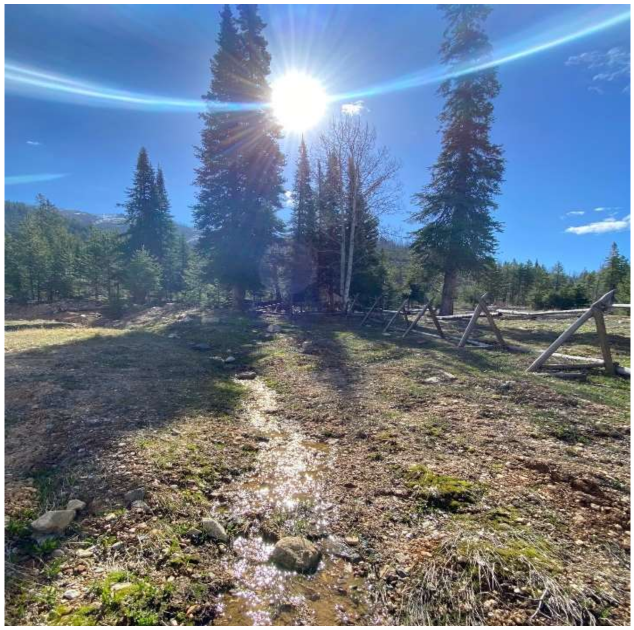

Stormwater Pollution Prevention Plan (SWPPP)

ESOP-029

Perpetua Resources Idaho, Inc.

Stibnite Gold Project

Stibnite, Idaho

Operated by:

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March 2024

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INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the purpose of controlling and reducing pollution from stormwater discharges associated with industrial activity at the Perpetua Resources Idaho, Inc., Stibnite Gold Project (SGP) ("Perpetua") through the use of control measures, implemented in accordance with good engineering practices. This SWPPP describes and provides guideless for the implementation of structural and non-structural control measures; these control measures shall be designed to minimize the likelihood of pollutants being carried off-site.

The US Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit (MSGP) for Stormwater Discharges Associated with Industrial Activity, effective March 21, 2021 and expiring on February 28, 2026 (see Appendix A), authorizes discharges of stormwater associated with industrial activities. Perpetua's SIC Code is 1041, which is a listed industrial activity under the MSGP: Sector G (*Metal Mining)*, Subsector G2 (*Iron Ores; Copper Ores; Lead and Zinc Ores; Gold and Silver Ores; Ferroalloy Ores; except Vanadium; and Miscellaneous Metal Ores (SIC* Codes 1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099)).

Perpetua has applied for coverage under the MSGP by submitting a Notice of Intent (see Appendix A) to EPA. Pursuant to Part 1.3.5 of the MSGP, Perpetua has posted a sign with required permit coverage information at the access gate to the Office Area (see map in Appendix C). Adjacent to the gate location is a publicly accessed road (NF-412) and the signage can be readily viewed as needed.

SWPPP MODIFICATIONS AND AVAILABILITY [MSGP Parts 6.3 and 6.4]

This SWPPP shall be updated based on any corrective actions and deadlines within the MSGP and all SWPPP modifications shall be signed/dated by the individuals listed in Appendix B of the MSGP. The following table contains a summary of substantive SWPPP modifications:

Table 1: SWPPP Modifications

Date	Description of Modification	Modification Completed By
1/14/2013 *Revision 1*	Update Figures, Text, Appendices – Administrative	Nick Smith
4/30/2013 *Revision 2*	Update Figures, Text, Appendices – Administrative	Nick Smith
11/10/2015 *Revision 3*	Update Document for new requirements in 2015 MSGP	--
2/9/2019 *Revision 4*	Update Figures, Text, Appendices – Administrative	Sam Field/Blaine Serrin
5/2021 *Revision 5*	Updated Plan to reflect 2021 MSGP changes: updated Plan layout, BMP sections, contact information; Updated inspection forms and figures	Kyle Fend / Sam Field / Aquionix, Inc.
6/2022 *Revision 6*	Update plan with final design plans for TCRA's included in Appendix J	Sam Field / Aquionix, Inc.
10/2023 *Revision 7*	Updated plan with 2023 TCRA information in Appendix J	Sam Field / Aquionix, Inc.
03/2024 *Revision 8*	Updated plan with 2023-2024 TCRA information in Appendix J	Blaine Serrin / Aquionix, Inc.

Refer to Appendix B of this SWPPP for all Delegation of Authority forms for Perpetua personnel.

A copy of this SWPPP is maintained at the Project site pursuant to Section 6.4 of the MSGP and is immediately available. Other applicable required documentation is also maintained with the SWPPP including:

- A copy of the NOI submitted to EPA along with any correspondence exchanged between Perpetua and EPA specific to coverage under the MSGP;
- A copy of the authorization from the EPA assigning a NPDES ID;
- A copy of the MSGP permit (either a hard copy or an electronic copy easily available to SWPPP personnel);
- Documentation of any maintenance and repairs of stormwater control measures, including the date(s) of regular maintenance, date(s) of discovery of areas in need of repair/replacement, and for repairs, date(s) that the control measure(s) returned to full function, and the justification for any extended maintenance/repair schedules;
- All inspection reports, including the Routine Facility Inspection Reports and Visual Assessment Documentation;

- Description of any deviations from the schedule for visual assessments and/or monitoring, and the reason for the deviations (e.g., adverse weather or it was impracticable to collect samples within the first 30 minutes of a measurable storm event);
- Corrective action documentation;
- Documentation of any benchmark threshold exceedances, which AIM Level triggering event the exceedance caused, and AIM response employed (currently not applicable);
- Documentation to support any determination that pollutants of concern are not expected to be present above natural background levels if discharge is directly to impaired waters, and that such pollutants were not detected in the discharge after three years or were solely attributable to natural background sources; and
- Documentation to support any status change from active to inactive and unstaffed with respect to the requirements to conduct routine facility inspections, quarterly visual assessments, benchmark monitoring, and/or impaired waters monitoring.

Part 6.4.1 of the MSGP also requires that Perpetua make this SWPPP publicly available. Perpetua has uploaded the SWPPP to a publicly accessible URL http://midasgoldidaho.com/swppp/# and shall update the documentation at the URL as necessary, but no later than 45 days after conducting the final routine facility inspection for the calendar year. The method of making the SWPPP publicly available may be switched throughout permit coverage; in the event Perpetua changes this method, an appropriate NOI change submittal will be completed.

SWPPP CERTIFICATION [MSGP Appendix B.11.E]

"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 contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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: Kyle Fend

Title: Field Operations Manager. & CERCLA Project Coordinator

Signature: ____________________

Date: 2024/04/24

MSGP Appendix B.11's signatory requirements state that NOIs, NOTs and NOEs must be signed as follows:

(1) For a corporation: By a responsible corporate officer. For the purpose of the MSPG, a responsible corporate officer means:

  (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or

  (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

(3) For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of the MSGP, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Changes to this SWPPP, including changes to document any corrective actions, advanced implementation measures or any other compliance documentation (including annual reports, DMRs and inspection reports) must be signed by a person defined in Items 1-3 above or a duly authorized representative of that person (see Appendix B of this SWPPP for Delegations of Authority).

1.0 FACILITY INFORMATION

1.1 Stormwater Pollution Prevention Team [MSGP Part 6.2.1]

Table 1-1 below lists the Stormwater Pollution Prevention Team members at the Perpetua facility. These personnel are responsible for overseeing development of the SWPPP, any modifications to it, and for implementing and maintaining control measures and taking corrective actions and/or Additional Implementation Measures (AIM) responses, when required. All members of the Team have ready access to the most current version of this SWPPP and all other relevant SWPPP documentation.

Table 1-1: Stormwater Pollution Prevention Team

Staff Position	SWPPP Function	SWPPP Individual Responsibilities
Field Operations Manager	Alternate Team Leader	Provide support and backup function to the Team Leader.
Field Operations Supervisor	Member	Taking corrective actions where required; Assisting Maintaining BMP's
Site Supervising Geologist	Team Leader	Develop and revise the facility SWPPP, complete inspections, prepare reports, develop and assist with deployment of training
Equipment Operator	Member	Taking corrective actions where required; Assisting Maintaining BMP's
Environmental Geologist	Member	Taking corrective actions where required; Assisting Maintaining BMP's

1.2 Site Description [MSGP Part 6.2.2]

The Perpetua Stibnite Mine is located in north-central Valley County, Idaho, along the East Fork South Fork Salmon River (EFSFSR), approximately 75 miles northeast of Cascade, Idaho and 14 miles southeast of Yellow Pine, Idaho, as shown on Figure 1 in Appendix C.

Exploration drilling occurs both on private patented property and on public lands that are managed by the U.S. Department of Agriculture (USDA) Forest Service (USFS). The Project area is displayed in Figures 2-5 in Appendix C. The mining district is surrounded by additional public lands administered by USFS. The Krassel Ranger District, Payette National Forest, under an exchange of administration agreement with the Boise National Forest, administers all public lands in the project area.

1.3 Activities at the Facility [MSGP Part 6.2.2.1]

The following sections describe current and planned activities associated with the Standard Gold Project.

1.3.1 Camp Area Activities

The Project camp area is located on private land near the old Stibnite town site. The camp area includes:

- Fuel storage and transfer for operations support;
- Helicopter maintenance and fueling;
- Site administrative offices;

- Living quarters and associated infrastructure, including potable water treatment and municipal wastewater treatment; and
- Vehicle and equipment storage and maintenance.

Refer to Figures 4 and 5 in Appendix C for camp area visual details.

1.3.2 Mine Site Preparation and Construction Activities

As Perpetua transitions to preparing the Project site for future mining operations, several current and future activities may include:

- Construction staging areas to prepare for erecting structures (e.g., personnel housing, mill buildings, etc.);
- Site preparation activities (e.g., tailings impoundments, heap leach pads);
- Access roads (for construction); and
- Cutting new rights of way.

1.3.3 Exploration Drilling Operations

Exploration drilling operations at Perpetua may include the following:

- Drill pad development and operations (track/helicopter core drill pads and reverse core drill pads);
- Access road construction and use (currently only one access road is proposed for construction as part of the exploration activities; all other pads are accessed by helicopter, tracked vehicle, or existing roads; some access roads will include temporarily re-opening old roads); and
- Winter-specific exploration activities.

Figure 3 in Appendix C displays the potential exploration areas within the Project boundary.

1.3.4 Borrow Pit Operations (Inactive)

The borrow pit, located adjacent to and east of the Shop (Figure 4, Appendix C) was used by previous mining operations and federal agencies as a rock resource. Perpetua has used the borrow pit for small quantities of rock borrow and for miscellaneous rock needs (e.g., to address a damaged culvert spillway). The proposed rock body outcrop is estimated to be approximately 75 feet high, 300 feet wide (from north to south), and intermittently exposed approximately 300 feet into the hillside to the east.

Other activities associated with the borrow pit area may include transportation from the borrow site to a rock processing facility (on private land) and a working surface would be required in front of the borrow site for loading and temporary stockpiling.

1.3.5 Time Critical Removal Actions (TCRAs)

Perpetua has prepared drafts of several Time Critical Removal Actions (TCRAs) in accordance with the requirements of an Administrative Settlement Agreement and Order on Consent (ASAOC) for Removal Actions with the U.S. EPA and U.S. Department of Agriculture Forest Service in efforts to reduce any uncontrolled release of metals to surface waters in the Project area (Meadow Creek, EFSFSR) related to historic mining activities. These potential TCRAs include:

- Stream Diversions (to divert upgradient surface water around historical mine features); and
- Relocation of historical (legacy mining) waste rock dumps and tailings storage impoundments (to remove the material from stream channels and banks).

Perpetua has developed a schedule to accomplish all the TCRAs, including collecting data to fill identified gaps during the Summer of 2021, with final design packages targeted for development and approval during the Spring of 2022 and 2023. Refer to Appendix J of this SWPPP for documentation related to the proposed TCRAs. Stormwater control measures, management and inspection activities will be built into the final design packages consistent with this SWPPP. Permanent control measures will be included in this SWPPP as part of future revisions, as required.

1.4 SWPPP Maps [MSGP Parts 6.2.2.2 and 6.2.2.3]

Appendix C contains a Site Location Map (Figure 1) and a Surrounding Waters Overview Map (Figure 2) for the facility showing the site location and surrounding receiving waters for stormwater discharges. Figures 3, 4, 5 and 6 show the following site characteristics (where applicable), as required in the MSGP:

- Boundaries of the property and the size of the property in acres;
- Location and extent of significant structures and impervious surfaces;
- Directions of stormwater flow (use arrows), including flows with a significant potential to cause soil erosion;
- Locations of all stormwater control measures;
- Locations of all receiving waters, including wetlands, in the immediate vicinity of the facility. Indicate which waterbodies are listed as impaired and which are identified by the state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 waters;
- Locations of all stormwater conveyances including ditches, pipes, and swales;
- Locations of potential pollutant sources identified;
- Locations where significant spills or leaks have occurred;
- Locations of all stormwater monitoring points;
- Locations of stormwater inlets and discharge points, with a unique identification code for each discharge point (e.g., 001, 002), indicating if one or more discharge points is considered “substantially identical” and an approximate outline of the areas draining to each discharge point;
- If applicable, municipal separate storm sewer systems (MS4s) and where stormwater discharges to them;

- Areas of Endangered Species Act-designated critical habitat for endangered or threatened species, if applicable; and
- Locations of the following activities where such activities are exposed to precipitation:
  - fueling stations;
  - vehicle and equipment maintenance and/or cleaning areas;
  - loading/unloading areas;
  - locations used for the treatment, storage, or disposal of wastes;
  - liquid storage tanks;
  - processing and storage areas;
  - immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
  - transfer areas for substances in bulk;
  - machinery; and
  - locations and sources of run-on to the site from adjacent property that contains significant quantities of pollutants.

2.0 POTENTIAL POLLUTANT SOURCES AND OUTFALLS [MSGP Part 6.2.3]

2.1 Potential Pollutant Sources [MSGP Part 6.2.3]

The following table details the potential stormwater pollutant sources throughout the Perpetua facility. The PPS # listed in the table corresponds to the potential pollutant source located on the Maps in Appendix C and the BMP ID No. in parathesis also corresponds to the BMPs on the Maps in Appendix C.

Table 2-1: Potential Pollutant Source Descriptions

#	Potential Pollutant Source	Location	Associated Outfall	Control Measures
Camp Area Activities				
1	Diesel Fuel	Primary Fuel Storage	Outfall 001	(1) Concrete containment (SH02); (2) Double-walled tanks; (3) Area is covered; (4) Spill cleanup materials nearby; (5) Earthen swale to divert flow around area (SH18); (6) Materials handling procedures; (7) Routine inspections (SPCC, stormwater); (8) Good housekeeping procedures
2	Gasoline	Secondary Fuel Storage	Outfall 001 Outfall 002	(1) Double-walled tanks; (2) Tertiary containment (SH12); (3) Spill cleanup materials nearby; (4) Lined transfer area; (5) Materials handling procedures; (6) Sediment pond down gradient (SH17); Earthen swale to divert flow (SH20); (7) Routine inspections (SPCC, stormwater); (8) Good housekeeping procedures; (9) Established vegetation adjacent
3	Drinking Water Treatment	Camp Facilities Area	Outfall 001	(1) System located within building itself; (2) Routine inspections
4	Wastewater Treatment and Reuse	Camp Facilities Area	Outfall 001	(1) System located within building itself; (2) Routine inspections
5	Used Oil Transfer / Storage	Shop	Outfall 002	(1) Storage located within Shop building itself; (2) Secondary containment at transfer area outside building (SH19); (3) Spill cleanup materials nearby; (4) Earthen swale to divert flow around area (SH18); (5) Materials handling procedures; (6) Routine

Table 2-1: Potential Pollutant Source Descriptions

#	Potential Pollutant Source	Location	Associated Outfall	Control Measures
				inspections (SPCC, stormwater); (7) Good housekeeping procedures
6	Sediment	Various (parking/disturbed areas, dust from vehicle traffic)	Outfall 001 Outfall 002 Outfall 003	Erosion control varies depending on location, may include: grading, berming, sedimentation ponds, compaction, rip-rap, wattles, and/or diversion utilizing culverts and swales (refer to maps for details)
7	Jet A, Diesel Fuel	Helipad Storage	Outfall 003	(1) Concrete containment (EC04); (2) Berm diverting flow around area (EC05); (3) Spill cleanup materials nearby; (4) Materials handling procedures; (5) Routine inspections (SPCC, stormwater); (6) Good housekeeping procedures
8	Oils, Greases, Fuel (Maintenance)	Equipment Parking Area	Outfall 002	(1) Good housekeeping procedures; (2) Area graded towards earthen swale to direct flow (SH16); (3) Sedimentation pond (SH17); (4) Routine inspections
9	Sanitary Waste	Varies	Varies on location	(1) Porta-pot (self-contained) (EC02, SH07, MY06)); (2) Earthen swale to direct flow (EC07, SH20); (3) Routine inspections; (4) Good housekeeping procedures
10	Diesel Fuel	Generator	Varies on location	(1) Containment for fuel tank (EC09); (2) Materials handling procedures; (3) Routine inspections (SWPPP and SPCC); (4) Good housekeeping procedures
11	Core Cuttings	Core Shed	Outfall 001	(1) Core cutting water storage tank (EC24); (2) Building itself (cutting occurs inside); (3) Routine inspections; (4) Good housekeeping procedures

Table 2-1: Potential Pollutant Source Descriptions				
#	**Potential Pollutant Source**	**Location**	**Associated Outfall**	**Control Measures**
12	Diesel Fuel	Generator	Outfall 003	(1) Containment for fuel tank (MY07); (2) Materials handling procedures; (3) Routine inspections (SWPPP and SPCC); (4) Good housekeeping procedures
Mine Site Preparation and Construction Activities				
15	Sediment, Dust, Chemicals, Equipment (fuels, oils, greases)	Various (construction staging areas)	Varies on location	(1) Timing of Construction; (2) Preservation of Existing Vegetation; (3) Stabilization of Construction Entrance/Exit; (4) Erosion Prevention of Temporary Roads
16	Sediment, Dust, Chemicals, Equipment (fuels, oils, greases)	Various (access road construction)	Varies on location	(1) Timing of Construction; (2) Preservation of Existing Vegetation; (3) Stabilization of Construction Entrance/Exit; (4) Erosion Prevention of Temporary Roads
Exploration Drilling Operations				
13	Sediment and Gravel	Various (drill pad locations)	Varies on location	(1) Minimization of disturbance (helicopter drilling and access); (2) Preservation of existing vegetation; (3) Earthen berming around pad; (4) Routine inspections; (5) Earthen swale(s) diverting around pad; (6) Temporary use of wattles and haybales; (7) Surface roughing and hydroseeding
14	Drilling Equipment (fuels, oils, greases) and Drilling Fluids	Various (drill pad locations)	Varies on location	(1) Secondary containment for fuels, oils and grease; (2) Infiltration sump for drilling fluids; (3) Routine inspections; (4) Good housekeeping practices
Borrow Pit Operation				
17	Sediment	Borrow Pit (inactive)	Outfall 001	(1) Earthen swale in area (SH20); (2) Preservation of existing vegetation; (3) Routine inspections
Time Critical Removal Actions (TCRAs)				
N/A	Sediment - Tailings	DMEA, Smelter Flat, Hennessy Cr.,	Varies on location	Select from IDEQ “Slope Protection and Stab”, “Channel

Table 2-1: Potential Pollutant Source Descriptions				
#	Potential Pollutant Source	Location	Associated Outfall	Control Measures
		Lower Meadow Creek, Bradley Man Camps, Repository Site		Protection" and "Sed Collection and Runoff Diversion", among other controls.
N/A	Sediment - Waste Rock/Overburden Piles	DMEA, Smelter Flat and Hennessy Cr.	Varies on location	Select from IDEQ "Slope Protection and Stab", "Channel Protection" and "Sed Collection and Runoff Diversion", among other controls.
N/A	Sediment – Stream Channel	DMEA, Smelter Flat and Hennessy Cr.	Varies on location	Select from IDEQ "Slope Protection and Stab", "Channel Protection" and "Sed Collection and Runoff Diversion", among other controls.
N/A	Sediment, Dust, Chemicals, Equipment (fuels, oils, greases)	DMEA, Smelter Flat and Hennessy Cr.	Varies on location	(1) Timing of Construction; (2) Preservation of Existing Vegetation; (3) Stabilization of Construction Entrance/Exit; (4) Erosion Prevention of Temporary Roads

2.1.1 Spills and Leaks [MSGP Part 6.2.3.3]

Table 2-2 below displays the significant spills and leaks that have occurred at the facility in the three years prior to the date of this SWPPP.

Table 2-2: Significant Spills and Leaks		
Date	Material	Location and Outfall Affected
None	-	-

Additionally, Table 2-3 lists the areas where *potential* spills and leaks could occur that may contribute pollutants to stormwater discharges:

Table 2-3: Potential Spills and Leaks	
Material	Location and Outfall Potentially Affected
Fuel (gasoline, diesel, Jet A)	Fuel Storage (Exploration Camp) (Outfalls 001 and 002)
Fuel (gasoline, diesel, Jet A)	Helicopter Pads (Outfall 003)
Drilling fluids, sediment	Drill pads

2.1.2 Covered Stormwater Discharges [MSGP Part 8.G.1.3]

Pursuant to Part 8.G.1.3 of the MSGP (specifically for Sector G facilities), all stormwater discharges from earth-disturbing activities conducted prior to active mining activities are covered by the MSGP. Earth-disturbing activities are defined as either:

- Activities performed for purposes of mine site preparation, including: cutting new rights of way (except when related to access road construction); providing access to the mine site for vehicles and equipment (except when related to access road construction); other earth disturbances associated with site preparation activities on any areas where active mining activities have not yet commenced (e.g., for heap leach pads, waste rock facilities, tailings impoundments, wastewater treatment plants); and
- Construction of staging areas to prepare for erecting structures such as to house project personnel and equipment, mill buildings, etc., and construction of access roads. Earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining are considered to be "construction" and have additional effluent limits in Part 8.G.4.2 of the MSGP.

2.1.3 Authorized Non-Stormwater Discharges [MSGP Part 1.2.2.1]

The following discharges are the only non-stormwater discharges authorized under the MSGP for all sectors, provided that all discharges comply with MSGP requirements:

- Discharges from emergency/unplanned fire-fighting activities;
- Fire hydrant flushings;
- Potable water, including uncontaminated water line flushings;
- Uncontaminated condensate from air conditioners, coolers/chillers, and other compressors and from the outside storage of refrigerated gases or liquids;
- Irrigation/landscape drainage, provided all pesticides, herbicides, and fertilizers have been applied in accordance with the approved labeling;
- Pavement wash waters, provided that detergents or hazardous cleaning products are not used (e.g., bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols), and the wash waters do not come into contact with oil and grease deposits, sources of pollutants associated with industrial activities (see Part 6.2.3), or any other toxic or hazardous materials, unless residues are first cleaned up using dry clean-up methods (e.g., applying absorbent materials and sweeping, using hydrophobic mops/rags) and you have implemented appropriate control measures to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention, settlement);
- External building/structure washdown / power wash water that does not use detergents or hazardous cleaning products (e.g., those containing bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols) and you have implemented appropriate control measures to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention, settlement);
- Uncontaminated ground water or spring water;
- Foundation or footing drains where flows are not contaminated with process materials;
- Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown; drains); and

- Any authorized non-stormwater discharge listed above in this Part 1.2.2 or any stormwater discharge listed in Part 1.2.1 mixed with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

2.1.4 Unauthorized Non-Stormwater Discharge Evaluation [MSGP Part 6.2.3.4]

Pursuant to MSGP Part 6.2.3.4, Perpetua shall inspect and document all discharge points at the facility for the presence of any unauthorized non-stormwater discharge before the end of the first year of permit coverage. Documentation of this evaluation is located in Appendix E of this Plan.

2.1.5 Salt Storage [MSGP Part 6.2.3.5]

There are no storage piles containing salt used for de-icing or other commercial or industrial purposed at the Perpetua facility.

2.1.6 Sampling Data [MSGP Part 6.2.3.6]

Table 2-3 below contains stormwater sampling data that was obtained at the facility during the previous MSGP permit term for Outfall 001. Because of irregular climate and stormwater runoff, discharge events from Outfall 001 did not yield enough volume for analysis; only events in 2018 and 2020 provided enough discharge flow to obtain a sample, as follows:

Table 2-4: Outfall Sampling Data

	2016	2017	2018	2019	2020
Outfall 001					
Arsenic (total as AS)	*No Discharge*	*No Discharge*	*0.188 mg/L*	*No Discharge*	*0.147 mg/L*
Antimony (total as Sb)	*No Discharge*	*No Discharge*	*0.0397 mg/L*	*No Discharge*	*0.0299 mg/L*

2.2 Stormwater Outfalls

The MSGP (2021) defines a “discharge point” as a location where collected and concentrated stormwater flows are discharged from the facility such that the first receiving waterbody into which the discharge flows, either directly or through a separate storm sewer system, into a water of the U.S.

Perpetua has identified three stormwater outfall locations at the facility, as detailed in the following table. Refer to the maps in Appendix C for outfall locations. The BMP ID No. listed in paratheses corresponds to the BMPs located on the maps in Appendix C.

Table 2-5: Stormwater Outfall Inventory

Outfall Number	Receiving Surface Water	Size of Drainage Area Associated	Type of Discharge	Latitude and Longitude	Associated Control Measures
001	East Fork South Fork Salmon River	Approximately 10 acres	Sheet	44.909395 / -115.328996	(1) Earthen drainage swale (EC20); (2) Sedimentation pond

					(EC20); (3) Established vegetation; (4) Routine inspections
002	East Fork South Fork Salmon River	Approximately 4 acres	Concentrated	44.906922 / -115.327650	(1) Earthen drainage swale (SH16); (2) Rock rip-rap and sedimentation pond prior to entrance (SH17); (3) Established vegetation; (4) Routine inspections
003	East Fork South Fork Salmon River	Approximately 4.8 acres	Concentrated	44.903170 / -115.328443	(1) Earthen drainage swale (MY12); (2) Sedimentation pond (MY13); (3) Rock rip-rap channel (MY14); (4) Established vegetation; (5) Routine inspections

2.2.1 Receiving Waters

The waterways associated with the general area include Meadow Creek, East Fork Meadow Creek (a.k.a. Blowout Creek), Garnet Creek, Fiddle Creek, Midnight Creek, Hennessey Creek, Sugar Creek, West End Creek and EFSFSR (Figure 2, Appendix C). The EFSFSR and its 1st and 2nd order tributaries within the Perpetua facility are associated with IDEQ 2012 303(d) impaired waters listing. The EFSFSR's 3rd order tributaries are just south of the facility and are associated with IDEQ 2008 303(d) impaired waters listing. The EFSFSR is a tributary to the South Fork of the Salmon River (SFSR).

IDEQ has recommended removing EFSFSR from the 303(d) listing for sediment and metals; however, this action has not yet been completed. An addendum to the initial listing indicates that the current management practices associated with the SFSR are consistent with BMPs for sediment.

Perpetua's ongoing wetland delineations have also identified wetlands in the general area, as shown on the maps in Appendix C of this SWPPP.

3.0 STORMWATER CONTROL MEASURES [MSGP Part 6.2.5.1]

Various stormwater control measures (formally known as Best Management Practices (BMPs)) are implemented at Perpetua. Control measures are used to achieve the non-numeric effluent limits in Part 2 of the MSGP and the sector-specific requirements in Part 8.G.5.

This section is organized into three parts: Section 3.1 describes general control measures and practices that are considered by Perpetua when evaluating stormwater management and that may be used at the facility; Section 3.2 describes the control measures described in the Idaho Department of Environmental Quality's (IDEQ's) BMP Catalog that Perpetua may use for technical guidance during design, installation and maintenance; and Section 3.3 discusses the additional control measure requirements under Part 8.G.5 (sector-specific) of the MSGP.

3.1 General Stormwater Control Measures

The following subsections list general control measures described in the MSGP and that may be implemented at Perpetua. Typically, these general control measures are considered for stormwater management and then implemented using the technical guidance provided in Section 3.2 of this SWPPP (IDEQ's BMP Catalog).

