), and is focused on effectively driving continuous performance improvement from each event.

Events that pose an immediate threat to life or property are subject to additional emergency notification requirements. See Section 3.12.

2.0 AUTHORITY AND APPLICABILITY

2.1 Authority

This document is issued under the authority of the Laboratory Director to direct the management and operation of the Laboratory, as delegated to the Contractor Assurance Officer (CAO), as provided in the Prime Contract. This document derives from the Laboratory Governing Policies, particularly the section on Management Systems, and SD320, *Los Alamos National Laboratory Contractor Assurance System Description Document*.

- Issuing Authority (IA): Contractor Assurance Officer (CAO)
- Responsible Manager (RM): Quality and Performance Assurance–Performance Assurance (QPA-PA) Group Leader
- Responsible Office (RO): Quality and Performance Assurance–Performance Assurance (QPA-PA)

2.2 Applicability

This document applies to all Laboratory workers, including employees of Los Alamos National Security, LLC (LANS), its contractors/subcontractors, students, guests, affiliates, or visitors. This document applies to work-related events on-site, i.e., within the physical boundaries of LANL, and off-site when the workers are (1) in LANL pay status, and (2) working under LANL procedures and requirements. Events involving LANL workers that occur at another Department of Energy (DOE)/National Nuclear Security Administration (NNSA) contractor site and where the work is under that site's procedures and requirements are managed by that contractor's abnormal event process.

Abnormal events include all abnormal conditions, accidents, incidents, or deviations from the planned outcome of a workplace activity that did or could have adversely affect(ed) health or safety of workers, the public, the environment, or the integrity of LANL programs or facilities.

Roles assigned in this document are based on P313, *Roles, Responsibilities, Authorities, and Accountability*. Key roles are filled by the Facility Operations Directors (FODs) and trained investigators from QPA-PA who support the FODs. The term FOD in this document refers to individuals in the Nuclear and High-Hazard Operations Directorate (NHHO), but for events that do not fall within the boundary of an NHHO-managed FOD Unit, refer to individuals outside of NHHO designated to fill the FOD role. Examples of the FOD role served from outside NHHO include:

- Construction/demolition project managers for events within their project,
- Subject matter experts, such as the Environmental Protection (ENV) Division Director, for multi-facility events or events with institutional impact, and
- The Laboratory Deputy Director for all Team Investigations.

Management authority and responsibility for execution of the abnormal event process are assigned to the FODs. FODs may delegate responsibilities and authorities for the abnormal event process to Operations Managers or Duty Officers. Facility-owning Responsible Associate Directors (RADs) establish their involvement in the process through agreements with the FODs. Details of the abnormal event process and procedures are maintained by QPA-PA and found on the Occurrence Reporting webpage.

Processes related to Operational Emergencies (OEs), security incidents, and the Price-Anderson Amendments Act (PAAA)/Worker Safety and Health (WSH) program are beyond the scope of this document. See Section 3.12.

3.0 PROCEDURE DESCRIPTION

The Laboratory has adopted a graded approach for investigating and resolving abnormal events. See Table 1 for a summary of the three-tier graded approach, and Attachment A, *Abnormal Event Process*, for the process flow at each of the three tiers.

Table 1. Graded Approach to Abnormal Events

Event Type	Examples	Who Investigates/Resolves
High-significance Occurrence Reporting and Processing System (ORPS)-reportable events are subject to Team Investigation. See Section 3.11.	▪ Fatality, terminal or disabling injury ▪ Criticality accident or near miss ▪ Radiation exposure exceeding limits for a worker or member of the public	▪ A team appointed by the Deputy Laboratory Director investigates. ▪ The Institutional Management Review Board (IMRB) oversees corrective action.
Low- to moderate-significance ORPS-reportable events, exceeding the ORPS thresholds. See Section 3.2.	▪ Injury requiring hospitalization ▪ Failures of safety-required equipment ▪ Moderate-hazard electrical shock events ▪ Violations of safety requirements	▪ Facility Operations Directors (FODs) with support from full-time, trained investigators in QPA-PA investigate. ▪ Appropriate Management Review Boards (MRBs) oversee corrective action.

Table 1. Graded Approach to Abnormal Events		
Event Type	**Examples**	**Who Investigates/Resolves**
Sub-ORPS events fall below the ORPS thresholds. See Section 3.10.	▪ Minor workplace incidents or near misses ▪ Minor equipment failures ▪ Operational concerns resulting in pause or stop work	▪ Improvement Responsible Managers (IRMs) from the facility or program where the event occurred investigate. ▪ Local MRB oversees corrective action.

3.1 Notify Management of an Abnormal Event

Abnormal events at LANL require immediate management notifications. Workers generally witness first hand or discover evidence of abnormal events, and it is their responsibility to recognize the abnormality, stabilize the situation to the extent possible (e.g., pause or stop work), and initiate the notifications to their chain of facility and line management. These immediate notifications must be concise and factual.

Workers who are involved in any abnormal event or who discover any abnormal condition must:

- Notify their immediate supervisor, or the first immediately available manager in the worker's chain of command; and
- Notify the FOD or FOD designee if required by local procedures or if their immediate supervisor is unavailable.

Supervisors and first line managers, group-level managers, and division-level managers who are notified by a worker or in any way become aware of an abnormal event must:

- Ensure notification of the FOD/designee for all abnormal events;
- Notify the first immediately available manager in their upward chain;

  Note: For minor events, line managers at each level may use their judgment as to the extent of additional, upward, line-management notification; and

- Follow any additional FOD or RAD expectations for additional notifications.

RADs, upon being notified of an abnormal event in their facility should, <u>according to their judgment</u>:

- Consult with the FOD/designee on response to the event;
- Notify their Principal Associate Director (PAD)
- Notify the Deputy Laboratory Director (see Section 3.1.1), and
- Notify affected sponsors or external program managers of the involved facility or project.

The management notifications described above are generally verbal. The responsibility for official written notification of the event is reserved to the FOD in accordance with Section 3.3.

3.2 Categorize the Event

Within two hours of becoming aware of an abnormal event, the FOD or FOD designee must gather key facts, decide whether an abnormal event has in fact occurred, and categorize the event as either ORPS or Sub-ORPS. Categorization follows the reporting criteria of DOE Order 232.2, *Occurrence Reporting and Processing of Operations Information*. Reporting and categorization criteria compliant with DOE requirements are maintained in procedures by QPA-PA found on the Occurrence Reporting webpage. Events falling below the ORPS thresholds are processed as Sub-ORPS. See Section 3.10.

The event categorization establishes the next steps, including:

- External notifications to include NNSA-Los Alamos Site Office (LASO) Facility Representative and possibly DOE Headquarters Operations Center (HQ OC).
- Reporting timelines.
- Rigor applied to the investigation, causal analysis, and corrective action.
- Approvals required for the final report.

Categorization places each ORPS-reportable event into a Significance Category (SC) based on DOE requirements as follows:

- **Significance Category OE**. Operational Emergencies, the highest significance, are categorized exclusively by the LANL Emergency Operations (EO) Division (see Section 3.12)
- **Significance Category 1 (SC1)**: Occurrences that have a significant impact on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests
- **Significance Category 2 (SC2)**: Occurrences that have a moderate impact on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests
- **Significance Category 3 (SC3)**: Occurrences that have a minor impact on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests
- **Significance Category 4 (SC4)**: Occurrences that have some impact on safe facility operations, worker or public safety and health, public/business interests
- **Significance Category R (SCR)**: Occurrences flagged as recurring, based usually on a history of prior similar abnormal events at LANL, and indicating failure of prior corrective actions. Declaration of a Category R event requires concurrence of the Deputy Laboratory Director and chartering of a resource-intensive Team Investigation to evaluate the historic data (see Section 3.11)

If early information is incomplete, the FOD must categorize conservatively (at the higher level being considered) within two hours, then adjust the category at the critique or as more information becomes available.

Events at all levels of severity (ORPS and Sub-ORPS) are subject to additional screening and possibly reporting under the PAAA/WSH program (see Section 3.12).

3.3 Transmit Prompt (E-mail) Event/Incident Notification

As soon as possible after categorization (indicating that an abnormal event has in fact occurred) the FOD or designee sends an e-mail (Event/Incident Notification) to key stakeholders both inside and outside LANL with the best available information about the event. The Event/Incident Notification includes the following:

- Date/Time of Discovery
- Date/Time of Categorization
- Location of the event (TA/Building; RAD)
- Description of the event, including the following information when relevant:
  - Personal injuries
  - Damage to facilities, systems, equipment
  - Impact of event on other activities and operations
  - Protective actions taken or recommended
  - Weather conditions at the scene
  - Level of media or public interest
- Other notifications made
- Whether or not the event is to be included in the Daily/Special Executive Report
  - Title and text for Executive Report
- Whether or not the event is ORPS-reportable
  - ORPS reporting criteria (Group/Subgroup/Criterion)
  - SC

The distribution group for the e-mail includes at a minimum:

- RAD for the event, and any subordinates in the RAD chain according to FOD/RAD agreements
- Associate Director for Nuclear and High-Hazard Operations (ADNHHO)
- QPA-PA investigator assigned to the facility
- QPA-PA staff responsible for the Daily/Special Executive Report
- NNSA Facility Representative for the FOD Unit (required within two hours of the event for all ORPS-reportable events)

  Note: Through agreement with the assigned NNSA Facility Representative, FODs establish facility-specific expectations to include telephone notification if necessary to ensure meeting the two-hour requirement.

- DOE HQ OC (required within two hours of the event for certain ORPS-reportable events, and identified with an asterisk [*] in DOE reporting criteria maintained by QPA-PA and found on the Occurrence Reporting webpage.)

In addition, through agreement with the RAD, FODs establish facility-specific expectations for inclusion of the RAD or certain RAD staff on distribution of Event/Incident Notifications.

3.3.1 Daily or Special Executive Report

The Event/Incident Notification is followed by a Daily Executive Report or Special Executive Report to LANL, LANS, and LASO senior managers. Only ORPS-reportable events and the most significant Sub-ORPS events are included in these Executive Reports. Executive Reports are generated from the FOD's Event/Incident Notification and transmitted by QPA-PA staff on a time scale dependent on event significance as follows:

- For SC2/3/4 ORPS-reportable events (not marked with an asterisk) and any Sub-ORPS event designated by the FOD for inclusion in the Daily Executive Report, QPA-PA develops from the Event/Incident Notification an Operations Event entry into the Daily Executive Report for the next business day.
- For SC1, and SC2*/3*/4*events (requiring notification within two hours of the event to HQ OC by the FOD), QPA-PA develops from the Event/Incident Notification a Special Executive Report to be distributed as soon as possible but no later than two hours after receipt of the FOD's Event/Incident Notification.
- For OE events (requiring notification within15-30 minutes of the event to HQ OC by EO personnel), QPA-PA develops from the EO information as forwarded by the FOD, a Special Executive Report to be distributed as soon as possible but no later than two hours after receipt of the EO e-mail. See Section 3.12 for cautions about exclusive communications authority assigned to EO personnel.

3.4 Critique the Event

The worker-involved meeting to discuss the abnormal event, called the "critique," is the most immediate part of the event investigation and plays a central role in launching an effective partnership between workers, supervisors, and managers to understand the event and improve future performance. Critiques are required for ORPS-reportable events and are optional, at FOD discretion, for Sub-ORPS events (see Section 3.10).

All critiques at the Laboratory must meet three key expectations:

- Critiques must be held as soon as possible after the event. The critique should be held the same day as the event, and for ORPS-reportable events must be held no later than close of the business day following the event. The FOD may, due to extenuating circumstances (e.g., a key involved worker is unavailable), grant an extension of this deadline.
- Attendance in the worker/responder portion of the critique must be held to the minimum necessary and sufficient to understand the event and immediate response. The guideline for minimum attendance is the FOD, QPA-PA investigator, and the involved worker(s). Supervisors and first line managers are encouraged to attend, but to maintain a manageable size and candid environment, managers above group level are encouraged to defer attendance to the critique closeout or post-critique follow-on meetings. The PAAA Office Coordinator, NNSA Facility Representatives, and (for nuclear facilities only) Defense Nuclear Facilities Safety Board Representatives must be invited to all critiques, but attendance is at their discretion and critiques proceed on schedule if they are absent. The size guidelines for LANL critiques apply equally to all events, from minor to the most severe.
- The critique must be an open discussion forum, never a blame placing session. Event investigation is often perceived as a punitive process. Combating this perception begins at the critique, where the FOD and all managers in attendance must take active steps to set and maintain a tone of learning from the experience rather than finding fault with individuals.

Involved workers, responders, managers and subject matter experts called upon to attend the critique must candidly explain the sequence of events leading up to, during, and immediately following the event, participate openly and effectively in the problem-solving discussion, and cooperate fully with the FOD and critique leader.

3.5 Open Event Record in the Performance Feedback and Improvement Tracking System (PFITS) and ORPS

For all abnormal events (ORPS and Sub-ORPS) a record is opened in the PFITS system. For ORPS-reportable events, parallel records are entered into the DOE ORPS system; for Sub-ORPS events, the PFITS record is the sole record of the event. PFITS maintenance beginning at this step is according to the local event-related Performance Feedback and Improvement (PFI) processes, administered with support of Improvement Management Coordinators (IMCs).

Consistency between the ORPS and PFITS systems is ensured by attachment of the written ORPS Notification Report to the PFITS record. The QPA-PA investigator provides assistance to the FOD in generating the Notification Report, or for SC4 events, the Notification/Final Report, in the ORPS system. Notification Reports must be submitted to the ORPS system within the first two business days after the event as follows:

- OE and SC1: no later than Close of Business (COB) the next business day after the day of categorization, not to exceed 80 hours from the date and time of categorization.
- SC2 and SCR: no later than COB the next business day after the day of categorization.
- SC3: no later than COB on the second business day after the day of categorization.
- SC4: Notification/Final (Short Form) Report: no later than COB on the second business day after the day of categorization.

3.6 Investigate

Investigations are required for ORPS-reportable events, and are led by the QPA-PA investigator as the agent of the FOD. Investigations for Sub-ORPS events are required only for more significant events, in accordance with criteria found in P322-4, *Laboratory Feedback and Improvement Process*. Sub-ORPS investigations, if performed, are generally led by the Improvement Responsible Manager (IRM) and IMC according to local event-related PFI processes (see Section 3.10). The most serious events are investigated by a multidisciplinary team (see Section 3.11). All investigations of abnormal events are graded to the risk or significance of the event, and must be performed by individuals trained according to P322-1, *Causal Analysis and Corrective Action Development*.

Subject matter experts are consulted by the lead investigator as deemed necessary to understand the specific event. Human Performance Improvement (HPI) Practitioners should be involved to address human error as it relates to organizational weakness and latent conditions.

3.7 Determine Causal Factors

Causal analysis is required for ORPS events in SCs OE/1/2/3/R, and is optional for SC4. ORPS causal analysis is led by the QPA-PA investigator as agent of the FOD, or by the Team Chair for Team Investigations (see Section 3.11),Causal analysis for Sub-ORPS events is required only for more significant events, in accordance with criteria found in P322-4, *Laboratory Feedback and Improvement Process*. Sub-ORPS causal analysis, if performed, is generally led by the IRM and IMC according to local event-related PFI processes (see Section 3.10). The target for completion of ORPS causal analysis and submittal of a report to the FOD is Day 24 from the event; a similar timeframe is recommended but not required for Team Investigations and Sub-ORPS events (see Attachment A, *Abnormal Event Process*). For all abnormal events the causal analysis must be performed by individuals who are trained and using methods in accordance with P322-1, *Causal Analysis and Corrective Action Development.*

3.8 Develop Corrective Actions

Corrective action development in response to identified causal factors is the same for all abnormal events (events requiring Team Investigations, ORPS-reportable events, and Sub-ORPS events) and follows event-related PFI processes within facilities and programs. PFI processes are described in P322-1, *Causal Analysis and Corrective Action Development* and P322-4, *Laboratory Performance Feedback and Improvement Process*.

Recording and tracking of corrective actions is shared between the DOE ORPS and the LANL PFITS systems. Basic corrective action statements are entered into the ORPS Final Report. Detailed action plans and all active tracking of actions to closure, including changes to the due date or content of the action, are managed using the PFI process and the PFITS system.

ORPS Final Reports (except SC4, for which Notification/Final Reports must be completed in two business days, but corrective actions are optional) must be completed 45 calendar days from categorization of the event. See Attachment A, *Abnormal Event Process*. Extensions beyond 45 days are coordinated between the FOD and QPA-PA investigator, and require FOD concurrence. Team Investigations follow a schedule established in the charter process. See Section 3.11.

Closure of Sub-ORPS events follows guidelines in P322-4, *Laboratory Performance Feedback and Improvement Process.*

3.9 Submit Final Report in PFITS and ORPS

For ORPS-reportable events, FODs approve by signature and own the Final Report. QPA-PA staff assist with filling all required Final Report fields and obtaining Derivative Classifier (DC) review either by QPA-PA staff or the FOD/RAD organizations. Parallel PFITS records for each event comprise the official record of corrective actions and concurrence of all assigned action owners.

NNSA Facility Representatives have approval and change control authority for ORPS Final Reports in significance categories SCR, SC2, SC1, and OE. Coordination of draft reports in these SCs with the Facility Representative and resolution of Facility Representative rejections are shared duties for the FOD and QPA-PA staff. The record of Facility Representative approvals and all change control is kept in PFITS.

Sub-ORPS reports consist of the PFITS record of the event. See Section 3.10.

Team Investigations are entered into the ORPS system but are also published according to the charter. See Section 3.11.

3.10 Sub-ORPS Events

Management notifications (see Section 3.1), categorization by the FOD (see Section 3.2), and prompt e-mail notification (see Section 3.3) apply to both ORPS and Sub-ORPS events. Process steps described in Sections 3.4 through 3.9 are carried out for Sub-ORPS events with the roles shifted from the FOD and QPA-PA investigators to responsible managers and IMCs in the facilities and programs. These differences from ORPS-reportable events are noted in each section above and summarized here as follows:

3.10.1 Criteria for Sub-ORPS Reporting

By definition, Sub-ORPS events include all events reported by the FOD in an Event/Incident Notification that do not meet any ORPS threshold. The Laboratory does not publish de minimis criteria or a “floor” for incidents warranting Event/Incident Notification, i.e., Sub-ORPS reporting. FODs are expected to use operational experience, professional judgment, and common sense in their decisions. Guidance and oversight of the Sub-ORPS reporting decision process are the responsibility and authority of ADNHHO.

3.10.2 Critique of Sub-ORPS Events

Critiques are optional, at the discretion of the FOD, for Sub-ORPS events. If the FOD opts to hold a critique, it should be held soon after the event, but there are no firm timeline requirements. The role of the QPA-PA investigator is replaced by a local IMC who serves as the records manager for the event and enters information about the event and response into PFITS.

3.10.3 Sub-ORPS Investigation, Causal Analysis, and Corrective Action Development

For Sub-ORPS events the requirement and level of rigor for investigation, causal analysis, and corrective action is graded to the severity of the event in accordance with criteria found in P322-4, *Laboratory Feedback and Improvement Process*. Sub-ORPS investigation, causal analysis, and corrective action, if required, are generally led by the IRM and IMC, in accordance with methods and training found in P322-1, *Causal Analysis and Corrective Action Development.* FOD involvement is at local discretion; QPA-PA investigators are generally not involved.

3.10.4 Reporting and Closure of Sub-ORPS Reports

Records and tracking to closure of Sub-ORPS events are strictly within the PFITS system. There are generally no external reporting requirements (see Section 3.12 regarding possible exceptions for PAAA/WSH events) and no timelines for Sub-ORPS events other than guidelines of the PFI process.

Sub-ORPS records are placed in PFITS at the appropriate level of the PFI significance hierarchy based on criteria in P322-4, *Laboratory Performance Feedback and Improvement Process*, and, if applicable, P141, *Price Anderson Amendments Act (PAAA), Worker Safety and Health (WSH), and Classified Information Security (CIS) Enforcement Procedure*.

3.11 Team Investigations

Team Investigations are performed by a three- to six-member team, and are reserved for the most serious ORPS-reportable events. They are subject to all requirements of Sections 3.1 through 3.9 above, but are sponsored by the affected senior managers and chartered by the Deputy Laboratory Director, who assumes the role of the FOD. The IMRB, chaired by the Deputy Laboratory Director supported by the Institutional Improvement Management Coordinator (IIMC) provides the PFI process regarding acceptance of causal factors and development of corrective actions.

Team Investigations are required for events with final categorizations of OE, SC1 and SCR (see the note below). For SC2/3/4 events, declaration of a Team Investigation is rare but may be recommended to the Deputy Laboratory Director. Proposals and plans for a Team Investigation are developed and submitted to the Deputy Laboratory Director by a sponsor group, comprising at a minimum the following collection of individuals:

- FOD with responsibility for the facility
- RAD with responsibility for the facility
- ADNHHO
- Contractor Assurance Officer

The sponsor group initiates the recommendation to launch a Team Investigation as the significance of the event is understood. Alternatively, the Deputy Laboratory Director may decide to launch a Team Investigation, directing the appropriate sponsor group to assemble and develop the plans. When a Team Investigation is declared, the FOD ensures the event scene is preserved and authority is formally turned over to the Team Chair.

The Team Chair is assigned full-time to the investigation, reports to the Deputy Laboratory Director for the duration of the Team Investigation process, and ensures the Team's report of investigative findings and causal analysis, addressing the scope and within the timeline of the charter memo, is submitted to the Deputy Laboratory Director. QPA-PA supports all aspects of the Team Investigation process and provides a trained investigator to serve full time in support of the process. Team members and consultants assigned in the charter memo are appointed as needed, up to full-time, to the investigation. The Team Chair has authority to enlist additional resources (safety experts, HPI Practitioners, etc.) as deemed necessary. The sponsor group proposes—and the Deputy Laboratory Director approves—resource and cost allocations for the Team's effort.

Guidance on the Team Investigation process, including recommended qualifications of the Chair and team members, charter, infrastructure, investigation, causal analysis, factual accuracy reviews, final report format and content, corrective action development, and approval process are maintained in procedures by QPA-PA found on the Occurrence Reporting webpage.

Note: The requirement for a Team Investigation is based on final ORPS categorization as OE, SC1, or SCR. Events that are declared an OE based on early data but after additional information becomes available are deemed by EO personnel to have at no time actually met the emergency criteria DO NOT automatically require Team Investigation. Such events retain the OE designation in the EO Division records but, like all events, are recategorized by the FOD in the ORPS system as new information becomes available.

3.12 Limitations

Additional event-related processes that apply to certain types of events are beyond the scope of this document, and in some instances preempt requirements of this document.

Operational Emergencies (OEs). Events requiring emergency response (e.g., explosion, fire, hazardous material release) are subject to categorization, notifications, and response under PD1200, *Emergency Management*, and EO-DO-PLAN-100, *Hazardous Materials Program Emergency Plan*, found on the EO webpage, plus any facility-specific emergency management plans and procedures. For the duration of emergency conditions, EO personnel and procedures take precedence and the requirements of this document are preempted.

The first responsibility of all employees in such events is to request immediate assistance by calling 911 and/or Emergency Operations-Emergency Management (EO-EM, 667-6211) as noted in Attachment A, *Abnormal Event Process*. All verbal and written communications regarding a declared OE, both internal and external to LANL and from declaration through termination of the emergency condition, are managed exclusively by EO personnel. After the OE is terminated by EO personnel, the FOD regains control of the event scene and the balance of the abnormal event process proceeds according to this document. Contact EO Division immediately for assistance with severe events that do or might meet OE criteria.

Security Incidents. Incidents of known or potential security concern must be reported to the Security Incident Team (SIT) in the Security Integration Office, in accordance with requirements in P201-3, *Reporting Known and Potential Incidents of Security Concern*. Events strictly of security concern are not subject to the requirements in this document. For events that present components of security concern but also safety or operational issues, the FOD must work with the SIT to ensure requirements of this document and P201-3 are met. Contact the SIT for assistance with the security inquiry program.

Price-Anderson Amendments Act/Worker Safety and Health (PAAA/WSH). Events at all levels of severity (ORPS and Sub-ORPS) are subject to all requirements in this document, but also to additional screening and possibly reporting to the DOE Noncompliance Tracking System (NTS) in accordance with P141, *Price Anderson Amendments Act (PAAA), Worker Safety and Health (WSH), and Classified Information Security (CIS) Enforcement Procedure*. Contact the local PAAA Point of Contact and/or PAAA Coordinators in the QPA PAAA Program Office for assistance with this program.

4.0 RESPONSIBILITIES

4.1 Deputy Laboratory Director

- Approves and charters Team Investigations.
- Receives and approves final reports from Team Investigations.
- Directs and oversees, through the IMRB, corrective actions from Team Investigations.

4.2 Associate Directors (as Facility-Owning Responsible Associate Directors [RADs])

- Establish agreement with each sponsored FOD regarding roles, responsibilities, and RAD involvement in the abnormal event process, including categorization, critique, corrective action development, and report approval. Written agreements are recommended but not required.
- Coordinate with the FOD on an effective PFI process, including MRB structure and IMC staffing, to support the 45-day closure of ORPS and Sub-ORPS abnormal event reports.

- For events warranting Team Investigation in an owned facility, serve as members of the Sponsor Group.

4.3 Group- and Division-Level Managers

- Ensure the appropriate immediate management notifications of abnormal events, compliant with facility and organizational expectations.
- Cooperate with FOD and QPA-PA investigators in all steps of event critiquing, investigation, causal analysis, and corrective action development.
- Participate in the Sub-ORPS process in accordance with FOD/RAD agreements and local PFI processes.

4.4 Supervisors/First Line Managers

- Ensure timely notification of the FOD (or FOD designee in accordance with local expectations) and first available line manager (group-level or above) for every abnormal event within their work area or span of supervision.
- Cooperate with the FOD and QPA-PA investigator in all steps of event critiquing, investigation, causal analysis, and corrective action development.

4.5 Workers

- Report to supervisors or first line managers any abnormal event or condition, whether within or beyond the bounds of the assigned work area.
- Participate candidly and openly when invited to critiques of abnormal events, or when interviewed as part of the investigation.
- Cooperate with the FOD, FOD staff, and QPA-PA investigator in abnormal event investigations, causal analysis, and corrective action development.

4.6 Associate Director for Nuclear and High Hazard Operations (ADNHHO)

- For all Team Investigations, serves as a member of the Sponsor Group advising the Deputy Laboratory Director and supporting the execution of the investigation.

4.7 Contractor Assurance Officer

- For all Team Investigations, serves as a member of the Sponsor Group advising the Deputy Laboratory Director and supporting the execution of the investigation.

4.8 Facility Operations Directors (FODs) (as defined in Section 2.2)

- Establish agreement with each sponsoring RAD regarding roles, responsibilities, and RAD involvement in the abnormal event process, including categorization, critique, corrective action development, and report approval. Written agreements are recommended but not required.
- Categorize each abnormal event within two hours of discovery.
- As soon as possible after categorization, transmit an Event/Incident Notification describing the event.
- Ensure required notifications to NNSA Facility Representatives and DOE HQ OC are made within required timelines.

- Manage the abnormal event process for the facility, including immediate communications, critique, investigation, causal analysis, and handoff to the local PFI process for corrective action development.
- Review, comment, approve, and assume ownership of every written report destined for the DOE ORPS system.
- Coordinate with the RAD on developing an effective PFI process, including MRB structure and IMC staffing, to support the closure of ORPS and Sub-ORPS abnormal event reports.
- Monitor and drive continuous improvement in meeting the target timeline of developing and providing to QPA-PA corrective actions and other report closure information by Day 45 after categorization of each ORPS-reportable event.
- Resolve conflicts or disputes regarding any aspect of the abnormal event process, and provide field managerial support to the assigned QPA-PA investigator.
- For events warranting Team Investigation, serve as a member of the Sponsor Group.

4.9 Quality and Performance Assurance–Performance Assurance (QPA-PA)

- Deploys trained investigators to support FODs in all aspects of the abnormal event process, from categorization to final report.
- Drafts for FOD review and submits after FOD approval all written reports of abnormal events destined for the DOE ORPS system.
- Maintains official records for each ORPS-reportable event of the complete process from categorization to final report.
- Monitors and drives continuous improvement in meeting the target timeline of delivering draft Update/Final ORPS reports, complete with investigative findings and causal analysis, by Day 24 after categorization of each ORPS-reportable event.
- Provides trained investigators as requested for Deputy Laboratory Director-chartered Team Investigations.
- Serves as a central clearinghouse for the Daily Executive Report and Special Executive Report (for OE and SC1 events).
- Coordinates development and dissemination to Laboratory management and the workforce, lessons learned in response to abnormal events, as needed.

5.0 IMPLEMENTATION

The requirements in this document are effective on the date of issue.

6.0 TRAINING

Personnel assigned responsibilities for the abnormal event process (e.g., Supervisors and First Line Managers in Moderate and High Hazard Operations), must be trained to this document in accordance with P781-1, *Conduct of Training Manual*, utilizing the graded approach found in the Systematic Approach to Training outlined in P781-1.

Specifically, within one year of issuance of this document FODs, Deputy FODs, Operations Managers, Duty Officers, and all other FOD Unit personnel assigned specific ORPS responsibilities must complete the following:

- Course #6206, *Occurrence Investigating and Reporting*

Note: (1) Prior completion of this course satisfies the requirement; refresher completion of Course #6206 is recommended every two years but is not a requirement. (2) If the training is neither grandfathered nor completed within six months of issuance of this document, the individual can continue to fulfill his/her roles and responsibilities with written authorization from the ADNHHO. The written authorization will include a schedule for completing the required training and will expire if training is not completed as scheduled.

Managers and supervisors frequently involved in event investigations or causal analyses should consider additional professional development, including one or more of the following courses:

- Course #53220, *Causal Analyst Training 2011*
- Course #43428, *HPI, Human Performance Improvement, Full Day*
- Course #46713, *HPI Practitioners*
- Course #45090, *HPI Accident Investigation*

7.0 EXCEPTION OR VARIANCE

To obtain an exception or variance to this document, see the following instructions:

- Managers may request an exception or variance from the IA through the RM.
- At the IA's request, the RM will provide a recommendation or supporting information.
- The IA or designee will provide the requester with a written response and copy the RM.

The requesting organization must maintain the official copy of record of the approved correspondence granting the exception or variance.

8.0 DOCUMENTS AND RECORDS

8.1 Office of Record

The Policy Office is the Laboratory Office of Record for this Institutional Document and maintains the administrative record.

QPA-PA is the Laboratory Office of Record for ORPS-reportable events, excluding corrective action records but including categorization records, Team Investigation charters, investigation records, causal analysis records, and all written reports from the initial Event/Incident Notification to the ORPS Final Report.

Responsible FOD and RAD offices are the Laboratory Offices of Record for all records related to Sub-ORPS events, and for records of corrective actions, including change control and closure records, for both Sub-ORPS and ORPS events. PFITS is the record system for all such records. Specific responsibilities are divided between FOD and RAD offices according to local event-related PFI processes.

9.0 DEFINITIONS AND ACRONYMS

9.1 Definitions

See LANL *Definition of Terms*.

Abnormal Event—Abnormal events include all abnormal conditions, accidents, incidents, or deviations from the planned outcome of a workplace activity that did or could have adversely

affect(ed) health or safety of workers, the public, the environment, or the integrity of LANL programs or facilities.

Facility Operations Director (FOD) Unit—A collection of buildings, structures, and work areas under a single FOD's span of responsibility. Abnormal events are assigned to FOD Units based on the physical location of the event.

Facility Operations Director (FOD)/Responsible Associate Director (RAD)—A general term to describe the joint management team of a FOD Unit and the RAD for a facility.

9.2 Acronyms

See LANL *Acronym Master List*.

ADNHHO	Associate Director for Nuclear and High-Hazard Operations
CAO	Contractor Assurance Officer
CAS	Contractor Assurance System
COB	Close of Business
DC	Derivative Classifier
DOE	Department of Energy
ENV	Environmental Protection
EO	Emergency Operations
EO-EM	Emergency Operations-Emergency Management
ESH&Q	Environment, Safety, Health, and Quality
FOD	Facility Operations Director
HPI	Human Performance Improvement
HQ	Headquarters
IA	Issuing Authority
IIMC	Institutional Improvement Management Coordinator
IMC	Improvement Management Coordinator
IMRB	Institutional Management Review Board
IRM	Improvement Responsible Manager
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LASO	Los Alamos Site Office
MRB	Management Review Board
NHHO	Nuclear and High-Hazard Operations
NNSA	National Nuclear Security Administration
NTS	Noncompliance Tracking System
OC	Operations Center
OE	Operational Emergency
ORPS	Occurrence Reporting and Processing System
PAAA	Price-Anderson Amendments Act
PAD	Principal Associate Director
PFI	Performance Feedback and Improvement
PFITS	Performance Feedback and Improvement Tracking System

QPA-PA	Quality and Performance Assurance–Performance Assurance
RAD	Responsible Associate Director
RM	Responsible Manager
RO	Responsible Office
SC	Significance Category
SIT	Security Incident Team
WSH	Worker Safety and Health

10.0 HISTORY

Revision History		
09/20/06	ISD 322-3.0	Initial Issue, ISD 322-3.0, *Manual for Communicating, Investigating, and Reporting Abnormal Events.*
09/25/06	ISD 322-3.1	Administrative Change. IP300-SD5 replaced and rescinded by IP320.0.
10/15/08	ISD 322-3.2	The following Quick Changes (minor non substantive) were made: Global change to document: QA-OA to ESH-IO. Page 5, Overview, paragraph 3 , add: 1. sentence: Events that do not meet ORPS reporting criteria are reported in the LIMTS system as described in P322-4, *Laboratory Performance Feedback and Improvement Process*. 2. add ESH Integration Office (ESH-IO) to sentence Events that meet a DOE defined reporting criterion are reported and investigated by trained and qualified… Page 5, Overview, paragraph 4, changed to: The Associate Director for Environment, Safety, Health, and Quality is the Issuing Authority (IA) for this document. The ESH-IO Office Manager is the Responsible Manager (RM) and the Occurrence Reporting Team (OR) is the Responsible Office (RO). Page 8, Abnormal Event/Condition Process Outline, change bullet 14 and add bullet 15: ▪ 14) All ORPS corrective actions are entered into LIMTS and tracked as described in P322-4. ▪ 15) ORPS events are trended and analyzed for repetitive events on a quarterly basis. Page 13, bullets 6 and 7: Events that do not meet ORPS reporting criteria are reported in the LIMTS system as described in P322-4. Page 12, Note: Delete note. Page 13, Categorization process, item 2, second bullet, change to: Events that do not meet ORPS reporting criteria are reported in the LIMTS system as described in P322-4. Page 14, Preparing for a Critique, item 2, second bullet, add: must be notified. Page 16, item 2, add: and consider extent of condition. Page 17, bullet 4, change to: Events are reported in LIMTS system as described in P322-4.

Revision History		
12/11/08	P322-3, Rev. 0	Renumbered document, ISD 322-3, *Manual for Communicating, Investigating, and Reporting Abnormal Events*.
04/15/09	P322-3, Rev. 1	Quick Change Replace previous IA with newly identified AD. Clarification of existing requirements as documented in detailed individual procedures (pages 5, 7, 10, 12, 15, 17, 18). Revision of flowchart to reflect adherence to P322-4.
07/27/11	P322-3, Rev. 2	Major Revision Change title from "Manual for Communicating, Investigating, and Reporting Abnormal Events," to "Performance Improvement from Abnormal Events." Revise process to achieve consistency with Performance Feedback and Improvement Process changes. Revise organizational roles due to move of ORPS Team from Environment, Safety, Health, and Quality (ESH&Q) to CAO-PF. Change IA, RO, and RM to match organizational restructure.
09/20/12	P322-3, Rev. 3	Changed CAO-PF to Quality and Performance Assurance-Performance Assurance (QPA-PA) throughout document due to reorganization. Clarified language in Section 2.2. Updated links, titles, and acronyms.

11.0 REFERENCES

Prime Contract:

- DOE O 232.2, *Occurrence Reporting and Processing of Operations Information*

11.1 Other References

- SD320, *Los Alamos National Laboratory Contractor Assurance System Description Document*
- P313, *Roles, Responsibilities, Authorities, and Accountability*
- Occurrence Reporting webpage
- P322-4, *Laboratory Performance Feedback and Improvement Process*
- P322-1, *Causal Analysis and Corrective Action Development*
- P141, *Price Anderson Amendments Act (PAAA), Worker Safety and Health (WSH), and Classified Information Security (CIS) Enforcement Procedure*
- PD1200, *Emergency Management*
- EO-DO-PLAN-100, *Hazardous Materials Program Emergency Plan*, found on the EO webpage
- P201-3, *Reporting Known and Potential Incidents of Security Concern*
- P781-1, *Conduct of Training Manual*

12.0 FORMS

There are no forms associated with this document.

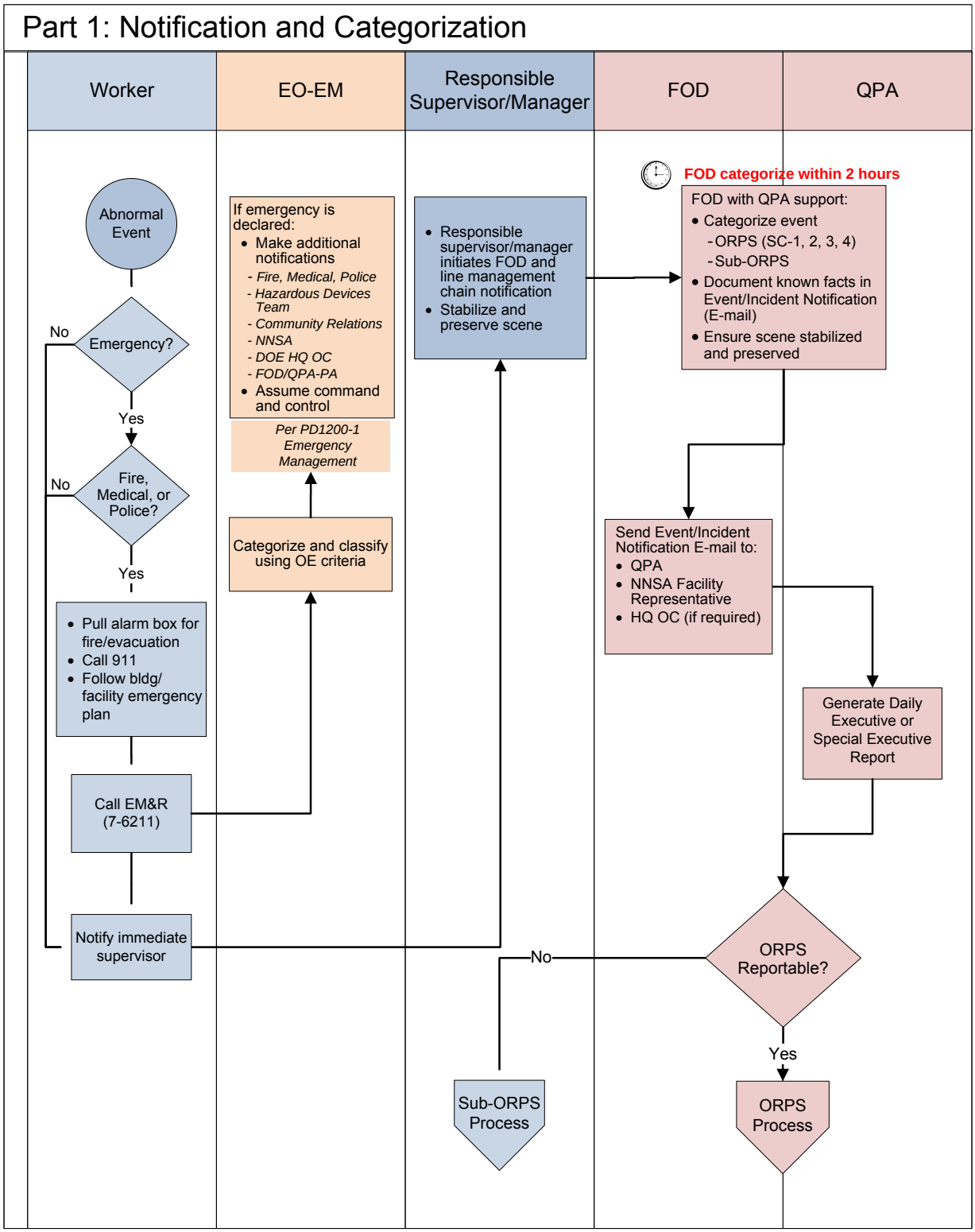
13.0 ATTACHMENTS

Attachment A. *Abnormal Event Process*

14.0 CONTACT

Quality and Performance Assurance–Performance Assurance (QPA-PA)
Telephone: (505) 606-2145

No: P322-3 Performance Improvement from Abnormal Events
Attachment A. Abnormal Event Process (Page 1 of 4)



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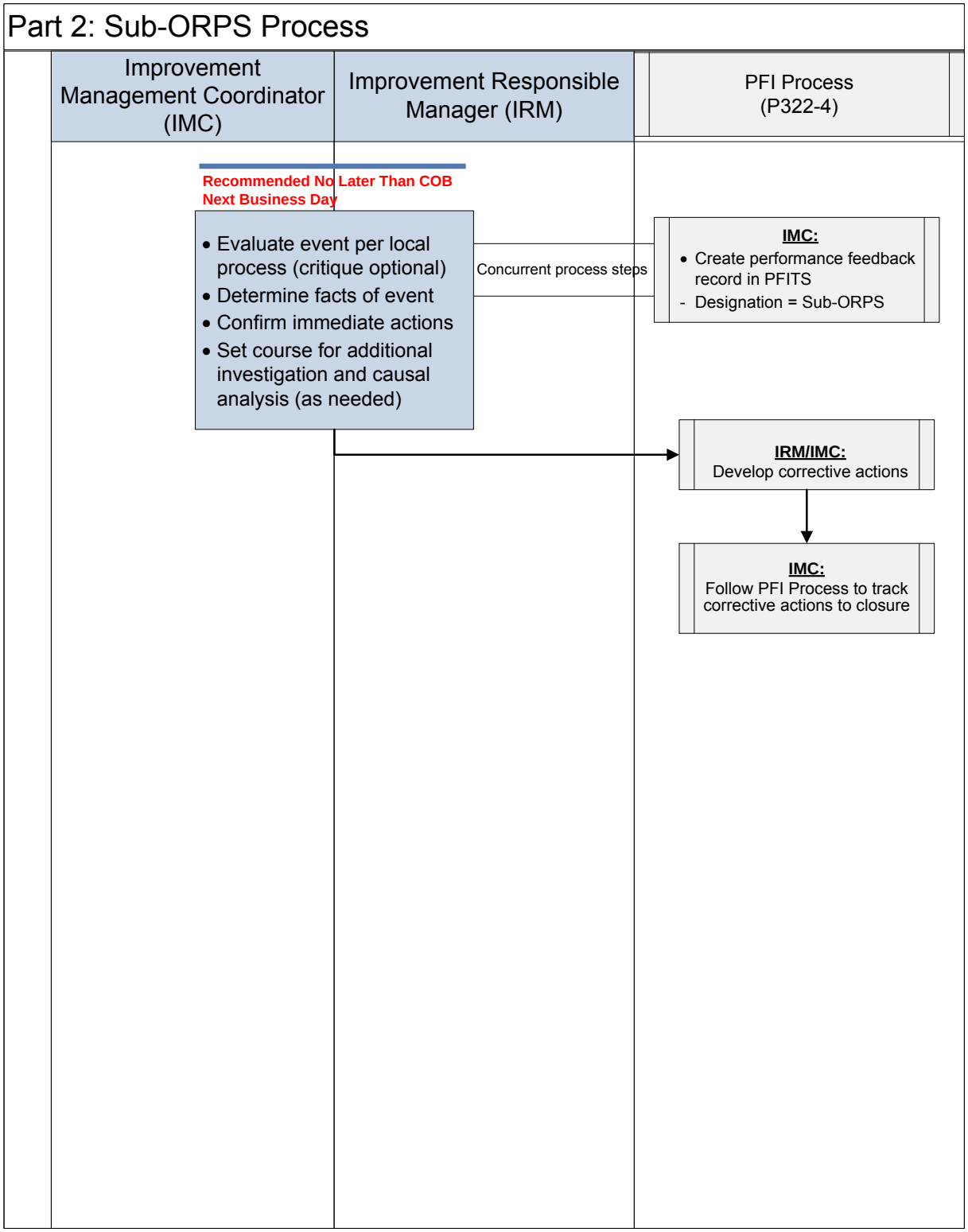
Attachment A. Abnormal Event Process (Cont.) (Page 2 of 4)



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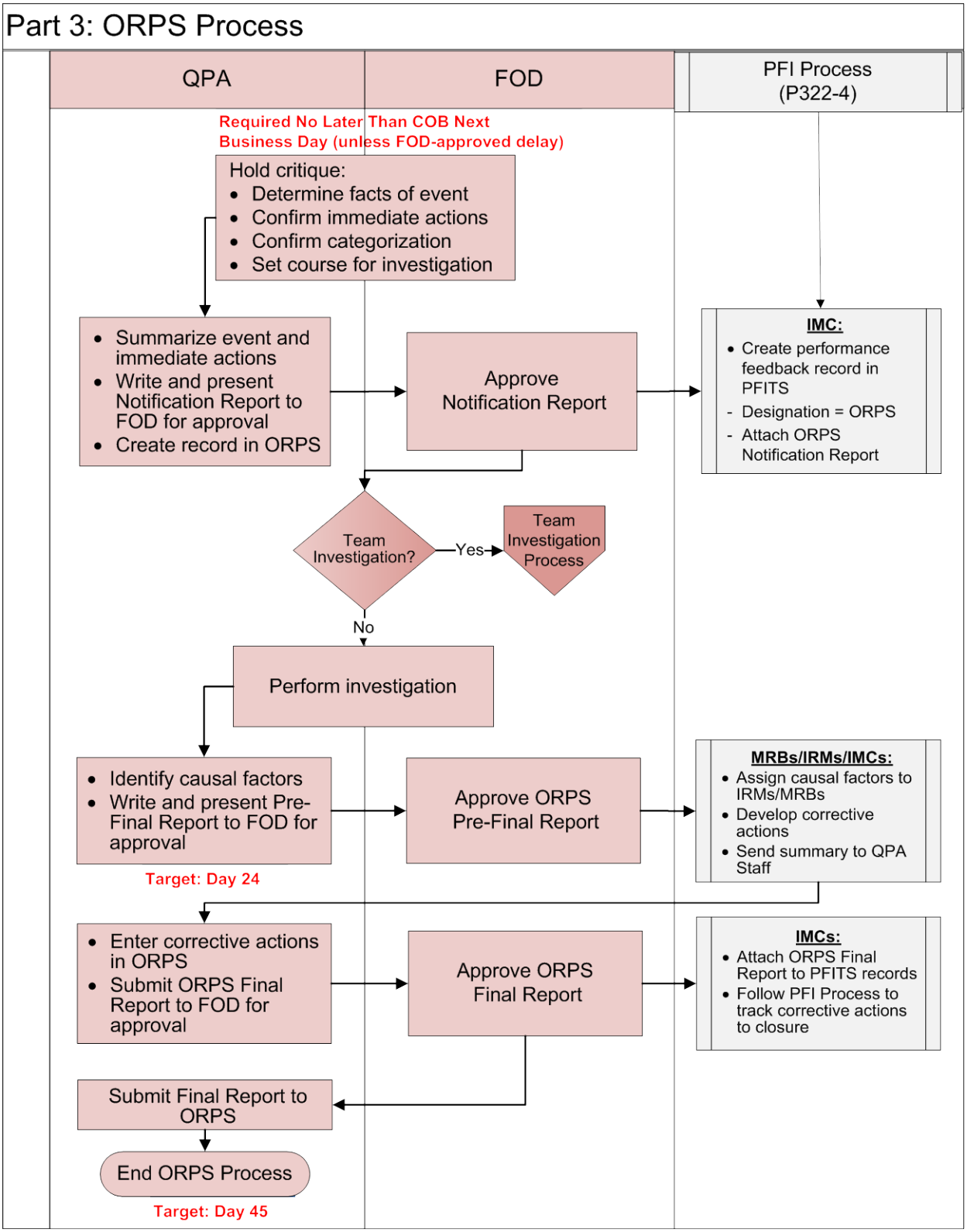
Attachment A. Abnormal Event Process (Cont.) (Page 3 of 4)



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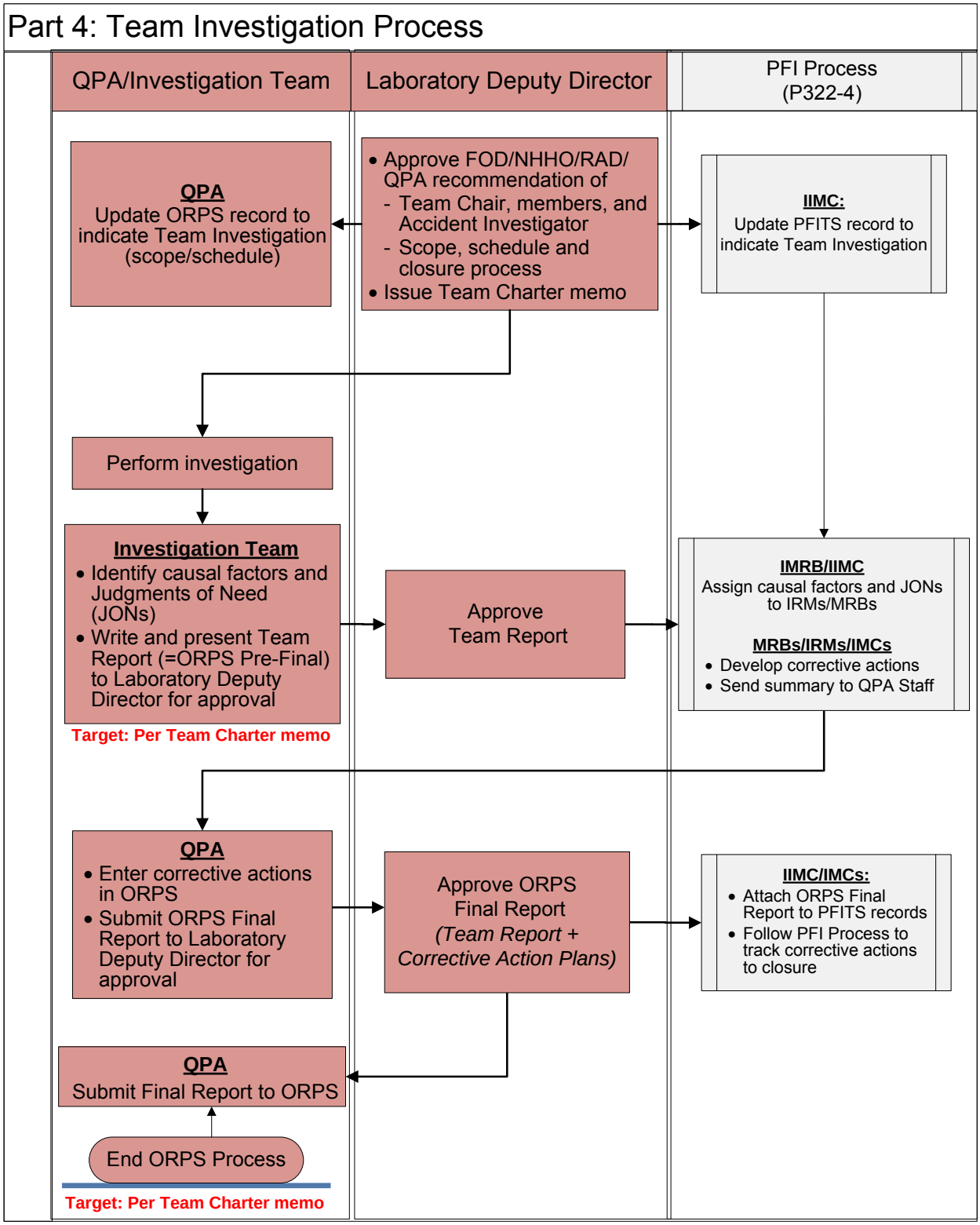
Attachment A. Abnormal Event Process (Cont.) (Page 4 of 4)



IMPORTANT

If you wish to receive credit for the preceding document you **must** enter the course through U*Train* **not** the Policy Office website.