3.1.1 Minimize Exposure [MSGP Part 2.1.2.1]

Perpetua has implemented a number of practices to minimize exposure of exploration related activities, including the following:

- Use helicopter delivery at the remote drill locations rather than constructing access roads.
- Design small drill pad footprints and use small self-contained track drill rigs and small mud pits.

Additionally, to minimize exposure of potential pollutant sources (activities and materials) to stormwater at Perpetua in areas where enclosed/covered storage is not feasible, the facility may also employ one or more of the following:

- Use grading, berming or curbing to prevent discharges of contaminated flows and divert run-on away from these areas;
- Locate materials, equipment, and activities so that potential leaks and spills are contained or able to be contained or diverted before discharge;
- Store leaky vehicles and equipment indoors;
- Perform all vehicle and/or equipment cleaning operations indoors, under cover, or in bermed areas that prevent discharges and run-on and also that capture any overspray; and
- Drain fluids from equipment and vehicles that will be decommissioned, and for any equipment and vehicles that will remain unused for extended periods of time, inspect at least monthly for leaks.

3.1.2 Good Housekeeping [MSGP Part 2.1.2.2]

Good housekeeping practices are a cost-effective way to reduce/eliminate potential pollutant sources from commingling with stormwater runoff. Any of the following good housekeeping measures may be utilized at Perpetua, if appropriate:

- Sweep or vacuum at regular intervals or, alternatively, wash down the area and collect and/or treat, and properly dispose of the washdown water;
- Store materials in appropriate containers;
- Keep all dumpster lids closed when not in use. For dumpsters and roll off boxes that do not have lids and could leak, ensure that discharges have a control (e.g., secondary containment, treatment).
- Minimize the potential for waste, garbage and floatable debris to be discharged by keeping exposed areas free of such materials, or by intercepting them before they are discharged.
- Plastic Materials Requirements: Facilities that handle pre-production plastic must implement control measures to eliminate discharges of plastic in stormwater.9 Examples of plastic material required to be addressed as stormwater pollutants include plastic resin pellets, powders, flakes, additives, regrind, scrap, waste and recycling.

3.1.3 Maintenance [MSGP Part 2.1.2.3]

Maintenance generally is a two-part approach:

- Maintaining on-site equipment, vehicles, and storage containers, to minimize the potential for a release of a pollutant to stormwater (e.g., maintenance of vehicles to avoid oil leaks).
- Maintaining stormwater control measures (e.g., maintaining a silt fence).

Perpetua has an equipment and vehicle maintenance program that includes routine inspection and maintenance of equipment. In general, maintenance of equipment and vehicles is in accordance with manufacturer recommendations, but may also include:

- Performing inspections and preventive maintenance of stormwater drainage, source controls, treatment systems, and plant equipment and systems that could fail and result in discharges of pollutants via stormwater;
- Maintaining non-structural control measures (e.g., keep spill response supplies available, personnel appropriately trained);
- Inspecting and maintaining baghouses at least quarterly to prevent the escape of dust from the system and immediately removing any accumulated dust at the base of the exterior baghouse.
- Cleaning catch basins when the depth of debris reaches two-thirds (2/3) of the sump depth, or in line with manufacturer specifications, whichever is lower, and keeping the debris surface at least six inches below the lowest outlet pipe.

During routine maintenance, if it is found that stormwater control measures need routine maintenance, the necessary maintenance shall be conducted immediately in order to minimize pollutant discharges.

If it is found that the stormwater control measure needs to be repaired or replaced, all reasonable steps shall immediately be taken to prevent or minimize the discharge of pollutants until the final repair or replacement is implemented, including cleaning up any contaminated surfaces. Final repairs/replacement of control measures shall be completed as soon as feasible, but **no later than 14 days**. If 14 days is infeasible, work must be completed with 45 days. Refer to 6.2 of this SWPPP for additional details.

3.1.4 Spill Prevention and Response [MSGP Part 2.1.2.4]

Perpetua may utilize one or more of the following spill prevention and response measures at the facility:

- Clean up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants;
- Use drip pans and absorbents if leaky vehicles and/or equipment are stored outdoors;
- Use spill/overflow protection equipment;
- Plainly label containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides") that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
- Implement procedures for material storage and handling, including the use of secondary containment and barriers between material storage and traffic areas, or a similarly effective means designed to prevent the discharge of pollutants from these areas;
- Develop training on the procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. As appropriate, execute such procedures as soon as possible;
- Keep spill kits onsite, located near areas where spills may occur or where a rapid response can be made; and
- Notify appropriate facility personnel when a leak, spill, or other release occurs.

The Perpetua Emergency Response Plan (ref OHS-008) is the primary response procedure at the facility. Additionally, a Spill Prevention, Control and Countermeasures (SPCC) Plan provides additional information for facility personnel, emergency response agencies, and regulatory agencies in the event of a hydrocarbon spill.

3.1.5 Management of Stormwater [MSGP Part 2.1.2.6]

The facility shall divert, infiltrate, reuse, contain or otherwise reduce stormwater to minimize pollutants in discharges.

Perpetua may employ various stormwater diversion ditches, detention basins and vegetated to direct, slow and filter stormwater runoff prior to discharging from the site. Refer to Section 2.1 of this SWPPP for specific control measures associated with potential pollutant sources and the site maps in Appendix C for their location(s).

3.1.6 Salt Storage Piles or Piles Containing Salt [MSGP Part 2.1.2.7]

At the time of this SWPPP revision, there are no outdoor salt storage locations at the Perpetua facility. Minimal amounts of ice melt is stored in bags inside facility buildings.

3.1.7 Employee Training [MSGP Part 2.1.2.8]

Personnel who work in areas where industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to comply with the MSGP, including all members of the SWPP Team shall be trained on the requirements of the MSGP and their specific responsibilities. Those personnel include:

- Personnel who are responsible for the design, installation, maintenance, and/or repair of controls (including pollution prevention measures);
- Personnel responsible for the storage and handling of chemicals and materials that could become pollutants discharged via stormwater;
- Personnel who are responsible for conducting and documenting monitoring and inspections; and
- Personnel who are responsible for taking and documenting corrective actions.

Personnel shall be trained in at least the following, if related to the scope of their job duties:

- An overview of what is in the SWPPP;
- Spill response procedures, good housekeeping, maintenance requirements, and material management practices;
- The location of all the controls 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; and
- The facility's emergency procedures, if applicable.

Perpetua has designated the Camp Supervisor as the training officer. Annual, new hire, and on-the-job training sessions are utilized to deliver the required training content to appropriate personnel. Training attendance records and documentation are maintained by the Environmental and Human Resources departments.

3.1.8 Non-Stormwater Discharges [MSGP Part 2.1.2.9]

Per Section 2.1.3 of this SWPPP, Perpetua shall complete a non-stormwater discharge evaluation at the facility. If any unauthorized non-stormwater discharges are observed during this evaluation, they shall be eliminated.

3.2 IDEQ's BMP Catalog

IDEQ's *Idaho Catalog of Storm Water Best Management Practices* (2020) provides technical guidance for design and selection of stormwater BMPs. The Catalog includes guidance for construction BMPs (temporary in nature and used during construction) and permanent BMPs (those that remain on the landscape after development completion) and each individual BMP 'Fact Sheet' typically describes the BMP purpose, guidelines for handling during construction, installation steps and schematic(s) and maintenance practices.

There are 94 BMPs included in the IDEQ catalog – not all of these are applicable to the Perpetua Project. The following table lists the IDEQ catalog Fact Sheet number and the application the BMP may have at the Project. Appendix D of this SWPPP contains each IDEQ BMP Fact Sheet listed in the table below.

Table 3-1: IDEQ Control Measure List

BMP Fact Sheet #	Description
General Control Measures for Earth Disturbing Activities and Construction	
36	Construction Timing
37	Staging Areas
38	Preserve Topsoil and Vegetation
39	Clearing Limits
40	Vehicle Sediment Control
41	Stabilized Construction Roads and Staging Areas
42	Erosion Prevention on Construction Roads
Good Housekeeping	
43	Dust Control
44	Stockpile Management
46	Spill Prevention and Control
47	Construction Equipment Washing and Maintenance
48	Hazardous Materials Management
49	Concrete Waste Management
50	Sanitary and Septic Waste Management
Slope Protection and Stabilization	
52	Mulching
53	Geotextile
54	Matting
55	Soil Binders
31	Topsoiling
32	Landscaping
58	Slope Roughening
59	Gradient Terracing
Channel Protection	
61	Channel Liners
56	Riprap Slope Protection
74	Inlet Protection

60	Check Dams
62	Temporary Stream Crossing
Sediment Collection and Runoff Diversion	
63	Biofilter Bags
64	Fiber Rolls
65	Silt Fence
11	Vegetative Filter Strip
66	Sedimentation Basins and Traps
67	Portable Sediment Tank
68	Temporary Swale
69	Diversion Dike
70	Temporary Berms

3.3 Sector-Specific Control Measures [MSGP Part 8.G.4]

The MSGP also has sector-specific requirements listed in Part 8.G.4 for Sector G (*Metal Mining)*, Subsector G2 (*Iron Ores; Copper Ores; Lead and Zinc Ores; Gold and Silver Ores; Ferroalloy Ores; except Vanadium; and Miscellaneous Metal Ores (SIC Codes 1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099)).* These control measures are geared toward the specific activities that may occur during earth-disturbing activities conducted prior to active mining activities.

If applicable, the sector-specific control measures described below shall be implemented using the technical guidance provided in Section 3.2 of this SWPPP (IDEQ's BMP Catalog).

3.3.1 Erosion and Sediment Controls [MSGP Parts 2.1.2.5 and 8.G.4.1]

To minimize pollutant discharges in stormwater, the site's focus shall be on stabilizing exposed soils at the facility and, if appropriate, place velocity dissipation devices at discharge locations to minimize channel and streambank erosion and scour in the immediate vicinity of the discharge locations.

Activities when erosion and sediment runoff could occur may include the following:

- Developing drill pads and during drill pad operations (exposed soil prior to reclamation);
- Constructing access roads;
- Conducting operations at the borrow pit;
- Earth disturbing activities associated with camp site activities; and
- Implementation of TCRAs.

3.3.1.1 Erosion and Sediment Control Installation Requirements [MSGP Part 8.G.4.1.1]

By the time construction activities commence, install and make operational downgradient sediment controls, unless this timeframe is infeasible. If infeasible the facility shall install and make such controls operational as soon as practicable or as soon as site conditions permit. All other stormwater controls described in this SWPPP must be installed and made operational as soon as conditions on each portion of the site allows.

3.3.1.2 Erosion and Sediment Control Maintenance Requirements [MSGP Part 8.G.4.1.2]

Pursuant to Part 8.G of the MSGP, all erosion and sediment controls shall remain in effective operating condition. Whenever it is determined that a stormwater control needs maintenance to control operating effectively, efforts to fix the control shall be initiated immediately after discovery of the problem and work shall be completed by the next day.

When a stormwater control needs to be replaced or significantly repaired, the work shall be completed within 7 days, unless infeasible. If 7 days is infeasible, the installation or repair shall be completed as soon as practicable.

3.3.1.3 Perimeter Controls [MSGP Part 8.G.4.1.3]

Sediment control measures shall be installed along the perimeter area of disturbed areas at the Perpetua facility, except where site conditions prevent the use of such controls or where sediment movement is not likely (i.e., uphill). Sediment shall be removed before it accumulates to one-half of the aboveground height of any perimeter control.

3.3.1.4 Sediment Basins [MSGP Part 8.G.4.1.6]

If sediment basins are installed to treat stormwater from earth-disturbing activities, the following characteristics should be considered:

- Storage capacity shall be for either (1) the 2-year, 24-hour storm or (2) 3,600 cubic feet per acre drained; and
- Erosion of basin embankments shall be prevented by using stabilization controls (e.g., erosion control blankets) and erosion of the inlet and outlet points of the basin shall be prevented using velocity dissipation devices.

3.3.2 Dust Generation and Vehicle Tracking [MSGP Parts 2.1.2.10, 8.G.4.1.4 and 8.G.4.1.7]

Perpetua shall minimize generation and dust of off-site tracking of raw, final or waste materials in order to minimize pollutants discharged in stormwater. For construction vehicles and equipment exiting the site directly onto paved roads, the facility shall:

- Use appropriate stabilization techniques to minimize sediment track-out from vehicles and equipment prior to exit;
- Use additional controls to remove sediment from vehicle and equipment tires prior to exit, where necessary; and
- Remove sediment that is tracked out onto paved roads by the end of the workday.

Minimization of dust through appropriate application of water or other dust suppression techniques shall be utilized to minimize pollutants being discharged into surface waters.

3.3.3 Soil or Sediment Stockpiles [MSGP Part 8.G.4.1.5]

Perpetua shall minimize erosion of stockpiles from stormwater and wind via temporary cover, if feasible. Any upslope stormwater flows shall be diverted around the stockpile to prevent erosion. Sediment that runs off stockpiles from stormwater shall be minimized using sediment controls (e.g., a sediment barrier or downslope sediment control).

3.3.4 Restrictions on Use of Treatment Chemicals [MSGP Part 8.G.4.1.8]

If chemicals are used for sediment treatment at Perpetua, the following minimum requirements shall apply:

- Use conventional erosion and sediment controls prior to and after application of chemicals;
- Select chemicals suited to soil type, and expected turbidity, pH, flow rate;
- Minimize the discharge risk from stored chemicals;
- Comply with state/local requirements;
- Use chemicals in accordance with good engineering practices and specifications of chemical supplier;
- Ensure proper training; and
- Provide proper SWPPP documentation.

Use of cationic treatment chemicals renders facilities ineligible for coverage under the MSGP, unless the EPA Regional Office is notified in advance and use is authorized.

3.3.5 Additional Technology-Based Effluent Limits Applicable Only to the Construction of Staging Areas for Structures and Access Roads [MSGP Part 8.G.4.2]

<u>Erosion and Sediment Control Design Requirements:</u>

Design, install and maintain effective erosion and sediment controls to minimize the discharge of pollutants from construction activities. The following factors shall be accounted for in designing erosion and sediment controls:

- The expected amount, frequency, intensity and duration of precipitation;
- The nature of stormwater discharges and run-on at the site, including factors such as impervious surfaces, slopes and site drainage features;
- The range of soil particle sizes expected to be present on the site.

Direct discharges to stormwater controls in vegetated areas of a site to increase sediment removal and maximize stormwater infiltration, including any natural buffers, unless infeasible. Use velocity dissipation devices if necessary to prevent erosion when directing stormwater to vegetated areas.

If any stormwater flow becomes or will be channelized, design erosion and sediment controls to control both peak flowrates and total stormwater volume to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.

Stormwater conveyance channels shall be designed to avoid unstabilized areas on the site and to reduce erosion, unless infeasible. In addition, minimize erosion of channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters during discharge conditions through the use of erosion controls and velocity dissipation devices within and along the length of any constructed stormwater conveyance channel, and at any outlet to provide a non-erosive flow velocity.

Natural Buffers:

For any stormwater discharges within 50 feet of a WOUS, one of the following compliance alternatives shall be applied:

(1) Provide a 50-foot undisturbed natural buffer between construction activities and the WOUS; or

(2) Provide an undisturbed natural buffer that is less than 50 feet supplemented by additional erosion and sediment controls, which in combination, achieve a sediment load reduction that is equivalent to a 50-foot undisturbed natural buffer; or

(3) If it is infeasible to provide an undisturbed natural buffer of any size, implement erosion and sediment controls that achieve a sediment load reduction that is equivalent to a 50-foot undisturbed natural buffer.

There are exceptions when buffer requirements do not apply:

- There is no stormwater discharge from construction disturbances to a water of the U.S;
- The natural buffer has already been eliminated by preexisting development disturbances;
- The disturbance is for the construction of a water-dependent structure or construction approved under a CWA section 404 permit;
- For linear construction projects, requirements are not required if there are site constraints provided that, to the extent feasible, disturbances are limited within 50 feet of a water of the U.S. and/or supplemental erosion and sediment controls are provided to treat stormwater discharges from any disturbances within 50 feet of a water of the U.S.

Soil or Sediment Stockpiles:

In addition to the requirements listed in Section 3.3.3 of this SWPPP, any soil or sediment stockpiles associated with the construction of staging areas for structures and access roads shall be located outside of any natural buffers established as detailed in the section above.

Sediment Basins:

In addition to the requirements discussed in Section 3.3.1.4 above, sediment basins associated with the construction of staging areas for structures and access roads shall be located outside of any surface waters and any natural buffers (as established above) and any outlet structure for the sediment basin shall withdraw water from the surface, unless infeasible.

Native Topsoil Preservation:

Native topsoil removed during clearing, grading or excavation, shall be preserved, unless infeasible. Topsoil shall be stored in a manner that maximizes reuse in reclamation or final vegetation stabilization (e.g., by keeping the topsoil stabilized with seed or similar measures).

<u>Steep Slopes:</u>
Disturbance from steep slopes shall be minimized. Depending on site conditions and needs, steep slopes may be necessary (e.g., a road cut in mountainous terrain). Where steep slopes are necessary, disturbances can be minimized through erosion and sediment control practices, such as by phasing disturbances in those areas and using stabilization practices specifically for steep grades.

<u>Soil Compaction:</u>
Where final vegetation will occur or where infiltration practices will be installed, either restrict vehicle / equipment use in these areas to avoid soil compaction or use soil conditioning techniques to support vegetative growth. Minimizing soil compaction is not required when compacted soil is integral to the functionality of the site.

<u>Dewatering Practices:</u>
Discharge groundwater or accumulated stormwater from excavations, trenches, foundations, vaults or similar, is prohibited unless waters are first effectively managed by appropriate controls (e.g., sediment basins or sediment traps, sediment socks, dewater tanks, tube settlers, weir tanks, or filtration systems). Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control (as long as it meets water quality standards). Additionally, the following requirements are for dewatering activities:

- No discharging visible floating solids or foam;
- Remove oil, grease and other pollutants from dewatering water via an oil-water separator or suitable filtration device (such as a cartridge filter);
- Utilize vegetated upland areas of the site, to the extent feasible, to infiltrate dewatering water before discharge. In no case shall waters of the U.S. be considered part of the treatment area;
- Implement velocity dissipation devices at all points where dewatering water is discharged;
- Haul backwash water away for disposal or return it to the beginning of the treatment process; and
- Clean or replace the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer’s specifications.

<u>Pollution Prevention Requirements:</u>
Prohibited discharges, in addition to those listed in Section 2.1.4 of this SWPPP, include:

- Wastewater from washout of concrete;
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;

- Fuels, oils or other pollutants used for operation and maintenance of equipment or vehicles;
- Soaps, solvents or detergents used in vehicle or equipment washing; or
- Toxic or hazardous substances from a spill or other release.

Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters shall be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.

Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to stormwater. Minimization of exposure is not required in cases where the exposure to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

<u>Site Stabilization Requirements:</u>
Site stabilization requirements for the construction of staging areas for structures and access roads shall include the following, unless the location of disturbed earth is due to the intended function (e.g., the area of construction will become actively mined):

- By no later than the end of the next workday after construction work in an area has stopped permanently or temporarily ("temporarily" means the land will be idle for a period of 14 days or more but earth disturbing activities will resume in the future), immediately initiate stabilization measures;
- If using vegetative measures, by no later than 14 days after initiating stabilization:
  - Seed or plant the area, and provide temporary cover to protect the planted area;
  - Once established, vegetation must be uniform, perennial (if final stabilization), and cover at least 70% of stabilized area based on density of native vegetation.
- If using non-vegetative stabilization, by no later than 14 days after initiating stabilization:
  - Install or apply all non-vegetative measures;
  - Cover all areas of exposed soil.

4.0 STORMWATER INSPECTIONS [MSGP Part 3]

4.1 Routine Visual Stormwater Inspection [MSGP Parts 3.1 and 8.G.4.4]

The MSGP requires all facilities with coverage under the permit to conduct visual stormwater inspections at their facility on a routine basis. There are two types of inspections that are required at the Perpetua facility:

- Inspection of industrial activity areas that **do not** involve earth disturbing activities prior to mining (primarily the camp area, fueling area and stabilized access roads) (driven by MSGP Parts 3.1 and 8.G.7)
- Inspection of earth-disturbing activities conducted prior to mining (drill pads, access road construction and gravel extraction) (driven by MSGP Part 8.G.4.4). These activities are grouped into two classes by Part 8.G.3.2(a) and (b) as:
    - Activities performed for purposes of mine site preparation, including: cutting new rights of way (except when related to access road construction); providing access to the mine site for vehicles and equipment (except when related to access road construction); other earth disturbances associated with site preparation activities on any areas where active mining activities have not yet commenced (e.g., for heap leach pads, waste rock facilities, tailings impoundments, wastewater treatment plants); and
    - Construction of staging areas to prepare for erecting structures such as to house project personnel and equipment, mill buildings, etc., and construction of access roads.

The following subsections describe the visual stormwater inspection characteristics for both types of the inspections listed above.

4.1.1 Visual Inspection Personnel [MSGP Part 3.1.1]

Qualified personnel at Perpetua complete the routine visual stormwater inspections. These qualified personnel may be members of the SWPP Team (see Section 1.1 of this Plan) or a hired third-party. At least one member of the SWPP Team shall participate in each routine stormwater inspection. When planning and conducting these routine inspections, the inspectors shall consider the results of any visual and analytical monitoring that was conducted for the past year (if applicable).

4.1.2 Areas to be Inspected [MSGP Part 3.1.2]

During normal facility operating hours, qualified personnel shall conduct inspections of areas at Perpetua that are covered by requirements in the MSGP, including, but not limited to, the following:

- Areas where industrial materials or activities are exposed to stormwater;
- Areas identified in the SWPPP and those that are potential pollutant sources;
- Areas where spills and leaks have occurred in the past three years;
- Discharge points;
- Control measures used to comply with the effluent limits contained in this permit;
- Disturbed areas;

- Pollution prevention measures;
- Locations where stabilization measures have been implemented; and
- Material, waste, borrow or equipment storage and maintenance areas.

4.1.3 Visual Inspection Focus [MSGP Part 3.1.3]

During the routine stormwater inspections, the qualified personnel shall examine or look out for the following:

- 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, 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;
- Erosion of soils at the facility, channel and streambank erosion and scour in the immediate vicinity of discharge points;
- Non-authorized non-stormwater discharges;
- Control measures needing replacement, maintenance or repair;
- During an inspection occurring during a stormwater event or stormwater discharge, observe control measures implemented to comply with effluent limits to ensure they are functioning correctly; and
- Discharge points (if locations are inaccessible, inspect nearby downstream locations).

4.1.4 Routine Visual Inspection Frequency [MSGP Parts 3 and 8.G.4.4.1]

Table 4-1: Routine Visual Inspection Frequencies

Type	Frequency
Industrial Activity Areas	Once per quarter Note: At least once per year, a routine stormwater inspection shall be conducted during a period with a stormwater discharge is occurring. Perpetua is located in an area with freezing conditions throughout much of the winter and, as such, it is expected that quarterly visual assessments will likely need to be distributed during warmer months, generally from May to early November (see Section 5.11 for further information).
Earth Disturbing Activities (prior to mining)	At least once every 7 calendar days; or Once every 14 calendar days and within 24 hours of a storm event of 0.25 inches or greater Note: ▪ Inspections are only required during working hours; ▪ Inspections are not required during unsafe conditions; and ▪ If you choose to inspection once every 14 days, you must have a method for measuring rainfall amount onsite (rain gauge or weather station).

	Reductions in inspection frequency: Stabilized areas: Reduce the frequency of inspections to once per month in any area of the site where stabilization has occurred pursuant to the MSGP. Arid, semi-arid, and drought-stricken areas: If earth-disturbing activities are occurring during the seasonally dry period or during a period in which drought is predicted to occur, reduce inspections to once per month and within 24 hours of a 0.25-inch storm event. Frozen conditions: Temporarily suspend or reduce inspections to once per month until thawing conditions occur if frozen conditions are continuous and disturbed areas have been stabilized. For extreme conditions in remote areas, e.g., where transit to the site is perilous/restricted or temperatures are routinely below freezing, you may suspend inspections until the conditions are conducive to safe access, and more frequent inspections can resume

The Routine Stormwater Inspection Form is located in Appendix F of this SWPPP. There are a significant number of control measures located at the facility – Appendix F also contains a Control Measure Inspection Form, to be used in conjunction with the Routine Stormwater Inspection Form.

4.1.5 Routine Inspection Documentation [MSGP Part 3.1.6]

Document routine stormwater inspections on the Routine Stormwater Inspection Form, located in Appendix F of this Plan. This form is generally completed while the inspection is being conducted but shall be completed no later than 24 hours after the inspection. Any corrective action as a result of a visual inspection event shall be completed in accordance with the MSGP (see Section 6.0 of this SWPPP). The Forms are retained with this SWPPP and are not required to be submitted to the EPA unless specifically requested. Findings from the routine inspections shall be summarized in the Annual Report (see Section 7.3 for Annual Report details).

4.2 Visual Assessment of Stormwater Discharges [MSGP Part 3.2]

Once per quarter, Perpetua shall collect a stormwater sample from each outfall (see Section 2.2 of this SWPPP) and conduct a visual assessment of each sample. The samples shall be collected in such a manner that they are representative of the stormwater discharge. Part 3.2.4.5 of the MSGP stipulates that if a facility has two or more discharge points that discharge substantially identical stormwater effluents, quarterly visual assessments can be conducted at just one of the discharge locations and report the results for the other substantially identical discharge points (SIDPs), provided that the assessments occur on a rotating basis of each SIDP. Refer to Section 5.6 below in this SWPPP for details regarding the SIDPs at Perpetua; quarterly visual assessments will rotate numerically through each SIDP (e.g., Outfall 001 first, then Outfall 002 the following quarter, Outfall 003 the quarter after that, etc.).

As discussed below in Section 4.2.3, Perpetua is located in an area with freezing conditions throughout much of the winter and, as such, it is expected that quarterly visual assessments will likely need to be distributed during warmer months, generally from May to early November.

4.2.1 Visual Assessment Procedures [MSGP Part 3.2.2]

The following steps shall be completed during a quarterly visual assessment event:

- Each discharge sample shall be collected in a clean, colorless glass or plastic container, and examined in a well-lit area;
- The visual assessment shall be made on the discharge sample within 30 minutes of an actual 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 and the reasoning shall be documented. In the case of snowmelt, samples must be taken during a period with a measurable discharge;
- For storm events, the assessment shall be made on discharges that occur at least 72 hours (three days) from the previous discharge. The 72-hour (three-day) storm interval does not apply if it is documented that less than a 72-hour (three-day) interval is representative for local storm events during the sampling period;
- Visually inspect or observe for the following water quality characteristics, which may be evidence of stormwater pollution:
    - Color;
    - Odor;
    - Clarity (diminished);
    - Floating solids;
    - Settled solids;
    - Suspended solids;
    - Foam;
    - Oil sheen; and
    - Other obvious indicators of stormwater pollution.
- Whenever the visual assessment shows evidence of stormwater pollution in the discharge, corrective action procedures shall be implemented.

4.2.2 Visual Assessment Documentation [MSGP Part 3.2.3]

Results of visual assessments are documented on the Visual Assessment Form in Appendix F of this Plan. These Forms shall be retained with this SWPPP. Any corrective action as a result of a visual assessment event shall be completed in accordance with the MSGP (see Section 6.0 of this SWPPP). The visual assessment findings are not required to be submitted to the EPA, unless specifically requested. Findings from visual assessments shall be summarized in the Annual Report (see Section F for Annual Report details).

4.2.3 Exceptions to Quarterly Visual Assessments [MSGP Part 3.2.4]

Adverse Weather Conditions: When adverse weather conditions prevent the collection of stormwater discharge sample(s) during the quarter, a substitute sample shall be taken during the next qualifying storm event. Documentation of the rationale for no visual assessment for the quarter is included on the Visual Assessment Form in Appendix F of this Plan. Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, electrical storms, or situations that otherwise make sampling impractical, such as extended frozen conditions.

Climates with Irregular Stormwater Discharges: If a facility is located in an area where limited rainfall occurs during many parts of the year (e.g., arid or semi-arid climate) or in an area where freezing conditions exist that prevent discharges from occurring for extended periods, then samples for the quarterly visual assessments may be distributed during seasons when precipitation more regularly occurs. Perpetua is located in an area with freezing conditions throughout much of the winter and, as such, it is expected that quarterly visual assessments will likely need to be distributed during warmer months, generally from May to early November.

Areas that Receive Snow: If a facility is in an area that typically receives snow and the facility receives snow at least once over a period of four quarters, at least one quarterly visual assessment must capture snowmelt discharge, as described above in Section 4.2.1, taking into account the exception described above for climates with irregular stormwater discharges.

5.0 STORMWATER MONITORING [MSGP Part 4]

The Perpetua facility is subject to MSGP Sector G (*Metal Mining)*, Subsector G2 (*Iron Ores; Copper Ores; Lead and Zinc Ores; Gold and Silver Ores; Ferroalloy Ores; except Vanadium; and Miscellaneous Metal Ores (SIC Codes 1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099)* requirements, including Indicator Monitoring and Effluent Limitations Monitoring.

5.1 Indicator Monitoring [MSGP Parts 4.2.1 and 8.G.8.1]

Table 8.G-1 in the MSGP (and the summarized table below) identifies the indicator monitoring required for Subsector G2 facilities:

Table 8.E-1: G2 Indicator Monitoring		
Subsector	**Indicator Monitoring Parameter**	**Indicator Monitoring Threshold**
Applies to all Sector G (Subsectors G1 and G2) facilities with stormwater discharges from paved surfaces that will be initially sealed or re-sealed with coal-tar sealcoat where industrial activities are located during coverage under this permit	Polycyclic Aromatic Hydrocarbons (PAHs)	Report Only/ No thresholds or baseline value

At the time of this SWPPP revision, there are no stormwater discharges from paved surfaces that were initially sealed or re-sealed with coal-tar sealcoat where industrial activities are located.

5.2 Benchmark Monitoring [MSGP Parts 4.2.2 and 8.G.8]

Sector G of the MSGP has benchmark monitoring requirements for active metal mining facilities. The Perpetua site is not yet categorized as an active metal mining operation, but rather is conducting earth-disturbing activities prior to active mining activities. Benchmark monitoring will be required once the SGP enters the active mining phase.

5.3 Effluent Limitations Monitoring [MSGP Parts 4.2.3.1 and 8.G.8]

Sector G facilities do not have effluent limitations monitoring under the MSGP.

5.4 State or Tribal Provisions Monitoring [MSGP Parts 4.2.4 and 8.G.8]

NPDES permitting authority in the State of Idaho is under the EPA; at the time of this SWPPP revision, there are no state of tribal provisions monitoring requirements for the Perpetua facility. This SWPPP will be updated July, 1 2021 when Idaho Department of Environmental Quality is granted regulatory authority over the MSGP program.

5.5 Impaired Waters Monitoring [MSPG Part 4.2.5]

As defined in the MSGP, a facility is considered to discharge to an impaired water if the first water of the United States to which it discharges is identified by a state, tribe, or EPA pursuant to section 303(d) of the CWA as not meeting an applicable water quality standard (i.e., without an EPA-approved or -established TMDL) or has been removed from the 303(d) list either because the impairments are addressed by an

EPA-approved or established TMDL or is covered by pollution control requirements that meet the requirements of 40 CFR 130.7(b)(1).

As discussed in Section 2.2 of this SWPPP, Perpetua has identified three stormwater outfalls, all of which may discharge into the EFSFSR. The EFSFSR does not have an EPA-approved or -established TMDL but is on the 303(d) impaired water body listing for arsenic (1st and 2nd order of EFSFSR) and arsenic and antimony (3rd order of EFSFSR).

Pursuant to Part 4.2.5.1 of the MSGP, discharges to impaired waters without an EPA-approved or -established TMDL are required to be monitored annually in the first year of permit coverage and again in the fourth year of permit coverage as follows (unless a pollutant causing an impairment is detected and then annual monitoring must continue):

- <u>Year 1 of Permit Coverage</u>: the first annual sample must be taken in the first year of permit coverage, which begins in the first full quarter following May 30, 2021. All pollutants causing impairments must be monitored for.
  - If monitoring results indicate the monitored pollutant is not detected in the discharge, or is within the acceptable range for a given parameter for the waterbody to meet its designated use, monitoring for the pollutant(s) may be discontinued for the next two years. Monitoring for the pollutant(s) must resume in year four of permit coverage.
  - If monitoring results indicate that the monitored pollutant(s) is detected in the discharge, or is outside the acceptable range for a given parameter for the waterbody to meet its designated use, monitoring for the pollutant(s) must continue annually until no longer detected, after which it may discontinue until monitoring resumes in year four of permit coverage.
- <u>Year 4 of Permit Coverage:</u> Annual monitoring resumes in the 4th year of permit coverage for a sub-set of parameters monitored for in the first monitoring year. If the 4th year of permit coverage, monitoring must occur for all pollutants causing impairments that are associated with your industrial activity and/or are listed as a benchmark parameter for the facility's subsector in the MSGP (refer to Part 4.2.5.1 of the MSGP for the evaluation of parameters at this step).
  - If monitoring results indicate the monitored pollutant(s) are not detected in the discharge or is within an acceptable range for a given parameter for the waterbody to meet its designated use, monitoring may be discontinued for the remainder of permit coverage.
  - If monitoring results indicate the monitored pollutant(s) are detected in the discharge or are outside the acceptable range for a given parameter for the waterbody to meet its designated use, monitoring must continue annually for the pollutant(s) until no longer detected.

Refer to Appendix G of this SWPPP for the Impaired Water Monitoring Form, to be completed during each monitoring event.

5.6 Substantially Identical Discharge Point (SIDPs) [MSPG 4.1.1]

Perpetua has classified three discharge points ("outfalls") that discharge substantially identical stormwater effluents, based on several criteria listed in the MSGP and detailed in the following table:

Table 5-2: Substantially Identical Discharge Point Evaluation

Outfall	Industrial Activities	Control Measures	Potential Exposed Materials	Area Runoff Coefficient[1]
001	Support staging for earth-disturbing activities (fuel storage, materials storage, equipment staging, equipment maintenance, personnel living facilities)	(1) Sedimentation basin; (2) Rock rip-rap; (3) Established vegetation; (4) Upgradient earthen swale; (5) Materials in double-walled tanks and secondary containment; (6) Good housekeeping measures; (7) Routine SWPPP inspections	(1) Sediment; (2) Fuels/oils (associated with equipment staging and maintenance)	0.20 – 0.40
002	Support staging for earth-disturbing activities (fuel storage, materials storage, equipment staging, equipment maintenance)	(1) Sedimentation basin; (2) Rock rip-rap; (3) Established vegetation; (4) Upgradient earthen swale; (5) Materials in double-walled tanks and secondary containment; (6) Good housekeeping measures; (7) Routine SWPPP inspections	(1) Sediment; (2) Fuels/oils (associated with equipment staging and maintenance)	0.20 – 0.40
003	Support staging for earth-disturbing activities (fuel storage, materials storage, equipment staging, equipment maintenance)	(1) Sedimentation basin; (2) Rock rip-rap; (3) Established vegetation; (4) Upgradient earthen swale; (5) Materials in double-walled tanks and secondary containment; (6) Good housekeeping measures; (7) Routine SWPPP inspections	(1) Sediment; (2) Fuels/oils (associated with equipment staging and maintenance)	0.20 – 0.40

[1] Runoff coefficient value obtained from Table 3-1 in the *U.S.DOT Urban Drainage Design Manual (2001)* for "railroad yard area" (closest area type)

As stated in Part 4.1.1 of the MSGP, Perpetua may monitor the effluent of just one of the above discharge points and report that the results also apply to the other two SIDPs. Perpetua will conduct the impaired waters monitoring that is required at the facility (see Section 5.5 above) at whichever SIDP listed above that is discharging the most volume resulting from a measurable storm event.

5.7 Commingled Discharges [MSGP Part 4.1.2]

If any authorized stormwater discharges commingle with discharges not authorized under the MSGP, required sampling of the authorized discharges shall be conducted at a point before they mix with other waste streams, to the extent practicable.

5.8 Measurable Storm Events [MSGP Part 4.1.3]

Required monitoring shall be conducted on a storm event that results in an actual discharge ("measurable storm event") that follows the preceding measurable storm event by at least 72 hours (three days). The 72-hour (3- day) storm interval does not apply if the facility is able to document that less than a 72-hour (3-day) interval is representative for local storm events during the sampling period. In the case of snowmelt, monitoring shall be conducted at a time when a measurable discharge occurs. For each monitoring event, except snowmelt monitoring, the date and duration (in hours) of the rainfall event must be identified, rainfall total (in inches) for that rainfall event, and time (in days) since the previous measurable storm event. The date of the sampling event must be identified for a snowmelt event.

5.9 Sample Type [MSGP Part 4.1.4]

A minimum of one grab sample from a discharge resulting from a measurable storm event is required. Samples shall be collected within 30 minutes of the start of discharge; if it is not possible to collect the sample within the first 30 minutes, the sample shall be taken as soon as possible, and documentation of the timeframe shall be included on the appropriate monitoring form (see Appendix F and G of this SWPPP).

5.10 Adverse Weather Conditions [MSGP Part 4.1.5]

When adverse weather conditions prevent the collection of stormwater discharge samples according to the sampling schedule, a substitute sample shall be taken during the next qualifying storm event.

5.11 Climates with Irregular Stormwater Discharges [MSGP Part 4.1.6]

Facilities located in areas where limited rainfall occurs during parts of the year (e.g., arid or semi-arid climates) or in areas where freezing conditions exist that prevent discharges from occurring for extended periods, the required monitoring events may be distributed during seasons when precipitation occurs, or when snowmelt results in a measurable discharge from the facility, as long as the required number of samples is still obtained.

5.12 Monitoring Periods [MSGP Part 4.1.7]

Monitoring requirements in this SWPPP begin in the first full quarter following either May 30, 2021 or the date of discharge authorization, whichever date comes later.

- January 1 – March 31
- April 1 – June 30
- July 1 – September 30
- October 1 – December 31

For example, if permit coverage is obtained on April 10, 2021, then the first monitoring quarter is July 1, 2021 – September 30, 2021 and the first monitoring year for discharges to impaired waters or discharges subject to an effluent limitation guideline is July 1, 2021 – June 30, 2022. This monitoring schedule may be modified in accordance with Section 5.11 if the revised schedule is documented in the SWPPP. However, Perpetua must indicate in Net-DMR any 3-month interval that a sample was not taken.

5.13 Monitoring Reports [MSGP Part 4.1.8]

Perpetua shall submit any applicable monitoring data using Net-DMR.

6.0 Corrective Actions and Additional Implementation Measures (AIM) [MSGP Part 5]

6.1 Corrective Actions [MSGP Part 5.1]

Corrective actions are the actions taken to ensure that MSGP provisions are met and any pollutant discharges are minimized and corrected. Corrective actions at Perpetua shall be overseen and/or performed by members of the SWPP Team.

6.1.1 Conditions Requiring SWPPP Review and Revision [MSGP Part 5.1.1]

When any of the following conditions occur or are detected during an inspection or monitoring event, the facility shall review and revise the SWPPP (as appropriate):

- 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 United States) occurs;
- A discharge violates a numeric effluent limit (see Section 5.2 above);
- Stormwater control measures are not stringent enough for the stormwater discharge to be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards or to meet the non-numeric effluent limits;
- A required control measure was never installed, was installed incorrectly, or not in accordance with the MSGP, or is not being properly operated or maintained; and/or
- Whenever a visual assessment shows evidence of stormwater pollution (e.g., color, odor, floating solids, settled solids, suspended solids, foam).

6.1.2 Conditions Requiring SWPPP Review [MSGP Part 5.1.2]

If construction or a change in design, operation, or maintenance at the facility occurs that significantly changes the nature of pollutants discharged via stormwater, or significantly increases the quantity of pollutants discharged, the facility shall review the SWPPP (e.g., sources of pollution, spill and leak procedures, non-stormwater discharges, selection, design, installation and implementation of stormwater control measures) to determine if modifications are necessary to meet the effluent limits in the MSGP.

6.2 Corrective Action Deadlines [MSGP Part 5.1.3]

<u>Immediate Action:</u> A facility must immediately take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution can be implemented, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events. In the MSGP, the term “immediately” means that the day you find a condition requiring corrective action, you must take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a permanent solution. However, if a problem is identified too late in the workday to initiate corrective action, the corrective action shall be performed the following workday morning.

<u>Subsequent Action:</u> If additional actions are required beyond the immediate actions discussed above, the facility shall complete the subsequent corrective action(s) before the next storm event if possible, and within 14 calendars from the time of discovery of the condition. It if is infeasible to complete the

subsequent corrective action(s) within the 14-day timeframe, the reasons shall be (see the Corrective Action Form in Appendix H of this Plan). The subsequent corrective action work must be completed as soon as practicable after the 14-day timeframe, but no longer than 45 days after discovery of the condition.

Where corrective action(s) result in changes to any of the facilities controls or procedures documented in this SWPPP, the Plan shall be modified accordingly within 14 days of completing the corrective action work.

6.3 Corrective Action Documentation [MSGP Part 5.3]

The existence of any conditions listed in Sections 6.1.1 and 6.1.2 above shall be documented on the Corrective Action Form in Appendix H of this Plan within **24-hours of discovery** of the condition. The 24-hour documentation shall also include a description of the condition, date, any immediate actions taken, and a signed/certified statement.

Within 14 days, any corrective actions taken since the 24-hour documentation shall also be recorded on the Corrective Action Form in Appendix H. Additional documentation at the 14-day mark includes any schedules, rationales, action initiation date and completion date.

Note that correction action documentation is not required to be submitted to EPA, unless specifically requested. A summary of correction actions is required in the Annual Report each year.

6.4 Additional Implementation Measures (AIM) [MSGP Part 5.2]

Part 5.2 of the MSGP contains Additional Implementation Measures (AIM), which are a tiered approach that prescribes sequential and increasingly robust responses when a benchmark monitoring exceedance occurs at the facility. At the time of this SWPPP update, Perpetua does not have any benchmark monitoring requirements and therefore would not be subject to the AIM requirements in the MSGP.

7.0 REPORTING AND RECORDKEEPING REQUIREMENTS [MSGP Part 7]

7.1 NeT-MSGP Tool for Forms [MSGP Parts 7.1 and 7.2]

All required information (NOIs, NOTs, annual reports) shall be submitted via EPA's electronic NPDES eREporting Tool (NeT). Information can be prepared and submitted in NeT-MSGP using specific forms.

7.2 NeT-DMR Tool for Monitoring [MSGP Part 7.3]

Discharge Monitoring Reports (DMRs) must be submitted electronically via EPA's DMR system: NeT-DMR. The facility's monitoring requirements will be pre-populated on DMR forms based on the information reported on the NOI submitted. Any changes to monitoring requirements are completed through submittal of a Change NOI (see Section 7.1 above).

7.3 Annual Report [MSGP Part 7.4]

Each year by January 30th, an annual report must be submitted via the NeT-MSGP tool, containing information generated from the past calendar year, including:

- A summary of the past year of routine visual inspections;
- A summary of the past year of visual assessments;
- A summary of the past year's corrective actions; and
- A certification statement.

7.4 Additional Standard Recordkeeping and Reporting [MSGP Part 7.6]

Table 7-1: Additional Standard Recordkeeping and Reporting

Reporting Type	Description
24-hour verbal reporting	Orally report any noncompliance which may endanger health or the environment
5-day written reporting	A written report of any noncompliance which may endanger health or the environment (follow-up to the oral report above)
Reportable quantity spills	As soon as you have knowledge of a leak, spill or other release containing a hazardous substance or oil in an amount equal to or in excess of an reportable quantity
Planned changes	Give notice to EPA no fewer than 30 days prior to making any planned physical alterations or additions to the permitted facility
Anticipated noncompliance	Give advanced notice to EPA of any planned changes in the permitted facility or activity
Compliance schedules	Reports of compliance or noncompliance with, or any progress reports on, compliance schedules must be submitted within 14 days following each schedule date

7.5 Record Retention Requirements [MSGP Part 7.7]

All copies of the SWPPP, including corrective action, inspection and reporting documentation shall be retained at the facility for at least three years.

7.6 IDEQ Reporting Requirements [MSGP Part 9.10.3]

Part 9.10.3 of the MSGP outlines additional reporting to the State of Idaho including:

- Numeric benchmarks and effluent limitations: at the time of this SWPPP update, Perpetua is not required to complete benchmark monitoring or effluent limitations monitoring. If that applicability changes, additional parameter requirements from the State of Idaho may include pH, Total Arsenic, Total Zinc, Cadmium, Chromium III and Total Recoverable Copper;
- Monitoring of Discharges to Impaired Waters: For water bodies included on the state's 303(d) list as "cause unknown" or "combined biota/habitat assessments", Perpetua must monitor for suspected pollutants listed in the cause comments section of the integrated report. Refer to Section 5.4 of this SWPPP for more information.
- New or Expanding Discharges: If new or existing dischargers wish to expand their discharge to high-quality waters are only eligible for coverage under the MSGP if it is established, to the satisfaction of EPA and IDEQ, that the new or expanded discharge will not result in an increase in the concentrations of pollutants relevant to the use for which the water is considered high-quality;
- Outstanding Resource Waters: Any permittee proposing to discharge to an outstanding resource water shall not be covered under the MSGP and is required to apply for an individual IPDES permit;
- SWPPP Availability: If requested, Perpetua must submit a copy of this SWPPP to IDEQ within 14 days of the request;
- Reporting of Discharges Containing Hazardous Materials or Petroleum Products:
  - Any spill of hazardous materials must be immediately reported to the State Communications Center by calling 1-800-632-8000 or 208-846-7610.
  - Spills must also be reported to the appropriate IDEQ Regional. Spills of petroleum products that exceed 25 gallons or that cause a visible sheen on surface waters should be reported to IDEQ within 24-hours. Petroleum product spills of less than 25 gallons or spills that do not cause sheen on surface waters must only be reported to IDEQ if clean-up cannot be accomplished within 24- hours.
- Other Reporting Requirements: Copies of the following information must be sent to the appropriate DEQ Regional Office:
  - Notices of Intent and Termination (NOIs and NOTs), as required by MSGP Part 7.2.1;
  - Monitoring data collected pursuant to Part 4 of the MSGP, as well as any additional monitoring required by 401 water quality certification;
  - Exceedance Reports, as required by MSGP Part 7.5;
  - Planned Changes Reports, as required by MSGP Parts 7.6.4 and 7.6.5

  Both monitoring data and exceedance reports must be sent to the appropriate DEQ Regional Office within 30 days of receipt of the analytical results.

Alternative Limitations: At the time of this SWPPP revision, Perpetua is not subject to benchmark monitoring requirements; if that applicability changes, the alternative limitations in this part of the MSGP shall be considered.

8.0 ENDANGERED SPECIES PROTECTION AND HISTORIC PROPERTIES PRESERVATION [MSGP Appendices E and F]

8.1 Procedures Relating to Endangered Species Protection [MSGP Part 1.1.4 and Appendix E]

Pursuant to Part 1.1.4 of the MSGP, the facilities shall be able to demonstrate that stormwater discharges, non-stormwater discharges, and stormwater discharge-related activities are not likely to adversely affect any species that are federally listed as endangered or threatened and are not likely to adversely affect habitat that is designated as "critical habitat", or said discharges and activities were the subject of an Endangered Species Act (ESA) Section 7 consultation or ESA Section 10 permit.

Perpetua has undergone formal consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) under Section 7 of the ESA. Therefore, the Perpetua facility meets Criterion D in Appendix E of the MSGP.

Appendix I of this SWPPP contains Perpetua's criterion evaluation document and an official concurrence letter from the USFWS and NMFS. Appendix A of this SWPPP contains the facility's NOI, which supports the eligibility criterion that the facility qualifies under. This documentation supports the assessment that Perpetua's stormwater discharges, non-stormwater discharges and stormwater discharge-related activities are not likely to adversely affect any species that are federally listed as endangered or threatened and are not likely to adversely affect habitat that is designated as "critical habitat".

8.2 Procedures Relating to Historic Properties Preservation [MSGP Part 1.1.5 and Appendix F)

Appendix F of the MSGP has up to four steps that facilities must complete in order to demonstrate that stormwater discharges, authorized stormwater discharges, and stormwater discharge-related activities meet one of the eligibility criteria. The steps for Perpetua are as follows:

<u>Step One:</u> ***Are you an existing facility that is resubmitting for certification under the 2021 MSGP?***
<u>Response:</u> Yes. Perpetua is an existing facility that is reapplying for certification under the 2021 MSGP.

The MSGP indicates that if the facility is an existing facility, and will construct or install stormwater control measures that will disturb less than one (1) acre, then proceed to Step Three in MSGP Appendix F.

<u>Step Three:</u> **Have prior earth disturbances determined that historic properties does not exist, or have prior disturbances precluded the existence of historic properties?**
<u>Response</u>: Prior disturbances have not revealed evidence of historic properties. In addition, an extensive cultural resource survey has been conducted as part of Perpetua's environmental assessment process (2015), including cultural resource surveys at proposed exploration pad locations and other proposed earth disturbing areas. The environmental assessment concluded that impacts to cultural resources is unlikely, but with the stipulation that if cultural resources are encountered during exploration activities, the appropriate authorities shall be notified and mitigation evaluated.

Appendix A: EPA MSGP, Perpetua NOI and Discharge Authorization Form

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
MULTI-SECTOR GENERAL PERMIT (MSGP)
FOR STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY

In compliance with the provisions of the Clean Water Act (CWA), as amended (33 U.S.C. 1251 et seq.), operators of stormwater discharges associated with industrial activity located in an area identified in Appendix C where EPA is the permitting authority are authorized to discharge to waters of the United States in accordance with the eligibility and Notice of Intent (NOI) requirements, effluent limitations, inspection requirements, and other conditions set forth in this permit. This permit is structured as follows:

- **Parts 1-7:** General requirements that apply to all facilities;
- **Part 8:** Industry sector-specific requirements;
- **Part 9:** Specific requirements that apply in individual states and Indian country; and
- **Appendices A through P:** Additional permit conditions that apply to all operators covered under this permit.

This permit becomes effective on **March 1, 2021.** This permit and the authorization to discharge shall expire at 11:59 pm eastern time, **February 28, 2026.**

Signed and issued this 15th day of January 2021
DENNIS DEZIEL
Digitally signed by DENNIS DEZIEL
Date: 2021.01.15 11:27:28 -05'00'
Dennis Deziel,
Regional Administrator, EPA Region 1.

Signed and issued this 15th day of January 2021
JEFFREY GRATZ
Digitally signed by JEFFREY GRATZ
Date: 2021.01.15 09:35:36 -05'00'
Jeffrey Gratz,
Deputy Director, Water Division, EPA Region 2.

Signed and issued this 15th day of January 2021
CARMEN GUERRERO PEREZ
Digitally signed by CARMEN GUERRERO PEREZ
Date: 2021.01.15 11:13:39 -04'00'
Carmen R. Guerrero-Perez,
Director, Caribbean Environmental Protection Division, EPA Region 2.

Signed and issued this 15th day of January 2021
CATHERINE LIBERTZ
Digitally signed by CATHERINE LIBERTZ
Date: 2021.01.15 10:55:42 -05'00'
Catherine A. Libertz,
Director, Water Division, EPA Region 3.

Signed and issued this 15th day of January 2021
JEANEANNE GETTLE
Digitally signed by JEANEANNE GETTLE
Date: 2021.01.15 08:29:14 -05'00'
Jeaneanne Gettle,
Director, Water Division, EPA Region 4.

Signed and issued this 15th day of January 2021
Digitally signed by TERA FONG
Date: 2021.01.15 11:31:25 -06'00'
Tera L. Fong,
Director, Water Division, EPA Region 5.

Signed and issued this 15th day of January 2021
CHARLES MAGUIRE
Digitally signed by CHARLES MAGUIRE
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=CHARLES MAGUIRE, 0.9.2342.19200300.100.1.1=68001003650036
Date: 2021.01.15 12:41:18 -06'00'
Charles Maguire,
Director, Water Division, EPA Region 6.

Signed and issued this 15th day of January 2021
JEFFERY ROBICHAUD
Digitally signed by JEFFERY ROBICHAUD
Date: 2021.01.15 13:43:45 -06'00'
Jeffery Robichaud,
Director, Water Division, EPA Region 7.

Signed and issued this 15th day of January 2021
DARCY OCONNOR
Digitally signed by DARCY OCONNOR
Date: 2021.01.15 14:22:01 -07'00'
Darcy O'Connor,
Director, Water Division, EPA Region 8.

Signed and issued this 15th day of January 2021
TOMAS TORRES
Digitally signed by TOMAS TORRES
Date: 2021.01.15 15:00:36 -08'00'
Tomás Torres,
Director, Water Division, EPA Region 9.

Signed and issued this 15th day of January 2021
DANIEL OPALSKI
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Date: 2021.01.15 15:30:11 -08'00'
Daniel D. Opalski,
Director, Water Division, EPA Region 10.

Table of Contents

1 How to Obtain Coverage Under the 2021 MSGP

To be covered under this permit, you must meet all of the eligibility conditions and follow the requirements for obtaining permit coverage in Part 1.

1.1 Eligibility Conditions

1.1.1 **Location of Your Facility.** Your facility must be located in an area where EPA is the permitting authority and where coverage under this permit is available (see Appendix C); [1]

1.1.2 **Your Discharges Are Associated with Industrial Activity.** Your facility must have an authorized stormwater discharge or an authorized non-stormwater discharge per Part 1.2 associated with industrial activity from your primary industrial activity (as defined in Appendix A and as listed in Appendix D), or you have been notified by EPA that you are eligible for coverage under Sector AD.

1.1.3 **Limitations on Coverage.** Discharges from your facility are **not**:

1.1.3.1 **Discharges mixed with non-stormwater discharges.** Discharges mixed with non-stormwater discharges other than those mixed with authorized non-stormwater discharges listed in Part 1.2.2, and/or those mixed with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES authorization.

1.1.3.2 **Stormwater discharges associated with construction activity.** Stormwater discharges associated with construction activity disturbing one acre or more, or that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb one acre or more, unless in conjunction with mining activities or certain oil and gas extraction activities as specified in Sectors G, H, I, and J of this permit.

1.1.3.3 **Discharges already covered by another NPDES permit.** Unless you have received written notification from EPA specifically allowing these discharges to be covered under this permit, you are not eligible for coverage under this permit for any of the following:

a. Stormwater discharges associated with industrial activity that are currently covered under an individual NPDES permit or an alternative NPDES general permit;

b. Stormwater discharges covered within five years prior to the effective date of this permit by an individual NPDES permit or alternative NPDES general permit where that permit established site-specific numeric water quality-based effluent limitations developed for the industrial stormwater component of the discharge; or

c. Discharges from facilities where any NPDES permit has been or is in the process of being denied, terminated, or revoked by EPA (this does not apply to the routine expiration and reissuance of NPDES permits every five years).

1.1.3.4 **Stormwater Discharges Subject to Effluent Limitations Guidelines.** Stormwater discharges subject to stormwater effluent limitation guidelines under 40 CFR, Subchapter N, other than those listed in Table 1-1 of this permit.

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[1] This condition also applies in the limited circumstances where your facility is located in a jurisdiction where EPA is not the permitting authority, but your discharge point location is to a water of the United States where EPA is the permitting authority.

1.1.4 **Eligibility Related to Endangered Species Act (ESA) Listed Species and Critical Habitat Protection.** You are able to demonstrate that your stormwater discharges, authorized non-stormwater discharges, and stormwater discharge-related activities are not likely to adversely affect any species that are federally listed as endangered or threatened ("ESA-listed") and are not likely to adversely affect habitat that is designated as "critical habitat" under the Endangered Species Act (ESA), or said discharges and activities were the subject of an ESA Section 7 consultation or an ESA Section 10 permit. You must follow the procedures outlined in the Endangered Species Protection section of the NOI in EPA's NPDES eReporting Tool (NeT-MSGP) and meet one of the criteria listed in Appendix E. You must comply with any measures that formed the basis of your criteria eligibility determination to be in compliance with the MSGP. These measures become permit requirements per Part 2.3. Documentation of these measures must be kept as part of your Stormwater Pollution Prevention Plan (SWPPP) (see Part 6.2.6.1).