Multi-Sector General Permit Annual Industrial Storm Water Training For

TA-3-38, Material Recycle Facility, Roads and Grounds, TA-60 Warehouse, TA-60 Heavy Equipment Yard, and the Asphalt Batch Plant

February 12, 2013

LA-UR-13-21009

Why Are You Taking This Training?

- **EPA's Multi-Sector General Permit for Industrial Storm Water Discharges Requires Annual Training**
  - Training applies to:
    - Employees who work at TA-3-38, the Material Recycle Facility, Roads and Grounds, TA-60 Warehouse, TA-60 Heavy Equipment Yard, and the Asphalt Batch Plant and who move product, metal, and other pollutants like oil, fuel, vehicles, equipment, pumps, etc. outside; or who work outside with industrial materials exposed to storm water
  - Employees responsible for implementing activities necessary to meet the conditions of the permit
    - Deployed Environmental Professionals (DEPs) or other personnel conducting inspections and visual assessments, identifying corrective actions, writing SWPPP revisions, etc.
    - Personnel installing storm water controls
    - All members of the facility MSGP Pollution Prevention Team (PPT)

TA-3-38 Pollution Prevention Team (PPT) Members

- ES&H Manager (Randy Sandoval 667-8424)
- Operations Supervisor (Tim Walker-Foster 667-5177)
- Leonard Sandoval (Primary Contact) ENV-ES deployed to UIF
  - 667-3557
- Cliff Heintschel (Secondary Contact) ENV-ES deployed to UIF
  - 667-9462
- Connie Gerth ENV-ES deployed to Logistics
  - 665-1893
- Holly Wheeler-ENV-RCRA MSGP Project Leader
  - 667-1312
- Waste Management Coordinator (Audrey Garcia 665-4914)

MRF Pollution Prevention Team (PPT) Members

- ES&H Manager (Randy Sandoval 667-8424)
- Shift Operations Manager (Jerry Gallegos 667-4190)
- Leonard Sandoval (Primary Contact) ENV-ES deployed to UIF
  - 667-3557
- Cliff Heintschel (Secondary Contact) ENV-ES deployed to UIF
  - 667-9462
- Holly Wheeler-ENV-RCRA MSGP Project Leader
  - 667-1312
- Waste Management Coordinators
  - Charlie Villareal 665-6148 and John Gonzales 665-8543

Roads and Grounds Pollution Prevention Team (PPT) Members

- ES&H Manager (Randy Sandoval 667-8424)
- Operations Supervisor (Dana Parrett 699-1317 or Levi Trujillo 699-0746)
- Leonard Sandoval (Primary Contact) ENV-ES deployed to UIF
  - 667-3557
- Cliff Heintschel (Secondary Contact) ENV-ES deployed to UIF
  - 667-9462
- Holly Wheeler-ENV-RCRA MSGP Project Leader
  - 667-1312
- Waste Management Coordinators
  - Charlie Villareal 665-6148 and John Gonzales 665-8543

Warehouse Pollution Prevention Team (PPT) Members

- ES&H Manager (Randy Sandoval 667-8424)
- Property Managers at the Warehouse
  - Steve Vandenbusch 665-4883
  - Earl Valdez 665-0574
- Leonard Sandoval (Primary Contact) ENV-ES deployed to UIF
  - 667-3557
- Cliff Heintschel (Secondary Contact) ENV-ES deployed to UIF
  - 667-9462
- Holly Wheeler-ENV-RCRA MSGP Project Leader
  - 667-1312
- Waste Management Coordinator
  - Audrey Garcia 665-4914

Heavy Equipment Yard Pollution Prevention Team (PPT) Members

- Operations Supervisor (Tim Walker-Foster 667-5177)
- Leonard Sandoval (Primary Contact) ENV-ES deployed to UIF
  - 667-3557
- Cliff Heintschel (Secondary Contact) ENV-ES deployed to UIF
  - 667-9462
- Holly Wheeler-ENV-RCRA MSGP Project Leader
  - 667-1312
- Beverly Aguino 667-4340
  - Yard Foreman
- Waste Management Coordinator
  - Audrey Garcia 665-4914

Asphalt Batch Plant Pollution Prevention Team (PPT) Members

- ES&H Manager (Randy Sandoval 667-8424)
- Operations Supervisor
  - Leslie McReynolds 667-6111
- Leonard Sandoval (Primary contact) ENV-ES deployed to UIF
  - 667-3557
- Cliff Heintschel (Secondary Contact) ENV-ES deployed to UIF
  - 667-9462
- Holly Wheeler-ENV-RCRA MSGP Project Leader
  - 667-1312
- Waste Management Coordinators
  - Charlie Villareal 665-6148 and John Gonzales 665-8543

Training Objectives

- **Cover all aspects of required training identified in the MSGP**
  - Monitoring
  - Inspections
  - Planning
  - Reporting
  - Documentation requirements
- **Become familiar with specific storm water pollutants and controls identified in the facility specific SWPPPs**
- **Cover spill prevention and response**
- **Recognize pollutant sources**
- **Recognize good housekeeping practices**
- **Know who to call if issues arise** (see slides of PPT members per facility)

TA-3-38 Sampler Location

Industrial Activity at TA-3-38

Storage of metal stock on covered racks and in roll-offs. Both roll-offs should be covered to prevent contact with precipitation.

Industrial Activity at TA-3-38 (continued)

Storage of metal stock on a covered storage rack

Storm Water Conveyance at TA-3-38

Storm drain

Storm Water Conveyance at TA-3-38 (continued)

Trench drain that transports storm water

What is a Control Measure?

- **Maintenance and operating procedures and practices to control site runoff, spillage or leaks, or drainage from raw material storage, to prevent pollutants from coming into contact with waters of the U.S.**
  - Waters of the U.S. are defined as follows:
    - All canyons, tributaries to canyons, dry arroyos, or other land features that convey storm water.

Trench drain that transports storm water

Storm Water Conveyance and Control at the Material Recycle Facility

Pond to capture storm water and settle out solids

Industrial Activity at the Material Recycle Facility

Storage of metal in uncovered roll-off bins coming in contact with precipitation

Industrial Activity and Control at the Material Recycle Facility

Roll off bin stored under cover and therefore protected from contact with precipitation

Industrial Activity and Control at the Material Recycle Facility (continued)

Metal stored in a covered roll off bin

Storm Water Controls at the Material Recycle Facility

Eco-Block and a rock run-down

Roads and Grounds Samplers

- **Sampler locations**
  - North and west of the salt shed at Roads and Grounds west
  - South along Eniwetok at Roads and Grounds west
  - North of Eniwetok and the Asphalt Batch Plant at Roads and Grounds east
  - Soon to be two samplers located north of the Sigma Mesa Staging Area

Sampler at Roads and Grounds West

Los Alamos NATIONAL LABORATORY EST. 1943

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Sampler at Roads and Grounds East

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Pollutant Sources at Roads and Grounds

Trucks and heavy equipment can leak fluids

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Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Pollutant Sources at Roads and Grounds (continued)

Residual road salt can be released from these trucks

Los Alamos NATIONAL LABORATORY EST. 1943

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Pollutant Sources at Roads and Grounds (continued)

Sediment can be transported with storm water from material piles like this without controls

Los Alamos NATIONAL LABORATORY EST. 1943

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Specific Control Measures at Roads and Grounds

This lined pond was constructed to contain the release of salt from the salt shed

Los Alamos NATIONAL LABORATORY EST. 1943

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Specific Control Measures at Roads and Grounds (continued)

Straw wattles and gravel bags to prevent sediment transport

Los Alamos NATIONAL LABORATORY EST. 1943

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Specific Control Measures at Roads and Grounds (continued)

An asphalt berm (north of Roads and Grounds west) to channel storm water and prevent sediment transport

Los Alamos NATIONAL LABORATORY EST. 1943

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Specific Control Measures at Roads and Grounds (continued)

Rock check dam between two Jersey barriers to slow storm water velocity and prevent sediment transport

Specific Control Measures at Roads and Grounds (continued)

Matting to stabilize a disturbed area and prevent erosion

Industrial Activity at the TA-60 Warehouse

- **Trucks going in and out of the yard delivering product/recyclables**
- **Product storage**
- **Metal storage**
- **Salvaged equipment storage**

Pollutant Sources at the TA-60 Warehouse

- **Battery acid spills**
- **Oil, diesel, gasoline, or other spills from equipment**
- **Metal pieces or shavings in uncovered roll-offs or on equipment**
- **Surface erosion of sediment/dirt/soil**

Industrial Activity at the TA-60 Heavy Equipment Yard

Stored equipment can leak fluids

Los Alamos NATIONAL LABORATORY EST. 1943

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

Industrial Activity at the TA-60 Heavy Equipment Yard

- Vehicle and equipment maintenance and storage
- Oil recovery system
- Draining oil filters
- Material and product storage

Typical Pollutant Sources at UIF Facilities That May Come In Contact With Storm Water

- **Hydraulic hose leaks, oil, transmission fluid, diesel or gasoline spills from vehicles and equipment**
  - Product motor oil and hydraulic fluid contains zinc
  - Any leaks or spills must be cleaned up immediately
    - Spills result in three environmental issues
      - May affect surface water quality

        Call Jake Meadows 231-0460
      - May affect storm water quality

        Call Holly Wheeler 667-1312
      - Will generate waste during clean-up

        Call your Waste Management Coordinator

Control Measures for UIF Facilities

- **Routinely check under heavy equipment and vehicles for spills/leaks**
- **Call Leonard Sandoval for assistance with recording the spill and to apply Micro Blaze**
- **Absorb diesel, gasoline and oil to the extent possible**
- **If the leak or spill is to soil, dig up and containerize the spill residue**

Control Measures for UIF Facilities

- **Place all metal that can come in contact with precipitation (small and large metal pieces and shavings) in covered, leak proof containers**
- **Clean up garbage and debris from the yard and get rid of old equipment, wood, metal etc.**
  - Salvage old equipment
- **Confine loading/unloading to designated areas away from outfalls and BMPs, indoors, or in a covered area**
- **Avoid loading/unloading in the rain**
- **Inspect loading/unloading area for problems before they occur**

Control Measures for UIF Facilities

- **Submit FSR for routine clean-up of the area**
  - Pick up debris/trash/metal weekly or monthly
- **Train personnel to recognize potential storm water pollutants and issues**
- **Keep track of projects to ensure proper BMPs are installed before workers leave the site (after excavation)**
  - Work done by others like LOG excavating utility lines
  - Soil needs stabilization regardless of excavated area size because the site is regulated under the Multi-Sector General Permit

Specific Control Measures at the TA-60 Heavy Equipment Yard

Storm water drainage culvert and asphalt berms

Los Alamos NATIONAL LABORATORY EST. 1943

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Specific Control Measures at the TA-60 Heavy Equipment Yard (continued)

Specific Control Measures at the TA-60 Heavy Equipment Yard (continued)

Rock gabions to channel storm water flow and prevent erosion

Specific Control Measures at the TA-60 Heavy Equipment Yard (continued)

Rock rundown and berm to channel storm water flow

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Specific Control Measures at the TA-60 Heavy Equipment Yard (continued)

Berm channeling storm water flow

Storm Water Sampler at the Asphalt Batch Plant

Rock and filter fabric lined detention pond to collect storm water

Industrial Activity at the Asphalt Batch Plant

Heavy equipment storage can result in spills of oil, gasoline, diesel or ethylene glycol

Specific Control Measures at the Asphalt Batch Plant

Detention pond

Specific Control Measures at the Asphalt Batch Plant (continued)

Detention pond

Benchmark Monitoring results for TA-3-38

- **At outfall 3-MFS-1, from 9/1/11 through, 8/31/12**
  - The average results of 4 zinc samples exceeded benchmark.
  - Two individual results (from storm events on 10/4/11 and 7/2/12 exceeded background.
  - Monitoring for zinc will continue for this outfall in 2013.

Benchmark Monitoring results for the Material Recycle Facility

- **At outfall 60-MRF-1, from 9/1/11 through 8/31/12**
  - The average results of 4 copper, zinc, and chemical oxygen demand (COD) samples exceeded benchmark.
    - The concentration of zinc from one storm event was greater than background. Therefore, monitoring for zinc will continue in 2013.
    - Copper is present below background levels. Therefore, monitoring will be discontinued for copper.
  - The average results of 5 total suspended solids (TSS) samples exceeded benchmark.
  - There are no background levels for TSS and COD. Monitoring will continue in 2013
- **Need to continue to evaluate solutions to address TSS exceedances**

Benchmark Monitoring results for the Material Recycle Facility (continued)

- **COD exceedances are believed to be from precipitation contact with vegetation at the sampling location**
- **Sampler intake tube will be moved to the end of the corrugated metal pipe**

Annual Impaired Waters Monitoring

- **Impaired water quality standard was exceeded at outfall 60-RG-8 at TA-60 Roads and Grounds, but was below background for Gross alpha in surface water.**
- **No further monitoring for impaired waters constituents will occur at this facility under the 2008 MSGP.**

Effluent Limitations Guidelines

- **Applicable to only the Asphalt Batch Plant**
  - Storm water did not discharge from the detention pond during 2012.

Facilities that do <u>not</u> require analytical monitoring for storm water constituents in 2013

- **TA-60 Heavy Equipment Yard**
- **TA-60 Warehouse**
- **TA-60 Roads and Grounds**

Quarterly Visual Assessments

- **Quarterly Visual Assessments (QVAs) are still required**
  - FOD personnel shall conduct QVAs on a rotating basis (one per quarter) for substantially identical outfalls at
    - TA-3-38
    - TA-60 Heavy Equipment Yard
    - TA-60 Warehouse
    - TA-60 Roads and Grounds
  - ENV-RCRA captures and conducts QVAs where the samplers are located

Inspections

- **Routine**
  - Performed by Leonard Sandoval or Cliff Heintschel (backup)
- **Comprehensive site inspection**
  - Performed by ENV-RCRA along with the Deployed Environmental Professional annually each September
- **Inspections may identify conditions that require corrective actions**

What Triggers a Corrective Action?

- **Spills**
- **Benchmark/background, or water quality standard exceedance**
- **Improperly maintained control measures**
- **Process or operational changes**

Corrective Actions

- **Identification of an issue either during routine operations or during an inspection**
  - Notify the Deployed Environmental Professional
  - Record the issue and corrective action
    - Enter the issue into the MSGP Corrective Action Report (CAR) Database
    - Propose a completion date
  - Follow-up and completion of corrective action
    - Perform work and record completion date in the database
    - Send e-mails to the following personnel every 30 days until corrective actions are closed
      - ES&H Manager
      - Operations Manager
      - Deployed Environmental Professionals

Planning and Progress for Roads and Grounds

- **Proposed application of compost**
  - Application of compost may be constrained to a specific maximum loading amount
  - UIF FOD is proposing to use compost on landscape throughout LANL
  - Compost cannot be applied until approval is received from NMED
- **Calendar year 2013 is the last year the facilities will be regulated under the 2008 MSGP**
- **EPA will either have to administratively continue the existing permit or will publish a new MSGP permit**
- **New permit will likely contain new more stringent requirements**

Planning for the TA-60 Heavy Equipment Yard

- **Maintain good housekeeping**
  - Try to clean up some of the lower yard
- **Investigating the idea of covered parking for service vehicles**
- **Evaluating the need for covers over outside oil storage areas**

Reporting

- **ENV-RCRA handles all reporting to EPA**
  - Annual Report
  - Discharge Monitoring Reports
  - Planned physical alterations or additions to the facility that qualify it as a new source
  - Spills that exceed reportable quantities
  - Effluent Limit Guideline (ELG) exceedance report
  - Non-compliances requiring reporting
  - Correction of any previously submitted information that was in error

Reporting (continued)

- **Deployed Environmental Professionals**
  - Enter issues and corrective actions into the MSGP Corrective Action Report Database
  - Coordinate certification by the FOD of the information to be submitted to the Environmental Protection Agency as part of the MSGP Annual Report

Documentation Requirements

- **The following documentation shall be kept in the SWPPP**
  - Routine inspections
  - Quarterly Visual Assessments
    - Or documentation of the inability to obtain a visual assessment due to no flow
  - MSGP Annual Report
  - Discharge Monitoring Reports
  - Background Study
  - Benchmark, Effluent Limitations or Water Quality Standard Exceedances
  - Records of employee training received
  - Corrective Action Reports (including documentation of spills/leaks)
  - Notice of Intent to Discharge (NOI)
  - Permit

What Happens If No Action Is Taken?

BNSF Agrees To Pay $1.5 Million

BNSF Railway Co. agreed to pay $1.5 million for Puget Sound restoration projects to resolve a lawsuit over storm water pollution at its Seattle facility.

The Puget Soundkeeper Alliance sued BNSF in 2009, alleging it violated federal clean-water laws with storm water discharges from its Balmer Yard facility.

Last August, U.S. District Court Judge John Coughenour found BNSF responsible for numerous federal clean-water violations at the facility. The settlement is one of the largest involving citizen actions taken under the federal Clean Water Act involving storm water pollution, Chris Wilke, executive director of the alliance, said.

The consent decree notes that BNSF has taken major steps to control storm water pollution from the Balmer Yard facility, including developing a prevention plan, coating roofs to minimize zinc pollution, covering trash bins and minimizing soil erosion.

Contact Information

- **MSGP storm water issues**
  - Holly Wheeler, 667-1312 or hbenson@lanl.gov
  - Leonard Sandoval, 667-3557 or lesandov@lanl.gov
- **Environmental issues associated with UIF-FOD**
  - Leonard Sandoval, 667-3557 or lesandov@lanl.gov
- **Spills**
  - Jake Meadows, 231-0460 or jmeadows@lanl.gov
- **Waste Management assistance**
  - Audrey Garcia, 665-4914 or algarcia@lanl.gov
  - Charlie Villareal 665-6148 or cv@lanl.gov
  - John Gonzales 665-8543 or johnj@lanl.gov

Click here for “Required Read” credit.

OIO-QP-219	Revision: **1**	
Effective Date: 09-02-2014	Next Review Date: 09-02-2016	

Environment, Safety, Health & Quality Directorate

Operations Integration Office

Standard Operation Procedure

Title: Sample Control and Field Documentation

Reviewers:

Name:	Organization:	Signature:	Date:
Sherri Sherwood	OIO-DO	Signature on File	09-02-2014

Derivative Classifier: ☐ **Classified** ☒ **Unclassified** **DUSA:** _____

Name:	Organization:	Signature:	Date:
Ellena Martinez	OIO-DO	Signature on File	09-02-2014

Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
Keith Greene	WES-EDA	Signature on File	09-02-2014
Responsible Line Manager:	Organization:	Signature:	Date:
Chris Echohawk	WES-EDA	Signature on File	09-02-2014

The Waste and Environmental Services work is categorized as low hazard/risk operation. Any work to be performed in a Moderate or High Hazard Facility shall be coordinated through the appropriate Facility Manager.

1.0 HISTORY OF REVISIONS

Document Number	Effective Date	Description	Type of Change (Technical [T] or Editorial [E])
EP-ERSS-SOP-5058, R0.0	02/09/07	New document number, reformatted and renumbered. Supersedes SOP-01.04	E
WES-EDA-QP-219, R0	10/20/10	New number assigned due to reorganization.	E
OIO-QP-219, R1		Minor revision to this procedure. The acronym was changed in the document control number from WES-EDA to OIO. The new number supersedes WES-EDA-QP-219, R0. The hyperlinks in the document were updated to reflect web changes. The SME conducted a technical review of the content in this procedure and deemed it accurate.	E

2.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) states the responsibilities and describes the process for documenting the traceability of samples collected for Los Alamos National Laboratory (LANL or Laboratory) using sample control and field documentation.

All LANL employees and their responsible subcontractors shall implement this procedure when collecting samples.

3.0 BACKGROUND AND PRECAUTIONS

Following the steps in this procedure assures that samples and field documentation are collected in a manner that creates and maintains legal defensibility. Following the procedure also assures that the field data generated during sample collection are correctly entered into the environmental databases for data analysis, compliance reporting, and long-term storage.

Samples are to be identified and controlled to ensure proper documentation.

4.0 EQUIPMENT AND TOOLS

The list below represents the equipment necessary to complete the tasks defined within this procedure:

- Sample Management Database
- computer
- printer
- Sample Containers
- Custody Seals

5.0 STEP-BY-STEP PROCESS DESCRIPTION

5.1 Notify the Sample Management Office

User

1. Notify the Sample Management Office (SMO) of the sampling campaign by completing and submitting the SMO Request spreadsheet found on the Environmental homepage at http://int.lanl.gov/environmental/index.shtml. Notify the SMO staff at least two days in advance of work.
2. Instructions for filling out the spreadsheet (also known as the Sampling Plan) are included in the download. Requestor must complete fields in sheets 1 (General Request Info) and 2 (Analytical Request Info). Guidance for allowable codes are provided on sheets 3 (Field Code Values to Print) and 4 (Analytical Methods and Analytes).
3. Email finished spreadsheet to smoorderrequest@lanl.gov
4. Contact Sample Management staff if questions arise while completing the SMO Request spreadsheet.

5.2 Sample Request and Paperwork Creation

SMO Staff

1. Enter Sampling Plan into the database according to client specifications on SMO Request spreadsheet.

User

2. Review the sampling paperwork or summaries. Approve for final printing, or coordinate with the SMO staff to correct problems.

SMO Staff

3. Print the approved Sample Collection Log/Field Chain of Custody Forms and Sample container Labels.
4. Call requestor for paperwork receipt. (It is not possible to e-mail the paperwork.).

5.3 Sample Collection and Documentation

Field Team Member

1. Obtain the appropriate sample containers and custody seals from the SMO, when applicable.

Collect samples according to applicable sampling procedures.