1.1.5 **Eligibility related to National Historic Preservation Act (NHPA)-Protected Properties.** You must follow the procedures outlined in the Historic Properties section of the NOI in NeT-MSGP to demonstrate that your stormwater discharges, authorized non-stormwater discharges, and stormwater discharge-related activities meet one of the eligibility criteria in Appendix F.

1.1.6 **Eligibility for "New Dischargers" and "New Sources" (as defined in Appendix A)[2] ONLY**

1.1.6.1 **Eligibility for "New Dischargers" and "New Sources" Based on Water Quality Standards.** Your stormwater discharge must be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards. You are ineligible for coverage under this permit if EPA determines prior to your authorization to discharge that your stormwater discharges will not be controlled as necessary such that the receiving water of the United States will not meet an applicable water quality standard. In such case, EPA may notify you that an individual permit application is necessary per Part 1.3.8, or, alternatively, EPA may authorize your coverage under this permit after you implement additional control measures so that your stormwater discharges will be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards.

1.1.6.2 **Eligibility for "New Dischargers" and "New Sources" for Water-Quality Impaired Waters.** If you discharge to an "impaired water" (as defined in Appendix A), you must do one of the following:

a. Prevent all exposure to stormwater of the pollutant(s) for which the waterbody is impaired, and retain documentation of procedures taken to prevent exposure onsite with your SWPPP;

b. When submitting your NOI in NeT-MSGP, provide the technical information or other documentation to support your claim that the pollutant(s) for which the waterbody

[2] "New Discharger" means a facility from which there is or may be a discharge, that did not commence the discharge of pollutants at a particular site prior to August 13, 1979, which is not a new source, and which has never received a finally effective NPDES permit for discharges at that site. See 40 CFR 122.2.

"New Source" means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced: i) after promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or ii) after proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal. See 40 CFR 122.2.

is impaired is not present at your facility, and retain such documentation with your SWPPP; or

c. When submitting your NOI in NeT-MSGP, provide either data or other technical documentation, to support a conclusion that the stormwater discharge will be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards and retain such information with your SWPPP. The information you submit must demonstrate:

i. For discharges to waters without an EPA-approved or established total maximum daily load (TMDL), that the discharge of the pollutant for which the water is impaired will be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards at the point of discharge to the waterbody; or

ii. For discharges to waters with an applicable EPA-approved or established TMDL, that there are, in accordance with 40 CFR 122.4(i), sufficient remaining wasteload allocations in the TMDL to allow your discharge and that existing dischargers to the waterbody are subject to compliance schedules designed to bring the waterbody into attainment with water quality standards (e.g., a reserve allocation for future growth).

You are eligible under Part 1.1.6.2.c if you receive a determination from the applicable EPA Regional Office that your stormwater discharge will be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards and you document the Region's determination in your SWPPP. If the applicable EPA Regional Office fails to respond to you within 30 days after submission of data, you are considered eligible for coverage.

1.1.6.3 <u>Eligibility for "New Dischargers" and "New Sources" for Waters with High Water Quality (Tier 2, 2.5, and 3).</u>

a. For new dischargers and new sources to Tier 2 or Tier 2.5 waters, your discharge must not lower the water quality of the applicable water. See a list of Tier 2 and Tier 2.5 waters in Appendix L.

b. For new dischargers and new sources to waters designed by a state or tribe as Tier 3 waters[3] (i.e., outstanding national resource waters) for antidegradation purposes under 40 CFR 131.13(a)(3), you are not eligible under this permit and you must apply for an individual permit. See a list of Tier 3 waters in Appendix L.

1.1.7 <u>Eligibility for Discharges to a Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Site.</u> If you discharge to a federal CERCLA Site listed in Appendix P, you must notify the EPA Region 10 Office when submitting your NOI, and the EPA Region 10 Office must determine that you are eligible for permit coverage. In determining eligibility for coverage under this Part, the EPA Region 10 Office may evaluate whether you are implementing or plan to implement adequate controls and/or procedures to ensure that your discharge will not lead to

[3] For the purposes of this permit, your project is considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first water of the United States to which you discharge is identified by a state, tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a separate storm sewer system prior to discharge, the first water of the United States to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system (separate storm sewer systems (MS4s and non-municipal storm sewers systems) do not include combined sewer systems or separate sanitary sewer systems).

recontamination of aquatic media at the CERCLA Site (i.e., your stormwater discharge will be controlled as necessary such that the receiving water of the United States will meet an applicable water quality standard). If it is determined that your facility discharges to a CERCLA Site listed in Appendix P after you have obtained coverage under this permit, you must contact the EPA Region 10 Office and ensure that you either have implemented or will implement adequate controls and/or procedures to ensure that your discharges will not lead to recontamination of aquatic media at the CERCLA Site such that your stormwater discharge will be controlled as necessary such that the receiving water of the United States will meet an applicable water quality standard.

For the purposes of this permit, a facility discharges to a federal CERCLA Site if the discharge flows directly into the site through its own conveyance, or through a conveyance owned by others, such as a municipal separate storm sewer system (MS4).

1.2 Types of Discharges Authorized Under the MSGP[4]

1.2.1 Authorized Stormwater Discharges. If you meet all the eligibility criteria in Part 1.1, then the following discharges from your facility are authorized under this permit:

1.2.1.1 Stormwater discharges associated with industrial activity for any primary industrial activities and co-located industrial activities (as defined in Appendix A) except for any stormwater discharges prohibited in Part 8;

1.2.1.2 Discharges EPA has designated as needing a stormwater permit as provided in Sector AD;

1.2.1.3 Discharges that are not otherwise required to obtain NPDES permit authorization but are mixed with discharges that are authorized under this permit; and

1.2.1.4 Stormwater discharges from facilities subject to any of the national stormwater-specific effluent limitations guidelines listed in Table 1-1.

Table 1-1. Stormwater-Specific Effluent Limitations Guidelines

Regulated Discharge	40 CFR Section	MSGP Sector	New Source Performance Standard (NSPS)	New Source Date
Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	Part 429, Subpart I	A	Yes	1/26/81
Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	Part 418, Subpart A	C	Yes	4/8/74
Runoff from asphalt emulsion facilities	Part 443, Subpart A	D	Yes	7/28/75
Runoff from material storage piles at cement manufacturing facilities	Part 411, Subpart C	E	Yes	2/20/74

[4] Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under Clean Water Act (CWA) section 402(k) by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the Stormwater Pollution Prevention Plan (SWPPP), or during an inspection.

Regulated Discharge	40 CFR Section	MSGP Sector	New Source Performance Standard (NSPS)	New Source Date
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	Part 436, Subparts B, C, and D	J	No	N/A
Runoff from hazardous waste and non-hazardous waste landfills	Part 445, Subparts A and B	K, L	Yes	2/2/00
Runoff from coal storage piles at steam electric generating facilities	Part 423	O	Yes	11/19/82 (10/8/74)[1]
Runoff containing urea from airfield pavement deicing at existing and new primary airports with 1,000 or more annual non-propeller aircraft departures	Part 449	S	Yes	6/15/1

[1] NSPS promulgated in 1974 were not removed via the 1982 regulation; therefore, wastewaters generated by 40 CFR Part 423-applicable sources that were New Sources under the 1974 regulations are subject to the 1974 NSPS.

1.2.2 **Authorized Non-Stormwater Discharges.** Below is the list of non-stormwater discharges authorized under this permit. Unless specifically listed in this Part, this permit does not authorize any other non-stormwater discharges requiring NPDES permit coverage and you must either eliminate those discharges or they must be covered under another NPDES permit; this includes the sector-specific non-stormwater discharges that are listed in Part 8 as prohibited (a non-exclusive list is provided only to raise awareness of contaminants or sources of contaminants generally characteristic of certain sectors).

1.2.2.1 **Authorized Non-Stormwater Discharges for All Sectors.** The following are the only non-stormwater discharges authorized under this permit for all sectors provided that all discharges comply with the effluent limits set forth in Parts 2 and 8.

a. Discharges from emergency/unplanned fire-fighting activities;

b. Fire hydrant flushings;

c. Potable water, including uncontaminated water line flushings;

d. Uncontaminated condensate from air conditioners, coolers/chillers, and other compressors and from the outside storage of refrigerated gases or liquids;

e. Irrigation/landscape drainage, provided all pesticides, herbicides, and fertilizers have been applied in accordance with the approved labeling;

f. Pavement wash waters, provided that detergents or hazardous cleaning products are not used (e.g., bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols), and the wash waters do not come into contact with oil and grease deposits, sources of pollutants associated with industrial activities (see Part 6.2.3), or any other toxic or hazardous materials, unless residues are first cleaned up using dry clean-up methods (e.g., applying absorbent materials and sweeping, using hydrophobic mops/rags) and you have implemented appropriate control measures to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention, settlement);

g. External building/structure washdown / power wash water that does not use detergents or hazardous cleaning products (e.g., those containing bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols) and you have implemented appropriate control measures to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention, settlement);

h. Uncontaminated ground water or spring water;

i. Foundation or footing drains where flows are not contaminated with process materials;

j. Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of your facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown; drains); and

k. Any authorized non-stormwater discharge listed above in this Part 1.2.2 or any stormwater discharge listed in Part 1.2.1 mixed with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.2.2.2 **<u>Additional Authorized Non-Stormwater Discharge for Sector A Facilities.</u>** Discharges from the spray down of lumber and wood product storage yards where no chemical additives are used in the spray-down waters and no chemicals are applied to the wood during storage, provided the non-stormwater component of the discharge is in compliance with the non-numeric effluent limits requirements in Part 2.1.2.

1.2.2.3 **<u>Additional Authorized Non-Stormwater Discharges for Earth-Disturbing Activities Conducted Prior to Active Mining Activities for Sectors G, H and J Facilities</u>**. The following non-stormwater discharges are only authorized for earth-disturbing activities conducted prior to active mining activities, as defined in Part 8.G.3.2, 8.H.3.2, and 8.J.3.2, provided that, with the exception of water used to control dust, these discharges are not routed to areas of exposed soil and all discharges comply with the permit's effluent limits. Once the earth-disturbing activities conducted prior to active mining activities have ceased, the only authorized non-stormwater discharges for Sectors G, H, and J are those listed here in Part 1.2.2.3:

a. Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;

b. Water used to control dust; and

c. Dewatering water that has been treated by an appropriate control under Parts 8.G.4.2.9, 8.H.4.2.9, or 8.J.4.2.9.

1.3 <u>Obtaining Authorization to Discharge</u>

1.3.1 **<u>Prepare Your Stormwater Pollution Prevention Plan (SWPPP) Prior to Submitting Your Notice of Intent (NOI).</u>** You must develop a SWPPP or update your existing SWPPP per Part 6 prior to submitting your NOI for coverage under this permit, per Part 1.3.2 below. You must make your SWPPP publicly available by either attaching it to your NOI, including a URL in your NOI, or providing additional information from your SWPPP on your NOI, per Part 6.4.

1.3.2 **<u>How to Submit Your NOI to Get Permit Coverage.</u>** To be covered under this permit, you must use EPA's NPDES eReporting Tool for the MSGP (NeT-MSGP) to electronically prepare and submit to EPA a complete and accurate NOI by the deadline applicable to your facility presented in Table 1-2. The NOI certifies to EPA that you are eligible for coverage according to Part 1.1 and provides information on your industrial activities and related discharges. Per Part 7.1, you must submit your NOI electronically via NeT-MSGP, unless the applicable EPA Regional Office grants you a waiver from electronic reporting, in which case you may use the paper NOI form in Appendix G. To access NeT-MSGP, go to https://www.epa.gov/npdes/stormwater-discharges-industrial-activities#accessingmsgp

1.3.3 **Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage.** Table 1-2 provides the deadlines for submitting your NOI and your official start date of permit coverage.

Table 1-2. NOI Submittal Deadlines and Discharge Authorization Dates

Category of Facility/Operator	NOI Submission Deadline	Discharge Authorization Date[1, 2]
Existing MSGP facility. Operators of industrial activities whose stormwater discharges were covered under the 2015 MSGP.	No later than May 30, 2021.	30 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization has been denied or delayed. Note: You must review and update your SWPPP to ensure that this permit's requirements are addressed prior to submitting your NOI. Provided you submit your NOI in accordance with the deadline, your authorization under the 2015 MSGP is automatically continued until you have been granted coverage under this permit or an alternative permit, or coverage is otherwise terminated.
Operator operating consistent with EPA's No Action Assurance and submitted an Intent to Operate (ITO) form. Operators of industrial activities who commenced discharging between June 4, 2020 and March 1, 2021 and have been operating consistent with EPA's June 3, 2020 'No Action Assurance for the NPDES Stormwater Multi-Sector General Permit for Industrial Activities.'	As soon as possible, but see the June 3, 2020 'No Action Assurance for the NPDES Stormwater Multi-Sector General Permit for Industrial Activities' (and any updates to that document) for additional guidance on deadlines.	30 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization has been denied or delayed.
New facility without MSGP coverage. Operators of industrial activities that will commence discharging after March 1, 2021.	At least 30 calendar days prior to commencing discharge.	30 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization has been denied or delayed.
Existing facility covered under an alternative permit. Operators seeking coverage for stormwater discharges previously covered under an individual permit or an alternative general permit.	At least 30 calendar days prior to commencing discharge.	

Category of Facility/Operator	NOI Submission Deadline	Discharge Authorization Date[1, 2]
Existing MSGP facility with a new operator. New operators of existing industrial activities with stormwater discharges previously authorized under the 2021 MSGP.	At least 30 calendar days prior to the date of transfer of control to the new operator.	
Existing facility without MSGP coverage. Operators of industrial activities that commenced discharging prior to March 1, 2021, but whose stormwater discharges were not covered under the 2015 MSGP or another NPDES permit and have not been operating consistent with EPA's No Action Assurance for EPA's NPDES MSGP.	Immediately; your stormwater discharges are currently unpermitted.[1]	

[1] If you have missed the deadline to submit your NOI, any and all discharges from your industrial activities will continue to be unauthorized under the CWA until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of discharging and discharge authorization.

[2] Discharges are not authorized if your NOI is incomplete or inaccurate or if you are ineligible for permit coverage.

1.3.4 **Modifying your NOI.** If after submitting your NOI, you need to correct or update any fields, you may do so by submitting a "Change NOI" form using NeT-MSGP. Per Part 7.1, you must submit your Change NOI electronically via NeT-MSGP, unless the EPA Regional Office grants you a waiver from electronic reporting, in which case you may use the suggested format for the paper Change NOI form.

1.3.4.1 For an existing operator, if any of the information supplied on the NOI changes, you must submit a Change NOI form within thirty (30) calendar days after the change occurs.

1.3.4.2 At a facility where there is a transfer in operator or a new operator takes over operational control at an existing facility, the new operator must submit a new NOI no later than thirty (30) calendar days after a change in operators. The previous operator must submit a Notice of Termination (NOT) no later than thirty (30) calendar days after MSGP coverage becomes active for the new operator, as specified in Part 1.4.

1.3.5 **Requirement to Post a Sign of your Permit Coverage.** You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to your facility. Public signage is not required where other laws or local ordinances prohibit such signage, in which case you must document in your SWPPP a brief explanation for why you cannot post a sign and a reference to the law or ordinance. You must use a font large enough to be readily viewed from a public right-of-way and perform periodic maintenance of the sign to ensure that it remains legible, visible, and factually correct. At minimum, the sign must include:

1.3.5.1 The following statement: "[*Name of facility*] is permitted for industrial stormwater discharges under the U.S. EPA's Multi-Sector General Permit (MSGP)";

1.3.5.2 Your NPDES ID number;

1.3.5.3 A contact phone number for obtaining additional facility information;

1.3.5.4 **One** of the following:

a. The Uniform Resource Locator (URL) for the SWPPP (if available), and the following statement: "To report observed indicators of stormwater pollution, contact [*optional: include facility point of contact and*] EPA at: [*include the applicable MSGP Regional Office contact information found at https://www.epa.gov/npdes/contact-us-stormwater#regional*]; **or**

b. The following statement: "To obtain the Stormwater Pollution Prevention Plan (SWPPP) for this facility or to report observed indicators of stormwater pollution, contact [*optional: include facility point of contact and*] EPA at [*include the applicable MSGP Regional Office contact information found at https://www.epa.gov/npdes/contact-us-stormwater#regional*]."

1.3.6 **Your Official End Date of Permit Coverage.** Once covered under this permit, your coverage will last until the date that:

1.3.6.1 You terminate permit coverage by submitting a Notice of Termination (NOT) per Part 1.4; or

1.3.6.2 You receive coverage under a different NPDES permit or a reissued or replacement version of this permit after it expires on February 28, 2026; or

1.3.6.3 You fail to submit an NOI for coverage under a reissued or replacement version of this permit before the required deadline.

1.3.7 **Continuation of Coverage for Existing Operators After the Permit Expires**

1.3.7.1 Note that if the 2021 MSGP is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with section 558(c) of the Administrative Procedure Act (see 40 CFR 122.6) and remain in force and effect for operators that were covered prior to its expiration. All operators authorized to discharge prior to the expiration date of the 2021 MSGP will automatically remain covered under the 2021 MSGP until the earliest of:

a. The date the operator is authorized for coverage under a new version of the MSGP following the timely submittal of a complete and accurate NOI. Note that if a timely NOI for coverage under the reissued or replacement permit is not submitted, coverage will terminate on the date that the NOI was due; or

b. The date of the submittal of a Notice of Termination; or

c. Issuance of an individual permit for the facility's discharge(s); or

d. A final permit decision by EPA not to reissue the MSGP, at which time EPA will identify a reasonable time period for covered operators to seek coverage under an alternative general permit or an individual permit. Coverage under the 2021 MSGP will terminate at the end of this time period.

1.3.7.2 EPA reserves the right to modify or revoke and reissue the 2021 MSGP under 40 CFR 122.62 and 63, in which case operators will be notified of any relevant changes or procedures to which they may be subject. If EPA fails to issue another general permit prior to the expiration of a previous one, EPA does not have the authority to provide coverage to industrial operators not already covered under that prior general permit. If the five-year expiration date for the 2021 MSGP has passed and a new MSGP has not been reissued, new operators seeking discharge authorization should contact EPA regarding the options available, such as applying for individual permit coverage.

1.3.8 **Coverage Under Alternative Permits.** EPA may require you to apply for and/or obtain authorization to discharge under an alternative permit, i.e., either an individual NPDES permit or an alternative NPDES general permit, in accordance with 40 CFR 122.64 and 124.5. If EPA requires you to apply for an alternative permit, the Agency will notify you in writing that a permit application or NOI is required. This notification will include a brief statement of the reasons for this decision and will contain alternative permit application or NOI requirements, including deadlines for completing your application or NOI.

1.3.8.1 **Denial of Coverage for New or Previously Unpermitted Facilities.** For new or previously unpermitted facilities, following the submittal of your NOI, you may be denied coverage under this permit and must apply for and/or obtain authorization to discharge under an alternative permit.

1.3.8.2 **Loss of Authorization Under the 2021 MSGP for Existing Permitted Facilities.** If your stormwater discharges are covered under this permit, you may receive a written notification that you must either apply for coverage under an individual NPDES permit or submit an NOI for coverage under an alternative general NPDES permit. In addition to the reasons for the decision and alternative permit application or NOI deadlines, the notice will include a statement that on the effective date of your alternative permit coverage, your coverage under the 2021 MSGP will terminate. EPA will terminate your MSGP permit coverage in NeT-MSGP at that time. EPA may grant additional time to submit the application or NOI if you request it. If you fail to submit an alternative permit application or NOI as required by EPA, then your authorization to discharge under the 2021 MSGP is terminated at the end of the day EPA required you to submit your alternative permit application or NOI. EPA may take appropriate enforcement action for any unpermitted discharge.

1.3.8.3 **Operators Requesting Coverage Under an Alternative Permit.** You may request to be covered under an individual permit. In such a case, you must submit an individual permit application in accordance with the requirements of 40 CFR 122.28(b)(3)(iii), with reasons supporting the request, to the applicable EPA Regional Office listed in Part 7.8 of this permit. The request may be granted by issuance of an individual permit if your reasons are adequate to support the request. When you are authorized to discharge under an alternative permit, your authorization to discharge under the 2021 MSGP is terminated on the effective date of the alternative permit.

1.4 Terminating Permit Coverage

1.4.1 **How to Submit your Notice of Termination (NOT) to Terminate Permit Coverage.** To terminate permit coverage, you must use EPA's NPDES eReporting Tool for the MSGP (NeT-MSGP) to electronically prepare and submit to EPA a complete and accurate NOT. Per Part 7.1, you must submit your NOT electronically via NeT-MSGP, unless the EPA Regional Office grants you a waiver from electronic reporting, in which case you may use the paper NOT form in Appendix H. To access NeT-MSGP, go to https://www.epa.gov/npdes/stormwater-discharges-industrial-activities#accessingmsgp

Your authorization to discharge under this permit terminates at midnight of the day that you are notified that your complete NOT has been processed. If you submit a NOT without meeting one or more of the conditions in Part 1.4.2 then your NOT is not valid.

Until you terminate permit coverage, you must comply with all conditions and effluent limitations in the permit.

1.4.2 **When to Submit Your Notice of Termination.** You must submit a NOT within 30 days after one or more of the following conditions have been met:

1.4.2.1 A new owner or operator has received authorization to discharge under this permit; or

1.4.2.2 You have ceased operations at the facility and/or there are not or no longer will be discharges of stormwater associated with industrial activity from the facility, and you have already implemented necessary sediment and erosion controls per Part 2.1.2.5; or

1.4.2.3 You are a Sector G, H, or J facility and you have met the applicable termination requirements; or

1.4.2.4 You obtained coverage under an individual or alternative general permit for all discharges required to be covered by an NPDES permit, unless EPA terminates your coverage for you per Part 1.3.8.

1.5 Conditional Exclusion for No Exposure

If you are covered by this permit and become eligible for a “no exposure” exclusion from permitting under 40 CFR 122.26(g), you may file a No Exposure Certification (NEC). You are no longer required to have a permit upon submission of a complete and accurate NEC to EPA. If you are no longer required to have permit coverage because of a no exposure exclusion and have submitted a NEC form to EPA, you are not required to submit a NOT. You must submit a NEC form to EPA once every five years.

You must use EPA’s NPDES eReporting Tool for the MSGP (NeT-MSGP) to electronically prepare and submit to EPA a complete and accurate NEC. Per Part 7.1, you must submit your NEC electronically via NeT-MSGP, unless the applicable EPA Regional Office grants you a waiver from electronic reporting, in which case you may use the paper NEC form in Appendix K. To access NeT-MSGP, go to https://cdxnodengn.epa.gov/net-msgp/action/login

1.6 Permit Compliance

Any noncompliance with any of the requirements of this permit constitutes a violation of this permit, and thus is a violation of the CWA. As detailed in Part 5, failure to take any required corrective actions constitutes an independent, additional violation of this permit, in addition to any original violation that triggered the need for a corrective action. As such, any actions and time periods specified for remedying noncompliance do not absolve you of the initial underlying noncompliance.

Where an Additional Implementation Measure (AIM) is triggered by an event that does not itself constitute permit noncompliance (i.e., an exceedance of an applicable benchmark), there is no permit violation provided you comply with the required responses within the relevant deadlines established in Part 5.

1.7 Severability

Invalidation of a portion of this permit does not necessarily render the whole permit invalid. EPA’s intent is that the permit is to remain in effect to the extent possible; in the event that any part of this permit is invalidated, EPA will advise the regulated community as to the effect of such invalidation.

2. Control Measures and Effluent Limits

In the technology-based limits included in Parts 2.1 and 8, the term "minimize" means to reduce and/or eliminate to the extent achievable using stormwater control measures (SCMs) (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice. The term "infeasible" means not technologically possible or not economically practicable and achievable in light of best industry practices. EPA notes that it does not intend for any permit requirement to conflict with state water rights law.

2.1 Stormwater Control Measures

You must select, design, install, and implement stormwater control measures (including best management practices) to minimize pollutant discharges that address the selection and design considerations in Part 2.1.1, meet the non-numeric effluent limits in Part 2.1.2, meet limits contained in applicable effluent limitations guidelines in Part 2.1.3, and meet the water quality-based effluent limitations in Part 2.2.

The selection, design, installation, and implementation of control measures to comply with Part 2 must be in accordance with good engineering practices and manufacturer's specifications. Note that you may deviate from such manufacturer's specifications where you provide justification for such deviation and include documentation of your rationale in the part of your SWPPP that describes your control measures, consistent with Part 6.2.4. You must modify your stormwater control measures per Part 5.1 if you find that your control measures are not achieving their intended effect of minimizing pollutant discharges (i.e., your discharges will be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards or meet any of the other non-numeric effluent limits in this permit). Regulated stormwater discharges from your facility include stormwater run-on that commingles with stormwater discharges associated with industrial activity at your facility.

2.1.1 **Stormwater Control Measure Selection and Design Considerations**. You must consider the following when selecting and designing control measures:

2.1.1.1 Preventing stormwater from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from stormwater;

2.1.1.2 Using stormwater control measures in combination may be more effective than using control measures in isolation for minimizing pollutants in your stormwater discharge;

2.1.1.3 Assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective stormwater control measures that will achieve the limits in this permit;

2.1.1.4 Minimizing impervious areas at your facility and infiltrating stormwater onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches) can reduce the frequency and volume of discharges and improve ground water recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination;

2.1.1.5 Attenuating flow using open vegetated swales and natural depressions can reduce in-stream impacts of erosive flows;

2.1.1.6 Conserving and/or restoring riparian buffers will help protect streams from stormwater discharges and improve water quality;

2.1.1.7 Using treatment interceptors (e.g., swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants; and

2.1.1.8 Implementing structural improvements, enhanced/resilient pollution prevention measures, and other mitigation measures can help to minimize impacts from stormwater discharges from major storm events such as hurricanes, storm surge, extreme/heavy precipitation,[5] and flood events. If such stormwater control measures are already in place due to existing requirements mandated by other state, local or federal agencies, you should document in your SWPPP a brief description of the controls and a reference to the existing requirement(s). If your facility may be exposed to or has previously experienced such major storm events,[6] additional stormwater control measures that may be considered include, but are not limited to:

- **a.** Reinforce materials storage structures to withstand flooding and additional exertion of force;
- **b.** Prevent floating of semi-stationary structures by elevating to the Base Flood Elevation (BFE)[7] level or securing with non-corrosive device;
- **c.** When a delivery of exposed materials is expected, and a storm is anticipated within 48 hours, delay delivery until after the storm or store materials as appropriate (refer to emergency procedures);
- **d.** Temporarily store materials and waste above the BFE level;
- **e.** Temporarily reduce or eliminate outdoor storage;
- **f.** Temporarily relocate any mobile vehicles and equipment to higher ground;
- **g.** Develop scenario-based emergency procedures for major storms that are complementary to regular stormwater pollution prevention planning and identify emergency contacts for staff and contractors; and

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[5] Heavy precipitation refers to instances during which the amount of rain or snow experienced in a location substantially exceeds what is normal. What constitutes a period of heavy precipitation varies according to location and season. Heavy precipitation does not necessarily mean the total amount of precipitation at a location has increased—just that precipitation is occurring in more intense or more frequent events.

[6] To determine if your facility is susceptible to an increased frequency of major storm events that could impact the discharge of pollutants in stormwater, you may reference FEMA, NOAA, or USGS flood map products at https://www.usgs.gov/faqs/where-can-i-find-flood-maps?qt-news_science_products=0#qt-news_science_products.

[7] Base Flood Elevation (BFE) is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year. The BFE is shown on the Flood Insurance Rate Map (FIRM) for zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1– A30, AR/AH, AR/AO, V1–V30 and VE. (Source: https://www.fema.gov/node/404233). The FEMA Flood Map Service Center can be accessed through https://msc.fema.gov/portal/search.

h. Conduct staff training for implementing your emergency procedures at regular intervals.