2. Complete all the blank fields in the Sample Collection Log/Field Chain of Custody Form prior to sample submission to SMO. Complete the sample container labels and seal sample containers with sample custody seals when the sample is collected. [NOTE: Summa canisters and silica gel containers do not require custody seals.]
3. Record "OK" in the "as collected" spaces if the "as planned" information is accurate.
   [NOTE: To fill in multiple spaces with "OK", draw an arrow from the first "OK" through the remainder of the spaces.]
   [NOTE: Write "N/A" for "Not Applicable" in the field, as appropriate.]
4. Correct the information listed under "as planned" on the Sample Collection Log/Field Chain of Custody Form by filling in the information listed under "as collected", based on field observations.
5. Special conditions for filling out Sample Collection Log/Field Chain of Custody Form:
   a. Priority – use this portion of the form for Stormwater sampling or cases of limited sample volume. This informs the analytical laboratory in which order you prefer the tests to be analyzed until sample is consumed. If your sample does not fall into one of these cases, mark N/A.
   b. Special Instructions – use this portion of the form to provide special instructions to the analytical laboratory; i.e. quicker turnaround time, additional analyses requested from that bottle, etc.
   [NOTE: All information entered in writing on the Sample Collection log will be entered into the database. PLEASE WRITE LEGIBLY]
6. Record all sample field data required by the sampling procedure on the sample collection log. This may include silica gel weights, silica gel bound water, and other parameters required by the sampling procedure.
7. If a sample was planned and not collected, mark the sample collection log/field chain of custody form with the words "not collected" across the forms and draw a diagonal line across the form. Record the reason for not collecting the sample, and initial and date the form.

8. Ensure that Sample collector and coworker (who participated in the sample collection and can verify the accuracy of the data) have reviewed and signed the appropriate lines so that if corrections are needed the sampler can be identified for future contact.
9. Submit the Sample Collection Log/Field Chain of Custody Forms to SMO staff when the samples are submitted.
10. Photocopy the Sample Collection Log/Field Chain of Custody Form for the project records, as appropriate.

5.4 Delivery of Samples to the SMO

Field Team Member

1. When transporting sample to the SMO from the field all the requirements of EP-ERSS-SOP 5057 must be followed. These requirements include proper packing and any required radiation screening PRIOR to sample submission to SMO.
2. Ensure that all Sample Collection Log/Field Chain of Custody Form accompany the sample(s) when samples are delivered to the SMO.
3. Print name and sign the Sample Collection Log/Field Chain of Custody Form in the "Relinquished by" block.

SMO Staff

4. Print name and sign the Sample Collection Log/Field Chain of Custody Form in the "Received by" block.

Field Team Member/SMO Staff

5. Note the date and time of the transfer on the Sample Collection Log/Field Chain of Custody Form. The date and time of field team sample delivery must exactly match the date and time for sample receipt by the SMO.

5.5 Sample Collection Log Updates after Sample Submission

Field Team Leader/Member

1. If situations are found after sample submission, the field team leader or field team member must return to the SMO and update the original Sample Collection Log/Field Chain of Custody Form.
2. Initial and date the Sample Collection Log change.
3. Photocopy the changed Sample Collection Log for the project files.

6.0 RECORDS

SMO Staff

1. Submit the following records generated from this procedure following SOP-5269.

    - Sample Collection Log/Field Chain of Custody forms

7.0 ATTACHMENTS

Attachment 1: Sample Collection Log/Field Chain of Custody Form

ATTACHMENT 1 – SAMPLE COLLECTION LOG/ FIELD CHANGE-OF-CUSTODY

Los Alamos National Laboratory

Page 1 of 1

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENTID: 2553 EVENT NAME: 051 Sampling2010

SAMPLE ID: NPDES051-10-13566 WORK ORDER:

	AS PLANNED	AS COLLECTED		ASPI.ANNED	ASCOLLECTED
DATE COLLECTED(MMIDD/YYYY):			MEDIA:	I::I.A	
TIME COLLECTED (HH:MM)			SUB-MEDIA:	Qnm&	
PRS ID:	I1cI2		SAMPLE TECH CODE:	12!:.	
LOCATION ID:	NPPES Outfall II.UOII		FIELD QC TYPE:	I::I.A	
LOCATION TYPE:	QUI		FIELD PREP:	IJ.E	
TOP DEPTH:	I!		SAMPLE USAGE:	CQMf	
BOTTOM DEPTH:	I!		SCREEN/PORT DESC:		
FIELD MATRIX:	YlQli		**EXCAVATED: YES / NO / NA**		

COMPOSITE TYPE = — — — — — — COMPOSITE TIME INTERVAL: — — 1-7 **WATER FLOWING: YES / NO / NA**

BOREHOLE: YES/ NO I NA BOREHOLE DECLINATION: -------: ''''''''' ''-'' **BOREHOLE DIRECTION:** _____

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
		NPDES-051 MET	250 ML POLY	Nitric Acid		
		NPDES-ClO4	500 ML POLY	Ice		
		NPDES-Ra-226+Ra-228	1 GAL POLY	Nitric Acid		
2		NPDES-PCBCONG	1 LITER AMBER GLASS	Ice		

Sample

SAMPLE DESC:

SAMPLE COMMENTS:

LOCATION DESC:

FIELD SCREENING/MEASUREMENT RESULTS:

COLLECTED BY (PRINT)

REVIEWED BY (PRINT)_____

RELINQUISHED BY (Printed Name) (Signature)	Date/rime	RECEIVED BY (Printed Name) (Signature)	Datefflme
RELINQUISHED BY (Printed Name) (Signature)	Date/rime	RECEIVED BY (Printed Name) (Signature)	Date/rime

OIO-QP-220	Revision: **0**	Los Alamos NATIONAL LABORATORY EST. 1943
Effective Date: September 12, 2014	Next Review Date: September 10, 2017	

Environment, Safety, Health Directorate

Operations Integration Office

Technical Procedure

SAMPLE CONTAINERS, PRESERVATION AND FIELD QUALITY CONTROL

Document Reviewer:

Name:	Organization:	Signature:	Date:
Doris Quintana	QPA-IQ	Signature on File	09-12-2014

Derivative Classifier: ☐ **Unclassified or** ☒ **DUSA ENVPRO**

Name:	Organization:	Signature:	Date:
Ellena I. Martinez	OIO-DO	Signature on File	09-12-2014

Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
Keith Greene	OIO-DO	Signature on File	09-12-2014
Responsible Line Manager:	Organization:	Signature:	Date:
Chris Echohawk	OIO-DO	Signature on File	09-12-2014

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1.0 REVISION HISTORY

Revision No. *[Enter current revision number, beginning with Rev.0]*	Effective Date *[DCC inserts effective date for revision]*	Description of Changes *[List specific changes made since the previous revision]*	Type of Change *[Technical (T) or Editorial (E)]*
1.0	07/29/05	New document derived from E-SOP-1.02 and WQH-SOP-020.	E
0.0	10/16/07	New Document number, reformatted, minor technical changes. Supersedes ENV-DO-206.	T, E
0	09-12-14	This document supercedes EP-ERSS-SOP-5059 Field Quality Control Samples and EP-ERSS-SOP-5056 Sample Containers and Preservation. These two documents have been consolidated to a new Document ID and Title.	T, E

2.0 PURPOSE AND SCOPE

The purpose of this procedure is to delineate the responsibilities, specific requirements, and process for sample containers, preservation techniques, Field Quality Control and holding times as specified by field regulations and guidance documents within the Los Alamos National Laboratory (LANL or Laboratory).

3.0 BACKGROUND AND PRECAUTIONS

3.1 Background

The use of specific types of sample containers and preservation techniques is mandatory for hazardous site investigations because the integrity of any sample is diminished over time. Physical factors (light, pressure, temperature, etc.), chemical factors (changes in pH, volatilization, etc.), and biological factors may alter the original quality of the sample. Because the various target parameters are uniquely altered at varying rates, distinct sample container, preservation techniques, and holding time have been established to maintain sample integrity for a reasonable and acceptable period of time.

3.2 Precautions

The volume of sample collected should be sufficient to perform all the required analysis, plus an additional amount to provide for any quality control needs, split samples, or repeat examinations. All Field QC samples must be sampled, preserved, and transported the same as regular samples. If the samples were collected in an area controlled by a Radiological Work Permit, they must be released by RP-1 prior to transfer to the SMO. The samples shall be preserved and secured at the site until the shipping requirements are met and the samples are removed from the site.

Never clean and re-use bottles. Keep bottles in clean, dry place until the sample has been collected and is ready to be transferred to the appropriate container.

4.0 EQUIPMENT AND TOOLS

- Certified 300 series sample containers; available from vendors such as I-CHEM (J-CHEM Certified ™ 300 Series), Environmental Sampling Supply (ESS), etc.

[NOTE: A Certificate of analysis with a bar-coded production number is typically in every case supplied by the vendor. Each bottle in the 300 series has a bar-code label for absolute traceability and is for use with the automated sample tracking system. The certificate of analysis should be retained for records.]

5.0 STEP-BY-STEP PROCESS DESCRIPTION

5.1	**Obtaining Proper Sample Containers and Preservatives**	
Field Team Member	1.	Check EPA website for proper containers and preservatives, follow (SMO) Field Chain of Custody specifications.
	2.	Verify all materials are ready and available prior to going into the field, including all QC samples, such as trip blanks, field blanks, etc., that are required by the applicable Sample and Analysis plan (SAP).
	3.	Obtain Field Chain of custody forms (COCs) and individual bottle identification stickers prior to going in the field.

4. For sample collection, use only Certified 300 series sample containers that have been processed and meet or exceed "US EPA Specifications and Guidance for Contaminant-Free Sample Container" (Publication 9240.05A, EPA/540/R-93/051, December 1992).

   Obtain bottles from SMO.

5. Verify all water samples for organics contain extra aliquots for the potential of laboratory quality control problems and/or breakage during shipment.

6. Refer to the OIO procedure OIO-QP-220, *Sample Containers, Preservation and Field Quality Control*, and follow all applicable transportation requirements.

7. Document all pertinent comments and any deviations on the Field/Chain of custody or Field logbook.

5.2 Collecting Samples

Field Team Member

1. For all matrices, fill bottles in the following order:
   - Volatile organics;
   - Semi-volatile organics;
   - Metals;
   - Other inorganic parameters; and
   - Radiochemistry.

2. Take special consideration when sampling volatile organic constituents.

3. Follow the following vial filling techniques for volatiles:
   - Add the preservative before the sample is taken.
   - Pour liquid samples into the vials without introducing any air bubbles.
   - If bubbling occurs as a result of vigorous pouring, discard the sample and refill the vial.
   - Completely fill the vial at the time of sampling so that when the septum cap is fitted and sealed, and the vial is inverted, no headspace is visible.
   - Do not open appropriately filled vials again prior to analysis.

   [NOTE: Pea-sized bubbles may accumulate in the vials during transportation and storage due to solubility differences affected by temperature change. This should not adversely affect the sample integrity. This will happen during storage but should not be present at the time of sampling.]

4. Collect solid samples in the following manner:
   - Collect the solid sample in EnCore ™ samplers, or fill the specific jar as completely as possible;
   - Tap the sides of the jar slightly during filling to try and eliminate as much air space as possible;

- If samples are shipped to the laboratory in EnCore ™ samplers, extrude the samples and place them in sample containers within 48 hours of sample collection.

5. Collect sludge samples in the following manner:
   - Take into consideration the consistency of the material since the analytical laboratory will extract or analyze the sample with respect to the relative pecent of liquid solid components;
   - If the sludge is mosly water with relatively low solid content (<40% solids), use the appropriate water sample containers;
   - If the specific analysis to be performed is only applicable to a certain fraction of the sludge, note this on the analytical request form.

5.3 Preserving Samples

Field Team Member	1.	Determine the type of preservation required for the specific analyses requested for all samples in accordance with EPA SW-846 and established industry practices for use by accredited analytical laboratories. [NOTE: Acid, base, or buffer preservative quantities to be added to samples.]
	2.	Preserve samples immediately following sample collection (except in the case of samples for organics analyses as described above). [NOTE: The SMO does not provide or perform preservation capabilities.] [NOTE: The proper reagent for pH adjustment should be in an easily usable form that can be added at the time of sampling.]
	3.	Store samples in a cooler with ice, or other appropriate cooling material, until they are delivered to the SMO by using the following process: • Place the samples in an insulated container (cooler) and maintain on ice (ice in bags or chemical “blue” ice) at 4° Centigrade within 8 hours of sample collection (where applicable); and • Avoid freezing the sample, particularly when using a small, < 40 ml glass container, by wrapping it in bubble pack to isolate it from the “blue” ice.
	4.	Check the pH with pH paper if using an acid or base preservative; however, never insert the pH paper directly into the sample vial.

5.4 Implementing Holding Times

Field Team Member	1.	Consider holding times and shipment schedules when collecting samples in order to minimize potential effects to samples due to holding time concerns.

2. Use the sample collection date and time for the beginning of the holding time:

   [NOTE: Both the sampler and the subcontract analytical laboratory must use this date/time. If the holding times are expressed in days, the sample must be extracted/analyzed before midnight. If the holding times are expressed in hours then the sample must be extracted/analyzed before the time frames expressed are exceeded. Remember to take into account time zone differences when collecting samples.]

3. When parameters are required to be analyzed in the field, use the allowable holding times, which are the maximum times that samples are considered valid.

4. If the site has suspected radiation contamination, obtain radiation screening results for the SMO or BUS-4 to ship the samples. (See procedure OIO-QP-221, *Handling, Packaging, and Transporting Field Samples,* for handling and transporting the samples.

   [NOTE: These results may be from historical knowledge or may be derived from field screening measurements of gross alpha/beta and gross gamma.]

5. If the samples are collected in an area controlled by a Radiological Work Permit, obtain a release by RP-1 prior to transfer to the SMO.

6. Preserve and secure the samples at the site until the shipping requirements are met and the samples are removed from the site.

5.5 Pre-Operation Activities

Field Team Leader

1. *Evaluate the requirements for field QC samples as part of preparation of the site-specific SAP.*

2. Include QC samples in accordance with the following table:

QC Sample Type	Sample Matrix	Frequency	Purpose
Field Duplicate	Soil and Water	One per day per matrix type or 1 per 20 samples, whichever is more frequent.	To evaluate the reproducibility of the sampling technique.
Equipment Rinseate Blank	Deionized water used to rinse equipment.	One per day or 1 per 20 samples collected, whichever is more frequent.	To evaluate decontamination procedures.
Trip Blank	Volatile organic compound (VOC)-free soil or sand; or VOC-free deionized water.	One per day or 1 per 20 samples collected for VOC analysis, whichever is more frequent.	To determine contamination during storage and transport.

3. Determine the need for additional types of QC samples to be collected during the SAP preparation activities.

   [NOTE: These additional types of QC samples may be collected to obtain information concerning the sampling site (e.g., background and control samples).]

4. Obtain deionized water in sealed containers appropriate for transport to the field and

in sufficient quantity to prepare the required equipment rinseate blanks.

[NOTE: Do not use tap water or drinking water purchased from a local store as these sources typically contain trihalomethanes.]

5. Obtain trip blanks from the SMO.

5.6 Sample Collection Process

Sample Collection Personnel

1. ***Collect and prepare each type of QC sample required in the manner prescribed in the table in Section 4.3 of this procedure.***
2. Refer to the table in Section 4.3 of this procedure for the collection frequency of field QC samples that shall be addressed within the SAP.

5.7 Equipment Rinseate Blank

Sample Collection Personnel

1. After decontaminating the field sampling equipment, rinse with deionized water and collect the rinseate for analysis.
2. Rinse all equipment surfaces that come in contact with the sampling materials (e.g., the inside of the bailer).
3. Collect rinseate water throughout the day and fill the sample container all at once at the end of the day's sampling activities.

   [NOTE: Do not collect the water used for decontaminating the field sampling equipment.]

5.8 Field Duplicate

Sample Collection Personnel

1. Collect two separate samples from the same source and at the same location and time.
2. Place the samples in separate containers, follow the sample preservation procedure, label each as a unique sample, and submit both samples for the same analyses.

5.9 Trip Blank

Sample Collection Personnel

1. Obtain trip blanks before the day's sampling events, and submit with the regular samples at the end of each day's sampling activities (when collecting samples for VOC analysis), or at the end of the project if the required frequency is maintained. [NOTE: The number of trip blanks to be prepared depends upon the number and frequency of VOC samples to be collected.]
2. Maintain the trip blank containers with the regular sample containers throughout the sampling event and return them to the SMO with the collected samples.
3. Do not open the trip blank container(s) at any time during the sampling activities.

5.10 Records

Field Team

1. Submit the following records generated by this procedure to the applicable Field

Member	Operations Task Leader • Daily Activity Log forms or field notebooks that include deviations (if applicable), calibration information, record of daily activities, and any other pertinent information, at a minimum; • Completed Chain-of-Custody Form; and • Sample Collection Log.

OIO-QP-221	Revision: **0**	Los Alamos NATIONAL LABORATORY EST. 1943
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Environment, Safety, Health Directorate

Operations Integration Office

Technical Procedure

Handling, Packaging, and Transporting Field Samples

Document Reviewer:

Name:	Organization:	Signature:	Date:
Doris Quintana	QPA-IQ	Signature on File	09-12-14

Derivative Classifier: ☐ **Unclassified or** ☒ **DUSA ENVPRO**

Name:	Organization:	Signature:	Date:
Ellena Martinez	OIO-DO	Signature on File	09-12-14

Approval Signatures:

Subject Matter Expert:	Organization:	Signature:	Date:
Keith Greene	OIO-DO	Signature on File	09-12-14
Responsible Line Manager:	**Organization:**	**Signature:**	**Date:**
Chris Echohawk	OIO-DO	Signature on File	09-12-14

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1.0 PURPOSE AND SCOPE

The purpose of this procedure is to describe the process for handling, packaging, and transporting field samples collected by the Los Alamos National Laboratory (LANL or Laboratory).

2.0 BACKGROUND AND PRECAUTIONS

2.1 Background

None.

2.2 Precautions

If the samples were collected in an area controlled by a Radiological Work Permit, they must be released by RP-1 prior to transfer to the SMO. The samples shall be preserved and secured at the site until the shipping requirements are met and the samples are removed from the site.

3.0 STEP-BY-STEP PROCESS DESCRIPTION

3.1 Preparation of Environmental Samples for Transport and Shipment

Field Team Member	1.	Properly label, securely seal, and wipe dry all sample containers before placing them in a transportation package (e.g., bubble wrap).
	2.	As necessary to control leakage, place and seal sample containers in a polyethylene, sealable bag (e.g., Ziploc™ bag).
	3.	If the sample requestor deems it necessary for liquid samples, place sufficient absorbent material in the cooler or other transport container to absorb all liquid in the event that sample containers break.
	4.	Seal and secure the drainage hole at the bottom of the cooler in case of sample container leakage.
	5.	Pack multiple sample containers by using bubble wrap, or other means to avoid breakage during transport.
	6.	Protect plastic containers from possible puncture during shipping by the use of cushioning material.
	7.	Separate glass vials in the shipping container with cushioning material to prevent breakage.
	8.	Place samples that require preservation in a sturdy ice chest with sufficient cooling material to maintain the required preservation temperature.
	9.	To avoid increasing the likelihood of container breakage, do not freeze water samples or transport water samples in dry ice. [NOTE: The goal is to maintain preserved samples at $4^{o}C \pm 2^{o}C$; however, under field conditions, this may not be possible.]

	10.	If using wet ice to preserve samples, place the ice in sealed containers, such as doubled Ziploc™ bags, so that water does not fill the cooler as the ice melts.
	11.	If water does leak into the transport container, ensure that labels and markings on sample containers remain intact and legible.
	12.	Complete original Field Chain-of-Custody forms and deliver with transport container to the SMO. [NOTE: Samples must remain under positive control of the individual who has signed for them.]
	13.	Place a “Chain-of-Custody” seal over the lid of all containers, so that tampering can be easily detected.
	14.	Mark the outside of all containers (e.g., coolers) used to transport environmental samples with the following information: • Environmental Samples; • Name of contact; and • Contact information (e.g., phone number).
3.2 Transport Environmental Samples for Shipment		
Field Team Member	1.	Transport environmental samples to the SMO or radiation screening laboratory by using a government vehicle or approved subcontractor vehicle only. [NOTE: Transportation of samples to the SMO by using a personal or other nongovernmental vehicle is not permitted; except for approved subcontractor vehicles.]
	2.	Deliver environmental samples to the SMO between the hours of 8:00 a.m. and 5:00 p.m. on workdays and, as necessary, coordinate with the SMO for delivery during other times.
	3.	Coordinate with the SMO for the delivery of samples that have limited holding times.
SMO Personnel	4.	Verify that samples transported to the SMO are properly prepared for shipment and the Field Chain-of-Custody documentation is complete and accurate.
	5.	Do not accept for analysis any environmental samples for which documentation is incomplete or incorrect. [NOTE: Such samples will not be accepted until the sample documentation is completed and/or corrected.]
	6.	Do not accept for analysis any environmental samples without appropriate radiation screening information (e.g., historical data, RP data, etc.).

SMO or Radiation Screening Laboratory Personnel	7.	Assume custody of properly packaged and transported environmental samples and perform packaging and shipment of the samples to contract laboratories as directed.
3.3 Sanitary Waste Samples for Transport and Shipment		
Field Team Leader	1.	For the safety of all laboratory personnel and before transport to the SMO, affix a Biohazard warning label to the outside of the transport container for samples from active septic systems and sewage lagoons that identifies the samples as sanitary waste. [NOTE: A typical warning label attached to the outside of the transport container might read as follows: *This package contains samples of sanitary waste. If leakage is noted, take all prudent precautions and notify the sampling team that collected the samples.*]
3.4 Handling, Packaging, and Transporting Samples Containing Radioactive Materials		
Field Team Leader	1.	Coordinate the handling and packaging of samples with an RP Radiological Control Technician (RCT).
	2.	Ensure RCT provides radioactivity data that will allow determination of specific activities. [Note: Data must be provided for each sample. The screening must be conducted on the sample media rather than on the sample container.]
	3.	Do not accept NDS (No Detected Activity).
	4.	Ensure data radiation screening data is provided for each sample.
	5.	Ensure RCT conducts the screening on the sample media, and not on the sample container.
	6.	Follow established RP safety precautions when handling and packaging field samples that meet DOT or RP action levels for radioactivity.
	7.	To prevent personnel exposure and equipment contamination, notify the SMO and RCT that the samples contain significant radioactivity.
	8.	Submit field samples to an SMO-approved radiation screening facility if more accurate determination of radioactivity levels is required. [NOTE: SMO-approved facilities are American Radiation Services (ARS) and RP.]
	9.	If RP reports a result for solids greater than 5,000 dpm above background, confirm the results using ARS.

3.5 Records		
SMO Staff	1.	Submit the following records generated by this procedure to the Records Processing Facility: • Field Chain-of-Custody; and • Shipping documentation.

4.0 REVISION HISTORY

Revision No. *[Enter current revision number, beginning with Rev.0]*	Effective Date *[DCC inserts effective date for revision]*	Description of Changes *[List specific changes made since the previous revision]*	Type of Change *[Technical (T) or Editorial (E)]*
0.0	07/29/05	New document derived from E-SOP-1.03 and WQH-SOP-020	T
0.0	10/16/07	New document number, reformatted, minor technical changes. Supersedes ENV-DO-207.	T
0	09-12-14	Assigned a new OIO document control number. This document supersedes EP-ERSS-SOP-5057. Revised and updated organization name and editorial changes.	E

OIO-SOP-5269	Revision: 0.1	Los Alamos NATIONAL LABORATORY EST. 1943
Effective Date: 3/17/15	Next Review Date: 3/17/18	

Environment Safety & Health

Operations Integration Office

Standard Operating Procedure

CHAIN-OF-CUSTODY AND FINAL RECORDS PREPARATION FOR ANALYTICAL DATA

Reviewers:

Name:	Organization:	Signature:	Date:
Doris Quintana	QPA-IQ	Signature on File	3/17/15

Derivative Classifier: ☐ **Unclassified or** ☒ **DUSA ENVPRO**

Name:	Organization:	Signature:	Date:
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Subject Matter Expert:	Organization	Signature	Date
Keith Greene	OIO-DO	Signature on File	3/17/15
Responsible Line Manager:	Organization	Signature	Date
Chris Echohawk	OIO-DO	Signature on File	3/17/15

REVISION HISTORY

Doc No. and Revision *[Enter current document number, beginning with Rev.0]*	**Effective Date** *[DCC inserts effective date for revision]*	**Description of Changes** *[List specific changes made since the previous revision]*	**Type of Change** *[Technical (T) or Editorial (E)]*
SOP-5269, R0	02/09/10	New document SOP-5269 Supersedes EP-ERSS-SOP-5085, R0.	T/E
SOP-5269, R 0.1	3/17/15	Revised organizational name, hyperlinks and editorial changes.	E

1.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) states the responsibilities and describes the process for establishing and maintaining a proper chain-of-custody in the management and processing of final analytical data record packages for Los Alamos National Laboratory (LANL or Laboratory).

This procedure integrates the criteria of the Quality Assurance Plan for the Environmental Programs, hereinafter referred to as the Quality Assurance Plan.

All **SMO team members** shall implement this procedure when processing final analytical data record packages.

1.0 BACKGROUND AND PRECAUTIONS

1.1 Background

This procedure conforms to the requirements of legal defensibility of Analytical Data.

Controls are established to assure that only correct and acceptable items are used, installed, or analyzed. LANL work includes sampling and analysis activities, which require identification to be maintained on the items (i.e., samples) or in documents traceable to the items, or in a manner that assures that identification is established and maintained.