Note: Part 2.1.1 requires that you must consider Parts 2.1.1.1 through 2.1.1.8 when selecting and designing control measures to minimize pollutant discharges via stormwater. Part 2.1.1 does not require nor prescribe specific control measure to be implemented; however, you must document in your SWPPP per Part 6.2.4 the considerations made to select and design control measures at your facility to minimize pollutants discharged via stormwater.

2.1.2 **Non-Numeric Technology-Based Effluent Limits (BPT/BAT/BCT).**[8] You must comply with the following non-numeric effluent limits as well as any sector-specific non-numeric effluent limits in Part 8, except where otherwise specified.

Effluent limit requirements in Part 2.1.2 that do not involve the site-specific selection of a control measure or are specific activity requirements (e.g., "Cleaning catch basins when the depth of debris reaches two-thirds (2/3) of the sump depth, in line with manufacturer specifications, whichever is lower, and keeping the debris surface at least six inches below the lowest outlet pipe") are marked with an asterisk (*). When documenting in your SWPPP, per Part 6, how you will comply with the requirements marked with an asterisk, you have the option of including additional information or you may just "copy-and-paste" those effluent limits word-for-word from the permit into your SWPPP without providing additional documentation (see Part 6.2.4).

2.1.2.1 **Minimize Exposure.** You must minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and stormwater in order to minimize pollutant discharges by either locating these industrial materials and activities inside or protecting them with storm resistant coverings. Unless infeasible, you must also:

a. Use grading, berming or curbing to prevent discharges of contaminated flows and divert run-on away from these areas;

b. Locate materials, equipment, and activities so that potential leaks and spills are contained or able to be contained or diverted before discharge;

c. Store leaky vehicles and equipment indoors;

d. Perform all vehicle and/or equipment cleaning operations indoors, under cover, or in bermed areas that prevent discharges and run-on and also that capture any overspray; and

e. Drain fluids from equipment and vehicles that will be decommissioned, and, for any equipment and vehicles that will remain unused for extended periods of time, inspect at least monthly for leaks.

[8] BPT is Best Practicable Control Technology Currently Available, as set forth in CWA section 304(b)(1) and Appendix A; BAT is Best Available Technology Economically Achievable, as set forth in CWA section 304(b)(2) and Appendix A; and BCT is Best Conventional Pollutant Control Technology, as set forth in CWA section 304(b)(4) and Appendix A.

Note: Industrial materials do not need to be enclosed or covered if stormwater from affected areas does not discharge pollutants to waters of the United States or if discharges are authorized under another NPDES permit.

2.1.2.2 **Good Housekeeping.** You must keep clean all exposed areas that are potential sources of pollutants. You must perform good housekeeping measures in order to minimize pollutant discharges, including but not limited to, the following:

a. Sweep or vacuum at regular intervals or, alternatively, wash down the area and collect and/or treat, and properly dispose of the washdown water;

b. Store materials in appropriate containers;

c. Keep all dumpster lids closed when not in use. For dumpsters and roll off boxes that do not have lids and could leak, ensure that discharges have a control (e.g., secondary containment, treatment). Consistent with Part 1.2.2 above, this permit does not authorize dry weather discharges from dumpsters or roll off boxes;*

d. Minimize the potential for waste, garbage and floatable debris to be discharged by keeping exposed areas free of such materials, or by intercepting them before they are discharged.

e. Plastic Materials Requirements: Facilities that handle pre-production plastic must implement control measures to eliminate discharges of plastic in stormwater.[9] Examples of plastic material required to be addressed as stormwater pollutants include plastic resin pellets, powders, flakes, additives, regrind, scrap, waste and recycling.

2.1.2.3 **Maintenance.**

a. **Maintenance Activities.** You must maintain all control measures that are used to achieve the effluent limits in this permit in effective operating condition, as well as all industrial equipment and systems, in order to minimize pollutant discharges. This includes:

ii. Performing inspections and preventive maintenance of stormwater drainage, source controls, treatment systems, and plant equipment and systems that could fail and result in discharges of pollutants via stormwater.

iii. Maintaining non-structural control measures (e.g., keep spill response supplies available, personnel appropriately trained).

iv. Inspecting and maintaining baghouses at least quarterly to prevent the escape of dust from the system and immediately removing any accumulated dust at the base of the exterior baghouse.*

[9] Examples of appropriate control measures include but are not limited to: installing a containment system, or other control, at each on-site storm drain discharge point down gradient of areas containing plastic material, designed to trap all particles retained by a 1 mm mesh screen; using a durable sealed container designed not to rupture under typical loading and unloading activities at all points of plastic transfer and storage; using capture devices as a form of secondary containment during transfers, loading, or unloading plastic materials, such as catch pans, tarps, berms or any other device that collects errant material; having a vacuum or vacuum-type system for quick cleanup of fugitive plastic material available for employees; for facilities that maintain outdoor storage of plastic materials, do so in a durable, permanent structure that prevents exposure to precipitation that could cause the material to be discharged via stormwater.

v. Cleaning catch basins when the depth of debris reaches two-thirds (2/3) of the sump depth, or in line with manufacturer specifications, whichever is lower, and keeping the debris surface at least six inches below the lowest outlet pipe.*

b. **<u>Maintenance Deadlines</u>.**

ii. If you find that your control measures need routine maintenance, you must conduct the necessary maintenance immediately in order to minimize pollutant discharges.

iii. If you find that your control measures need to be repaired or replaced, you must immediately take all reasonable steps to prevent or minimize the discharge of pollutants until the final repair or replacement is implemented, including cleaning up any contaminated surfaces so that the material will not be discharged during subsequent storm events. Final repairs/replacement of stormwater controls should be completed as soon as feasible but must be no later than the timeframe established in Part 5.1.3 for corrective actions, i.e., within 14 days or, if that is infeasible, within 45 days. If the completion of stormwater control repairs/replacement will exceed the 45 day timeframe, you may take the minimum additional time necessary to complete the maintenance, provided that you notify the EPA Regional Office of your intention to exceed 45 days, and document in your SWPPP your rationale for your modified maintenance timeframe. If a control measure was never installed, was installed incorrectly or not in accordance with Parts 2 and/or 8, or is not being properly operated or maintained, you must conduct corrective action as specified in Part 5.1.

Note: In this context, the term "immediately" means the day you identify that a control measure needs to be maintained, repaired, or replaced, you must take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a permanent solution. However, if you identify a problem too late in the work day to initiate action, you must perform the action the following work day morning. "All reasonable steps" means you must respond to the conditions triggering the action, such as, cleaning up any exposed materials that may be discharged in a storm event (e.g., through sweeping, vacuuming) or making arrangements (i.e., scheduling) for a new SCM to be installed.

2.1.2.4 **<u>Spill Prevention and Response</u>.** You must minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur in order to minimize pollutant discharges. You must conduct spill prevention and response measures, including but not limited to, the following:

a. Clean up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants;

b. Use drip pans and absorbents if leaky vehicles and/or equipment are stored outdoors;

c. Use spill/overflow protection equipment;

d. Plainly label containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides") that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;*

e. Implement procedures for material storage and handling, including the use of secondary containment and barriers between material storage and traffic areas, or a similarly effective means designed to prevent the discharge of pollutants from these areas;

f. Develop training on the procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. As appropriate, execute such procedures as soon as possible;

g. Keep spill kits onsite, located near areas where spills may occur or where a rapid response can be made; and

h. Notify appropriate facility personnel when a leak, spill, or other release occurs.

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, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC, metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302 as soon as you have 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. Contact information must be in locations that are readily accessible and available.

2.1.2.5 **Erosion and Sediment Controls.** To minimize pollutant discharges in stormwater, you must minimize erosion by stabilizing exposed soils at your facility and placing flow velocity dissipation devices at discharge locations to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points. You must also use structural and non-structural control measures to minimize the discharge of sediment. If you use polymers and/or other chemical treatments as part of your controls, you must identify the polymers and/or chemicals used and the purpose in your SWPPP. There are many resources available to help you select appropriate SCMs for erosion and sediment control, including EPA's Stormwater Discharges from Construction Activities website at: https://www.epa.gov/npdes/stormwater-discharges-construction-activities.

2.1.2.6 **Management of Stormwater.** You must divert, infiltrate, reuse, contain, or otherwise reduce stormwater to minimize pollutants in your discharges. In selecting, designing, installing, and implementing appropriate control measures, you are encouraged to consult with EPA's resources relating to stormwater management, including the sector-specific *Industrial Stormwater Fact Sheet Series*, (https://www.epa.gov/npdes/stormwater-discharges-industrial-activities#factsheets) and any similar state or tribal resources.

2.1.2.7 **Salt Storage Piles or Piles Containing Salt.** You must enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces, in order to minimize pollutant discharges. You must implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered pursuant to this permit if stormwater from the piles is not discharged or if discharges from the piles are authorized under another NPDES permit.

2.1.2.8 Employee Training.

a. Types of Personnel Who Require Training. You must train all employees who work in areas where industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to comply with this permit (e.g., inspectors, maintenance personnel), including all members of your stormwater pollution prevention team. You must ensure the following personnel understand the requirements of this permit and their specific responsibilities with respect to those requirements:

i. Personnel who are responsible for the design, installation, maintenance, and/or repair of controls (including pollution prevention measures);

ii. Personnel responsible for the storage and handling of chemicals and materials that could become pollutants discharged via stormwater;

iii. Personnel who are responsible for conducting and documenting monitoring and inspections as required in Parts 3 and 4; and

iv. Personnel who are responsible for taking and documenting corrective actions as required in Part 5.

b. Areas of Required Training. Personnel must be trained in at least the following if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections):

i. An overview of what is in the SWPPP;

ii. Spill response procedures, good housekeeping, maintenance requirements, and material management practices;

iii. The location of all the controls required by this permit, and how they are to be maintained;

iv. The proper procedures to follow with respect to the permit's pollution prevention requirements; and

v. When and how to conduct inspections, record applicable findings, and take corrective actions; and

vi. The facility's emergency procedures, if applicable per Part 2.1.1.8.

2.1.2.9 Non-Stormwater Discharges. You must evaluate for the presence of non-stormwater discharges. You must eliminate any non-stormwater discharges not explicitly authorized in Part 1.2.2 or covered by another NPDES permit, including vehicle and equipment/tank wash water (except for those authorized in Part 1.2.2.3 for Sectors G, H, and J). If not covered under a separate NPDES permit, wastewater, wash water and any other unauthorized non-stormwater must be discharged to a sanitary sewer in accordance with applicable industrial pretreatment requirements, or otherwise disposed of appropriately.

2.1.2.10 Dust Generation and Vehicle Tracking of Industrial Materials. You must minimize generation of dust and off-site tracking of raw, final, or waste materials in order to minimize pollutants discharged via stormwater.

2.1.3 **Numeric Effluent Limitations Based on Effluent Limitations Guidelines.** If you are in an industrial category subject to one of the effluent limitations guidelines identified in Table 4-3 (see Part 4.2.3.1), you must meet the effluent limits referenced in Table 2-1 below:

Table 2-1. Applicable Effluent Limitations Guidelines

Regulated Activity	40 CFR Part/Subpart	Effluent Limit
Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	Part 429, Subpart I	See Part 8.A.7
Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	Part 418, Subpart A	See Part 8.C.4
Runoff from asphalt emulsion facilities	Part 443, Subpart A	See Part 8.D.4
Runoff from material storage piles at cement manufacturing facilities	Part 411, Subpart C	See Part 8.E.5
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	Part 436, Subparts B, C, or D	See Part 8.J.9
Runoff from hazardous waste landfills	Part 445, Subpart A	See Part 8.K.6
Runoff from non-hazardous waste landfills	Part 445, Subpart B	See Part 8.L.10
Runoff from coal storage piles at steam electric generating facilities	Part 423	See Part 8.O.8
Runoff containing urea from airfield pavement deicing at existing and new primary airports with 1,000 or more annual non-propeller aircraft departures	Part 449	See Part 8.S.8

2.2 Water Quality-Based Effluent Limitations

2.2.1 **Water Quality Standards.** Your discharge must be controlled as necessary to meet applicable water quality standards of all affected states.

EPA expects that compliance with the conditions in this permit will control discharges as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that your stormwater discharge will not be controlled as necessary such that the receiving water of the United States will not meet an applicable water quality standard, you must take corrective action(s) as required in Part 5.1 and document the corrective actions as required in Part 5.3. You must also comply with any additional requirements that your state or tribe requires in Part 9.

EPA may also require that you undertake additional control measures (to meet the narrative water quality-based effluent limit above) on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI, required reports, or from other sources indicates that your discharges are not controlled as necessary such that the receiving water of the United States will not meet applicable water quality standards. You must implement all measures necessary to be consistent with an available wasteload allocation in an EPA-established or approved TMDL.

2.2.2 **Discharges to Water Quality-Impaired Waters.** You are considered to discharge to an impaired water if the first water of the United States to which your discharge is identified by a state, tribe or EPA as not meeting an applicable water quality standard, and:

- Requires development of a TMDL (pursuant to section 303(d) of the CWA);
- Is addressed by an EPA-approved or established TMDL; or
- Is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1).

Note: For discharges that enter a separate storm sewer system[10] prior to discharge, the first water of the United States to which you discharge is the waterbody that receives the water from the storm sewer system.

2.2.2.1 **Existing Discharge to an Impaired Water with an EPA-Approved or Established TMDL.** If you discharge to an impaired water with an EPA-approved or established TMDL, EPA will inform you whether any additional measures are necessary for your discharge to be consistent with the assumptions and requirements of the applicable TMDL and its wasteload allocation, or if coverage under an individual permit is necessary per Part 1.3.8.

2.2.2.2 **Existing Discharger to an Impaired Water without an EPA-Approved or Established TMDL.** If you discharge to an impaired water without an EPA-approved or established TMDL, you are still required to comply with Part 2.2.1 and the monitoring requirements of Part 4.2.5.1. Note that the impaired waters monitoring requirements of Part 4.2.5.1 also apply where EPA determines that your discharge is not controlled as necessary such that the receiving water of the United States will not meet applicable water quality standards in an impaired downstream water segment, even if your discharge is initially to a receiving water(s) that is not identified as impaired according to Part 2.2.2.

2.2.2.3 **New Discharger or New Source to an Impaired Water.** If your authorization to discharge under this permit relied on Part 1.1.6.2 for a new discharger or a new source to an impaired water, you must implement and maintain any measures that enabled you to become eligible under Part 1.1.6.2, and modify such measures as necessary pursuant to any Part 5 corrective actions. You also must comply with Part 2.2.1 and the monitoring requirements of Parts 4.2.5.1.

2.2.3 **Tier 2 Antidegradation Requirements for New Dischargers, New Sources, or Increased Discharges.** If you are a new discharger or a new source (as defined in Appendix A), or an existing discharger required to notify EPA of an increased discharge consistent with Part 7.6 (i.e., a "planned changes" report), and you discharge directly to waters designated by a state or tribe as Tier 2 or Tier 2.5 for antidegradation purposes under 40 CFR 131.12(a), EPA may require that you undertake additional control measures as necessary to ensure compliance with the applicable antidegradation requirements, or notify you that an individual permit application is necessary in accordance with Part 1.3.8. See list of Tier 2 and 2.5 waters in Appendix L.

2.3 Requirements Relating to Endangered Species, Historic Properties, and CERCLA Sites

If your eligibility under either Part 1.1.4, Part 1.1.5, and/or Part 1.1.7 was made possible through your, or another operator's, agreement to undertake additional measures, you must comply with all such measures to maintain eligibility under the MSGP. Note that if

[10] Separate storm systems include both municipal storm sewer systems (MS4s) and non-municipal separate storm sewers. Separate storm systems do not include combined sewer systems or sanitary sewer systems.

at any time you become aware, or EPA determines, that your discharges and/or discharge-related activities have the potential to adversely affect listed species and/or critical habitat, have an effect on historic properties, or that your facility discharges to a CERCLA Site listed in Appendix P after you have obtained coverage under this permit, EPA may inform you of the need to implement additional measures on a site-specific basis to meet the effluent limits in this permit, or require you to obtain coverage under an individual permit.

3. Inspections

3.1 Routine Facility Inspections

3.1.1 **Inspection Personnel.** Qualified personnel (as defined in Appendix A) must perform the inspections. The qualified personnel may be a member of your stormwater pollution prevention team, or if the qualified personnel is a third-party you hire (i.e., a contractor), at least one member of your stormwater pollution prevention team must participate in the inspection. Inspectors must consider the results of visual and analytical monitoring (if any) for the past year when planning and conducting inspections.

3.1.2 **Areas that You Must Inspect.** During normal facility operating hours, the qualified personnel must conduct inspections of areas of the facility covered by the requirements in this permit, including, but not limited to, the following:

3.1.2.1 Areas where industrial materials or activities are exposed to stormwater;

3.1.2.2 Areas identified in the SWPPP and those that are potential pollutant sources (see Part 6.2.3);

3.1.2.3 Areas where spills and leaks have occurred in the past three years;

3.1.2.4 Discharge points; and

3.1.2.5 Control measures used to comply with the effluent limits contained in this permit.

3.1.3 **What You Must Look for During an Inspection.** During the inspection, the qualified personnel must examine or look out for, including, but not limited to, the following:

3.1.3.1 Industrial materials, residue or trash that may have or could come into contact with stormwater;

3.1.3.2 Leaks or spills from industrial equipment, drums, tanks and other containers;

3.1.3.3 Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site;

3.1.3.4 Tracking or blowing of raw, final or waste materials from areas of no exposure to exposed areas;

3.1.3.5 Erosion of soils at your facility, channel and streambank erosion and scour in the immediate vicinity of discharge points, per Part 2.1.2.5;

3.1.3.6 Non-authorized non-stormwater discharges, per Part 2.1.2.9;

3.1.3.7 Control measures needing replacement, maintenance or repair; and

3.1.3.8 During an inspection occurring during a stormwater event or stormwater discharge, you must observe control measures implemented to comply with effluent limits to ensure they are functioning correctly. You must also observe discharge points, as defined in Appendix A, during this inspection. If such discharge locations are inaccessible, you must inspect nearby downstream locations.

3.1.4 **Inspection Frequency.** The qualified personnel must conduct inspections at least quarterly (i.e., once each calendar quarter), or in some instances more frequently (e.g., monthly). Increased frequency may be appropriate for some types of equipment, processes and stormwater control measures, or areas of the facility with significant activities and materials exposed to stormwater. At least once each calendar year, the routine inspection must be conducted during a period when a stormwater discharge is occurring.

3.1.5 **Exceptions to Routine Facility Inspections for Inactive and Unstaffed Facilities.** The requirement to conduct facility inspections on a routine basis does not apply at a facility that is inactive and unstaffed, as long as there are no industrial materials or activities exposed to stormwater. Such a facility is only required to conduct an annual site inspection in accordance with Part 3.1. To invoke this exception, you must indicate that your facility is inactive and unstaffed on your NOI. If you are already covered under the permit and your facility has changed from active to inactive and unstaffed, you must modify and re-certify your NOI. You must also include a statement in your SWPPP per Part 6.2.5.2 indicating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to stormwater, in accordance with the substantive requirements in 40 CFR 122.26(g)(4)(iii). The statement must be signed and certified in accordance with Appendix B, Subsection 11. If circumstances change and industrial materials or activities become exposed to stormwater or your facility becomes active and/or staffed, this exception no longer applies, and you must immediately resume routine facility inspections. If you are not qualified for this exception at the time you become authorized under this permit, but during the permit term you become qualified because your facility becomes inactive and unstaffed, and there are no industrial materials or activities exposed to stormwater, you must include the same signed and certified statement as above and retain it with your records pursuant to Part6.5.

Inactive and unstaffed facilities covered under Sectors G (Metal Mining), H (Coal Mines and Coal Mining-Related Facilities), and J (Non-Metallic Mineral Mining and Dressing) are not required to meet the “no industrial materials or activities exposed to stormwater” standard to be eligible for this exception from routine inspections, per Parts 8.G.8.4, 8.H.9.1, and 8.J.9.1.

3.1.6 **Routine Facility Inspection Documentation.** You must document the findings of your facility inspections and maintain this report with your SWPPP as required in Part 6.5. You must conduct any corrective action required as a result of a routine facility inspection consistent with Part 5. If you conducted a discharge visual assessment required in Part 3.2 during your facility inspection, you may include the results of the assessment with the report required in this Part, as long as you include all components of both types of inspections in the report.

Do not submit your routine facility inspection report to EPA, unless specifically requested to do so. However, you must summarize your findings in the Annual Report per Part 7.4. Document all findings, including but not limited to, the following information.

3.1.6.1 The inspection date and time;

3.1.6.2 The name(s) and signature(s) of the inspector(s);

3.1.6.3 Weather information;

3.1.6.4 All observations relating to the implementation of stormwater control measures at the facility, including:

a. A description of any stormwater discharges occurring at the time of the inspection;

b. Any previously unidentified stormwater discharges from and/or pollutants at the facility;

c. Any evidence of, or the potential for, pollutants entering the stormwater drainage system;

d. Observations regarding the physical condition of and around all stormwater discharge points, including any flow dissipation devices, and evidence of pollutants in discharges and/or the receiving water;

e. Any stormwater control measures needing maintenance, repairs, or replacement;

3.1.6.5 Any additional stormwater control measures needed to comply with the permit requirements;

3.1.6.6 Any incidents of noncompliance; and

3.1.6.7 A statement, signed and certified in accordance with Appendix B, Subsection 11.

3.2 Quarterly Visual Assessment of Stormwater Discharges

3.2.1 **Visual Assessment Frequency.** Once each quarter for your entire permit coverage, you must collect a stormwater sample from each discharge point (except as noted in Part 3.2.4) and conduct a visual assessment of each of these samples. These samples are not required to be collected consistent with 40 CFR Part 136 procedures but must be collected in such a manner that the samples are representative of the stormwater discharge. Guidance on monitoring is available at https://www.epa.gov/sites/production/files/2015-11/documents/msgp_monitoring_guide.pdf.

3.2.2 **Visual Assessment Procedures.** You must do the following for the quarterly visual assessment:

3.2.2.1 Make the assessment of a stormwater discharge sample in a clean, colorless glass or plastic container, and examined in a well-lit area;

3.2.2.2 Make the assessment of the sample you collected within the first 30 minutes of an actual 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 and you must document why it was not possible to take the sample within the first 30 minutes. In the case of snowmelt, samples must be taken during a period with a measurable discharge; and

3.2.2.3 For storm events, make the assessment on discharges that occur at least 72 hours (three days) from the previous discharge. The 72-hour (three-day) storm interval does not apply if you document that less than a 72-hour (three-day) interval is representative for local storm events during the sampling period.

3.2.2.4 Visually inspect or observe for the following water quality characteristics, which may be evidence of stormwater pollution:

- **a.** Color;
- **b.** Odor;
- **c.** Clarity (diminished);
- **d.** Floating solids;
- **e.** Settled solids;
- **f.** Suspended solids;
- **g.** Foam;
- **h.** Oil sheen; and
- **i.** Other obvious indicators of stormwater pollution.

3.2.2.5 Whenever the visual assessment shows evidence of stormwater pollution in the discharge, you must initiate the corrective action procedures in Part 5.1.1.

3.2.3 **Visual Assessment Documentation.** You must document the results of your visual assessments and maintain this documentation onsite with your SWPPP as required in Part 6.5. Any corrective action required as a result of a quarterly visual assessment must be conducted consistent with Part 5 of this permit. You are not required to submit your visual assessment findings to EPA, unless specifically requested to do so. However, you must summarize your findings in the annual report per Part 7.4. Your documentation of the visual assessment must include, but not be limited to:

3.2.3.1 Sample location(s);

3.2.3.2 Sample collection date and time, and visual assessment date and time for each sample;

3.2.3.3 Personnel collecting the sample and conducting visual assessment, and their signatures;

3.2.3.4 Nature of the discharge (i.e., stormwater from rain or snow);

3.2.3.5 Results of observations of the stormwater discharge;

3.2.3.6 Probable sources of any observed stormwater contamination;

3.2.3.7 If applicable, why it was not possible to take samples within the first 30 minutes; and

3.2.3.8 A statement, signed and certified in accordance with Appendix B, Subsection 11.

3.2.4 **Exceptions to Quarterly Visual Assessments**

3.2.4.1 **Adverse Weather Conditions.** When adverse weather conditions prevent the collection of stormwater discharge sample(s) during the quarter, you must take a substitute sample during the next qualifying storm event. Documentation of the rationale for no visual assessment for the quarter must be included with your SWPPP records as described in Part 6.5. Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, electrical storms, or situations that otherwise make sampling impractical, such as extended frozen conditions.

3.2.4.2 **Climates with Irregular Stormwater Discharges.** If your facility is located in an area where limited rainfall occurs during many parts of the year (e.g., arid or semi-arid climate) or in an area where freezing conditions exist that prevent discharges from occurring for extended periods, then your samples for the quarterly visual assessments may be distributed during seasons when precipitation more regularly occurs.

3.2.4.3 **Areas that Receive Snow.** If the facility is in an area that typically receives snow and the facility receives snow at least once over a period of four quarters, at least one quarterly visual assessment must capture snowmelt discharge, as described in Part 4.1.3, taking into account the exception described above for climates with irregular stormwater discharges.

3.2.4.4 **Inactive and Unstaffed Facilities.** The requirement for a quarterly visual assessment does not apply at a facility that is inactive and unstaffed, as long as there are no industrial materials or activities exposed to stormwater. To invoke this exception, you must maintain a statement in your SWPPP per Part 6.2.5.2 indicating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to precipitation, in accordance with the substantive requirements in 40 CFR 122.26(g)(4)(iii). The statement must be signed and certified in accordance with Appendix B, Subsection 11. If circumstances change and industrial materials or activities become exposed to stormwater or your facility becomes active and/or staffed, this exception no longer applies, and you must immediately resume quarterly visual assessments. If you are not qualified for this exception at the time you are authorized under this permit, but during the permit term you become qualified because your facility becomes inactive and unstaffed, and there are no industrial materials or activities that are exposed to stormwater, then you must include the same signed and certified statement as above and retain it with your records pursuant to Part 6.5. Inactive and unstaffed facilities covered under Sectors G (Metal Mining), H (Coal Mines and Coal Mining-Related Facilities), and J (Non-Metallic Mineral Mining and Dressing), are not required to meet the "no industrial materials or activities exposed to stormwater" standard to be eligible for this exception from quarterly visual assessments, consistent with the requirements established in Parts 8.G.8.4, 8.H.9.1, and 8.J.9.1.

3.2.4.5 **Substantially Identical Discharge Points (SIDP).** If your facility has two or more discharge points that discharge substantially identical stormwater effluents, as documented in Part 6.2.5.3, you may conduct quarterly visual assessments of the discharge at just one of the discharge points and report that the results also apply to the SIDPs provided that you conduct visual assessments on a rotating basis of each SIDP throughout the period of your coverage under this permit. If stormwater contamination is identified through visual assessment conducted at a SIDP, you must assess and modify your stormwater control measures as appropriate for each discharge point represented by the monitored discharge point.

4. Monitoring

You must collect and analyze stormwater samples and document monitoring activities consistent with the procedures described in Part 4 and Appendix B, Subsections B.10 – 12, and any additional sector-specific or state/tribal-specific requirements in Parts 8 and 9, respectively. Refer to Part 7 for reporting and recordkeeping requirements.

4.1 Monitoring Procedures

4.1.1 Monitored Stormwater Discharge Points. Applicable monitoring requirements apply to each discharge point authorized by this permit, except as otherwise exempt from monitoring as a "substantially identical discharge point" (SIDP). If your facility has two or more discharge points that you believe discharge substantially identical stormwater effluents, based on the similarities of the general industrial activities and control measures, exposed materials that may significantly contribute pollutants to stormwater, and runoff coefficients of their drainage areas, you may monitor the effluent of just one of the discharge points and report that the results also apply to the SIDP(s). As required in Part 6.2.5.3, your SWPPP must identify each discharge point authorized by this permit and describe the rationale for any SIDP determinations. The allowance for monitoring only one of the SIDP is not applicable to any discharge points with numeric effluent limitations. You are required to monitor each discharge point covered by a numeric effluent limit as identified in Part 4.2.2.