Sample identification is maintained from sample collection through analysis and reporting. The chain-of-custody form provides this traceability.

1.2 Precautions

Due to the high volume of analytical data record packages that are processed by the Sample Management Office (SMO); authorization has been delegated to the SMO to process their own records in accordance with the Laboratory's Record Management Procedure (P1020-1). This is done to gain programmatic efficiency and avoid backlog at the ADEP Records Processing Facility (RPF). The SMO Team completes the LANL Form 1701 Records Transfer Request and submits hardcopies directly to the offsite Federal Records Center in Denver, CO., which has been authorized by the LANL SI-RMS Records Center.

2.0 EQUIPMENT AND TOOLS

None.

3.0 STEP-BY-STEP PROCESS DESCRIPTION

3.1 Receive Analytical Data Record Package from Contract Laboratory

SMO Team

1. Ensure that the following items have been received from the contract analytical laboratory:
   - Hardcopy (paper) EPA defined Level IV analytical data package,
     PDF copy of the data package both Level (IV) Level (II), and
   - Electronic Data Deliverable (EDD).

   All must be received to consider the analytical request complete for payment of services.

3.2 Manage the Analytical Records

SMO Team

1. Store the hardcopy (paper, Level (IV) only) data package in numerical succession in controlled area of the SMO facility.
2. Log the data package into the SMO database as received.
3. Load the EDD into the EIM database, typically loaded by the analytical laboratory.
4. Load the PDF copies both Level (IV) and Level (II) into the network folder for access by data stewards.

3.3 Prepare Analytical Data Record Package

SMO Team

1. Verify all required information is available and received.
2. Combine, in preparation for scanning, the following:
   - The original SMO analytical request folder.
   - Data validation report printed from the EIM database when applicable.
   - Scan these documents in the following order: Lab request, Field Chain-of custodies (in numerical order) and validation report.

     Note: In the abnormal event that these items are not verifiable, for the analytical request and validation report re-print documents from the EIM database.

3.4 Preparation of Final Analytical Data Records Package - PDF

SMO Team

1. Identify SMO scanned request folder.
2. Identify Level (IV) PDF from analytical laboratory.
3. Using Adobe Acrobat merge these saved pdfs.
4. Move the merged file into the Final SMO-Work storage folder on the projects drive for final disposition and transfer to the INTELLUS public website.
5. Make sure all temporary files made to create the final analytical data records package PDF are deleted.

   Note: In the abnormal event that these items are not verifiable, request the missing information from the responsible analytical laboratory.

3.5 Preparation of Final Analytical Data Records Package – Paper Level (IV)

SMO Team

1. Identify SMO paper request folder.

2. Identify Level (IV) paper data from analytical laboratory.

   Note: In the abnormal event that these items are not verifiable, request the missing information from the responsible analytical laboratory.

3. Prepare the paper analytical data records package by selecting a required lilac colored title sheet which contains, the request number and number of pages in the document. This sheet is placed at the front of the records package. This is used as a records package separator for the records center.

4. Place the paper analytical data in the designated records center folder and write the correct request number on the tab of the folder. Place the folder into the designated records center packaging white box.

5. Correspondingly, give the white record box a sequential number starting with 1 and log the number in the records logbook with also the corresponding requests in that box for form 1701 entry and future retrieval.

6. Requirement for record transfer is two pallets of 45 boxes, each at a minimum.

7. Follow the SI-RMS procedure P1020-1 for long term disposition.

3.6 Records Management

SMO Team

1. Complete Form 1701 Records Transfer Request and send to SI-RMS to capture records being transferred to the offsite Federal Records Center (FRC) in Denver, CO.

   NOTE: While filling out Form 1701, if the data entry exceeds 130 characters for each box line then write “see attached” and put the required information in an excel spreadsheet and attach to the request.

OIO-TP-222	Revision: **0**	
Effective Date: 3/17/2015	Next Review Date: 3/17/2018	

Environment, Safety, Health Directorate

Operations Integration Office

Technical Procedure

Shipping/Receiving of Environmental Samples by the Sample Management Office (SMO)

Document Owner:

Name:	Organization:	Signature:	Date:
Keith Greene	OIO	Signature on File	3/17/15

Derivative Classifier: ☐ **Unclassified or** ☒ **DUSA ENVPRO**

Name:	Organization:	Signature:	Date:
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Chris Echohawk	OIO	Signature on File	3/17/15

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REVISION HISTORY

Document Number and Revision *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
OIO-TP-222 RO	03/17/2015	This document supersedes SOP-5255, formatted into Technical Procedure template. Document to Keith Greene for revision to procedure.

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1.0 INTRODUCTION

The work specified in this procedure will be conducted in accordance with the applicable sampling activity Integrated Work Documents, in accordance with LANL IMP 300-00-00, Integrated Work Management for Work Activities, or with the applicable sampling activity Hazard Review.

1.1 Purpose and Scope

The purpose of this procedure is to describe the process for shipping and/or receiving environmental samples from the Los Alamos National Laboratory (LANL or Laboratory) Sample Management Office (SMO) to/from analytical laboratories.

1.2 Applicability

This procedure is applicable to all SMO staff members.

2.0 PRECUATIONS AND LIMITATIONS

The chain-of-custody process provides confidence and documentation in analytical data integrity by establishing the traceability of the data from the time of collection, to delivery, through processing, to final maintenance as a record.

2.1 Precautions

Chain-of-custody must be maintained for legally defensible environmental sampling.

2.2 Limitations

This SOP is for samples shipped and/or received by SMO staff members. This does not apply to any other LANL shipping or receiving entity.

3.0 PREREQUISITE ACTIONS

None

4.0 STEP-BY-STEP PROCESS DESCRIPTION

4.1 Receipt of Samples for Shipment

SMO Team

1. Accept samples only if they are described on completed chain-of-custody forms. Completed chain-of-custody forms include date and time of sample collection, acknowledgement that containers are accounted for or canceled, annotation for any container deviations, and representation for field screening results. Acceptance is also contingent on the custody seals being in place. Once the above has been verified Relinquished and Received signatures and date/time must be completed.
2. Immediately after the samples are properly received at the SMO, store in secondary containment (for breakable storage containers) and place in refrigerated storage area where applicable until they are prepared for shipment to the analytical laboratory.

4.2 Packaging of Samples for Shipment

SMO Team

1. Seal and secure the drainage hole at the bottom of the cooler in case of sample container leakage.
2. Pack individual sample containers to prevent breakage and transport in a sealed cooler with ice or other suitable coolant, or other EPA or industry-wide accepted method
3. First, individually wrap glass bottles in plastic to contain sample if breakage during shipment. Then wrap in cushioning material to help prevent breakage.
4. Protect plastic containers from possible puncture during shipping using cushioning material.
5. Include temperature blanks with each shipping container.
6. Apply chain-of-custody seals to each cooler prior to shipment of samples from LANL to the designated analytical laboratory.
7. Include the chain-of-custody form and analytical request form within the sealed storage container to be delivered to the analytical laboratory.

   Samples may be bundled and shipped to the analytical lab. In this case, chain of custody analytical request forms are also bundled with the shipment and placed in one of the shipping containers. The paper work is also faxed to the analytical lab in case the shipping containers get separated in transit.

   However, some programs cannot be bundled. Samples associated with NPDES compliance, UN2910 Rad and New Mexico Special waste (high TPH) must be shipped in their own shipping container with its corresponding paperwork.

4.3 Submission of Samples to Analytical Laboratory

SMO Team

1. Ship each cooler, or other shipping container, directly to the analytical laboratory by FED-EX.
2. Submit all samples to the laboratory in a timely manner to allow the analytical laboratory to conduct analyses within analytical method holding times.

4.4 Receipt of Samples from Analytical Laboratory

SMO Team

1. In the abnormal situation that samples need to be returned from the analytical laboratory, the same conditions of acceptance must be followed as specified in OIO-QP-221 with the following additional Completed field chain-of-custody forms.
   - Must have prior approval from the SMO manager and STR from the project the samples were collected for.
   - Confirmed charge code and disposal path, either back to site from which the samples were collected from or projects approved waste stream.

   NOTE: If the above conditions are not met the samples must not be accepted.

   -

5.0 TRAINING

All other applicable SMO Standard operating procedures.

6.0 DEFINITIONS AND ACRONYMS

See LANL *Definition of Terms*.

6.1 Definitions

None

6.2 Acronyms

See LANL Acronym Master List.

DOE	Department of Energy
LANL or the Laboratory	Los Alamos National Laboratory
SMO	Sample Management Office

7.0 RECORDS

Follow OIO-SOP-5269, Chain of Custody and Final Records Preparation for Analytical Data.

8.0 REFERENCES

OIO-QP-221, Handling, Packaging, and Transporting Field Samples.

9.0 ATTACHMENTS OR APPENDICES

None

No: P409
Revision: 5

Issued: 07/30/15
Effective Date: 07/30/15

LANL Waste Management

1.0 PURPOSE

This document describes Los Alamos National Laboratory (LANL or the Laboratory) requirements for waste generated and managed by Waste Generators and Treatment Storage Facilities (TSFs) to ensure compliance with legal mandates and Laboratory requirements as necessary to protect human health, safety, and the environment. This document has been revised as part of a process in which the Laboratory systematically plans, documents, executes, and evaluates its management of regulated waste streams.

This document addresses LANL's waste management requirements for Waste Generators and TSFs as necessary to safely manage, store, and treat wastes. The Waste Generator must know and document what is in the waste, and TSFs must meet waste analysis requirements under the LANL Hazardous Waste Facility Permit. This document also addresses LANL's Waste Certification and Self-Assessment Programs, to ensure there is a systematic, documented approach for compliance with requirements in this document.

All Waste Generators, including subcontractors, who generate a regulated waste, must work with Waste Management (WM) to meet the requirements in this and other required documents to ensure that the following are met:

- the waste is properly characterized, managed, stored, and transported, and
- the waste certification program is implemented at the waste generating site before the waste is shipped off-site from LANL.

The Environmental Protection Agency (EPA) and the New Mexico Environment Department (NMED) have established requirements, which are addressed in this document, for Waste Generators and TSFs to ensure regulated waste is characterized, managed, stored, treated, and transported compliantly. To ensure compliance with legal mandates, the requirements in this and other requirements documents (i.e., P930-1, *LANL Waste Acceptance Criteria*, Associate Director for Environment, Safety, and Health [ADESH], and Functional Series Documents [FSDs]) are established to be consistent with Department of Energy (DOE) Orders, federal and state laws and regulations, the LANL Hazardous Waste Facility Permit, and reporting requirements.

2.0 AUTHORITY AND APPLICABILITY

2.1 Authority

This document is issued under the authority of the Laboratory Director to direct the management and operation of the Laboratory, as delegated to ADESH as provided in the Prime Contract. This document derives from the Laboratory Governing Policies, particularly the section on Environment, and implements requirements in the Prime Contract, particularly Department of Energy Acquisition Regulation (DEAR) 970.5223-1, *Integration of Environment, Safety, and Health into Work Planning and Execution* (Dec. 2000); Part III, Section J, Appendix B 4.2 and Part III, Section J, Appendix G; DOE Order (O) 435.1, *Radioactive Waste Management*; DOE Manual (M) 435.1-1; *Radioactive Waste Management Manual*; the Resource Conservation and Recovery Act (RCRA); the Toxic Substances Control Act (TSCA); New Mexico Special Waste Act; 74-9-1 NMSA 1978, *Solid Waste Act*, and the 74-4-1 NMSA 1978, *Hazardous Waste Act*.

- Issuing Authority (IA): Associate Director for Environment, Safety, and Health (ADESH)
- Responsible Manager (RM): Waste Management (WM) Division Leader
- Responsible Office (RO): Waste Management-Division Office (WM-DO)

2.2 Applicability

This document applies to all workers, including subcontractors, who generate, manage, treat, or store regulated waste at the Laboratory as a Waste Generator or at a TSF. Regulated waste, as used in this document, refers to all types of waste including office waste, solid waste, universal waste, hazardous waste, mixed radioactive waste, and radioactive-only waste. Waste Generators include workers who generate regulated waste and store the waste in staging areas, accumulation areas, or less-than 90 day storage areas. TSFs include workers who manage, treat, or store regulated waste under the LANL Hazardous Waste Facility Permit. All other persons working at the Laboratory must follow the requirements as set forth in their contractual agreements or subcontracts.

3.0 PROCEDURE DESCRIPTION

3.1 Overview

There are two main aspects to this document. First, it establishes specific responsibilities for Waste Generators and TSFs to manage and store regulated wastes to ensure the protection of human health, safety, and the environment (Sections 3.2 through 3.7). Second, it describes LANL's Waste Certification Program, which requires a documented approach to ensure that waste management (treatment, storage and disposal) of waste streams complies with applicable requirements (Section 3.8) prior to off-site shipment.

Fig. 1. LANL Waste Management Components

Waste Generators and TSF workers will find more detailed information on waste compliance in the ADESH FSDs. These FSDs may consist of non-mandatory information, such as aids and guidance (ADESH-TOOLS) or mandatory requirements, regarding waste type and compliance factors. These FSDs are issued by ADESH in accordance with PD311, *Requirements System and Hierarchy* and ADESH-AP-007, *Document Control*.

If a Facility Operations Director (FOD), the Facility Responsible Line Manager (RLM), a Facility Point of Contact and/or a Waste Generator chooses to specify additional local-level procedures for waste management activities, those local procedures and changes thereto must be reviewed and approved through WM-DO before they are issued and implemented. Such procedures, including ADESH Administrative Procedures (ADESH-APs) and ADESH Technical Procedures (ADESH-TPs), may be subject to review in accordance with Safety Basis Procedure (SBP) SBP-112-3-R1.2, *Unreviewed Safety Question (USQ) Process*, and P315, *Conduct of Operations Manual*. WM-DO confirms that Waste Generators are compliant with potential waste streams through oversight requirements for their waste streams and that waste requirements are met in the planning stage for all waste and potential waste streams.

Before waste generating projects (remediation, Demolition and Decontamination, Footprint Reduction, etc.) begin, WM-DO must review (1) all characterization methodologies that were part of the planning stage and the preparation for waste disposition and (2) all requests for use of a DOE or LANL subcontractor that was not procured through WM-DO via e-mail.

Before generating regulated waste or commencing waste characterization activities, a Waste Generator must consult with their Waste Management Coordinator (WMC). TSFs must comply with their local-level procedures and the LANL Hazardous Waste Facility Permit.

Waste Generators and TSFs must also meet the requirements of the LANL Pollution Prevention Program, which implements pollution minimization goals through Pollution Prevention Opportunity Assessments and other tools. The LANL Pollution Prevention Program requires Waste Generators and TSFs to identify potential alternatives to the generation of waste including use of less toxic materials, alternative processes, waste minimization techniques, and following the requirements DOE O/M 435.1, *Radioactive Waste Management/Manual* and DOE O 436.1, *Departmental Sustainability*. In addition, TSFs must meet waste minimization requirements of the LANL Hazardous Waste Facility Permit.

The Waste Certification Official (WCO) must be notified by the originating organization when a Nonconformance Report (NCR) or a Performance Feedback and Improvement Tracking System (PFITS) issue is entered into the system regarding regulated waste. WCO concurrence for corrective actions must be obtained by e-mail prior to closure.

3.2 Identifying Waste

Waste Generators must correctly identify their waste through waste characterization as specified below. If a Waste Generator needs assistance with and/or cannot identify the waste type, the worker must contact their WMC. In addition, if a LANL worker or subcontractor discovers a waste stream with no identifiable Waste Generator, the worker must contact their WMC. See ADESH-TOOL-213, *No Owner Waste*.

“Office waste” refers to wastes generated in an office environment and can include solid waste (e.g., office paper, food waste, trash), recyclables (e.g., paper, cardboard, plastics), universal waste (e.g., batteries and fluorescent light bulbs) and hazardous waste (e.g., aerosol cans). ADESH-TOOL-114, *Office Waste Tool*, ADESH-TOOL-111, *Waste Characterization*, and ADESH-TOOL-314, *Radioactive Characterization,* help Waste Generators quickly identify their regulated waste types and describe additional tools with requirements for their regulated waste types.

Project Management (PM) projects, Environmental Remediation (ER) or decontaminated and decommissioned must notify WM-DO via e-mail of upcoming waste generation projects and provide all pertinent planning documentation and characterization documentation for evaluation. Use of the Permits and Requirements Identification (PRID) system is required (see PD400, *Environmental Protection*).

3.2.1 Waste Characterization

Waste Generators and TSFs are required to ensure that waste characterization is accurate, complete and up-to-date. Waste Generators must make a waste determination and characterize regulated waste by appropriate analytical testing or use of acceptable knowledge e.g., Material Safety Data Sheets (MSDSs), product labels, and historical data. TSFs must meet waste analysis plan requirements under the LANL Hazardous Waste Facility Permit prior to acceptance of the generator’s waste for treatment or storage. If a Waste Generator does not supply complete and adequate waste characterization information, the TSF or off-site Treatment Storage and Disposal Facility (TSDF) may not accept the waste. Waste Generators and TSFs must ensure that waste characterization documentation is maintained, protected, controlled, and available for internal and/or any third party reviews.

Note: TSF workers become “Waste Generators” when activities at the TSF (e.g., repackaging, sorting, and segregation) lead to the generation of regulated waste or trigger re-characterization of the waste stream as described within this section.

Waste Generators must consult with their WMCs to start the waste characterization process, when working with a new process that may create a new regulated waste stream, or when waste processing has been modified. ADESH-TOOL-111, *Waste Characterization* and ADESH-TOOL-314, *Radioactive Characterization,* help Waste Generators document and characterize regulated wastes, and describe additional tools with requirements for their regulated waste types. The Waste Generator must sign a Waste Stream Profile (WSP) Certification Statement in the Waste Compliance and Tracking System (WCATS), assuring that waste characterization is correct and meets applicable waste acceptance criteria. This certification attests to the accountability and legal defensibility of the waste characterization for internal or external third party reviews.

As part of the requirement to characterize regulated waste, the Waste Generator must

- submit a waste stream profile in WCATS for each waste stream;
- upload all waste characterization documentation into WCATS and ensure that all valid documentation is referenced in WCATS with a unique identifier;
- sign the WSP Certification Statement assuring accurate and complete characterization of the waste; and
- annually re-evaluate waste characterization for each WSP to verify accuracy of the waste characterization. For compliance purposes, this annual period is defined as less than one year since the original waste characterization or the last recharacterization.

After waste has been identified and entered into WCATS, the waste characterization will be reviewed by the WM-DO prior to a new waste stream identification number being activated. WM-DO screens documentation for LANL facilities that characterize waste streams by acceptable knowledge, process knowledge (or knowledge of process), historical knowledge, etc.

Note: If waste with no disposal path must be generated, the Waste Generator must contact WM-DO via e-mail for prior authorization.

TSFs must meet waste characterization requirements of the LANL Hazardous Waste Facility Permit, including specifically the Waste Analysis Plan (WAP).

3.2.1.a Waste Generator Recharacterization

Waste Generators must recharacterize and update waste characterization based on the following conditions if

- after an annual re-evaluation, there is any change to waste characterization information, including changes to the waste-generating process or operations;
- there is a change to the waste-generating processes or operations;
- analytical results indicate a change in the waste stream;
- new characterization information becomes available;
- a waste container is opened and secondary material is added to the container;
- waste is repackaged and secondary material is added during this process;
- there is a change in the ownership of a WSP; or
- the Waste Generator is notified that waste received at an off-site facility does not match a pre-approved waste analysis certification or accompanying shipping documentation.

Note: TSF workers may become Waste Generators when waste processing includes one of the activities described above.

The Waste Generators must contact the WM-DO in the event it is required to update waste characterization information described above. WM-DO will work through appropriate subject matter experts to assess the identified changes in the waste characterization and recommend actions.

3.2.1.b Recharacterization at Treatment and Storage Facilities (TSFs)

Under the LANL Hazardous Waste Facility Permit, TSFs must update their waste characterization when the following occurs:

- a Waste Generator determines one or more of the above conditions in Section 3.2.1.a has occurred;
- TSF workers have reason to believe that the process or operation generating the waste has changed;
- waste is repackaged and secondary material is added during this process;
- waste received at an off-site facility does not match a pre-approved waste analysis certification or accompanying shipping documentation; or
- an inspection reveals that the waste does not match the identity of the waste specified by the Waste Generator or a manifest on a shipping paper.

3.2.2 Waste Containing Potential Radioactive Contamination

Potentially radioactive wastes (e.g., the waste or waste item was generated in a radiologically contaminated area) are summarized in ADESH-TOOL-306, *Potentially Radioactive or Mixed Investigation-Derived Waste*. The Waste Generator is required to meet the actions specified in the tool.

If radioactive contamination is reasonably suspected to be present at a site (e.g., in wastes from potential release sites or poorly documented decontaminated and decommissioned sites), the waste must be characterized. See ADESH-TOOL-314, *Radioactive Characterization*. The Authorized Release Limits Process is defined in P411, *Authorized Release Limits Proposal Process* and is applicable only to materials that

- have residual radioactivity below the dose limits specified in DOE O 458.1, *Radiation Protection of the Public and the Environment*; and
- do not contain 74-4-1 NMSA 1978, *Hazardous Waste Act* and Resource Conservation and Recovery Act [RCRA]) constituents.

Note: For release of potentially activated metals previously stored in Radiation Control areas, see RP-SOP-077.004, *LANSCE Metals Clearance Process* and RP-SVS-RIC-TBD-03, *Technical Basis Documentation Regarding Health Physics Measurements for the Unrestricted Release of Metals from LANSCE*.

3.2.3 Waste Verification

To ensure compliance with DOE Directives, federal and state laws and regulations, P930-1, *LANL Waste Acceptance Criteria*, and reporting requirements, WM-DO completes a verification checklist in accordance with WM-PROG-QP-236, *Waste Certification Program Waste Verification,* and must verify accurate and thorough waste characterization. This includes the random or selected waste stream and can include the following (if applicable):

- a review of radiological assay;
- a visual examination of the waste;
- a sampling and chemical analysis of the waste;
- a verification that the waste has been properly characterized in accordance with applicable procedures, acceptable knowledge documentation, non-destructive assay records, chemical analysis documentation, and, if applicable, documentation of past visual examinations of the waste;
- a review of past verification results to determine the nature of any pre-existing problems; and
- a review of facility waste processes and procedures to verify operations meet waste certification requirements.

Note: The LANL Hazardous Waste Facility Permit requires an annual verification of the waste characterization of one percent of the total number of hazardous waste streams characterized solely by acceptable knowledge and managed at TA-54 in the previous calendar year.

3.3 Packaging Waste

Low-Level Waste (LLW) and Mixed Low-Level Waste (MLLW) must meet waste package certification requirements before the waste is disposed. Waste Generators of LLW and MLLW must make a request via e-mail to WM-DO to arrange for waste package certification. If there are specific waste issues regarding LLW and MLLW, the Waste Generator must contact the WCO. To ensure compliance with federal and state laws, regulations and reporting requirements, the WCO will rely on established waste disposition requirements that are consistent with Waste Acceptance Criteria (WAC) requirements from the Nevada National Security Site (NNSS).

To prepare for waste disposition, the Waste Generator must refer to the 600 Series FSDs, (*Transport of Waste*). All waste information regarding waste disposition must be documented in WCATS and a disposal request must be submitted through the WCATS system by the WMC. This will prompt WM-DO to initiate a waste shipment. WM-DO must be consulted on all specific waste issues as WM-DO is responsible for compliance with safe packaging and transportation requirements to off-site receiving facilities.

3.4 Storing Waste

Waste Generators and TSFs will store their waste in accordance with the requirements listed below.

3.4.1 Waste Areas

Waste Generators are responsible for ensuring that on-site waste accumulation and temporary storage (e.g., less-than 90-day storage areas) are conducted in Registered Waste Areas. For more detailed instruction see the following:

- ADESH-TOOL-206, *Hazardous Waste;*

- 300 Series Tools, (*Radioactive Waste*);
- 400 Series Tools, (*Universal Waste*);
- 500 Series Tools, (*NM Special Waste*);
- ADESH-TOOL-712, *Polychlorinated Biphenyl (PCB) Waste;* and
- ADESH-TOOL-716, *Used Oil for Recycle*.

TSFs can meet the requirements in the LANL Hazardous Waste Facility Permit by operating to the 800 Series Tools, (*Treatment, Storage, and Disposal Facilities*).

The WMC must also certify waste protection and storage by evaluating the waste and using ADESH-TOOL-300, *General Radioactive Waste Management*, and P930-1, *LANL Waste Acceptance Criteria*.