4.1.2 Commingled Discharges. If any authorized stormwater discharges commingle with discharges not authorized under this permit, you must conduct any required sampling of the authorized discharges at a point before they mix with other waste streams, to the extent practicable.

4.1.3 Measurable Storm Events. You must conduct all required monitoring on a storm event that results in an actual discharge ("measurable storm event") that follows the preceding measurable storm event by at least 72 hours (three days). The 72-hour (3-day) storm interval does not apply if you are able to document that less than a 72-hour (3-day) interval is representative for local storm events during the sampling period. In the case of snowmelt, you must conduct monitoring at a time when a measurable discharge occurs.

For each monitoring event, except snowmelt monitoring, you must identify the date and duration (in hours) of the rainfall event, rainfall total (in inches) for that rainfall event, and time (in days) since the previous measurable storm event. For snowmelt monitoring, you must identify the date of the sampling event.

4.1.4 Sample Type. You must take a minimum of one grab sample from a discharge resulting from a measurable storm event as described in Part 4.1.3. You must collect samples within the first 30 minutes of a discharge associated with a measurable storm event. If it is not possible to collect the sample within the first 30 minutes of a measurable storm event, you must collect the sample as soon as possible after the first 30 minutes and keep documentation with the SWPPP explaining why it was not possible to take samples within the first 30 minutes. In the case of snowmelt, you must take samples during a period with a measurable discharge.

For indicator monitoring and benchmark monitoring, you may choose to use a composite sampling method instead of taking grab samples. This composite method may be either flow-weighted or time-weighted and performed manually or with the use of automated sampling equipment. For the purposes of this permit, a flow-weighted composite sample means a composite sample consisting of a mixture of aliquots collected at a constant or variable time interval, where the volume of each aliquot included in the composite sample is proportional to the estimated or measured incremental discharge volume at the time of the aliquot collection compared to the total discharge volume estimated or measured over the monitoring event. For the purposes of this permit, a time-weighted composite sample means a composite sample consisting of a mixture of equal volume aliquots collected at a regular defined time interval over a specific period of time. Composite sampling must be initiated during the first 30 minutes of the same storm event. If it is not possible to initiate composite sampling within the first 30 minutes of a measurable storm event, you must initiate composite sampling as soon as possible after the first 30 minutes and keep documentation with the SWPPP explaining why it was not possible to initiate composite sampling within the first 30 minutes. You must submit all monitoring results to EPA per Part 4.1.9. Composite sampling may not be used in situations where hold times for processing or sample preservation requirements cannot be satisfied. For parameters measured in-situ with a probe or meter such as dissolved oxygen, conductivity, pH, or temperature, the composite sampling method shall be modified by calculating an average all individual measurements, weighted by flow volume if applicable.

4.1.5 **Adverse Weather Conditions.** When adverse weather conditions as described in Part 3.2.4.1 prevent the collection of stormwater discharge samples according to the relevant monitoring schedule, you must take a substitute sample during the next qualifying storm event. Adverse weather does not exempt you from having to file a benchmark monitoring report in accordance with your sampling schedule. As specified in Part 7.4, you must indicate in Net-DMR any failure to monitor during the regular reporting period.

4.1.6 **Facilities in Climates with Irregular Stormwater Discharges.** If your facility is located in areas where limited rainfall occurs during parts of the year (e.g., arid or semi-arid climates) or in areas where freezing conditions exist that prevent discharges from occurring for extended periods, you may distribute your required monitoring events during seasons when precipitation occurs, or when snowmelt results in a measurable discharge from your facility. You must still collect the required number of samples. As specified in Part 7.4, you must also indicate in Net-DMR that there was no monitoring for the respective monitoring period.

4.1.7 **Monitoring Periods.** Your monitoring requirements in this permit begin in the first full quarter following either May 30, 2021or your date of discharge authorization, whichever date comes later.

- January 1 – March 31
- April 1 – June 30
- July 1 – September 30
- October 1 – December 31

For example, if you obtain permit coverage on April 10, 2021, then your first monitoring quarter for benchmark monitoring is– July 1, 2021 – September 30, 2021 and your first monitoring year for discharges to impaired waters or discharges subject to an effluent limitation guideline is July 1, 2021 – June 30, 2022. This monitoring schedule may be modified in accordance with Part 4.1.6 if you document the revised schedule in your SWPPP. However, you must indicate in Net-DMR any 3-month interval that you did not take a sample.

4.1.8 **<u>Monitoring for Authorized Non-Stormwater Discharges</u>.** You are only required to monitor authorized non-stormwater discharges (as delineated in Part 1.2.2) when they are commingled with stormwater discharges associated with industrial activity.

4.1.9 **<u>Monitoring Reports.</u>** You must report monitoring data using Net-DMR, EPA's electronic DMR tool, as described in Part 7.3 (unless the applicable EPA Regional Office grants you a waiver from electronic reporting, in which case you may submit a paper DMR form).

4.2 Required Monitoring

This permit includes six types of required analytical monitoring, one or more of which may apply to your stormwater discharge:

- Indicator monitoring (Part 4.2.1);
- Benchmark monitoring (Part 4.2.2);
- Annual effluent limitations guidelines monitoring (Part 4.2.3);
- State- or tribal-specific monitoring (Part 4.2.4);
- Impaired waters monitoring (Part 4.2.5); and
- Other monitoring as required by EPA (Part 4.2.6).

Unless otherwise specified, samples must be analyzed consistent with 40 CFR Part 136 analytical methods that are sufficiently sensitive for the monitored parameter. When more than one type of monitoring for the same pollutant at the same discharge point applies (e.g., total suspended solids once per year for an effluent limitation and once per quarter for benchmark monitoring at a given discharge point), you may use a single sample to satisfy both monitoring requirements (i.e., one sample satisfying both the annual effluent limitation sample and one of the four quarterly benchmark monitoring samples). Similarly, when the same type of monitoring is required for the same pollutant but for different activities, you may use a single sample to satisfy both monitoring requirements (i.e., when you are required to monitor for PAHs in stormwater discharges from paved surfaces that will be sealed or re-sealed with coal-tar sealcoat where industrial activities are located during coverage under this permit and you are also required to monitor for PAHs in stormwater discharges since you manufacture, use, or store creosote or creosote-treated wood in areas that are exposed to precipitation).

When the effluent limitation is lower than the benchmark threshold for the same pollutant, your Additional Implementation Measure (AIM) trigger is based on an exceedance of the effluent limitation threshold, which would subject you to the AIM requirements of Part 5.2. Exceedance of an effluent limitation associated with the results of any analytical monitoring type required by this Part subjects you to the corrective action requirements of Part 5.1. You must conduct all required monitoring in accordance with the procedures described in Appendix B, Subsection B.10.

Per Part 1.3.7, in the event that the permit is administratively continued, monitoring requirements remain in force and effect at their original frequency during any continuance for operators that were covered prior to permit expiration. In the event that monitoring results are unable to be electronically reported in Net-DMR, operators must maintain monitoring results and records within their SWPPP.

Table 4-1. Summary of Each Type of Monitoring

Monitoring Type	Monitoring Type Applies To	Frequency	Duration	Follow-up Action	Permit Part Reference
Indicator – pH, TSS, COD	Subsectors B2, C5, D2, E3, F5, I1, J3, L2, N2, O1, P1, R1, T1, U3, V1, W1, X1, Y2, Z1, AB1, AC1, and AD1	Quarterly	Entirety of permit coverage	None	Part 4.2.1.1.a
Indicator – PAHs*	Operators with stormwater discharges from paved surfaces that will be sealed or re-sealed with coal-tar sealcoat where industrial activities are located during coverage under this permit; sectors; Sector A facilities that manufacture, use, or store creosote or creosote-treated wood in areas that are exposed to precipitation; and Sectors C (SIC 2911), D, F, H, I, M, O, P (SIC 4011, 4013, and 5171), Q (SIC 4491), R, and S	Bi-annually (2 times per year)	First year and fourth year	None	Part 4.2.1.1.b
Benchmark	Subsectors A1, A2, A3, A4, B1, C1, C2, C3, C4, D1, E1, E2, F1, F2, F3, F4, G1, G2, H1, J1, J2, K1, L1, M1, N1, Q1, S1, U1, U2, Y1, AA1, AA2	Quarterly	First year and fourth year	AIM. See Part 5.2.	Part 4.2.2
Effluent limitation guidelines (ELG)	See Part 4.2.3	Annually	Entirety of permit coverage	See Part 5.1	Part 4.2.3
State- or tribal-specific	Depends on the discharge location of your facility. See Part 9				
Impaired Waters	Depends on the receiving waterbody. See Part 4.2.5				
Other as required by EPA	See Part 4.2.6				

* Monitoring is required for the 16 individual PAHs identified at Appendix A to 40 CFR Part 423: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, benzo[g,h,i]perylene, indeno[1,2,3-c,d]pyrene, and dibenz[a,h]anthracene.

4.2.1 **Indicator Monitoring.** This permit requires indicator monitoring of stormwater discharges for three parameters – pH, Total Suspended Solids (TSS), and Chemical Oxygen Demand (COD) – for certain sectors/subsectors (see Part 4.2.1.1.a below) and for polycyclic aromatic hydrocarbons (PAHs) for certain sectors/activities, with additional limitations (see Part 4.2.1.1.b below). Indicator monitoring data will provide you and EPA with a baseline and comparable understanding of industrial stormwater discharge quality and potential water quality problems. The indicator monitoring parameters are "report-only" and do not have thresholds or baseline values for comparison, therefore no follow-up action is triggered or required under this part. The requirement in Part 2.2.1

that your stormwater discharge be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards still applies. You may find it useful to evaluate and compare your indicator monitoring data over time to identify any fluctuating values and why they may be occurring, and to further inform any revisions to your SWPPP/SCMs if necessary.[11] Indicator monitoring is report-only and is neither benchmark monitoring nor an effluent limitation. Instead, it is a permit condition. Thus, failure to conduct indicator monitoring is a permit violation.

4.2.1.1 Applicability and Schedule of Indicator Monitoring

a. pH, Total Suspended Solids (TSS), and Chemical Oxygen Demand (COD).

i. **Applicability.** Operators in the following subsectors must monitor stormwater discharges for pH, TSS, and COD (also specified in the sector-specific requirements in Part 8): B2, C5, D2, E3, F5, I1, J3, L2, N2, O1, P1, R1, T1, U3, V1, W1, X1, Y2, Z1, AB1, AC1, and AD1). Samples must be analyzed consistent with 40 CFR Part 136 analytical methods.

ii. **Schedule.** You must conduct indicator monitoring of stormwater discharges for pH, TSS, and COD each quarter, beginning in your first full quarter of permit coverage as identified in Part 4.1.7.

b. Polycyclic Aromatic Hydrocarbons (PAH).

i. **Applicability.** The following operators must monitor stormwater discharges for the 16 individual priority pollutant PAHs (also specified in the sector-specific requirements in Part 8): operators in all sectors with stormwater discharges from paved surfaces that will be sealed or re-sealed with coal-tar sealcoat where industrial activities are located during coverage under this permit; operators in sectors A (facilities that manufacture, use, or store creosote or creosote-treated wood in areas that are exposed to precipitation), C (SIC Code 2911), D, F, H, I, M, O, P (SIC Codes 4011, 4013, and 5171), Q (SIC Code 4491), R, and S. Monitoring is required for the 16 individual PAHs identified at Appendix A to 40 CFR Part 423: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, benzo[g,h,i]perylene, indeno[1,2,3-c,d]pyrene, and dibenz[a,h]anthracene. Samples must be analyzed using EPA Method 625.1, or EPA Method 610/Standard Method 6440B if preferred by the operator, consistent with 40 CFR Part 136 analytical methods.

ii. **Schedule.** You must conduct indicator monitoring of stormwater discharges for PAHs bi-annually (i.e., sample twice per year) in the first and fourth years of permit coverage. Your first year of permit coverage begins in your first full quarter of permit coverage, identified in Part 4.1.7, commencing no earlier than May 30, 2021, followed by two years of no monitoring. Bi-annual monitoring resumes in your fourth year of permit coverage for another year,

[11] Examples of possible reviews and revisions to the SWPPP/SCMs that could be informed by indicator monitoring values include: reviewing sources of pollution or any changes to performed industrial activities and processes; reviewing spill and leak procedures, and/or non-stormwater discharges; conducting a single comprehensive clean-up, implementing a new control measure, and/or increasing inspections. EPA notes, however, that these actions are not required under the 2021 MSGP in response to indicator monitoring.

after which you may discontinue bi-annual PAH monitoring for the remainder of your permit coverage.

4.2.1.2 **Exception for Facilities in Climates with Irregular Stormwater Discharges**. As described in Part 4.1.6, facilities in climates with irregular stormwater discharges may modify this schedule provided you report this revised schedule directly to EPA by the due date of the first indicator monitoring sample (see EPA Regional contacts in Part 7.8), and you keep this revised schedule with the facility's SWPPP as specified in Part 6.5. As noted in Part 4.1.7, you must indicate in Net-DMR any 3-month interval that you did not take a sample.

4.2.1.3 **Exception for Inactive and Unstaffed Facilities.** The requirement for indicator monitoring does not apply at a facility that is inactive and unstaffed, provided that there are no industrial materials or activities exposed to stormwater. To invoke this exception, you must do the following:

a. Maintain a statement with your SWPPP stating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to stormwater in accordance with the substantive requirements in 40 CFR 122.26(g) and sign and certify the statement in accordance with Appendix B, Subsection 11.

b. If circumstances change and industrial materials or activities become exposed to stormwater or your facility becomes active and/or staffed, this exception no longer applies and you must immediately begin complying with the applicable indicator monitoring requirements under Part 4.2.1 as if you were in your first year of permit coverage. You must indicate in your NOI that your facility has materials or activities exposed to stormwater or has become active and/or staffed.

c. If you are not qualified for this exception at the time you are authorized under this permit, but during the permit term you become qualified because your facility is inactive and unstaffed, and there are no industrial materials or activities that are exposed to stormwater, then you must notify EPA of this change on your NOI form. You may discontinue indicator monitoring once you have notified EPA, and prepared and signed the certification statement described above concerning your facility's qualification for this special exception.

Note: This exception has different requirements for Sectors G, H, and J (see Part 8).

4.2.2 **Benchmark Monitoring.** This permit requires benchmark monitoring parameters of stormwater discharges for certain sectors/subsectors. Benchmark monitoring data are primarily for your use to determine the overall effectiveness of your stormwater control measures and to assist you in determining when additional action(s) may be necessary to comply with the effluent limitations in Part 2.

The benchmark thresholds are not effluent limitations; a benchmark exceedance, therefore, is not a permit violation. However, if a benchmark exceedance triggers Additional Implementation Measures (AIM) in Part 5.2, failure to conduct any required measures is a permit violation. At your discretion, you may take more than four samples during separate stormwater discharge events to determine the average benchmark parameter value for facility discharges.

4.2.2.1 Applicability of Benchmark Monitoring.

You must monitor stormwater discharges for any benchmark parameters specified for the industrial sector(s), both primary industrial activity and any co-located industrial activities, applicable to your discharge listed in Part 8. If your facility is in one of the industrial sectors subject to benchmark thresholds that are hardness-dependent, you must include in your NOI a hardness value, established consistent with the procedures in Appendix J, that is representative of your receiving water. Hardness is not a specific benchmark and therefore the permit does not include a benchmark threshold with which to compare.

Samples must be analyzed consistent with 40 CFR Part 136 analytical methods and using test procedures with quantitation limits at or below benchmark thresholds for all benchmark parameters for which you are required to sample, i.e. sufficiently sensitive methods. For averaging purposes, you may use a value of zero for any individual sample parameter which is determined to be less than the method detection limit. For sample values that fall between the method detection limit and the quantitation limit (i.e., a confirmed detection but below the level that can be reliably quantified), use a value halfway between zero and the quantitation limit.

4.2.2.2 Summary of the 2021 MSGP Benchmark Thresholds

The Table 4-2 presents the 2021 MSGP's freshwater and saltwater benchmark thresholds. Sector-specific benchmark requirements are detailed in Part 8. Values match the original units found in the source documents, detailed in the corresponding section of the fact sheet.

Table 4-2 2021 MSGP Benchmark Thresholds

Pollutant		2021 MSGP Benchmark Threshold
Total Recoverable Aluminum (T)		1,100 µg/L
Total Recoverable Beryllium		130 µg/L
Biochemical Oxygen Demand (5-day)		30 mg/L
pH		6.0 – 9.0 s.u.
Chemical Oxygen Demand		120 mg/L
Total Phosphorus		2.0 mg/L
Total Suspended Solids (TSS)		100 mg/L
Nitrate and Nitrite Nitrogen		0.68 mg/L
Turbidity		50 NTU
Total Recoverable Antimony		640 µg/L
Ammonia		2.14 mg/L
Total Recoverable Cadmium	Freshwater [a]	1.8 µg/L
	Saltwater	33 µg/L
Total Recoverable Copper	Freshwater	5.19 µg/L
	Saltwater	4.8 µg/L

Pollutant		2021 MSGP Benchmark Threshold
Total Recoverable Cyanide	Freshwater	22 µg/L
	Saltwater	1 µg/L
Total Recoverable Mercury	Freshwater	1.4 µg/L
	Saltwater	1.8 µg/L
Total Recoverable Nickel	Freshwater [a]	470 µg/L
	Saltwater	74 µg/L
Total Recoverable Selenium	Freshwater	1.5 µg/L for still/standing (lentic) waters 3.1 µg/L for flowing (lotic) waters
	Saltwater	290 µg/L
Total Recoverable Silver	Freshwater [a]	3.2 µg/L
	Saltwater	1.9 µg/L
Total Recoverable Zinc	Freshwater [a]	120 µg/L
	Saltwater	90 µg/L
Total Recoverable Arsenic	Freshwater [a]	150 µg/L
	Saltwater	69 µg/L
Total Recoverable Lead	Freshwater [a]	82 µg/L
	Saltwater	210 µg/L

[a] These pollutants are dependent on water hardness where discharged into freshwaters. The freshwater benchmark value listed is based on a hardness of 100 mg/L. When a facility analyzes receiving water samples for hardness, the operator must use the hardness ranges provided in Table 1 in Appendix J of the 2021 MSGP and in the appropriate tables in Part 8 of the 2021 MSGP to determine applicable benchmark values for that facility. Benchmark thresholds for discharges of these pollutants into saline waters are not dependent on receiving water hardness and do not need to be adjusted.

4.2.2.3 **Benchmark Monitoring Schedule.** Benchmark monitoring of stormwater discharges is required quarterly, as identified in Part 4.1.7, in the first and fourth year of permit coverage, as follows:

a. **Year one of permit coverage:** You must conduct benchmark monitoring for all parameters applicable to your subsector(s) for four quarters in your first year of permit coverage, beginning in your first *full* quarter of permit coverage, no earlier than May 30, 2021.

i. If the annual average[12] for a parameter does not exceed the benchmark threshold, you can discontinue benchmark monitoring for that parameter for the next two years (i.e., eight quarters).

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[12] For this permit, an annual average exceedance for a parameter can occur if: (a) The four-quarter annual average for a parameter exceeds the benchmark threshold; or (b) Fewer than four quarterly samples are collected, but a single sample or the sum of any sample results within the sampling year exceeds the benchmark threshold by more than four times for a parameter. The result in (b) indicates an exceedance is mathematically certain (i.e., the sum of quarterly sample results to date is already more than four times the benchmark threshold). For pH, an annual average exceedance can only occur if the four-quarter annual average exceeds the benchmark threshold.

ii. If the annual average for a parameter exceeds the benchmark threshold, you must comply with Part 5.2 (Additional Implementation Measures responses and deadlines) and continue quarterly benchmark monitoring for that parameter until results indicate that the annual average is no longer exceeded, after which you can discontinue benchmark monitoring for that parameter until monitoring resumes in year four of permit coverage, per Part 4.2.2.3.b below.

b. **Year four of permit coverage:** You must conduct benchmark monitoring for all parameters applicable to your subsector(s) for four quarters in your fourth year of permit coverage (i.e., your thirteenth through sixteenth quarters), unless the first quarter of your fourth year of permit coverage occurs on or after the date this permit expires.

i. If the annual average[13] for a parameter does not exceed the benchmark threshold, you can discontinue benchmark monitoring for that parameter for the remainder of your permit coverage.

ii. If the annual average for a parameter exceeds the benchmark threshold, you must comply with Part 5.2 (Additional Implementation Measures responses and deadlines) and continue quarterly benchmark monitoring for that parameter until results indicate that the annual average is no longer exceeded, after which you can discontinue benchmark monitoring for that parameter for the remainder of permit coverage.

4.2.2.4 **Exception for Facilities in Climates with Irregular Stormwater Discharges**. As described in Part 4.1.6, facilities in climates with irregular stormwater discharges may modify this quarterly schedule provided you report this revised schedule directly to EPA by the due date of the first benchmark sample (see EPA Regional contacts in Part 7.8), and you keep this revised schedule with the facility's SWPPP as specified in Part 6.5. When conditions prevent you from obtaining four samples in four consecutive quarters, you must continue monitoring until you have the four samples required for calculating your benchmark monitoring average. As noted in Part 4.1.7, you must indicate in Net-DMR any 3-month interval that you did not take a sample.

4.2.2.5 ***Exception for Inactive and Unstaffed Facilities.*** The requirement for benchmark monitoring does not apply at a facility that is inactive and unstaffed, provided that there are no industrial materials or activities exposed to stormwater. To invoke this exception, you must do the following:

a. Maintain a statement with your SWPPP stating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to stormwater in accordance with the substantive requirements in 40 CFR 122.26(g) and sign and certify the statement in accordance with Appendix B, Subsection 11.

b. If circumstances change and industrial materials or activities become exposed to stormwater or your facility becomes active and/or staffed, this exception no longer applies and you must immediately begin complying with the applicable benchmark monitoring requirements under Part 4.2.2 as if you were in your first year of permit coverage. You must indicate in your NOI that your facility has

[13] *Ibid*.

materials or activities exposed to stormwater or has become active and/or staffed.

c. If you are not qualified for this exception at the time you are authorized under this permit, but during the permit term you become qualified because your facility is inactive and unstaffed, and there are no industrial materials or activities that are exposed to stormwater, then you must notify EPA of this change on your NOI form. You may discontinue benchmark monitoring once you have notified EPA, and prepared and signed the certification statement described above concerning your facility's qualification for this special exception.

Note: This exception has different requirements for Sectors G, H, and J (see Part 8).

4.2.3 Effluent Limitations Monitoring

4.2.3.1 Monitoring Based on Effluent Limitations Guidelines. Table 4-3 identifies the stormwater discharges subject to effluent limitation guidelines that are authorized for coverage under this permit. An exceedance of the effluent limitation is a permit violation. Beginning in the first full quarter following May 30, 2021 or your date of discharge authorization, whichever date comes later, you must monitor once per year at each stormwater discharge point containing the discharges identified in Table 4-3 for the parameters specified in the sector-specific section of Part 8.

Table 4-3. Required Monitoring for Effluent Limits Based on Effluent Limitations Guidelines

Regulated Activity	Effluent Limit	Monitoring Frequency	Sample Type
Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	See Part 8.A.8	1/year	Grab
Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	See Part 8.C.5	1/year	Grab
Runoff from asphalt emulsion facilities	See Part 8.D.5	1/year	Grab
Runoff from material storage piles at cement manufacturing facilities	See Part 8.E.6	1/year	Grab
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	See Part 8.J.10	1/year	Grab
Runoff from hazardous waste landfills	See Part 8.K.7	1/year	Grab
Runoff from non-hazardous waste landfills	See Part 8.L.11	1/year	Grab
Runoff from coal storage piles at steam electric generating facilities	See Part 8.O.8	1/year	Grab
Runoff containing urea from airfield pavement deicing at existing and new primary airports with 1,000 or more annual non- propeller aircraft departures.	See Part 8.S.9	1/year	Grab

4.2.3.2 Substantially Identical Discharge Points Not Applicable. You must monitor each discharge point discharging stormwater from any regulated activity identified in Table

4-3. The substantially identical discharge points (SIDP) monitoring provisions are not available for numeric effluent limit monitoring.

4.2.3.3 **Follow-up Actions if Discharge Exceeds Numeric Effluent Limitation.** If any monitoring value exceeds a numeric effluent limitation contained in this permit, you must indicate the exceedance on a "Change NOI" form in the NPDES eReporting Tool (NeT), and you must conduct follow-up monitoring within 30 calendar days (or during the next measurable storm event, should none occur within 30 days) of implementing corrective action(s) taken per Part 5.1. If your follow-up monitoring exceeds the applicable effluent limitation, you must:

a. **Submit an Exceedance Report:** You must submit an Exceedance Report no later than 30 days after you have received your laboratory result consistent with Part 7.5; and

b. **Continue to Monitor:** You must monitor, at least quarterly, until your stormwater discharge is in compliance with the effluent limit or until EPA waives the requirement for additional monitoring. Once your discharge is back in compliance with the effluent limitation you must indicate this on a "Change NOI" form per Part 7.3.

4.2.4 **State or Tribal Required Monitoring**

4.2.4.1 **Sectors Required to Conduct State or Tribal Monitoring.** You must comply with any state or tribal monitoring requirements in Part 9 of the permit applicable to your facility's discharge location.

4.2.4.2 **State or Tribal Monitoring Schedule.** If a monitoring frequency is not specified foran applicable requirement in Part 9, you must monitor once per year for the duration of your permit coverage.

4.2.5 **Impaired Waters Monitoring.** For the purposes of this permit, your facility is considered to discharge to an impaired water if the first water of the United States to which you discharge is identified by a state, tribe, or EPA pursuant to section 303(d) of the CWA as not meeting an applicable water quality standard (i.e., without an EPA-approved or -established TMDL, see Part 4.2.5.1.a below), or has been removed from the 303(d) list either because the impairments are addressed by an EPA-approved or established TMDL or is covered by pollution control requirements that meet the requirements of 40 CFR 130.7(b)(1) (see Part 4.2.5.1.b below). For discharges that enter a separate storm sewer system[14] prior to discharge, the first water of the United States to which you discharge is the waterbody that receives the stormwater discharge from the separate storm sewer system.

4.2.5.1 **Facilities Required to Monitor Stormwater Discharges to Impaired Waters.**

a. **Discharges to impaired waters without an EPA-approved or established TMDL:**

Monitoring is required annually in the first year of permit coverage and again in the fourth year of permit coverage as follows, unless you detect a pollutant causing an impairment, in which case annual monitoring must continue.

[14] Separate storm sewer systems do not include combined sewer systems or sanitary sewer systems. Separate storm sewer systems include both municipal storm sewer systems (MS4s) and non-municipal separate storm sewers.

i. **Year one of permit coverage:** You must take your first annual sample in your first year of permit coverage, which begins in the first full quarter following May 30, 2021 or your date of discharge authorization, whichever date comes later. You must monitor for all pollutants causing impairments using a standard analytical method, provided one exists (see 40 CFR Part 136), once at each discharge point (except substantially identical discharge points) discharging stormwater to impaired waters without an EPA-approved or established TMDL. *Note*: Except where otherwise directed by EPA, if the pollutant of concern for the impaired waterbody is suspended solids, turbidity, or sediment/sedimentation, you must monitor for Total Suspended Solids (TSS). If a pollutant of concern is expressed in the form of an indicator or surrogate pollutant, you must monitor for that indicator or surrogate pollutant. No monitoring is required when a waterbody's biological communities are impaired but no pollutant, including indicator or surrogate pollutants, is specified as causing the impairment, or when a waterbody's impairment is related to hydrologic modifications, impaired hydrology, or other non-pollutant. Operators must consult the applicable EPA Regional Office for any available guidance regarding required monitoring parameters under this part.

1) If monitoring results indicate the monitored pollutant is not detected in your discharge, or is within the acceptable range for a given parameter for the waterbody to meet its designated use (e.g., pH or temperature),[15] you may discontinue monitoring for that pollutant for the next two years. You must resume monitoring for that pollutant in year four of permit coverage, if applicable, per Part 4.2.5.1.a.ii.