3.4.2 Site Treatment Plan (STP) for Mixed Transuranic (MTRU) and Mixed Low-Level Waste (MLLW) at TSFs

In accordance with the Site Treatment Plan (STP), LANL must report to NMED all MTRU waste and MLLW that will be stored at the Laboratory after 1-year of its accumulation start date. For STP waste containers, the start date refers to the date of receipt for storage at the LANL TSF. The STP summarizes the status of the current inventory, describes the progress being made to dispose of the waste, identifies treatment and disposal options for addressing the STP inventory, and provides overall schedules for management and disposition of mixed waste to demonstrate compliance with Land Disposal Requirement storage prohibitions under the RCRA and demonstrates compliance with the Federal Facility Compliance Order issued by NMED under the New Mexico Hazardous Waste Act.

To meet these compliance requirements, Waste Generators must notify the STP Manager via e-mail at least three months prior to the waste exceeding its 1-year accumulation start date that their waste must be added to the STP. The Waste Generators must provide the following:

- for MLLW and MTRU waste, an explanation as to why the waste will exceed its 1-year accumulation start date; and
- for MLLW only, compliance milestone dates when waste will be shipped off-site for treatment and disposal.

3.4.3 Radioactive Waste Management Basis

For Radioactive Waste, the FOD or RLM must submit Form 2107, *Radioactive Waste Management Basis Report Form* (RWMB) to WM-DO. The Waste Generator must submit an updated RWMB to WM when there are changes in facility operations or waste status. For assistance in completing the RWMB, contact WM-DO. The LANL RWMB consists of

- identification of the generating process owner;
- identification of every area where radioactive waste is generated;
- identification of waste management activities;
- reference to documents that support the RWMB;
- institutional documents applicable to waste management;
- waste authorization basis documents pertinent to the waste generating facility;
- waste management processes within the facility and their locations;

- waste matrix (solid or liquid);
- waste categories generated, i.e., LLW, MLLW, TRU, and MTRU;
- volumes of generated waste by matrix, category, and annual estimates;
- characterization methods for each waste stream;
- how waste certification is protected when waste is transported;
- how waste certification is protected during waste storage;
- how the waste management quality assurance program protects waste certification; and
- proposed disposition for each waste stream (reported under "Life-Cycle Waste Management").

WM-DO then reviews, edits, and forwards the RWMB to the DOE Field Element Manager for review and approval. WM-DO monitors compliance and is responsible for reporting the status of compliance to the DOE Field Element Manager. If WM-DO detects radioactive waste activities that were not included in the RWMB, WM-DO will notify the FOD or RLM to submit an updated RWMB with a description of the newly identified activities. DOE will not approve radioactive waste management activities that were not included in the RWMB, and may terminate the activities if not reported.

WM-DO may allow facilities to generate radioactive waste without continuous updates to the RWMB, e.g., remedial projects, superfund projects, etc., so long as

- the facilities (1) are performing work in accordance with EP-DIR-SOP-10021, *Characterization and Management of Environmental Programs Waste* and (2) have provided WM-DO a completed and signed Waste Characterization Strategy Form (WCSF); and
- WM-DO has approved the work being performed at the facility and DOE concurrence has been obtained by WM-DO.

3.4.3.a Storage Extension Requests

If a determination is made that radioactive waste cannot be shipped for final disposition within one year of waste generation, the FOD or RLM (or Facility Point of Contact) must submit a request for storage extension to WM-DO at least three months before exceeding the one year expiration of the date the container was sealed. The storage extension request must be submitted by e-mail an updated RWMB that contains

- a checked box, "Extension Request;"
- a specific description of the waste;
- a specific description of the location of the waste;
- the specific length of time it will take to dispose of the waste; and
- the reason the extension is needed.

After reviewing the request, WM-DO will send a letter to the DOE Field Element Manager at least 60 days prior to the storage expiration requesting DOE approval for continued storage. If DOE approval has not been received and the waste is nearing the storage expiration, the Waste Generator must notify WM-DO via e-mail at least three days prior to the expiration date that DOE approval has not been received. If approval for extension is not granted, DOE will provide direction back to WM-DO.

Note: If WM-DO discovers that an extension request was never submitted, WM-DO will initiate a PFITS issue in accordance with P322-4, *Laboratory Performance Feedback and Improvement Process*.

3.4.4 Processing Waste at Treatment and Storage Facilities (TSFs)

Waste processing at TSFs is conducted within storage units and includes all activities that require opening of a container after it has been characterized and sealed, including but not limited to sorting, segregating, repacking, and resizing of waste. TSFs cannot engage in any sorting, segregating, repackaging, or resizing activities that involve the addition of any new material (e.g., sorbents, inert materials, secondary waste) or an activity that could potentially change the chemical or physical composition of the waste (i.e., that could constitute "waste treatment"). These activities at TSFs must be described in the LANL Hazardous Waste Facility Permit or a permit modification is required. If processing will require a change to the physical, chemical or biological character or composition of the waste, or any secondary material will be added to the waste, a permit modification may be required and Environmental Protection-Compliance Programs (ENV-CP) must be contacted via e-mail. Waste processing activities are conducted in the areas outlined in ADESH-TOOL-810, *Waste Processing at Permitted Units*.

3.4.5 Treating Waste

Waste Generators and TSFs cannot engage in waste "treatment" activities unless one of two conditions exist

- the waste treatment is authorized under the LANL Hazardous Waste Facility Permit; or
- the waste treatment is exempt from permitting requirements.

Waste treatment, as broadly defined, includes "any method ... or process ... designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste nonhazardous; less hazardous; (or) safer to transport, store, or dispose of" (40 CFR Section 260.10, *Hazardous Waste Management System: General, Definitions*). Waste treatment may be conducted under the LANL Hazardous Waste Facility Permit or interim status documents as outlined in the following:

- ADESH-TOOL-903, *TA-55 Storage in Tanks and Treatment by Stabilization*;
- ADESH-TOOL-904, *Treatment by Open Burning*; and
- ADESH-TOOL-905, *Treatment by Open Detonation*.

All LANL workers and subcontractors must contact ENV-CP prior to engaging in an activity that may constitute waste treatment (e.g., addition of sorbents or evaporation). Requirements for other permit exempted treatment that do not have specific location requirements (i.e., Waste Generator areas or TSFs), are found in ADESH-TOOL-901, *Elementary Neutralization* and ADESH-TOOL-902, *Absorption without a Permit*.

3.5 Shipping Waste

Once the waste is ready for shipment, the Waste Generator must contact the WCO, who serves as the LANL Point of Contact for the off-site receiving facility and the Los Alamos Field Office. The WCO reviews the appropriate documentation pertaining to the off-site receiving facility and/or the Los Alamos Field Office, such as the TSDF waste profiles, DOE profiles, subcontracts, etc.

3.5.1 Shipments of Radioactive Waste to Non-Department of Energy (DOE) Treatment, Storage, and/or Disposal Facilities (TSDFs)

If a Waste Generator would like to send waste to a facility that is not owned or operated by DOE, the Laboratory must obtain an "exemption request for direct off-site shipment of Radioactive Waste to Non-DOE and TSDFs" (DOE O 435.1 Exemption Request). To obtain this exemption, the Waste Generator must send an e-mail to WM-DO identifying

- the specific waste stream with background description (including radioactivity);
- the exact location and volume of waste to be generated or placed in a container; and
- the length of time needed to complete the project's waste disposition.

WM-DO reviews the e-mail and coordinates the shipment with appropriate LANL workers, organizations and subcontractors. WM-DO and LANL's shipping subcontractor prepare the DOE O 435.1 Exemption Request, which includes a cost analysis and description of the Waste Generator's request. WM-DO then submits the final DOE O 435.1 Exemption Request to the DOE Los Alamos Field Office.

The DOE Los Alamos Field Office will review WM-DO's submittal and evaluate the request. If approved, the DOE Los Alamos Field Office will forward the request to DOE Headquarters. WM-DO will be notified if the request has been approved by DOE. If notification is not received within 15 working days from WM-DO's submittal to the DOE Los Alamos Field Office, WM-DO will contact the DOE Los Alamos Field Office for a documented response.

3.6 Disposing Waste

LANL does not have on-site disposal capacity for RCRA, TRU, or MLLW wastes. LANL retains limited capacity for on-site disposal for LLW under special circumstances and with prior approval from WM-DO. WM-DO will determine the optimal disposal path for each waste stream in consultation with its disposal subcontractor(s) and DOE and based on a cost benefit analysis of available options. Primary consideration will be given to off-site DOE TSDFs, commercial TSDFs approved by DOE, and on-site disposal respectively.

All waste shipments (on-site and off-site) must be coordinated through WM-DO. This process supports waste certification to final TSDF destination.

3.7 LANL's Oversight of Waste Management

Compliance oversight at LANL occurs throughout the life-cycle of waste planning, minimization, generation, characterization, accumulation, packaging, management and disposition. ENV-CP provides guidance on DOE Directives and State Regulatory requirements. Waste management operations, including waste certification, are conducted by WM-DO to meet additional requirements from DOE Directives. Internal assessments and external inspections are performed to ensure institutional waste management compliance is met and waste certification is maintained.

3.7.1 Certification Assessments for All Waste Types

To certify that facility waste operations are in accordance with WM-PROG-QP-250*, Radioactive Waste Facility Certification,* and ADESH-TOOL-300, *General Radioactive Waste Management*, WM-DO performs compliance assessments at a facility level against DOE O 435.1, *Radioactive Waste Management,* DOE M 435.1, *Radioactive Waste Management Manua*l, RCRA regulations, and this document*.* These assessments are documented in an Independent Assessment report in

accordance with P328-2, *Independent Assessment*, and distributed to the FOD, RLM and participants after the assessment has been completed.

Assessments include, but are not limited to

- an effectiveness evaluation to determine the nature of any pre-existing problems. When pre-existing problems are found, the assessment team reviews corrective actions that have been taken and determines whether the corrective actions are effective for continuous quality improvement;
- an evaluation of registered waste areas for waste certification compliance. RCRA corrective actions and opportunities for improvement must be reported to Environmental ENV-CP;
- an inspection of the registered waste area and review of the inspection records;
- a tracking and review of past corrective actions resulting from independent assessments conducted by other LANL organizations, DOE, or their contractors, if possible and;
- a review of nonconformance and corrective action documentation and, when appropriate, an action plan to periodically monitor facilities to ensure appropriate corrective actions are being taken.

WM-DO must notify the FOD and RLM in advance of upcoming site visits and assessments. Registered waste area information will be recorded and tracked in a database managed by ADESH.

3.7.2 LANL Self-Assessment

DOE and NMED expect LANL to assess compliance of the Waste Generator's waste management activities and TSF permit compliance. Waste Generator assessments include but are not limited to, accumulation and registered waste areas, LANL inspection forms, containers or tanks, labels, time limits, worker health and safety practices, and the Waste Generator's records and training records. Compliance evaluations routinely include sites outside registered areas (see the ADESH-FSD for requirements on various registered waste areas including TSF requirements). Assessments of registered waste areas are performed by WM-DO and ENV-CP in addition to periodic Independent Assessments (see P328-2, *Independent Assessment*) and Management Assessments (see P328-3, *Management Assessment*).

Waste Generators and TSFs must retain waste documents and records in accordance with PD1020*, Document Control and Records Management.*

3.8 Waste Certification

The LANL Waste Certification Program was developed, documented and implemented to ensure that the waste acceptance requirements of off-site facilities receiving waste for storage, treatment, and disposal are met. LANL waste management components that are provided complex wide support waste certification.

Waste certification is a process by which a Waste Generator affirms that waste meets the waste acceptance criteria of the off-site facility to which the Waste Generator intends to transfer the waste for treatment, storage, and disposal. As such, LANL's Waste Certification Program includes the waste certifying process from generation to disposition (cradle-to-grave) for all regulated wastes. Identifying, characterizing and recharacterizing waste with consideration for associated hazards and signing the WSP certification statement is conducted by the Waste Generator and WMC. Assuring compliance performance includes waste verification, storage certification, packaging certification, data management, and STP and RWMB reporting. Finally, preparing waste for shipment, disposal acceptance, final disposition and on-going assessments completes LANL's Waste Certification Program.

Waste certification includes WM-DO providing oversight of Waste Generator activities to meet the requirements of this document and the waste acceptance criteria of the receiving TSDF. LANL's Waste Certification Program includes compliance for all waste types. Fig. 2 illustrates key components of LANL's Waste Certification Program.

Fig. 2. Key components of the LANL Waste Certification Program

4.0 RESPONSIBILITIES

4.1 Facility Operations Director (FOD)

- If needed, issues local-level procedures for waste management activities in accordance with Section 3.1.
- Routes local level procedures through review and approval process adopted by WM-DO.
- Ensures completion and management of their facility's *Radioactive Waste Management Basis Report* (RWMB Form 2107, *Radioactive Waste Management Basis Report Form*).

4.2 Responsible Line Manager (RLM)

- Participates and encourages others' participation in WM-DO's assessment for facility certification.
- Assists in the management and implementation of corrective actions, findings and opportunities for improvement regarding their facilities.
- Ensures waste management compliance at their facilities.

4.3 Waste Management Division Leader

- Ensures waste management compliance processes are implemented across the Laboratory.
- Ensures waste management oversight processes are implemented.

- Acknowledges the process by which local waste management procedures are reviewed and approved before they are issued or implemented.
- Initiates the review of waste characterization documentation by subject matter experts when new information or discrepancies in waste characterization are discovered.
- Monitors work in progress and conducts effectiveness evaluations (i.e., through facility assessment and waste verification).
- Documents compliance or noncompliance with characterization/certification requirements.
- Identifies the facility's waste management quality assurance program and how it protects waste certification and the proposed disposition for each waste stream.
- Performs re-evaluation and verification of characterization information for facilities' waste generation operations.
- Evaluates corrective actions regarding waste management as timely or untimely.
- Reports corrective action regarding waste management adequacy to management.
- Provides notification to facility RLMs of the status and performance of activities under assessment.
- Documents facility waste certification reviews resulting from internal (e.g., Authorization Authority) or external (e.g., DOE) audits and assessments, tracking corrective actions and reporting observations to management.
- Determines whether waste management staging/storage facilities and systems are adequate to certify waste and to maintain waste certification until shipment.
- Ensures LLW/MLLW waste containers are certified by a qualified Waste Package Certifier (WPC).
- Completes receiving facility documentation and notifications for LANL.
- Maintains LANL facility operations certification and off-site receiving facility certification.
- Provides WCO disposition approval for final TSDF destination.
- Performs LANL Self Assessments of radioactive waste staging and storage areas in accordance with Section 3.7.2.
- Ensures that the WCO and designees certify waste for disposition to off-site TSDFs.
- Performs annual verification of the waste characterization of one percent of the total number of hazardous waste streams characterized solely by acceptable knowledge and managed at TA-54 in the previous calendar year.
- Provides notification and reporting to regulatory oversight bodies.
- Provides WMC qualification training.

4.4 Waste Management Coordinators (WMCs)

- Certify waste for storage in LANL's registered storage areas.
- Verify waste containers or tanks meet the requirements for transfer into storage at their facility or verify waste can be transferred to a TSF or TSDF.

- Ensure waste characterization and acceptable knowledge documentation is accurate, defensible, and complete.
- Ensure waste meets accepting facility WAC and follows the ADESH-FSD processes.
- Ensure the WSP is completed and submitted in WCATS.
- Support Waste Generators in internal assessments and external inspections.
- Ensure waste containers are closed in accordance with manufacturer's instructions prior to shipment.
- Ensure waste container or tank is adequate to protect the waste against external sources of contamination, and ensure waste management integrity and compatibility.

4.5 Environmental Protection - Compliance Programs (ENV-CP) Group Leader

- Directs the waste management compliance process.
- Coordinates information and compliance requests and activities with regulators.
- Manages the ADESH-FSD collection.
- Receives information on RCRA corrective actions and opportunities for improvement from WM-DO's assessment of facility certification.
- Ensures that LANL Self Assessments in accordance with Section 3.7.2 are performed.
- Assists WM-DO by providing regulatory information and institutional guidance on waste management requirements.
- Maintains the LANL Hazardous Waste Facility Permit and is responsible for developing permit modification requests.

4.6 Waste Generators

- Comply with the requirements in this document and other requirements documents referenced herein.
- Characterize waste pursuant to the requirements in this document and the ADESH-FSDs.
- Before waste is generated and/or packaged, conduct waste avoidance or minimization analysis in consultation with the WMC.
- Ensure adequacy of the documentation used for waste characterization (acceptable knowledge and physical/chemical analysis).
- Maintain registered waste areas within their span of control.
- Manage on-site storage as required in this document.
- Initiate the WSP.
- Notify the STP Manager via e-mail, at least three months prior to the waste exceeding its 1-year accumulation start date that their waste must be added to the STP.

5.0 IMPLEMENTATION

The requirements in this document are effective on the issue date. All ADESH FSDs that are referenced in this document will be reviewed and updated by December 31, 2015, in accordance with ADESH-AP-007, *Document Control* and PD311, *Requirements System and Hierarchy*. The FSDs will be reviewed and updated on a three year schedule beginning with the issue date of P409, Rev.5.

6.0 TRAINING

The training courses listed in this section are required for all workers who generate waste (except office trash) and workers who manage waste or work at TSFs. Workers must notify their managers of expired training. Unless specified, there is no grace period for the training requirements below; this training must be completed and kept current.

Note: Site-specific training may be required and directed by RLMs.

6.1 Waste Generators and WMCs must complete:

- Course #23263, *Waste Generation Overview Live*; and
- Course #21464, *Waste Generation Overview Refresher SS*, every three years.

6.2 Persons who work in, or are owners of, less-than-90-day waste accumulation areas must complete:

- Course #7488, *RCRA Personnel Training*, and
- Course #28582, *RCRA Refresher (Self-Study)*, every twelve months.

Note: The RCRA-related training listed above must be completed within six months of employment or new assignment; during this period, workers must work under the supervision of a trained worker.

6.3 Persons who work in TSFs must complete:

- Course #7488, *RCRA Personnel Training*;
- Course #28582, *RCRA Refresher (Self-Study)*, every twelve months; and
- Course #23263, *Waste Generation Overview Live*.

Note: The RCRA-related training listed above must be completed within six months of employment; during this period, workers must work under the supervision of a trained worker.

6.4 Remediation Workers must complete:

- Course #23263, *Waste Generation Overview Live;*
- Course #4464, *HAZWOPER: General Site Worker*, or Course #4465, *HAZWOPER: Limited Site Worker*;
- Course #28652, *HAZWOPER: Refresher*, every twelve months;
- Course #7488, *RCRA Personnel Training*;
- Course #28582, *RCRA Refresher (Self-Study)*, every twelve months; and

or other courses as assigned by the supervisor.

7.0 EXCEPTION OR VARIANCE

Changes in the processes conducted at the TSF or changes to the TSF structure must be reviewed by ENV-CP for necessary permit modifications. Hazardous waste treatment activities that are not authorized by the LANL Hazardous Waste Facility Permit or interim status documents must be reviewed by ENV-CP for regulatory compliance.

8.0 DOCUMENTS AND RECORDS

8.1 Office of Record

The Policy Office is the Laboratory Office of Record for this Institutional Document and maintains the administrative record.

8.2 Waste Management Records

WM-DO and ENV-CP work with Waste Generators, FODs and RLMs to ensure that the following records and documentation are kept in accordance with PD1020, *Document Control and Records Management*:

- WCATS for waste characterization
- Form 2107, *Radioactive Waste Management Basis Report Form*
- *RWMB Storage Extension Request*
- DOE O 435.1, *Exemption Request*
- STP plan and correspondence to and from NMED
- Independent Assessment Reports
- Trend analysis on waste management data
- ADESH database containing Registered Waste Area information
- Inspection Forms

9.0 DEFINITIONS AND ACRONYMS

9.1 Definitions

See LANL *Definition of Terms* and ADESH-TOOL-101, *Waste Management Glossary*.

9.2 Acronyms

See LANL *Acronym Master List*.

ADESH	Associate Director for Environment, Safety, and Health
AP	Administrative Procedures
DEAR	Department of Energy Acquisition Regulation
DOE	Department of Energy
DOT	Department of Transportation
ENV-CP	Environmental Protection-Compliance Programs
EPA	Environmental Protection Agency
ER	Environmental Restoration
FOD	Facility Operations Director
FSD	Functional Series Documents
IA	Issuing Authority
LANL	Los Alamos National Laboratory
LLW	Low-Level Waste
M	Manual
MLLW	Mixed Low-Level Waste

MSDSs	Material Safety Data Sheets
MTRU	Mixed Transuranic
NCR	Nonconformance Report
NMED	New Mexico Environment Department
NNSS	Nevada National Security Site
O	Order
OP	Operating Tools
PFITS	Performance Feedback and Improvement Tracking System
PRID	Permits and Requirements Identification
PM	Project Management
RCRA	Resource Conservation and Recovery Act
RLM	Responsible Line Manager
RM	Responsible Manager
RO	Responsible Office
RWMB	Radioactive Waste Management Basis
SBP	Safety Basis Procedure
SOP	Standard Operating Procedure
STP	Site Treatment Plan
TP	Technical Procedure
TRU	Transuranic
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and/or Disposal Facility
TSFs	Treatment Storage Facilities
WAC	Waste Acceptance Criteria
WAP	Waste Analysis Plan
WCATS	Waste Compliance and Tracking System
WCO	Waste Certification Official
WCSF	Waste Characterization Strategy Form
WSP	Waste Stream Profile
WM	Waste Management
WMC	Waste Management Coordinator
WM-DO	Waste Management-Division Office

10.0 HISTORY

Revision History		
03/27/08	P409, Rev. 0	Initial Issue. This document and its linked Waste Management Tools replaces and cancels the Laboratory Implementation Requirements (LIRs) and Laboratory Implementation Guidance (LIG) listed below. The LIRs will remain in force and effect for each nuclear facility until that facility completes the Unreviewed Safety Question (USQ) or Unreviewed Safety Issue (USI) review determinations. ▪ LIG 404-00-02, *Acceptable Knowledge Guidance*

Revision History		
		▪ LIR 404-00-02, *General Waste Management Requirements* ▪ LIR 404-00-03, *Hazardous and Mixed Waste Requirements* ▪ LIR 404-00-04, *Managing Solid Waste* ▪ LIR 404-00-05, *Managing Radioactive Waste* ▪ LIR 404-00-06, Managing Polychlorinated Biphenyls
05/22/08	P409, Rev. 1	Section 6.0 Training: Changed Waste Profile Form Signers to Waste Generators and removed Waste Documentation Forms from the Waste Generators list.
06/04/10	P409, Rev. 2	Extensive revision: Clarified training requirements and responsibilities, corrected links to tools, clarified tool creation process, and simplified the document.
03/19/12	P409, Rev. 3	This document cancels RN0808, *Requirements for Recycling Metal from Areas posted for Radiological Hazards*. Section 6.0: Separated the third bullet into two bullets, reflecting the separate training requirements for persons who work in Treatment, Storage, and/or Disposal Facilities (TSDFs) and Remediation Workers, to align with the Laboratory's Hazardous Waste Permit. Added Course #23263, *Waste Generation Overview Live,* as a training requirement for persons who work in TSDFs and Remediation Workers.
04/10/13	P409, Rev. 4	Removed references to cancelled Form 1346, *Waste Profile Form*, which has been replaced by the Waste Stream Profile (found in the Waste Compliance and Tracking System (WCATS). Section 5.0: Updated to reflect effective date of May 28, 2013 for applicable nuclear, high- and moderate-hazard facilities and accelerators. Performed three year review in accordance with PD311, *Requirements System and Hierarchy*. Updated links, titles, and acronyms.
07/30/15	P409, Rev. 5	Performed three-year review in accordance with PD311, *Requirements System and Hierarchy*. This document cancels P930-2, *Radioactive Waste Certification Program* and P930-3, *Off-Site Shipment of Chemical, Hazardous, or Radioactive Waste.* Although this is not "a new document," it is a complete re-write of P409, Rev. 4 as the requirements from P930-2 have been merged with this document. P409 title has also changed to "LANL Waste Management."