2) If monitoring results indicate that the monitored pollutant is detected in your stormwater discharge, or is outside the acceptable range for a given parameter (e.g., pH or temperature) for the waterbody to meet its designated use,[16] you must continue to monitor for the pollutant(s) annually until no longer detected, after which you may discontinue monitoring for that pollutant until monitoring resumes in year four of permit coverage, if applicable, per Part 4.2.5.1.a.ii.

ii. **Year four of permit coverage.** Annual monitoring resumes in your fourth year of permit coverage for another year for a sub-set of parameters monitored for in the first monitoring year. In the fourth year of permit coverage, you must monitor for all pollutants causing impairment(s) that are associated with your industrial activity and/or are listed as a benchmark parameter for your subsector(s) (regardless of whether you have satisfied benchmark monitoring for the parameter per Part 4.2.2). To determine these pollutants, start with the list of pollutants for which the receiving waterbody is impaired and for which a standard analytical method exists (see 40 CFR Part 136), then compare that list to the industrial pollutants you identified in Part 6.2.3.2 and any sector-specific benchmark monitoring pollutants in Part 8 and, if applicable, Part 9. You must monitor for pollutants that appear on both the impairments list and either your industrial pollutants and/or your benchmark parameter list, including "indicator" or "surrogate" pollutants (as described in the "note" in 1 above). You must monitor once at each discharge point (except

[15] Refer to your state's Water Quality Standards or contact the EPA Regional Office for assistance.
[16] *Ibid*.

substantially identical discharge points (SIDPs)) for these pollutants. Consistent with Part 4.2, annual samples may be used to also satisfy any single remaining quarterly benchmark monitoring requirement applicable to your discharge.

1) If monitoring results indicate the monitored pollutant is not detected in your discharge, or is within the acceptable range for a given parameter for the waterbody to meet its designated use (e.g., pH or temperature),[17] you may discontinue monitoring for that pollutant for the remainder of your permit coverage.

2) If the monitoring results indicate that the monitored pollutant is detected in your discharge, or is outside the acceptable range for a given parameter (e.g., pH or temperature) for the waterbody to meet its designated use, you must continue to monitor for the pollutant(s) annually until no longer detected, after which you may discontinue monitoring for that pollutant for the remainder of your permit coverage.

iii. ***Exception****:* If sampling results in either Part 4.2.5.1.a.i or Part 4.2.5.1.a.ii above indicate the monitored pollutant is detected in your discharge, but you have determined that its presence is caused solely by natural background sources, you may discontinue monitoring for that pollutant for the duration of your permit coverage.

To support a determination that the pollutant's presence is caused solely by natural background sources, you must document and maintain with your SWPPP, as required by Part 6.5:

1) An explanation of why you believe that the presence of the pollutant of concern in your discharge is not related to the activities or materials at your facility; and

2) Data and/or studies that tie the presence of the pollutant of concern inyour discharge to natural background sources in the watershed.

Natural background pollutants include those that occur naturally as a result of native soils, and vegetation, wildlife, or ground water. Natural background pollutants do not include legacy pollutants from earlier activity on your site, or pollutants in run-on from neighboring sources that are not naturally occurring. However, you may be eligible to discontinue annual monitoring for pollutants that occur solely from these sources and should consult the applicable EPA Regional Office for related guidance.

b. **Discharges to impaired waters with an EPA-approved or established TMDL:** For stormwater discharges to waters for which there is an EPA-approved or established TMDL, you are not required to monitor for the pollutant(s) for which the TMDL was written unless EPA informs you, upon examination of the applicable TMDL and its wasteload allocation, that you are subject to such a requirement consistent with the assumptions and findings of the applicable TMDL and its wasteload allocation. EPA's notice will include specifications on stormwater discharge monitoring parameters and frequency. If there are questions, you may consult the applicable EPA Regional Office for guidance regarding required monitoring under this Part.

[17] *Ibid*.

4.2.5.2 **Exception for Inactive and Unstaffed Facilities.** The requirement for impaired waters monitoring does not apply at a facility that is inactive and unstaffed, as long as there are no industrial materials or activities exposed to stormwater. To invoke this exception, you must do the following:

a. Maintain a statement with your SWPPP stating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to stormwater in accordance with the substantive requirements in 40 CFR 122.26(g) and sign and certify the statement in accordance with Appendix B, Subsection 11.

b. If circumstances change and industrial materials or activities become exposed to stormwater or your facility becomes active and/or staffed, this exception no longer applies and you must immediately begin complying with the applicable impaired waters monitoring requirements under Part 4.2.5 as if you were in your first year of permit coverage. You must indicate in a "Change NOI" form per Part 7.2 that your facility has materials or activities exposed to stormwater or has become active and/or staffed.

c. If you are not qualified for this exception at the time you are authorized under this permit, but during the permit term you become qualified because your facility is inactive and unstaffed, and there are no industrial materials or activities that are exposed to stormwater, then you must notify EPA of this change on your NOI form. You may discontinue impaired waters monitoring once you have notified EPA, and prepared and signed the certification statement described above concerning your facility's qualification for this special exception.

Note: This exception has different requirements for Sectors G, H, and J (see Part 8).

4.2.6 **Additional Monitoring Required by EPA.** EPA may notify you of additional stormwater discharge monitoring requirements that EPA determines are necessary to meet the permit's effluent limitations. Any such notice will briefly state the reasons for the monitoring, locations, and parameters to be monitored, frequency and period of monitoring, sample types, and reporting requirements.

5. Corrective Actions and Additional Implementation Measures (AIM)

5.1 Corrective Action

5.1.1 **Conditions Requiring SWPPP Review and Revision to Ensure Effluent Limits are Met.** When any of the following conditions occur or are detected during an inspection, monitoring or other means, or EPA or the operator of the MS4 through which you discharge informs you that any of the following conditions have occurred, you must review and revise, as appropriate, your SWPPP (e.g., sources of pollution; spill and leak procedures; non-stormwater discharges; the selection, design, installation and implementation of your stormwater control measures) so that this permit's effluent limits are met and pollutant discharges are minimized:

5.1.1.1 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 United States) occurs at your facility.

5.1.1.2 A discharge violates a numeric effluent limit listed in Table 2-1 and/or in your Part 8 sector-specific requirements.

5.1.1.3 Your stormwater control measures are not stringent enough for your stormwater discharge to be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards or to meet the non-numeric effluent limits in this permit.

5.1.1.4 A required control measure was never installed, was installed incorrectly, ornot in accordance with Parts 2 and/or 8, or is not being properly operated or maintained.

5.1.1.5 Whenever a visual assessment shows evidence of stormwater pollution (e.g., color, odor, floating solids, settled solids, suspended solids, foam).

5.1.2 **Conditions Requiring SWPPP Review to Determine if Modifications Are Necessary.** If construction or a change in design, operation, or maintenance at your facility occurs that significantly changes the nature of pollutants discharged via stormwater from your facility, or significantly increases the quantity of pollutants discharged, you must review your SWPPP (e.g., sources of pollution, spill and leak procedures, non-stormwater discharges, selection, design, installation and implementation of your stormwater control measures) to determine if modifications are necessary to meet the effluent limits in this permit.

5.1.3 Deadlines for Corrective Actions

5.1.3.1 **Immediate Actions.** You must immediately take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a permanent solution, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events. In Part 5, the term “immediately” means that the day you find a condition requiring corrective action, you must take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a permanent solution. However, if you identify a problem too late in the work day to initiate corrective action, you must perform the corrective action the following work day morning. The term “all reasonable steps” means you must respond to the conditions triggering the corrective action, such as cleaning up any exposed materials that may be discharged in a storm event (e.g., through sweeping, vacuuming) or making arrangements (i.e., scheduling) for a new SCM to be installed.

5.1.3.2 **Subsequent Actions.** If additional actions are necessary beyond those implemented pursuant to Part 5.1.3.1, you must complete the corrective actions (e.g., install a new or modified control and make it operational, complete the repair) before the next storm event if possible, and within 14 calendar days from the time of discovery that the condition in Part 5.1.1 is not met. If it is infeasible to complete the corrective action within 14 calendar days, you must document why it is infeasible to complete the corrective action within the 14-day timeframe. You must also identify your schedule for completing the work, which must be done as soon as practicable after the 14-day timeframe but no longer than 45 days after discovery. If the completion of corrective action will exceed the 45-day timeframe, you may take the minimum additional time necessary to complete the corrective action, provided that you notify the appropriate EPA Regional Office of your intention to exceed 45 days, your rationale for an extension, and a completion date, which you must also include in your corrective action documentation (see Part 5.3). Where your corrective actions result in changes to any of the controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within 14 calendar days of completing corrective action work.

These time intervals are not grace periods, but are schedules considered reasonable for documenting your findings and for making repairs and improvements. They are included in this permit to ensure that the conditions prompting the need for these repairs and improvements do not persist indefinitely.

5.1.4 **Effect of Corrective Action.** If the event triggering the review is a permit violation (e.g., non-compliance with an effluent limit), correcting it does not remove the original violation. Additionally, failing to take corrective action in accordance with this section is an additional permit violation. EPA may consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations.

5.1.5 **Substantially Identical Discharge Points.** If the event triggering corrective action is associated with a discharge point that had been identified as a "substantially identical discharge point" (SIDP) (see Parts 3.2.4.5 and 4.1.1), your review must assess the need for corrective action for all related SIDPs. Any necessary changes to control measures that affect these other discharge points must also be made before the next storm event if possible, or as soon as practicable following that storm event. Any corrective actions must be conducted within the timeframes set forth in Part 5.1.3.

5.2 Additional Implementation Measures (AIM)

If any of the following AIM triggering events in Parts 5.2.3, 5.2.4, or 5.2.5 occur, you must follow the response procedures described in those parts, called "additional implementation measures" or "AIM." There are three AIM levels: AIM Level 1, Level 2, and Level 3. You must respond as required to different AIM levels which prescribe sequential and increasingly robust responses when a benchmark exceedance occurs. You must follow the corresponding AIM level responses and deadlines described in Parts 5.2.1, 5.2.2, and 5.2.3 unless you qualify for an exception under Part 5.2.6.

5.2.1 Baseline Status

Once you receive discharge authorization under this permit per Part 1.3, you are in a baseline status for all applicable benchmark parameters. If an AIM triggering event occurs and you have proceeded sequentially to AIM Level 1, 2 or 3, you may return directly to baseline status once the corresponding AIM-level response and conditions are met.

5.2.2 **AIM Triggering Events.** If an annual average exceeds an applicable benchmark threshold based on the following events, the AIM requirements have been triggered for that benchmark parameter. You must follow the corresponding AIM-level responses and deadlines described in Parts 5.2.3, 5.2.4, and 5.2.5 unless you qualify for an exception under Part 5.2.6. An annual average exceedance for a parameter can occur if:

5.2.2.1 The four-quarterly annual average for a parameter exceeds the benchmark threshold, or

5.2.2.2 Fewer than four quarterly samples are collected, but a single sample or the sum of any sample results within the sampling year exceeds the benchmark threshold by more than four times for a parameter. This result indicates an exceedance is mathematically certain (i.e., the sum of quarterly sample results to date is already more than four times the benchmark threshold).[18]

5.2.3 AIM Level 1

Your status changes from baseline to AIM Level 1 if quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2 has occurred, unless you qualify for an exception under Part 5.2.6.

5.2.3.1 **AIM Level 1 Responses.** If any of the triggering events in Part 5.2.2 occur, you must:

a. **Review SWPPP/Stormwater Control Measures.** Immediately review your SWPPP and the selection, design, installation, and implementation of your stormwater control measures to ensure the effectiveness of your existing measures and determine if modifications are necessary to meet the benchmark threshold for the applicable parameter,[19] and

b. **Implement Additional Measures.** After reviewing your SWPPP/stormwater control measures, you must implement additional measures, considering good engineering practices, that would reasonably be expected to bring your exceedances below the parameter's benchmark threshold; or if you determine nothing further needs to be done with your stormwater control measures, you must document per Part 5.3 and include in your annual report why you expect your existing control measures to bring your exceedances below the parameter's benchmark threshold for the next 12-month period.

5.2.3.2 **AIM Level 1 Deadlines.** If any modifications to or additional control measures are necessary in response to AIM Level 1, you must implement those modifications or control measures within 14 days of receipt of laboratory results, unless doing so within 14 days is infeasible. If doing so within 14 days is infeasible, you must document per Part 5.3 why it is infeasible and implement such modifications within 45 days.

5.2.3.3 **Continue Quarterly Benchmark Monitoring**. After compliance with AIM Level 1 responses and deadlines, you must continue quarterly benchmark monitoring for the next four quarters for the parameter(s) that caused the AIM triggering event at all affected stormwater discharge points, beginning no later than the next full quarter after compliance.

5.2.3.4 **AIM Level 1 Status Update.** While in AIM Level 1 status, you may either:

a. **Return to Baseline Status.** Your AIM Level 1 status will return to baseline status if the AIM Level 1 responses have been met and continued quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2 has not occurred after four quarters of monitoring (i.e., the benchmark threshold is no longer exceeded for the parameter(s)). You may discontinue benchmark monitoring for that parameter until monitoring resumes in year 4 of permit coverage per Part 4.2.2.3 or if you have fulfilled all benchmark monitoring

[18] For pH, an annual average exceedance can only occur if the four-quarter annual average exceeds the benchmark threshold.

[19] Examples may include: review sources of pollution, spill and leak procedures, and/or non-stormwater discharges; conducting a single comprehensive clean-up, making a change in subcontractor, implementing a new control measure, and/or increasing inspections.

requirements per Part 4.2.2.3, then you may discontinue monitoring for that parameter for the remainder of the permit.

b. Advance to AIM Level 2. Your AIM Level 1 status advances to AIM Level 2 status if you have completed AIM Level 1 responses and the continued quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2 has occurred (i.e., the benchmark threshold continues to be exceeded for the same parameter(s)).

5.2.4 AIM Level 2

Your status changes from AIM Level 1 to AIM Level 2 if your continued quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2 has occurred (i.e., the benchmark threshold continues to be exceeded for the parameter(s)), unless you qualify for an exception under Part 5.2.6.

5.2.4.1 **AIM Level 2 Responses.** If any of the events in Part 5.2.2 occur, you must review your SWPPP and implement additional pollution prevention/good housekeeping SCMs, considering good engineering practices, beyond what you did in your AIM Level 1 responses that would reasonably be expected to bring your exceedances below the parameter's benchmark threshold. Refer to the MSGP sector-specific fact sheets for recommended controls found at [https://www.epa.gov/npdes/stormwater-discharges-industrial-activities-fact-sheets-and-guidance].

5.2.4.2 **AIM Level 2 Deadlines.** You must implement additional pollution prevention/good housekeeping SCMs within 14 days of receipt of laboratory results that indicate an AIM triggering event has occurred and document per Part 5.3 how the measures will achieve benchmark thresholds. If it is feasible for you to implement a measure, but not within 14 days, you may take up to 45 days to implement such measure. You must document per Part 5.3 why it was infeasible to implement such measure in 14 days. EPA may also grant you an extension beyond 45 days, based on an appropriate demonstration by you, the operator.

5.2.4.3 **Continue Quarterly Benchmark Monitoring.** After compliance with AIM Level 2 responses and deadlines, you must continue quarterly benchmark monitoring for the next four quarters for the parameter(s) that caused the AIM triggering event at all affected discharge points, beginning no later than the next full quarter after compliance.

5.2.4.4 **AIM Level 2 Status Update.** While in AIM Level 2 status, you may either:

a. Return to Baseline Status. Your AIM Level 2 status will return to baseline status if the AIM Level 2 responses have been met and the continued quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2 has not occurred after four quarters of monitoring (i.e., the benchmark threshold is no longer exceeded for the parameter(s)). You may discontinue benchmark monitoring for that parameter until monitoring resumes in year 4 of permit coverage per Part 4.2.2.3, or if you have fulfilled all benchmark monitoring requirements per Part 4.2.2.3, then you may discontinue monitoring for that parameter for the remainder of the permit.

b. Advance to AIM Level 3. Your AIM Level 2 status advances to AIM Level 3 status if you have completed the AIM Level 2 responses and the continued quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2

has occurred (i.e., the benchmark threshold continues to be exceeded for the same parameter(s)).

5.2.5 AIM Level 3

Your status changes from AIM Level 2 to AIM Level 3 if your continued quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2 has occurred (i.e., the benchmark threshold continues to be exceeded for the parameter(s)), unless you qualify for an exception per Part 5.2.6.

5.2.5.1 **AIM Level 3 Responses.** if any of the triggering events in Part 5.2.2 occur, you must install structural source controls (e.g., permanent controls such as permanent cover, berms, and secondary containment), and/or treatment controls (e.g., sand filters, hydrodynamic separators, oil-water separators, retention ponds, and infiltration structures), except as provided in Part 5.2.6 (AIM Exceptions). The controls or treatment technologies or treatment train you install should be appropriate for the pollutants that triggered AIM Level 3 and should be more rigorous than the pollution prevention/good housekeeping-type stormwater control measures implemented under AIM Tier 2 in Part 5.2.4. You must select controls with pollutant removal efficiencies that are sufficient to bring your exceedances below the benchmark threshold. You must install such stormwater control measures for the discharge point(s) in question and for substantially identical discharge points (SIDPs), unless you individually monitor those SIDPs and demonstrate that AIM Level 3 requirements are not triggered at those discharge points.

5.2.5.2 **AIM Level 3 Deadlines**. You must identify the schedule for installing the appropriate structural source and/or treatment stormwater control measures within 14 days and install such measures within 60 days. If is not feasible within 60 days, you may take up to 90 days to install such measures, documenting in your SWPPP per Part 5.3 why it is infeasible to install the measure within 60 days. EPA may also grant you an extension beyond 90 days, based on an appropriate demonstration by you, the operator.

5.2.5.3 **Continue Quarterly Benchmark Monitoring.** After compliance with AIM Level 3 responses and deadlines, you must continue quarterly benchmark monitoring for the next four quarters for the parameter(s) that caused the AIM triggering event at all affected discharge points, beginning no later than the next full quarter after compliance.

5.2.5.4 **AIM Level 3 Status Update.** While in AIM Level 3 status, you may either:

a. **Return to Baseline Status.** Your AIM Level 3 status will return to baseline status if the AIM Level 3 response(s) have been met and the continued quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2 has not occurred after four quarters of monitoring (i.e., the benchmark threshold is no longer exceeded for the parameter(s)). You may discontinue benchmark monitoring for that parameter until monitoring resumes in what would be year 4 of permit coverage per Part 4.2.2.3, or if you have fulfilled all benchmark monitoring requirements per Part 4.2.2.3, then you may discontinue monitoring for that parameter for the remainder of the permit.

b. **Continue in AIM Level 3.** Your AIM Level 3 status will remain at Level 3 if you have completed the AIM Level 3 responses and the continued quarterly benchmark monitoring results indicate that an AIM triggering event per Part 5.2.2 has occurred (i.e., the benchmark threshold continues to be exceeded for the same parameter(s)). You must continue quarterly benchmark monitoring for the next four quarters for the parameter(s) that caused the AIM triggering event at all affected discharge points, beginning no later than the next full quarter after compliance. If you continue to exceed the benchmark threshold for the same parameter even after compliance with AIM Level 3, EPA may require you to apply for an individual permit.

5.2.6 AIM Exceptions

Following the occurrence of an AIM triggering event per Part 5.2.2, at any point or tier level of AIM and following four quarters of benchmark monitoring (or sooner if the exceedance is triggered by less than four quarters of data), you may qualify for an exception below from AIM requirements and continued benchmark monitoring. Regardless if you qualify for and claim an exception, you must still review your SCMs, SWPPP, and other on-site activities to determine if actions or modifications are necessary or appropriate in light of your benchmark exceedance(s). If claiming an AIM exception, you must follow the requirements to demonstrate that you qualify for the exception as provided below. If you qualify for an exception, you are not required to comply with the AIM responses or the continuation of quarterly benchmark monitoring for any parameters for which you can demonstrate that the benchmark exceedance is:

5.2.6.1 **Solely Attributable to Natural Background Pollutant Levels:** You must demonstrate that the benchmark exceedance is solely attributable to the presence of that pollutant in natural background sources, provided that all the following conditions are met and you submit your analysis and documentation to the applicable EPA Regional Office upon request:

a. The four-quarter average concentration of your benchmark monitoring results (or fewer than four-quarters of data that trigger an exceedance) is less than or equal to the concentration of that pollutant in the natural background; and

b. You document and maintain with your SWPPP, as required in Part 6.5.9, your supporting rationale for concluding that benchmark exceedances are in fact attributable solely to natural background pollutant levels. You must include in your supporting rationale any data previously collected by you or others (including literature studies) that describe the levels of natural background pollutants in your stormwater discharge. Natural background pollutants are those substances that are naturally occurring in soils or ground water. Natural background pollutants do not include legacy pollutants from earlier activity on your site, or pollutants in run-on from neighboring sources which are not naturally occurring, such as other industrial facilities or roadways.

5.2.6.2 **Due to Run-On:** You must demonstrate and obtain EPA agreement that run-on from a neighboring source (e.g., a source external to your facility) is the cause of the exceedance, provided that all the following conditions are met and you submit your analysis and documentation to the applicable EPA Regional Office for concurrence:

a. After reviewing and revising your SWPPP, as appropriate, you should notify the other facility or entity contributing run-on to your discharges and request that they abate their pollutant contribution.

b. If the other facility or entity fails to take action to address their discharges or sources of pollutants, you should contact your applicable EPA Regional Office.

5.2.6.3 **Due to an abnormal event:** You must immediately document per Part 5.3 that the AIM triggering event was abnormal, a description explaining what caused the abnormal event, and how any measures taken within 14 days of such event will prevent a reoccurrence of the exceedance. You must also collect a sample during the next measurable storm event to demonstrate that the result is less than the benchmark threshold, in which case you do not trigger any AIM requirements based on the abnormal event. You must report the result of this sample in NeT-DMR in lieu of the result from the sample that caused the AIM triggering event. You may avail yourself of the "abnormal" demonstration opportunity at any AIM Level, one time per parameter, and one time per discharge point, which shall include substantially identical discharge points (SIDP), provided you qualify for the exception.

5.2.6.4 **For Aluminum and Copper benchmark parameters only: Demonstrated to not result in an exceedance of your facility-specific value using the national recommended water quality criteria in-lieu of the applicable MSGP benchmark threshold:**

To be eligible for the exception, you must demonstrate to EPA that your stormwater discharge(s) that exceeded the applicable nationally representative MSGP benchmark threshold would not result in an exceedance of a derived facility-specific value. The demonstration to EPA, which will be made publicly available, must meet the minimum elements below in order to be considered for and approved by the applicable EPA Regional Office. If you exceed the MSGP benchmark threshold for aluminum or copper, you must still comply with any applicable AIM requirements and additional benchmark monitoring until the demonstration is made to and approved by the applicable EPA Regional Office. In this case, EPA suggests that samples collected for any continued benchmark monitoring also be analyzed for the required input parameters for each model for efficiency. If you are an existing operator and you anticipate an exceedance of the MSGP benchmark(s) based on previous monitoring data and expect to utilize this exception(s), EPA recommends you begin the required data collection in your first year of permit coverage.

a. **Aluminum:**

i. Conditions for this exception are:

1) Use of EPA's 2018 National Recommended Aluminum Aquatic Life Criteria: https://www.epa.gov/wqc/aquatic-life-criteria-aluminum;

2) In-stream waterbody sampling for the three water quality input parameters for the recommended criteria model: pH, total hardness, and dissolved organic carbon (DOC); and

3) Completion of sampling events sufficient to capture spatial and temporal variability. Sampling events must adequately represent each applicable season at the facility's location, which would likely be over the course of at least one year. An equal number of ambient waterbody samples must be collected at a single upstream and downstream location from the operator's discharge point(s) to the receiving water of the United States. Where there exists no ambient source water upstream of the operator's discharge point(s) to the receiving water of the United States, samples of the ambient downstream waterbody conditions are sufficient.

ii. The demonstration provided to EPA must include, at minimum:

1) A description of the sampling, analysis, and quality assurance procedures that were followed for data collection, following the guidance in Section

3 of EPA's Industrial Stormwater Monitoring and Sampling Guide. https://www.epa.gov/sites/production/files/2015-11/documents/msgp_monitoring_guide.pdf;

2) The input parameters and export of results from the Aluminum Criteria Calculator, available at: https://www.epa.gov/sites/production/files/2018-12/aluminum-criteria-calculator-v20.xlsm; and,

3) A narrative summary of results.

b. Copper (only for discharges to freshwater):

i. Conditions for this exception are:

1) Use of EPA's 2007 National Recommended Freshwater Copper Aquatic Life Criteria: https://www.epa.gov/wqc/aquatic-life-criteria-copper;

2) In-stream waterbody sampling for the 10 water quality input parameters to the BLM for copper: pH; dissolved organic carbon (DOC); alkalinity; temperature; major cations (calcium, magnesium, sodium, and potassium); and major anions (sulfate, chloride);

3) The water quality input parameters, with the exception of temperature, must fall within the range of conditions recommended for use in the BLM, found in Table 1-1 of the Data Requirements document: https://www.epa.gov/sites/production/files/2015-11/documents/copper-data-requirements-training.pdf; and

4) Completion of sampling events sufficient to capture spatial and temporal variability. Because some of the BLM input parameters are known to vary seasonally, EPA suggests a possible starting point of at least one sampling event per season.[20] Sampling events must adequately represent each applicable season at the facility's location, which would likely be over the course of at least one year. An equal number of ambient waterbody samples must be collected at a single upstream and downstream location from the operator's discharge point(s) to the receiving water of the United States. Where there exists no ambient source water upstream of the operator's discharge point(s) to the receiving water of the United States, samples of the ambient downstream waterbody conditions are sufficient.

ii. The demonstration provided to EPA must include, at minimum:

1) A description of the sampling, analysis, and quality assurance procedures that were followed for data collection, following the guidance in Section 3 of EPA's Industrial Stormwater Monitoring and Sampling Guide.

[20] EPA training materials on Copper BLM for Data Requirements states that spatial variability in the BLM input parameters caused by physical factors such as watershed size or the presence or absence of a point source discharge(s) to a waterbody should also be considered when determining how many sampling events should be collected when using the BLM to develop site-specific copper criteria. Spatial variability in the BLM input parameters should also be considered when determining how many sampling locations should be selected for development of site-specific copper criteria using the BLM. Regardless of the number of sampling events involved, data collection should reflect site-specific characteristics and consider special circumstances that may affect copper toxicity throughout the expected range of receiving water conditions. See https://www.epa.gov/sites/production/files/2015-11/documents/copper-data-requirements-training.pdf.

https://www.epa.gov/sites/production/files/2015-11/documents/msgp_monitoring_guide.pdf;

2) A discussion of how the data collected reflects the site-specific characteristics and how the operator considered special circumstances that may affect copper toxicity throughout the expected range of receiving water conditions;

3) The input file and export of the results from the BLM software, which can be requested at: https://www.epa.gov/wqs-tech/copper-biotic-ligand-model; and

4) A narrative summary of results.

5.2.6.5 **Demonstrated to not result in any exceedance of water quality standards:** You must demonstrate to EPA within 30 days of the AIM triggering event that the triggering event does not result in any exceedance of water quality standards. If it is not feasible to complete this demonstration within 30 days, you may take up to 90 days, documenting in your SWPPP why it is infeasible to complete the demonstration within 30 days. EPA may also grant you an extension beyond 90 days, based on an appropriate demonstration by you, the operator. The demonstration to EPA, which will be made publicly available, must include the following minimum elements in order to be considered for approval by the EPA Regional Office:

a. the water quality standards applicable to the receiving water;

b. the average flow rate of the stormwater discharge;

c. the average instream flow rates of the receiving water immediately upstream and downstream of the discharge point;

d. the ambient concentration of the parameter(s) of concern in the receiving water immediately upstream and downstream of the discharge point demonstrated by full-storm composite sampling;

e. the concentration of the parameter(s) of concern in the stormwater discharge demonstrated by full-storm, flow-weighted composite sampling;

f. any relevant dilution factors applicable to the discharge; and

g. the hardness of the receiving water.

Timeframe of EPA Review of Your Submitted Demonstration: EPA will review and either approve or disapprove of such demonstration within 90 days of receipt (EPA may take up to 180 days upon notice to you before the 90th day that EPA needs additional time).