11.0 REFERENCES

Prime Contract:

- DEAR 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution (Dec. 2000)
- Part II, Section H-83 (DEAR 5223-1)
- Part III, Section J, Appendix B 4.2

- Part III, Section J, Appendix G
- Appendix B, Statement of Work: §1.0 General
- DOE O 435.1, *Radioactive Waste Management*
- DOE M 435.1-1, *Radioactive Waste Management Manual*
- DOE O 436.1, *Departmental Sustainability*
- 40 CFR Section 260.10, *Hazardous Waste Management System: General, Definitions*
- DOE O 458.1, *Radiation Protection of the Public and the Environment*

11.1 Other References

- LANL Hazardous Waste Facility Permit
- P930-1, *LANL Waste Acceptance Criteria*
- *Resource Conservation and Recovery Act* (RCRA)
- Toxic Substances Control Act (TSCA)
- New Mexico Special Waste Act
- 74-9-1 NMSA 1978, *Solid Waste Act*
- 74-4-1 NMSA 1978, *Hazardous Waste Act*
- PD311, *Requirements System and Hierarchy*
- ADESH-AP-007, *Document Control*
- SBP-112-3-R1.2, *Unreviewed Safety Question (USQ) Process*
- P315, *Conduct of Operations Manual*
- ADESH-TOOL-213, *No Owner Waste*
- ADESH-TOOL-114, *Office Waste Tool*
- ADESH-TOOL-111, *Waste Characterization*
- ADESH-TOOL-314, *Radioactive Characterization*
- PD400, *Environmental Protection*
- Waste Compliance and Tracking System (WCATS)
- ADESH-TOOL-306, *Potentially Radioactive or Mixed Investigation-Derived Waste*
- P411, *Authorized Release Limits Proposal Process*
- RP-SOP-077.004, *LANSCE Metals Clearance Process*
- RP-SVS-RIC-TBD-03, *Technical Basis Documentation Regarding Health Physics Measurements for the Unrestricted Release of Metals from LANSCE*
- WM-PROG-QP-236, *Waste Certification Program Waste Verification*

- ADESH-TOOL-600, *Certification, Documentation, Shipment of ChemHaz*
- ADESH-TOOL-206, *Hazardous Waste*
- 300 Series Tools, (Radioactive Waste)
- 400 Series Tools, (*Universal Waste*)
- 500 Series Tools, (*NM Special Waste*)
- ADESH-TOOL-712, *Polychlorinated Biphenyl (PCB) Waste*
- ADESH-TOOL-716, *Used Oil for Recycle*
- 800 Series Tools,(*Treatment, Storage and Disposal Facilities*)
- ADESH-TOOL-300, *General Radioactive Waste Management*
- EP-DIR-SOP-10021, *Characterization and Management of Environmental Programs Waste*
- P322-4, *Laboratory Performance Feedback and Improvement Process*
- ADESH-TOOL-810, *Waste Processing at Permitted Units*
- ADESH-TOOL-903, *TA-55 Storage in Tanks and Treatment by Stabilization*
- ADESH-TOOL-904, *Treatment by Open Burning*
- ADESH-TOOL-905, *Treatment by Open Detonation*
- ADESH-TOOL-901, *Elementary Neutralization*
- ADESH-TOOL-902, *Absorption without a Permit*
- WM-PROG-QP-250*, Radioactive Waste Facility Certification*
- P328-2, *Independent Assessment*
- P328-3, *Management Assessment*
- PD1020*, Document Control and Records Management*
- PD311, *Requirements System and Hierarchy*
- ADESH-TOOL-101, *Waste Management Glossary*

12.0 FORMS

Form 2107, *Radioactive Waste Management Basis Report Form*

13.0 ATTACHMENTS

There are no attachments associated with this document.

14.0 CONTACT

Waste Management Division Office
Telephone: (505) 667-2211
Fax: (505) 667-1945
Website: http://int.lanl.gov/org/padops/adesh/waste-management/index.shtml

IMPORTANT

If you wish to receive credit for the preceding document you **must** enter the course through U*Train* **not** the Policy Office website.

Identifier: **SOP-5255**	Revision: **1**	
Effective Date: 01/21/2010	Next Review Date: 01/21/2014	

Environmental Programs
Waste and Environmental Services

Standard Operating Procedure

for **SHIPPING OF ENVIRONMENTAL SAMPLES BY THE WES SAMPLE MANAGEMENT OFFICE (SMO)**

APPROVAL SIGNATURES:

Subject Matter Expert:	**Organization:**	**Signature:**	**Date:**
Keith Greene	WES-EDA	Signature on file	01/21/2010
Responsible Line Manager:	**Organization:**	**Signature:**	**Date:**
Craig Eberhart	WES-EDA	Signature on file	01/21/2010

1.0 PURPOSE AND SCOPE

This purpose of this procedure is to describe the process for shipping environmental samples from the Los Alamos National Laboratory (LANL or Laboratory) Environmental Programs (EP) Directorate Waste and Environmental Services (WES) Sample Management Office (SMO) to analytical laboratories.

The work specified in this procedure will be conducted in accordance with the applicable sampling activity Integrated Work Documents, in accordance with LANL IMP 300-00-00, Integrated Work Management for Work Activities, or with the applicable sampling activity Hazard Review.

2.0 BACKGROUND AND PRECAUTIONS

2.1 Background

The chain-of-custody process provides confidence and documentation in analytical data integrity by establishing the traceability of the data from the time of collection, to delivery, through processing, to final maintenance as a record.

2.2 Precautions

Chain-of-custody must be maintained for legally defensible environmental sampling.

3.0 EQUIPMENT AND TOOLS

None

4.0 STEP-BY-STEP PROCESS DESCRIPTION

4.1 Receipt of Samples for Shipment		
Sample Management Office (SMO) Personnel	1.	Accept samples only if they are described on completed chain-of-custody forms. Completed chain-of-custody forms include date and time of sample collection, acknowledgement that containers are accounted for or canceled, annotation for any container deviations, and representation for field screening results. Acceptance is also contingent on the custody seals being in place. Once the above has been verified Relinquished and Received signatures and date/time must be completed.
	2.	Immediately after the samples are properly received at the SMO, store in secondary containment (for breakable storage containers) and place in refrigerated storage area where applicable until they are prepared for shipment to the analytical laboratory.

4.2 Packaging of Samples for Shipment

SMO Personnel	1.	Seal and secure the drainage hole at the bottom of the cooler in case of sample container leakage.
	2.	Pack individual sample containers to prevent breakage and transport in a sealed cooler with ice or other suitable coolant, or other EPA or industry-wide accepted method.
	3.	First, individually wrap glass bottles in plastic to contain sample if breakage during shipment. Then wrap in cushioning material to help prevent breakage.
	4.	Protect plastic containers from possible puncture during shipping using cushioning material.
	5.	Include temperature blanks with each shipping container.
	6.	Apply chain-of-custody seals to each cooler prior to shipment of samples from LANL to the designated analytical laboratory.
	7.	Include the chain-of-custody form and analytical request form within the sealed storage container to be delivered to the analytical laboratory. Samples may be bundled and shipped to the analytical lab. In this case, chain-of-custody analytical request forms are also bundled with the shipment and placed in one of the shipping containers. The paper work is also faxed to the analytical lab in case the shipping containers get separated in transit. However, some programs can not be bundled. Samples associated with NPDES compliance, UN2910 Rad and New Mexico Special waste (high TPH) must be shipped in their own shipping container with its corresponding paperwork.

4.3 Submission of Samples to Analytical Laboratory

SMO Personnel	1.	Ship each cooler, or other shipping container, directly to the analytical laboratory.
	2.	Submit all samples to the laboratory in a timely manner to allow the analytical laboratory to conduct analyses within analytical method holding times.

4.4	Records	
Sampling Personnel and/or SMO Personnel	1.	Complete Form 1701 Records Transfer Request form and send to IRM-RMMSO to capture records being transferred to the offsite Federal Records Center (FRC) in Denver, CO. Prepare, package and submit records and/or documents directly to the offsite FRC: • Completed field chain-of-custody forms. • Completed Analytical Request forms. • Analytical data package results generated from the collected samples. • Data validation reports corresponding to the analytical data package.

5.0 PROCESS FLOW CHART

None

6.0 ATTACHMENTS

None

7.0 REVISION HISTORY

Revision No. *(Enter current revision number, beginning with Rev.0.0)*	**Effective Date** *(DCC inserts effective date for revision)*	**Description of Changes** *(List specific changes made since the previous revision)*	**Type of Change** *(Technical [T] or Editorial [E])*
0.0	8/16/07	New document.	T/E
0.0	12/21/09	New document. Supersedes EP-ERSS-SOP-5095.	T/E
1.0	1/21/10	Minor change to Section 4.4, to reflect ADEP Records Management procedures.	T/E

Click here for “Required Read” credit.

Operations Procedure

TA-03 CoGen Plant – Spill Prevention Control and Countermeasures (SPCC) Compliance

Review frequency: 1 yr ☐ 2 yr ☐ 3 yr ☒

Process Owner	Signature	Date
Pablo C de Vaca		2-2-15
CoGen Plant Operations Specialist		

Reviewed by	Signature	Date
Paul Parker		2/2/2015
CoGen Plant System Engineer		

Reviewed by	Signature	Date
Phil Romero	Phil Romero	2-2/2015
ESH Manager		

Approved by	Signature	Date
Lawrence Chavez		2/2/15
Operations Manager		

Reviewed by	Signature	Date
HENRY VIGIL		2/3/15
Derivative Classifier	Unclassified	

History of Revisions

Document Number	Issue Date	Action
UI-PROC-66-20-020-R1	2-3-15	Review and reissue with changes.
UI-PROC-66-20-020-R0	10/22/12	Convert to Utilities & Institutional Facilities (UI) procedure. Minor changes to organization and formatting.
66-20-020 Rev. 1	06/20/06	Converted to KSL template. Minor modifications to content.

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Utilities & Institutional Facilities
Operations Procedure

TA-03 CoGen Plant – Spill Prevention Control and Countermeasures (SPCC) Compliance

1 Purpose

The purpose of this procedure is to ensure (a) that TA-03 CoGen Plant Spill Prevention Control and Countermeasures (SPCC) Plan requirements are met and (b) that the CoGen Plant remains in compliance with the SPCC Plan through inspections, record keeping, and implementation.

2 Scope/Applicability

1. This procedure lists inspections, record keeping, and implementation needed for TA-03 compliance.
2. Affected personnel: CoGen Plant Operations Specialist and other CoGen Plant personnel

3 Prerequisites

1. Required training and qualifications:
   a. Understanding of Utilities & Institutional Facilities (UI) procedures and work processes
   b. Qualification in accordance with UI work control processes and Occupational Safety and Health Administration (OSHA) requirements
   c. Current on UI training
   d. Understanding of this procedure and its operations, equipment, tools, parts, supplies, etc.
   e. On-the-job training (OJT)
   f. Lockout/Tagout (LO/TO) training per P101-3, Lockout/Tagout for Hazardous Energy Control
2. Pre-job briefing

4 Precautions and Limitations

1. All hazards, both task specific and site specific, must be addressed in accordance with governing work control processes.

2. Required Personal Protection Equipment (PPE):
   - Hardhat
   - Safety glasses with side shields
   - Splash-proof chemical face shield
   - Hearing protection
   - Long-sleeve shirt
   - Rubber gloves and boots
   - Rubber suit or rubber jacket and pants

5 Equipment, Supplies, etc.

Supplies, materials, parts:

- Zorball soak pads
- Containment berms

6 Responsibilities

1. Persons performing this procedure are responsible for—
   - Complying with its requirements
   - Notifying Foreman or Superintendent of equipment damage or other conditions that could require corrective action
   - Issuing a PAUSE/STOP WORK order whenever warranted by conditions related to health or safety in accordance with P101-18, Procedure for Pause/Stop Work
2. Managers are responsible for ensuring procedure compliance.
3. CoGen Plant Shifthead or designee is responsible for conducting a walk-around (visual inspection from the ground) each day as part of routine operations and preventive maintenance.
4. CoGen Plant Operations Specialist is responsible for conducting monthly walk-around inspections to observe factors relevant to SPCC.

7 Procedural Steps

7.1 General

1. The SPCC Plan is a requirement of 40 CFR Part 112, Environmental Protection Agency – Oil Pollution Prevention Regulation. It is intended to prevent oil-related spills from polluting navigable waters of the U.S. through implementation of adequate prevention and response measures.

   Note: SPCC requirements are performance-based, which permits facility owners and operators to substitute alternative forms of spill containment if the substitute provides substantially equivalent protection against discharges to navigable waters as suggested by the systems listed in 40 CFR 112.7(c).

2. The TA-03 CoGen Plant is classified under SPCC regulations as a bulk storage facility.

3. TA-03 contains a large aboveground storage tank (AST), AST SM-2382, a cylindrical tank with a nominal capacity of 228,000 gallons,.

   a. AST SM-2382 is used only for storage of #2 fuel oil.

   b. All underground fuel oil piping is cathodically protected.

   c. The SM-2382 storage tank bottom is cathodically protected.

   d. Inspections of cathodic protection piping and tanks are initiated by a Preventive Maintenance task and documented per UI-PROC-76-71-500, Inspection of Cathodic Protection on Aboveground Storage Tanks and Fuel Oil Lines.

7.2 Requirements/Compliance

7.2.1 Inspections

1. On-Shift Day CoGen Plant Shifthead or designee is to conduct a walk-around (visual inspection from the ground) each day as part of routine operations and preventive maintenance.

2. The following issues are to be observed and noted on Form 66-20-020.1, TA-03-SM-22 CoGen Plant Daily Inspection Form (Attachment 1):

   a. Spills or leaks

   b. Conditions and level of water contained in berms

   c. Obvious problems with tanks

   d. Level of Tank SM-2382 as described in Step 3

   e. Valves, plugs, fittings, or containment structures

f. General safety condition of facility

- Potential problems are to be brought to the attention of UI Facility Operations Director, CoGen Plant Operations Specialist or designee, or TA-03 Plant Foreman for corrective action.

3. CoGen Plant Operations Specialist or designee is to conduct monthly walk-around inspections. The inspection is initiated by a Preventive Maintenance Task and documented per UI-PROC-76-71-002, Aboveground Storage Tank Inspection.

4. Inspections are conducted to observe the following:

   a. Condition of tank shells

   b. Secondary containment

   c. Fuel oil level for Tank SM-2382 (must be conducted by qualified operator)

   d. Foundations and supports

   e. Pumps

   f. Piping

   g. Valves

   h. Oil

   i. Ground wires

   j. Gauges

   k. Drums (regardless of condition)

   l. Access to drum areas

   m. Drum labeling

   n. Manways

   o. Roof integrity

   p. Sample hatch

   q. Handrails and landing

   r. Vacuum breaker

   s. Water accumulations in secondary containment areas

   t. General good housekeeping practices

   Notes:

   1) Inspections are recorded and retained in Appendix A of the SPCC Plan.

   2) Oil leaks, dirt, sand, or other potential problems are to be brought to the attention of the CoGen Plant Spill Coordinator and/or Operations Specialist to respond to and make any necessary corrections.

5. Fuel oil tank quantity readings off the digital meter from Tank SM-2382 are to be recorded each day during the CoGen Plant Shifthead or designee daily walk-around and entered on Attachment 1. Data entered on Attachment 1 are also to be entered in a specified UI server location.

6. First-of-month reading is to be carried over each week until the end of month. If reading changes more than 0.2 K gallons (200 gallons) from reading taken the first day of month, CoGen Plant Operations Specialist and Steam System Engineer are to be notified to investigate and take any necessary corrective action.

   Note: If the digital meter is inoperable, report this fact to CoGen Plant Operations Specialist or Foreman.

7. Tank level readings recorded on the last day of each month are to be shown on the Monthly Quantities Report and sent to Metering Program Administrator for validation, i.e. to determine if tank quantities following delivery or usage vary downward by 0.2 K gallons or more from the validated quantity established in Section 7.2.4, Facility Loading/Unloading.

   * If they do vary downward by 0.2 K gallons or more, the Metering Program Administrator is to notify the CoGen Plant Operations Specialist and Steam System Engineer, who will investigate to determine the reason for the fuel oil reduction.

7.2.2 Spill Response, Control, and Reporting

1. UI-PROC-66-20-055-R1, TA-03 CoGen Plant – Spill Response, outlines personnel parameters for determining and making appropriate responses to any spill or unplanned release of oil, chemicals, or other substances at TA-03 CoGen Plant.

   a. Spill events in excess of one quart must be documented in Appendix C of the SPCC Plan.

   b. All spill events require notification of CoGen Plant Operations Specialist and Facility Operations Director.

   c. All spill events require notification of the Emergency Management Group (EO-3) in accordance with the SPCC Plan.

2. Spill Prevention Kits are inventoried monthly by Spill Coordinator to ensure that proper materials are available in sufficient quantity and of sufficient quality to minimize spread of oil or chemical products in the event of a spill. Inventory documents are kept on file with kits.

7.2.3 Facility Loading/Unloading

1. Number 2 fuel oil for ASTs is to be delivered by tank trucks and off-loaded at a fuel transfer area into ASTs.

   a. All loading/unloading operations at TA-03 CoGen Plant must be conducted in accordance with UI-PROC-66-20-170, Fuel Oil Delivery and Reloading onto Trucks/Tankers – Steam Plant TA-03.

b. Tank supply, return, and drain valves must be locked and closed when not in use.

2. Each AST volume is to be measured by digital meter before and after fueling operations and recorded in Operator's Daily Logbook.
3. A digital reading is to be taken after fuel is delivered or removed. Steam System Engineer must reconcile and check the validity of this value. Validated quantities must be sent to Meter Program Administrator for use as described in Section 7.2.1.

7.2.4 Training

1. TA-03 Operators are to be instructed and briefed in operation of equipment to prevent discharge of oil.
2. Employee training is conducted at least annually and more often when needed.
   a. Informal briefings and training critical to the SPCC Plan are documented and maintained in Appendix D of the SPCC Plan.

8 Records

Records generated as a result of implementing this procedure are maintained in accordance with the UI records program.

9 Abbreviations, Acronyms, and Terms

Abbreviation, Acronym, or Term	Definition
AST	Aboveground Storage Tank
CFR	Code of Federal Regulations
EO-EM	Emergency Operations – Emergency Management
ESH	Environment, Safety & Health

Abbreviation, Acronym, or Term	Definition
LO/TO	Lockout/Tagout
OJT	On-the-job-training
OSHA	Occupational Safety and Health Administration
PPE	Personal Protection Equipment
SPCC	Spill Prevention Control and Countermeasures
UI	Utilities & Institutional Facilities

10 References

40 CFR Part 112, Environmental Protection Agency – Oil Pollution Prevention Regulation

P101-3, Lockout/Tagout for Hazardous Energy Control

P101-18, Procedure for Pause/Stop Work

Spill Prevention Control and Countermeasures Plan

UI-PROC-66-20-055, TA-03 CoGen Plant – Spill Response

UI-PROC-66-20-170, Fuel Oil Delivery and Reloading Onto Trucks/Tankers – Steam Plant TA-03

UI-PROC-76-71-001, Fuel Oil Tank Soundings

UI-PROC-76-71-002, Aboveground Storage Tank Inspection

UI-PROC-76-71-010, Internal Integrity Testing of Aboveground Storage Tanks

UI-PROC-76-71-012, External Integrity Testing of Aboveground Storage Tanks

UI-PROC-76-71-500, Inspection of Cathodic Protection on Aboveground Storage Tanks and Fuel Oil Lines

UI-PROC-76-71-510, Underground Fuel Oil Line Pressure Testing

11 Appendices and Attachments

Attachment 1. TA-03-SM-22 CoGen Plant Daily Inspection Form

Attachment 1. TA-03-SM-22 CoGen Plant Daily Inspection Form

Start a new form at the beginning of each week.

TA-03 SM-22 Power Plant Daily Inspection Form

***OK = COMPLIANT** **AR = ACTION REQUIRED**

Aboveground Diesel Tank (SM 26, SM 2382)	1st Day Reading for Current Month	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Secondary Containment Berm Condition								
Tank Condition and Labels								
Secondary Containment Water Depth								
Pump House Pumps, Valves, and Fittings								
Transfer Lines/Valves Plant Building Wall								
Valve Position Closed								
Spill Control								
SM 2382 Transmitter Tank Level (kGallons)								
SM 2382 Transmitter Tank Level (feet)								
Security / Lighting								

Date / Time								
Operator								
Review / Foreman								

Remarks / Comments	

Form 66-20-020.1

Operations Procedure

Fuel Oil Delivery and Reloading – TA-03 Power Plant

Review frequency: 1 yr ☐ 2 yr ☐ 3 yr ☒

Process Owner	Signature	Date
Pablo C de Vaca	Pablo C de Vaca	11-22-13
Power Plant Operations Specialist		

Reviewed by	Signature	Date
Paul Parker	Paul Parker	11/22/2013
System Engineer		

Reviewed by	Signature	Date
Phil Romero	Phil Romero	12/4/13
ESH Manager		

Approved by	Signature	Date
Lawrence Chavez		12/11/13
Operations Manager		

Reviewed by	Signature	Date
Harold Salazar	H. Salazar	12-11-13
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UI-PROC-66-20-170-R1	12-11-13	Review and reissue with changes. New Attachment 3.
UI-PROC-66-20-170-R0	07/08/10	Convert from KSL to U&I procedure. Changed title. Minor changes to content.
66-20-170 Rev. 3	07/06/06	Converted to KSL template. Made minor modifications to content.

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Utilities & Institutional Facilities

Operations Procedure

Fuel Oil Delivery and Reloading – TA-03 Power Plant

1 Purpose

The purpose of this procedure is to provide a process for the safe handling of Number 2 fuel oil (#2, diesel) during delivery and reloading at the SM-2382 External Storage Tank.

2 Scope/Applicability

1. The SM-2382 External Storage Tank is located northeast of SM-22.
2. Affected Personnel: TA-03 Power Plant Superintendent and shift personnel

3 Prerequisites

1. Required training and qualifications:
   a. Utilities & Institutional Facilities (UI) procedures and work control processes
   b. The current procedure
   c. On-the-job training (OJT)
2. Training decision: process briefing with roster before work being performed.

4 Precautions and Limitations

Required Personal Protective Equipment (PPE):

- Earplugs
- Steel-toe shoes
- Safety glasses (with side shields)
- Long-sleeve shirt
- Hardhat

5 Equipment, Supplies, etc.

Not applicable

6 Responsibilities

1. Persons performing this procedure are responsible for—
   - Notifying Foreman or Superintendent of equipment damage or other conditions that could require corrective action
   - Issuing a PAUSE/STOP Work Order whenever warranted by conditions related to health or safety in accordance with P101-18, Procedure for Pause/Stop Work
2. Managers and Superintendents are responsible for ensuring procedure compliance.

7 Procedural Steps

Warning

Hazard: Number 2 fuel oil (diesel) is flammable. Accidental ignition will result in fire and/or explosion..

Control: Use caution at all times when working with or near Number 2 fuel oil. No cell phones, matches, lighters, or smoking are permitted at the unloading point.

7.1 General

1. The following definitions apply to this procedure:
   a. Deliveries: transference of fuel oil from a truck or tanker to the SM-2382 External Storage Tank.
   b. Reloading: transference of fuel oil from SM-2382 to a truck or tanker.
2. Deliveries of fuel oil may be scheduled only during normal working hours (7:30 am to 2:00 pm) unless prior arrangements have been made.
3. Drivers of Commercial Delivery Vehicles who need to access LANL property must stop at Post 10 on East Jemez Road for inspection and surrender Truck Inspection Pass.
4. A 3-inch camlock connection will be necessary to join to the transfer point.
5. Truck tankers require 85–90 ft of hose.

6. Maximum fill volume:
   a. Secondary containment for SM-2382 has insufficient volume to contain the gross volume capacity of the tank and freeboard to contain precipitation as required under 40 CFR 112.9 (c) (2).
   b. To ensure that secondary containment capacity is not exceeded, a maximum fill volume for Tank SM-2382 less than the gross the capacity has been established.
   c. This maximum fill volume is 179,300 gallons.
   d. Until modifications are made to provide sufficient containment capacity, this maximum fill volume may not to be exceeded.

7.2 Preliminary Steps

1. Have Lineman open disconnect on 13.2-kV/4160-kV transformer.
2. Check the fluid levels in fuel oil storage tank SM-2382 to ensure that it will not be filled beyond capacity.
3. Have the tanker enter South Gate and back into the containment berm at the Fuel Oil Unloading Dock. Inspect tanker for leaks.

   Note: To exit, tanker truck will have to back next to Cooling Tower 592 and go through South Gate.
4. Tanker truck is limited to 7500 gallons of No. 2 fuel oil.
5. The fuel oil must meet the followings standards:
   - May not be a blend containing waste oils or solvents.
   - Must contain less than or equal to 0.05% sulfur, by weight.

7.3 Transfer Fuel Oil from Tanker Truck to Storage Tank

Complete Form 66-20-170.1, Fuel Oil Delivery – Checklist (Attachment 1), while performing these steps.

Note: Valves at tank are locked. To unlock, obtain key from Control Room key box.

1. Fully close valves FO-9 through FO-16.
2. Unlock and fully open valves FO-20 and FO-18.
3. Ensure valves FO-33 and FO-30 are fully closed.
4. Fully open valves FO-31, FO-29, FO-34, and FO-32.
5. Ensure valves FO-28 and FO-46 are closed.
6. Connect the tanker hose (using 3-inch camlock connections) to the fuel oil inlet line.

7. Verify that fuel oil catch pans and absorbent pads are in place.
8. Fully open valve FO-52.
9. Have driver open tanker drain valve and start unloading pump (PTO) to begin unloading process.
10. Once the unloading process is complete, close FO-20 and FO-18 and lock.
11. Fully close valves FO-31, FO-29, FO-34, and FO-32.
12. Fully close valve FO-52.
13. Disconnect hoses and drain fuel oil in bucket.
14. Fully close valves, FO-31, FO-29, FO-34, and FO-32.
15. Fully close valve FO-52.
16. Dispose of oily rags and absorbent pads in proper waste barrels.
17. Obtain copy of the Bill of Lading from the tanker driver.
18. Loader: Complete and sign Form 66-20-170.1A, Fuel Oil Delivery to TA-03 Power Plant – Receipt from Loader (Attachment 1A).
19. Turn in completed Bill of Lading, Form 66-20-170.1, and Form 66-20-170.1A to Power Plant Superintendent.
20. Return keys to Control Room key box.

7.4 Transfer Fuel Oil from Storage Tank to Tanker Truck

Complete Form 66-20-170.2, Fuel Oil Reloading onto Trucks/Tanks – Checklist (Attachment 2), while performing these steps.

1. Utilizing Pump #1:
    a. Unlock and ensure valves FO-21 and FO-23 are open.
    b. Ensure valves FO-11 and FO-22 are closed.
    c. Ensure valves FO-38, FO-40, FO-37, and FO-39 are closed.
    d. Ensure valves FO-25 and FO-27 are open.
    e. Ensure valve FO-35 is open.
    f. Ensure valve FO-41 is closed.
    g. Ensure valve FO-46 is open.
    h. Ensure valves FO-29, FO-30, and FO-31 are closed.
    i. Ensure valve FO-33 is closed.

j. Ensure valves FO-32 and FO-34 are open.

k. Ensure valve FO-52 is closed.

Note: Open valve FO-52 after tanker hoses are connected to inlet line and tanker is ready to start receiving fuel oil.

2. Utilizing Pump #2:

a. Unlock and ensure valves FO-21 and FO-23 are open.

b. Ensure valves FO-11 and FO-22 are closed.

c. Ensure valves FO-28 and FO-26 are closed.

d. Ensure valves FO-25 and FO-27 are open.

e. Ensure valve FO-35 is closed.

f. Ensure valve FO-36 is open.

g. Ensure valves FO-38 and FO-40 are closed.

h. Ensure valve FO-42 is open.

i. Ensure valve FO-43 is closed.

j. Ensure valves FO-41 and FO-46 are open.

k. Ensure valves FO-29, FO-30, and FO-31 are closed.

l. Ensure valve FO-33 is closed.

m. Ensure valves FO-32 and FO-34 are open.

n. Ensure valve FO-52 is closed.

Note: After tanker hoses are connected to inlet line and tanker is ready to start receiving fuel oil, open valve FO-52.

3. When the tanker is 3/4 full, shut off the pump and have tanker operator close inlet valve on the tanker.

4. Fully open valves FO-29 and FO-31 in the fuel oil house.

5. Fully open valves FO-20 and FO-18.

6. Fully close valves FO-21, FO-23, FO-25, and FO-27.

7. Start the unloading pump and empty the line from the tanker's inlet valve back to the storage tank.

- This will prevent the fuel oil remaining in the line from spilling as the line is disconnected from the tanker.

8. Turn unloading pump off.

9. Close valves FO-52 FO-32, FO-34, FO-29, and FO-31.

10. Close and lock valves FO-18, FO-20, FO-21, and FO-23.
11. Disconnect tanker from the inlet line.
12. Complete Form 66-20-170.2B, Fuel Oil Reloading Delivery Receipt (Attachment 2B), showing amount of oil shipped and destination, and give to driver.
13. Loader: Complete and sign Form 66-20-170.2A, Acknowledgment of Receipt of Fuel Oil (Attachment 2A), showing the amount of oil shipped and the destination.
14. Notify receiving party/destination when the transport leaves the plant site.
15. Turn in completed Forms 66-20-170.2 and 66-20-170.2A to Power Plant Superintendent.
16. Return keys to Control Room key box.

8 Records

Records generated as a result of implementing this procedure are maintained in accordance with the UI records program.

9 Abbreviations, Acronyms, and Terms

Abbreviation, Acronym, or Term	Definition
AST	Aboveground Storage Tank
CFR	Code of Federal Regulations
CGTG	Combustion Gas Turbine Generator
ESH	Environment, Safety, and Health
UI	Utilities & Institutional Facilities

10 References

40 CFR 112.9 (c) (2)

P101-18, Procedure for Pause/Stop Work

11 Appendices and Attachments

Attachment 1. Fuel Oil Delivery – Checklist

Attachment 1A. Fuel Oil Delivery to TA-03 Power Plant – Receipt from Loader

Attachment 2. Fuel Oil Reloading onto Trucks/Tanks – Checklist

Attachment 2A. Fuel Oil Reloaded onto Truck/Tank – Driver Sign-off

Attachment 2B. Fuel Oil Reloading Delivery Receipt

Attachment 3. Fuel Oil Pump Building Configuration

Attachment 1. Fuel Oil Delivery – Checklist

Date: _____

Initials	Time	Step
_____ _____	_____ _____	1. Check the fluid levels in SM-2382 External Storage Tank to ensure that the tank will not be filled beyond capacity. If there is not sufficient capacity in the tank, stop the procedure immediately and contact the plant Superintendent.
_____	_____	2. Have the tanker enter South Gate and back into the containment berm at the Fuel Oil Unloading Dock.
Note: *Use the East Tank valve alignment to complete the following tasks:*		
_____	_____	3. Follow these steps for fuel oil transfer from tanker truck to east storage tank SM-2382:
_____	_____	a. Fully close valves FO-9 through FO-16.
_____	_____	b. Fully open valves FO-20 and FO-18. Ensure that FO-19 is fully closed.
_____	_____	c. Ensure valves FO-33 and FO-30 are fully closed.
_____	_____	d. Fully open valves FO-31, FO-29, FO-34, and FO-32.
_____	_____	e. Ensure valves FO-28 and FO-46 are closed.
_____	_____	f. Ensure valve FO-52 is fully closed.
_____	_____	4. Connect the tank's drain valve to the fuel oil inlet line.
_____	_____	5. Fully open valve FO-52.
_____	_____	6. The tanker is ready to unload fuel oil with PTO.
_____	_____	7. When tanker is done unloading, PTO will be turned off
_____	_____	8. Ensure valve FO-52 is closed.
_____	_____	9. Disconnect the tanker's drain valve from fuel oil inlet line and drain into bucket.
_____	_____	10. Dispose of oily rags and absorbent pads into proper waste barrels.
_____	_____	11. Fully close valves FO-34, FO-32, FO-29, and FO-31 at the fuel house.
_____	_____	12. Ensure that valves FO-30 and FO-33 are fully closed.
		13. Obtain copy of Bill of Lading from tanker driver.
		14. Complete Form 66-20-170.1A, Fuel Oil Delivery to TA-03 Power Plant – Receipt from Loader (Attachment 1A).
_____	_____	15. Turn in Bill of Lading, this form, and Form 66-20-170.1A to Power Plant Superintendent.

Form 66-20-170.1

Attachment 1A. Fuel Oil Delivery to TA-03 Power Plant – Receipt from Loader

Date: _____

Amount of fuel oil delivered: _____ *gal*

Destination: _____

Shipped via: _____

*Driver:*_____

*TA-03 Loader:*_____

*Loader signature:*_____

Form 66-20-170.1A

Attachment 2. Fuel Oil Reloading onto Trucks/Tanks – Checklist

Date: _____

Initials	Time	Step
_____	_____	1. Have tanker back into containment berm at unloading dock.
_____	_____	2. Connect fuel oil inlet line to tanker's inlet valve.
_____	_____	3. Fully open inlet valve.
_____	_____	4. Fully open valve FO-52.
_____	_____	5. Open supply valves FO-21 and FO-23. Ensure that FO-22 is closed.
_____	_____	6. Fully close valves FO-43 and FO-45 at Fuel House.
_____	_____	7. Fully close valves FO-29, FO-31, and FO-28 at Fuel House.
_____	_____	8. Open valves FO-25 and FO-27.
_____	_____	9. If using Pump #1, open valves FO-35, FO-46, FO-34, and FO-32. If using Pump #2, open valves FO-41, FO-46, FO-32, FO-34, FO-36, and FO-42.
_____	_____	10. Start selected pump from the control panel in Fuel House.
_____	_____	11. When tanker is 3/4 full, shut off pump and have tanker operator close inlet valve on the tanker.
_____	_____	12. Close valves FO-27, FO-25, FO-21, and FO-23.
_____	_____	13. Open valves FO-28, FO-29, FO-31, FO-18, and FO-20.
_____	_____	14. Start pump and empty the line from the tanker's inlet valve back to the storage tank. This will prevent the fuel oil remaining in the line from spilling as the line is disconnected from the tanker.
_____	_____	15. Turn pump off and close valve FO-52.
_____	_____	16. Disconnect hoses and drain into bucket.
_____	_____	17. Put oil-saturated rags and absorbent pads into proper waste barrels.
_____	_____	18. Record amount of oil being shipped and destination: Fuel Oil: _____ gal. Destination: _____
_____	_____	19. Complete Form 66-20-170.2B, Fuel Oil Reloading Delivery Receipt (Attachment 2B), showing amount of oil shipped and destination, and give to driver.
_____	_____	20. Complete Form 66-20-170.2A, Fuel Oil Reloaded onto Truck/Tank – Driver Sign-off (Attachment 2A), and have driver sign where indicated.
		21. When the transport leaves plant site, notify receiving party/destination.
_____	_____	22. Turn in this form and Form 66-20-170.2A to Power Plant Superintendent.

Form 66-20-170.2

Attachment 2A. Fuel Oil Reloaded onto Truck/Tank – Driver Sign-off

Date: _____

Amount of fuel oil received: _____ *gal*

Shipped out via: _____

*Driver:*_____

*Driver signature:*_____

Form 66-20-170.2A

Attachment 2B. Fuel Oil Reloading Delivery Receipt

Date: _____

Amount of fuel oil reloaded: _____ *gal*

Destination: _____

Shipped via: _____

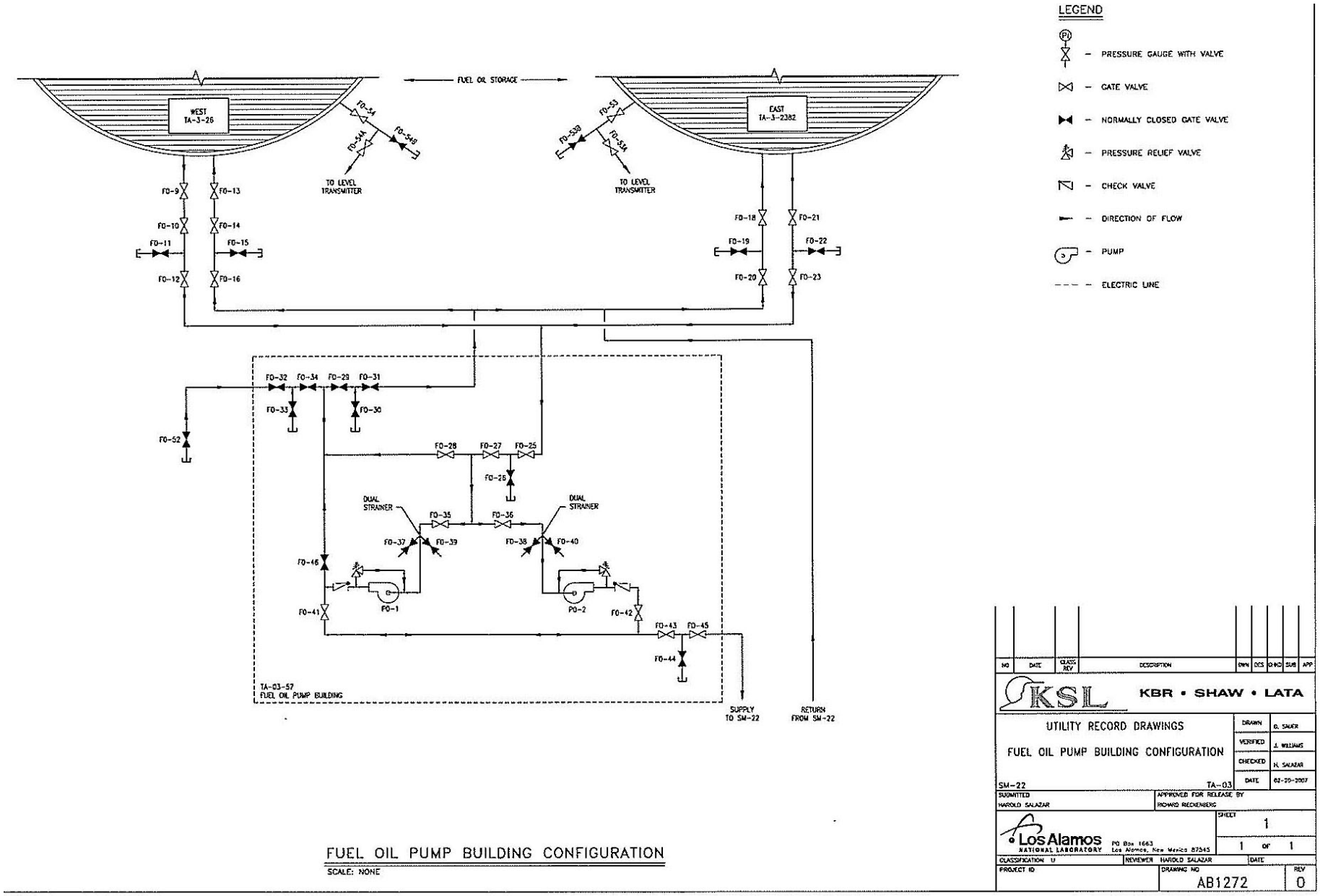
*Driver:*_____

*TA-03 Loader:*_____

*Loader signature:*_____

Form 66-20-170.2B

Attachment 3. Fuel Oil Pump Building Configuration



JOE ORTIZ

UTILITIES AND INFRASTRUCTURE

Blue Sheet
U&I FOD

Review Date: 6/10/08

This Blue Sheet applies to:
- [x] Utilities-KSL policy/procedure
- [ ] U&I policy/procedure

Change Type: [ ] Minor [ ] Delete policy/procedure
[x] Complete revision (if checked, specify projected completion date) Date:

Policy/Procedure Title: **Chemical Hygiene – TA-3 Steam Plant**	Rev. No.	Date:

Policy/Procedure Number: **66-20-050**

Reason for Revision (if complete revision is checked above):

Date Revision Required:

Brief description of revision/change:

Minor Change
Page 4 of 8 under 7. Tools Parts & Supplies.
Note Change:

Review w/ Walter Atencio

[x] Wherever KSL appears, replace with U&I

Prepared by: Jim Weinman
U&I Support Manager
Date: 9/23/08

Reviewed by: [signature]
U&I Function Lead
5/18/08
Date: 6/10/08

Approved by: [signature]
U&I FOD
Date: 6/10/08

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UTILITIES OPERATING INSTRUCTION

CHEMICAL HYGIENE - TA-3 STEAM PLANT

66-20-050

IMPLEMENTATION

Affected Personnel: ALL TA-3 STEAM PLANT PERSONNEL, PLANT FOREMAN, PLANT SUPERVISOR & UESB WATER TREATMENT SPECIALIST

Training Decision: Process Briefing with Roster prior to work being performed

Work Instruction Owner:: Utilities Division

Release Date: 6/20/2006	**Next Revision Date:** 6/20/2009
Work Instruction Type: UOI	**Revision Number:** 2
Work Instruction Level: Department	**Effective Date:** 7/13/06
Frequency: As Needed	

DOCUMENT MODIFICATION HISTORY

Rev No.	Description of Modification
2	Format changes and transfer to KSL, Minor modification to grammar and content.

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DOCUMENT REVIEW AND APPROVAL

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	Richard Flores	Safety Engineer	7/13/06	Signature on file
	James Williams	Training Foreman	7/11/06	Signature on file
Final Approval by	Gary Blauert	Utilities Division Director	7/13/06	Signature on file

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1.0 PURPOSE/SCOPE

To protect the safety of personnel, equipment, and the environment by establishing a standardized procedure for handling chemicals at the TA-3 Steam Plant.

This procedure includes instructions for checking chemical containers for proper condition and labeling prior to acceptance, performing a safety assessment on a new chemical, reporting assessment results, communicating to plant personnel both the results of the assessment and special instructions for handling the chemical, obtaining any special personal protective equipment (PPE) prior to handling and use of the chemical, and proper disposal of empty chemical containers.

2.0 DEFINITIONS/ACRONYMS

HSFT – Health & Safety Department

MSDS – Material Safety Data Sheet

NFPA – National Fire Protection Association

PPE - Personal Protective Equipment

UESB – Utilities Electric & Steam Section

UOI – Utility Operating Procedure

3.0 RESPONSIBILITIES

Water Treatment Specialist – Keeps signed copies of receiving slips for chemicals along with any additional material provided by the shippers, completes the first section of the Hazard Communication – "Site Specific Training Documentation Form" for new chemicals, gives instructions on storing containers, and schedules training sessions.

General Forman - Orders the necessary PPE and issues it to the appropriate personnel.

Plant Supervisor – Alternative to the Water Treatment Specialist if the Water Treatment Specialist is not available.

HSFT Industrial Hygienist – Performs safety assessments of new chemicals before plant personnel use them and completes the next two sections of the "Site Specific Training Documentation Form" after the assessment is complete.

Plant Engineer - Alternative to the Water Treatment Specialist if the Water Treatment Specialist is not available.

UESB Manager - Alternative to the Water Treatment Specialist if the Water Treatment Specialist is not available.

4.0 SAFETY

Refer to listed references for safety requirements. Also, use appropriate PPE for safety requirements for the TA-3 SM-22 Power Plant; see Section 7.0 for PPE list.

5.0 QUALIFICATIONS

Refer to UTP 001 – "Operator and Maintenance Worker Initial Qualification," UOI 60-10-040, "Worker Qualification and Training – Utilities Department" and KSL AP 17-30-101 – "Worker Qualification and Training & Department Training Coordinators."

6.0 TRAINING

Refer to UOI 60-10-040, "Worker Qualification and Training – Utilities Department" and KSL AP 17-30-101 – "Worker Qualification and Training & Department Training Coordinators."

7.0 TOOLS, PARTS & SUPPLIES

- Hearing protection
- Earplugs
- Steel toe shoes
- Safety glasses (with side shields)
- Long sleeve shirt
- Hard hat
- Rubber suits
- Zorball soak pads
- Containment berms
- Goggles and face shield
- Rubber gloves

8.0 METHODOLOGY

8.1 SAFETY PRECAUTIONS:

1. In the event of any accidental leakage, spill, or unintentional release of chemicals during this procedure, follow the instructions in UOI 66-20-055, Spill Response, immediately.

8.2 GENERAL:

1. This procedure is designed to comply with federal and state guidelines regarding hazard communication and the proper handling and storage of chemicals used in the TA-3 Steam Plant. For more information, refer to the Power Plant Water Analysis Laboratory Chemical Hygiene Plan.
2. Before a new chemical is used by plant personnel, a safety assessment must be performed by KSL Health & Safety Department (HSFT) industrial hygienists. Information from the assessment must then be presented to plant personnel in a training session prior to the first use of the new chemical.
3. No new chemical will be accepted if there is no Material Safety Data Sheet (MSDS) accompanying the shipment.
4. This procedure is divided into three sections:
    a. Receiving, which deals with examining, accepting (or refusing) a shipment of chemical containers, and storing the containers, and begins with Step 1 in Section 5.3.1,
    b. Assessment and training, which explains the steps that must be taken before a new chemical may be used at the plant, and begins with Step 15, and

c. Disposal, which deals with the handling and disposal of empty chemical containers, and begins with Step 1 in Section 5.3.3.

8.3 INSTRUCTIONS/PROCEDURES:

8.3.1 Receiving

1. Direct vehicles to deliver chemical containers at Loading Docks #2 & #3, which are located on the Southeast corner of SM-22. Chemical containers are also delivered to the loading dock at SM-24.
2. Before allowing the chemicals to be off-loaded from the delivery vehicle, visually inspect each container for:
   a. Good condition (no visible signs of leakage or damage).
   b. Label showing name, address, and telephone number of manufacturer.
   c. Label showing contents.
   d. National Fire Protection Association (NFPA) hazard warning label.

NOTE:	This is a diamond-shaped label colored red, yellow, white, and blue.

   e. MSDS (for new chemicals only).
3. If the containers are in good condition and all required labels are present, delivery may be accepted. If not, delivery must NOT be accepted.
4. If the containers weigh more than 80lbs each, use the monorail crane on the East side of the building to unload the containers; otherwise, use a hand truck.

NOTE:	Only personnel trained in their proper operation must operate hoists and cranes. For more information, refer to KSL HSE Manual Procedure S-6, "Standard Signals for Crane Operations" and KSL HSE Manual Procedure S-26, "Mobile Crane Operations"

5. Before signing the receiving slip, check it for accuracy (quantity and type of chemicals are correct).
6. Take the signed copy of the receiving slip along with any additional material provided by the shipper (MSDSs, etc.) to the Water Treatment Specialist or, if the Water Treatment Specialist is unavailable, to the Plant Supervisor.
7. Store the containers on pallets with spill containment on the main floor of the building along the East wall according to the Water Treatment Specialist's instructions.
8. Turn the containers so that their identification and hazard labels are clearly visible.
9. If the shipment included no new chemicals, the Water Treatment Specialist will file the receiving slip and other materials. Go to Step 8 in Section 5.3.2.

8.3.2 Assessment & Training

1. If the shipment included new chemicals, the Water Treatment Specialist will complete the first section of the Hazard Communication – Site SpecificTraining Documentation Form for each chemical involved and send both the form(s) and copy(s) of the MSDS to HSFT.
2. A HSFT Industrial Hygienist will perform a safety assessment on each chemical involved, including:
   a. Health and safety hazards posed by the chemical.
   b. Reactivity of the chemical with water and other chemicals in use at the plant.
   c. PPE required for handling the chemical.
   d. Proper handling of the chemical.
   e. Storage requirements.
   f. Steps to take if exposed to the chemical.
3. The HSFT Industrial Hygienist will then complete the next two sections of the form and return it to the Water Treatment Specialist.
4. The Water Treatment Specialist will schedule a training session and relay the safety information to the personnel involved.

NOTE:	The assistance of a HSFT Industrial Hygienist may be required.

5. All personnel attending the training will sign the training documentation form. The Water Treatment Specialist will keep a copy of the form and send the original to HSFT.
6. If the required PPE is not already in stock at the plant, the General Forman will order the necessary PPE and issue it to all personnel involved.
7. The Water Treatment Specialist will add a copy of the MSDS for each new chemical to the plant MSDS file.
8. Plant personnel may begin using the chemical(s) as directed by the Water Treatment Specialist.

NOTE:	Instructions for wearing the proper safety equipment while using a particular chemical are contained in the operating procedures (UOIs) that call for that chemical.

8.3.3 Disposal

1. When a chemical container is empty, notify the Water Treatment Specialist or, if the Water Treatment Specialist is unavailable, notify the Plant Supervisor.
2. The Water Treatment Specialist will provide instructions for sealing, labeling, and storing the empty container in the proper storage area.

NOTE:	The empty container MUST remain on a pallet while in storage.

3. If the chemical is a Nalco product, the Water Treatment Specialist shall:
   a. Triple rinse the container,
   b. Store in the designated storage area, and
   c. Call for the container to be picked up.
4. If the product is not a Nalco product, or it is unclear whether it is a Nalco product, contact the Water Treatment Specialist. If the Water Treatment Specialist is unavailable, contact a Plant Supervisor, the Plant Engineer or the UESB Manager.
5. All empty containers will remain in storage until authorized picked up.

9.0 RECORDS

1. Receiving slip and other materials filed with the Water Treatment Specialist.
2. All personnel attending the training scheduled by the Water Treatment Specialist will sign the training documentation form. The Water Treatment Specialist will keep a copy of the form and send the original to HSFT.
3. The Water Treatment Specialist will add a copy of the MSDS for each new chemical to the plant MSDS file.

10.0 REFERENCES

Power Plant Water Analysis Laboratory Chemical Hygiene Plan

LANL LIR 402-10-01, Hazard Anaylsis & Control for Facility Work

KSL HSE Manual Procedure E-11, Hazardous Waste Generation, Management and Disposal

UOI 66-20-055, Spill Response

11.0 ATTACHMENTS

66-20-050.1, Hazard Communication – Site Specific Training Documentation

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Hazard Communication – Site Specific Training Documentation

Date:	Instructor:		
Chemical Name:			CAS #:
Manufacturer:			
How/Where Chemical Will Be Used:			
The following safety equipment will be used when handling/storing this product.			
	Yes	No	Notes
SAFETY EQUIPMENT			
Full Face Mask			
Half Face Mask			
Coveralls			
Gloves			
Boots			
Faceshield			
Other			
ENGINEERING CONTROLS			
Eye Wash			
Safety Shower			
Ventilation			
HYGIENE CONTROLS			
Soap & Water			
Special Cleaner			
STORAGE			
Regular Storage			
Flammable Storage Cabinet			
Corrosives Storage Cabinet			
Other			
Comments:			

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DOCUMENTATION

The following employees have been instructed on the hazards of the product listed on the reverse side. The instructions included review of the Material Safety Data Sheet (MSDS) for the product and the required designated proper safety personal protective equipment.

Printed Name	Signature	Z-Number	Date