- **EPA Approval of Your Submitted Demonstration**. If EPA approves such demonstration within this timeframe, you have met the requirements for this exception, and you do not have to comply with the corresponding AIM requirements and continued benchmark monitoring.
- **EPA Disapproval of Your Submitted Demonstration.** If EPA disapproves such demonstration within this timeframe, you must comply with the corresponding AIM requirements and continued benchmark monitoring, as required. Compliance with the AIM requirements would begin from the date EPA notifies you of the disapproval unless you submit a Notice of Dispute to the applicable EPA Regional Office in Part 7 within 30 days of EPA's disapproval.

- **EPA Does Not Provide Response Related to Your Submitted Demonstration**. If EPA does not provide a response on the demonstration within this timeframe, you may submit to the EPA Regional Office in Part 7 a Notice of Dispute.
- **Operator Submittal of Notice of Dispute.** You may submit all relevant materials, including support for your demonstration and all notices and responses to the Water Division Director for the applicable EPA Region to review within 30 days of EPA's disapproval or after 90 days (or 180 days if EPA has provided notice that it needs more time) of not receiving a response from EPA.
- **EPA Review of Notice of Dispute.** EPA will send you a response within 30 days of receipt of the Notice of Dispute. Time for action by you, the operator, upon disapproval shall be tolled during the period from filing of the Notice of Dispute until the decision on the Notice of Dispute is issued by the Water Division Director for the applicable EPA Region.

5.3 Corrective Action and AIM Documentation

5.3.1 **Documentation within 24 Hours.** You must document the existence of any of the conditions listed in Parts 5.1.1, 5.2.3, 5.2.4, or 5.2.5 within 24 hours of becoming aware of such condition. You are not required to submit this documentation to EPA, unless specifically required or requested to do so. However, you must summarize your findings in the annual report per Part 7.4. Include the following information in your documentation:

5.3.2 Description of the condition or event triggering the need for corrective action review and/or AIM response. For any spills or leaks, include the following information: a description ofthe incident including material, date/time, amount, location, and reason for spill, and any leaks, spills or other releases that resulted in discharges of pollutants to waters of United States, through stormwater or otherwise;

5.3.2.1 Date the condition/triggering event was identified;

5.3.2.2 Description of immediate actions taken pursuant to Part 5.1.3.1 to minimize or prevent the discharge of pollutants. For any spills or leaks, include response actions, the date/time clean-up completed, notifications made, and staff involved. Also include any measures taken to prevent the reoccurrence ofsuch releases (see Part 2.1.2.4); and

5.3.2.3 A statement, signed and certified in accordance with Appendix B, Subsection 11.

5.3.3 **Documentation within 14 Days.** You must also document the corrective actions and/or AIM responses you took or will take as a result of the conditions listed in Part 5.1.1, 5.2.3, 5.2.4, and/or 5.2.5 within 14 days from the time of discovery of any of those conditions/triggering events. Provide the dates when you initiated and completed (or expect to complete) each corrective action and/or AIM response. If infeasible to complete the necessary corrective actions and/or AIM responses within the specified timeframe, per Parts 5.1.1, 5.2.3, 5.2.4, or 5.2.5, you must document your rationale and schedule for installing the controls and making them operational as soon as practicable after the specified timeframe. If you notified EPA regarding an allowed extension of the specified timeframe, you must document your rationale for an extension. Include any additional information and/or rationale that is required and/or applicable to the specified corrective action and/or AIM response in Part 5. You are not required to submit this documentation to EPA, unless specifically required or requested to do so. However, you must summarize your corrective actions and/or AIM responses in the Annual Report per Part 7.4.

6. Stormwater Pollution Prevention Plan (SWPPP)

You must prepare a SWPPP for your facility before submitting your NOI for permit coverage. If you prepared a SWPPP for coverage under a previous version of this permit, you must review and update the SWPPP to implement all provisions of this permit prior to submitting your NOI. The SWPPP does not contain effluent limitations; such limitations are contained in Parts 2, 8, and 9 of the permit. The SWPPP is intended to document the selection, design, and installation of stormwater control measures to meet the permit's effluent limits. The SWPPP is a living document. Facilities must keep their SWPPP up-to-date throughout their permit coverage, such as making revisions and improvements to their stormwater management program based on new information and experiences with major storm events. As distinct from the SWPPP, the additional documentation requirements (see Part 6.5) are so that you document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements.

Note: Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the SWPPP, during an inspection, etc.

6.1 Person(s) Responsible for Preparing the SWPPP

You shall prepare the SWPPP in accordance with good engineering practices and to industry standards. The SWPPP may be developed by either a person on your staff or a third party you hire, but it must be developed by a "qualified person" and must be certified per the signature requirements in Part 6.2.7. If EPA concludes that the SWPPP is not in compliance with Part 6.2 of this permit, EPA may require the SWPPP to be reviewed, amended as necessary, and certified by a Professional Engineer, or for Sector G, H or J, by a Professional Geologist, with the education and experience necessary to prepare an adequate SWPPP.

Note: A "qualified person," as defined in Appendix A, is a person knowledgeable in the principles and practices of industrial stormwater controls and pollution prevention, and possesses the education and ability to assess conditions at the industrial facility that could impact stormwater quality, and the education and ability to assess the effectiveness of stormwater controls selected and installed to meet the requirements of the permit.

6.2 Required Contents of Your SWPPP

To be covered under this permit, your SWPPP must contain all of the following elements:

- Stormwater pollution prevention team (Part 6.2.1);
- Site description (Part 6.2.2);
- Summary of potential pollutant sources (Part 6.2.3);
- Description of stormwater control measures (Part 6.2.4);
- Schedules and procedures (Part 6.2.5);
- Documentation to support eligibility pertaining to other federal laws (Part 6.2.6); and

- Signature requirements (Part 6.2.7).

Where your SWPPP refers to procedures in other facility documents, such as a Spill Prevention, Control and Countermeasure (SPCC) Plan or an Environmental Management System (EMS), copies of the relevant portions of those documents must be kept with your SWPPP.

6.2.1 **Stormwater Pollution Prevention Team.** You must identify the staff members (by name or title) that comprise the facility's stormwater pollution prevention team as well as their individual responsibilities. Your stormwater pollution prevention team is responsible for overseeing development of the SWPPP, any modifications to it, and for implementing and maintaining control measures and taking corrective actions and/or AIM responses, when required. Each member of the stormwater pollution prevention team must have ready access to either an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

6.2.2 **Site Description.** Your SWPPP must include the following:

6.2.2.1 **Activities at the facility.** Provide a description of the nature of the industrial activities at your facility.

6.2.2.2 **General location map.** Provide a general location map (e.g., U.S. Geological Survey (USGS) quadrangle map) with enough detail to identify the location of your facility and all receiving waters for your stormwater discharges.

6.2.2.3 **Site map.** Provide a map showing:

a. Boundaries of the property and the size of the property in acres;

b. Location and extent of significant structures and impervious surfaces;

c. Directions of stormwater flow (use arrows), including flows with a significant potential to cause soil erosion;

d. Locations of all stormwater control measures;

e. Locations of all receiving waters, including wetlands, in the immediate vicinity of your facility. Indicate which waterbodies are listed as impaired and which are identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 waters;

f. Locations of all stormwater conveyances including ditches, pipes, and swales;

g. Locations of potential pollutant sources identified under Part 6.2.3.2;

h. Locations where significant spills or leaks identified under Part 6.2.3.3 have occurred;

i. Locations of all stormwater monitoring points;

j. Locations of stormwater inlets and discharge points, with a unique identification code for each discharge point (e.g., 001, 002), indicating if you are treating one or more discharge points as "substantially identical" under Parts 3.2.4.5, 6.2.5.3, and 4.1.1, and an approximate outline of the areas draining to each discharge point;

k. If applicable, municipal separate storm sewer systems (MS4s) and where your stormwater discharges to them;

l. Areas of Endangered Species Act-designated critical habitat for endangered or threatened species, if applicable.

m. Locations of the following activities where such activities are exposed to precipitation:

ii. fueling stations;

iii. vehicle and equipment maintenance and/or cleaning areas;

iv. loading/unloading areas;

v. locations used for the treatment, storage, or disposal of wastes;

vi. liquid storage tanks;

vii. processing and storage areas;

viii. immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;

ix. transfer areas for substances in bulk;

x. machinery;

xi. locations and sources of run-on to your site from adjacent property that contains significant quantities of pollutants.

6.2.3 **Summary of Potential Pollutant Sources.** You must describe in the SWPPP areas at your facility where industrial materials or activities are exposed to stormwater or from which authorized non-stormwater discharges originate. Industrial materials or activities include but are not limited to: material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products. Material handling activities include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For structures located in areas of industrial activity, you must be aware that the structures themselves are potential sources of pollutants. This could occur, for example, when metals such as aluminum or copper are leached from the structures as a result of acid rain.

For each area identified, the description must include:

6.2.3.1 **Activities in the Area.** A list of the industrial activities exposed to stormwater (e.g., material storage; equipment fueling, maintenance, and cleaning; cutting steel beams).

6.2.3.2 **Pollutants.** A list of the pollutant(s) or pollutant constituents (e.g., crankcase oil, zinc, sulfuric acid, cleaning solvents) associated with each identified activity, which could be exposed to rainfall or snowmelt and could be discharged from your facility. The pollutant list must include all significant materials that have been handled, treated, stored or disposed, and that have been exposed to stormwater in the three years prior to the date you prepare or amend your SWPPP.

6.2.3.3 **Spills and Leaks.** You must document where potential spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding discharge point(s) that would be affected by such spills and leaks. You must document all significant spills and leaks of oil or toxic or hazardous substances that actually occurred at exposed areas, or that drained to a stormwater conveyance, in the three years prior to the date you prepare or amend your SWPPP.

Note: Significant spills and leaks include, but are not limited to, releases of oil or hazardous substances in excess of quantities that are reportable under CWA section 311 (see 40 CFR 110.6 and 40 CFR 117.21) or section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC § 9602. This permit does not relieve you of the reporting requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302 relating to spills or other releases of oils or hazardous substances.

6.2.3.4 **Unauthorized Non-Stormwater Discharges Evaluation.** By the end of the first year of your permit coverage under this permit, you must inspect and document all discharge points at your facility as part of the SWPPP. If it is infeasible to complete the evaluation within the first year of permit coverage, you must document in your SWPPP why this is the case and identify the schedule by which you expect to complete the evaluation. Documentation of your evaluation must include:

a. The date of the evaluation;

b. A description of the evaluation criteria used;

c. A list of the discharge points or onsite drainage points that were directly observed during the evaluation; and

d. If there are any unauthorized non-stormwater discharges (see Part 1.2.2 for the exclusive list of authorized non-stormwater discharges under this permit) you must immediately take action(s), such as implementing control measures, to eliminate those discharges or seek an individual NPDES wastewater permit and document that you obtained the permit (for example, a floor drain was sealed, a sink drain was re-routed to sanitary, or an NPDES permit application was submitted for an unauthorized cooling water discharge).

e. An explanation of everything you did to immediately eliminate the unauthorized discharge per Part 5 Corrective Actions.

6.2.3.5 **Salt Storage.** You must document the location of any storage piles containing salt used for deicing or other commercial or industrial purposes.

6.2.3.6 **Sampling Data.** Existing permitted facilities must summarize all stormwater discharge sampling data collected at the facility during the previous permit term. The summary shall include a narrative description (and may include data tables/figures) that adequately summarizes the collected sampling data tosupport identification of potential pollution sources at your facility. New dischargers and new sources must provide a summary of any available stormwater data they may have.

6.2.4 **Description of Stormwater Control Measures to Meet Technology-Based and Water Quality-Based Effluent Limits.** You must document the location and type of stormwater control measures you have specifically chosen and/or designed to comply with:

6.2.4.1 Part 2.1.2: Non-numeric technology-based effluent limits;

6.2.4.2 Parts 2.1.3 and 8: Applicable numeric effluent limitations guidelines-based limits;

6.2.4.3 Part 2.2: Water quality-based effluent limits;

6.2.4.4 Part 2.3: Any additional measures that formed the basis of eligibility regarding Endangered Species Act-listed threatened and endangered species or their critical habitat, National Historic Preservation Act historic properties, and/orfederal CERCLA Site requirements;

6.2.4.5 Parts 8 and 9: Applicable effluent limits;

6.2.4.6 Regarding your control measures, you must also document, as appropriate:

a. How you addressed the selection and design considerations in Part 2.1.1;

b. How they address the pollutant sources identified in Part 6.2.3.

Effluent limit requirements in Part 2.1.2 that do not involve the site-specific selection of a stormwater control measure or are specific activity requirements (e.g., "cleaning catch basins when the depth of debris reaches two-thirds (2/3) of the sump depth, or in line with manufacturer specifications, whichever is lower, and keeping the debris surface at least six inches below the lowest outlet pipe") are marked with an asterisk (*). For the requirements marked with an asterisk, you may include extra information, or you may just "copy-and-paste" these effluent limits word-for-word into your SWPPP without providing additional documentation.

6.2.5 Schedules and Procedures

6.2.5.1 **Pertaining to Stormwater Control Measures Used to Comply with the Effluent Limits in Part 2**. You must document the following in your SWPPP:

a. **Good Housekeeping (see Part 2.1.2.2)** – A schedule or the convention used for determining when pickup and disposal of waste materials occurs. Also provide a schedule for routine inspections for leaks and conditions of drums, tanks and containers.

b. **Maintenance (see Part 2.1.2.3)** – Preventative maintenance procedures, including regular inspections, testing, maintenance and repair of all stormwater control measures to avoid situations that may result in leaks, spills, and other releases, and any back-up practices in place should a storm event resulting in a stormwater discharge occur while a control measure is off-line. The SWPPP shall include the schedule or frequency for maintaining all control measures used to comply with the effluent limits in Part 2;

c. **Spill Prevention and Response Procedures (see Part 2.1.2.4**) – Procedures for preventing and responding to spills and leaks, including notification procedures. For preventing spills, include in your SWPPP the stormwater control measures for material handling and storage, and the procedures for preventing spills that can contaminate stormwater. Also specify cleanup equipment, procedures and spill logs, as appropriate, in the event of spills. You may reference the existence of other plans for Spill Prevention, Control and Countermeasure (SPCC) developed for the facility under section 311 of the CWA or BMP programs otherwise required by an NPDES permit for the facility, provided that you keep a copy of that other plan onsite and make it available for review consistent with Part 6.4;

d. **Erosion and Sediment Controls (see Part 2.1.2.5)** – If you use polymers and/or other chemical treatments as part of your erosion and sediment controls, you must identify the polymers and/or chemicals used and the purpose;

e. **Employee Training (see Part 2.1.2.8)** – The elements of your employee training plan shall include all, but not necessarily limited to, the requirements set forth in Part 2.1.2.8, and also the following:

ii. The content of the training;

iii. The frequency/schedule of training for employees who work in areas where industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit;

iv. A log of the dates on which specific employees received training.

6.2.5.2 **Pertaining to Inspections and Assessments.** You must document in your SWPPP your procedures for performing, as appropriate, the types of inspections specified by this permit, including:

a. Routine facility inspections (see Part 3.1) and;

b. Quarterly visual assessment of stormwater discharges (see Part 3.2).

For each type of inspection performed, your SWPPP must identify:

a. Person(s) or positions of person(s) responsible for the inspection;

b. Schedules for conducting inspections, including tentative schedule for facilities in climates with irregular stormwater discharges (see Part 3.2.4);

c. Specific items to be covered by the inspection, including schedules for specific discharge points.

If you are invoking the exception for inactive and unstaffed facilities relating to routine facility inspections and quarterly visual assessments, you must include in your SWPPP the information to support this claim as required by Parts 3.1.5 and 3.2.4.

6.2.5.3 **Pertaining to Monitoring**

a. **Procedures for Each Type of Monitoring.** You must document in your SWPPP procedures for conducting the six types of analytical stormwater discharge monitoring specified by this permit, where applicable to your facility, including:

i. Indicator monitoring (Part 4.2.1);

ii. Benchmark monitoring (Part 4.2.2);

iii. Effluent limitations guidelines monitoring (Part 4.2.3);

iv. State- or tribal-specific monitoring (Part 4.2.4);

v. Impaired waters monitoring (Part 4.2.5);

vi. Other monitoring as required by EPA (Part 4.2.6).

b. **Documentation for Each Type of Monitoring.** For each type of stormwater discharge monitoring, you must document in your SWPPP:

i. Locations where samples are collected, including any determination that two or more discharge points are substantially identical;

ii. Parameters for sampling and the frequency of sampling for each parameter;

iii. Schedules for monitoring at your facility, including schedule for alternate monitoring periods for climates with irregular stormwater discharges (see Part 4.1.6);

iv. Any numeric control values (benchmark thresholds, effluent limitations guidelines, TMDL-related requirements, or other requirements) applicable to stormwater discharges from each discharge point;

v. Procedures (e.g., responsible staff, logistics, laboratory to be used) for gathering storm event data, as specified in Part 4.1.

c. **Exception for Inactive and Unstaffed Facilities**. If you are invoking the exception for inactive and unstaffed facilities for indicator monitoring, benchmark monitoring or impaired waters monitoring, you must include in your SWPPP the information to support this claim as required by Part 4.2.2.5 and 4.2.5.2.

d. **Exception for Substantially Identical Discharge Points (SIDP).** You must document the following in your SWPPP if you plan to use the SIDP exception for your quarterly visual assessment requirements in Part 3.2.4 or your indicator, benchmark, or impaired waters monitoring requirements in Parts 4.2.1, 4.2.2, and 4.2.5, respectively (see also Part 4.1.1):

i. Location of each SIDP;

ii. Description of the general industrial activities conducted in the drainage area of each discharge point;

iii. Description of the control measures implemented in the drainage area of each discharge point;

iv. Description of the exposed materials located in the drainage area of each discharge point that are likely to be significant contributors of pollutants via stormwater discharges;

v. An estimate of the runoff coefficient of the drainage areas (low = under 40%; medium = 40 to 65%; high = above 65%);

vi. Why the discharge points are expected to discharge substantially identical effluents.

6.2.6 **Documentation to Support Eligibility Pertaining to Other Federal Laws**

6.2.6.1 **Documentation Regarding Endangered Species Act-Listed Threatened and Endangered Species and Critical Habitat Protection.** You must keep with your SWPPP the documentation supporting your determination with regard to Part 1.1.4.

6.2.6.2 **Documentation Regarding National Historic Preservation Act Historic Properties.** You must keep with your SWPPP the documentation supporting your determination with regard to Part 1.1.5.

6.2.7 **Signature Requirements.** You must sign and date your SWPPP in accordance with Appendix B, Subsection 11.

6.3 Required SWPPP Modifications

You must modify your SWPPP based on any corrective actions and deadlines required under Part 5. You must sign and date any SWPPP modifications in accordance with Appendix B, Subsection 11.

6.4 SWPPP Availability

You must retain a complete copy of your current SWPPP required by this permit at the facility in any accessible format. A complete SWPPP includes any documents incorporated by reference and all documentation supporting your permit eligibility pursuant to Part 1.1 of this permit, as well as your signed and dated certification page. Regardless of the format, the SWPPP must be immediately available to facility employees, EPA, a state or tribe, the operator of an MS4 into which you discharge, and representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) at the time of an on-site inspection.

Your current SWPPP or certain information from your current SWPPP described below must also be made available to the public (except any confidential business information (CBI) or restricted information [as defined in Appendix A]), but you must clearly identify those portions of the SWPPP that are being withheld from public access; to do so, you must comply with one of the following two options:

6.4.1 Making Your SWPPP Publicly Available

You have three options to comply with the public availability requirements for the SWPPP: attaching your SWPPP to your NOI; providing a URL of your SWPPP in your NOI; or providing SWPPP information in your NOI. To remain current for all three options, you must update your SWPPP (by updating the attachment per Part 6.4.1.1 via a Change NOI, updating your webpage per Part 6.4.1.2, or updating the SWPPP information in the NOI per Part 6.4.1.3 via a Change NOI no later than 45 days after conducting the final routine facility inspection for the year required in Part 3.1. You may switch your preferred option throughout your permit coverage, but you must update your NOI as necessary to indicate your change in option. You are not required to post any CBI or restricted information (as defined in Appendix A) (such information may be redacted), but you must clearly identify those portions of the SWPPP that are being withheld from public access. CBI may not be withheld from those staff cleared for CBI review within EPA, USFWS or NMFS.

6.4.1.1 Attaching Your SWPPP to your NOI: You may attach a copy of your SWPP, and any SWPPP modifications, records, and other reporting elements that must be kept with your SWPPP, to your NOI in NeT-MSGP.

6.4.1.2 Providing a URL of your SWPPP in your NOI: You may provide a URL in your NOI in NeT-MSGP where your SWPPP can be found, and maintain your current SWPPP at this URL. You must post any SWPPP modifications, records, and other reporting elements that must be kept with your SWPPP required for the previous year at the same URL as the main body of the SWPPP.

6.4.1.3 Providing SWPPP Information in your NOI. You may include the following information in your NOI in NeT-MSGP. Irrespective of this requirement, EPA may provide access to portions of your SWPPP to a member of the public upon request (except any CBI or restricted information (as defined in Appendix A)).

a. Onsite industrial activities exposed to stormwater, including potential spill and leak areas (see Parts 6.2.3.1, 6.2.3.3 and 6.2.3.5);

b. Pollutants or pollutant constituents associated with each industrial activity exposed to stormwater that could be discharged in stormwater and/or any authorized non-stormwater discharges listed in Part 1.2.2 (see Part 6.2.3.2);

c. Stormwater control measures you employ to comply with the non-numeric technology-based effluent limits required in Part 2.1.2 and Part 8, and any other measures taken to comply with the requirements in Part 2.2 Water Quality-Based Effluent Limitations (see Part 6.2.4). If you use polymers and/or other chemical treatments as part of your erosion and sediment controls, you must identify the polymers and/or chemicals used and the purpose; and

d. Schedule for good housekeeping and maintenance (see Part 6.2.5.1) and schedule for all inspections required in Part 3 (see Part 6.2.5.2).

6.5 Additional Documentation Requirements

You are required to keep the following inspection, monitoring, and certification records with your SWPPP that together keep your records complete and up-to-date, and demonstrate your full compliance with the conditions of this permit:

6.5.1 A copy of the NOI submitted to EPA along with any correspondence exchanged between you and EPA specific to coverage under this permit;

6.5.2 A copy of the authorization email you receive from the EPA assigning your NPDES ID;

6.5.3 A copy of this permit (either a hard copy or an electronic copy easily available to SWPPP personnel);

6.5.4 Documentation of any maintenance and repairs of stormwater control measures, including the date(s) of regular maintenance, date(s) of discovery of areas in need of repair/replacement, and for repairs, date(s) that the control measure(s) returned to full function, and the justification for any extended maintenance/repair schedules (see Part 2.1.2.3);

6.5.5 All inspection reports, including the Routine Facility Inspection Reports (see Part 3.1.6) and Visual Assessment Documentation (see Part 3.2.3);

6.5.6 Description of any deviations from the schedule for visual assessments and/or monitoring, and the reason for the deviations (e.g., adverse weather or it was impracticable to collect samples within the first 30 minutes of a measurable storm event) (see Parts 3.2.4 and 4.1.5);

6.5.7 Corrective action documentation required per Part 5.1;

6.5.8 Documentation of any benchmark threshold exceedances, which AIM Level triggering event the exceedance caused, and AIM response you employed per Part 5.2, including:

6.5.8.1 The AIM triggering event;

6.5.8.2 The AIM response taken;

6.5.8.3 Any rationale that SWPPP/SCM changes were unnecessary;

6.5.8.4 Any documentation required to meet any AIM exception per Part 5.2.6.

6.5.9 Documentation to support any determination that pollutants of concern are not expected to be present above natural background levels if you discharge directly to impaired waters, and that such pollutants were not detected in your discharge after three years or were solely attributable to natural background sources (see Part 4.2.5.1); and

6.5.10 Documentation to support your claim that your facility has changed its status from active to inactive and unstaffed with respect to the requirements to conduct routine facility inspections (see Part 3.1.5), quarterly visual assessments (see Part 3.2.4.4), benchmark monitoring (see Part 4.2.2.4), and/or impaired waters monitoring (see Part 4.2.5.2).

7. Reporting and Recordkeeping

7.1 Electronic Reporting Requirement

You must submit all NOIs, NOTs, NECs, Annual Reports, Discharge Monitoring Reports (DMRs), and other reporting information as appropriate electronically, unless the EPA Regional Office grants you a waiver based on one of the following conditions:

- If your headquarters is physically located in a geographic area (i.e., zip code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission; or
- If you have limitations regarding available computer access or computer capability.

Waivers are only granted for a one-time use for a single information submittal, e.g., an initial waiver for an NOI does not apply for the entire term of the permit for other forms. If you need to submit information on paper after your first waiver, you must apply for a new waiver. The EPA Regional Office may extend a wavier on a case-by-case basis.

If you wish to obtain a waiver from submitting a report electronically, you must submit a request to the applicable EPA Regional Office, found in Part 7.9. In that request you must document which exemption you meet, provide evidence supporting any claims, and a copy of your completed paper form. A waiver may only be considered granted once you receive written confirmation from EPA or its authorized representative.

7.2 Submitting Information to EPA

7.2.1 **Submitting Forms via NeT-MSGP.** You must submit all required information via EPA's electronic NPDES eReporting tool (NeT), unless the permit states otherwise or unless you have been granted a waiver per Part 7.1. You can both prepare and submit required information in NeT-MSGP using specific forms, also found in the permit's appendices. To access NeT-MSGP, go to https://cdxnodengn.epa.gov/net-msgp/action/login.

Information you must submit to EPA via NeT-MSGP:

- Notice of Intent (NOI) (Part 1.3);
- Change Notice of Intent (NOI) (Part 1.3.4);

- No Exposure Certification (NEC) (Part 1.5);
- Notice of Termination (NOT) (Part 1.4); and
- Annual Report (AR) (Part 7.4).

Note: You must submit Discharge Monitoring Reports (see Part 7.3) electronically using Net-DMR.

If the applicable EPA Regional Office grants you a waiver from electronic reporting, you must use the required forms found in the Appendices.

7.2.2 **Other Information Required to be Submitted.** Information required to be submitted to the applicable EPA Regional Office at the address in Part 7.8:

- New Dischargers and New Sources to Water Quality-Impaired Waters (Part 1.1.6.2);
- Exceedance Report for Numeric Effluent Limitations (Part 7.5); and
- Additional Reporting (Part 7.6)

7.3 **Reporting Monitoring Data to EPA**

7.3.1 **Submitting Monitoring Data via NeT-DMR.** You must submit all stormwater discharge monitoring data collected pursuant to Part 4 to EPA using Net-DMR, EPA's electronic DMR system (for more information visit: https://www.epa.gov/compliance/npdes-ereporting (unless the applicable EPA Regional Office grants you a waiver from electronic reporting, in which case you may submit a paper DMR form) no later than 30 days after you have received your complete laboratory results for all monitoring discharge points for the reporting period. Your monitoring requirements (i.e., parameters required to be monitored and sample frequency) will be prepopulated on your electronic Discharge Monitoring Report (DMR) form based on the information you reported on your NOI form through the NeT-MSGP. Accordingly, you must certify the following changes to your monitoring frequency to EPA by submitting a Change NOI in NeT-MSGP, unless EPA has completed the development of planned features in the electronic systems to process submitted monitoring results to automatically turn monitoring on/off as applicable, which will trigger changes to your monitoring requirements in Net-DMR:

7.3.1.1 All benchmark monitoring requirements have been fulfilled for the permitterm;

7.3.1.2 All impaired waters monitoring requirements have been fulfilled for the permit term;

7.3.1.3 Benchmark monitoring requirements no longer apply because the EPA Regional Office has concurred with your assessment that run-on from a neighboring source is the cause of the exceedance;

7.3.1.4 Benchmark and/or impaired monitoring requirements no longer apply because your facility is inactive and unstaffed;

7.3.1.5 Benchmark and/or impaired monitoring requirements now apply because your facility has changed from inactive and unstaffed to active and staffed;

7.3.1.6 For Sector G2 only: Discharges from waste rock and overburden piles have exceeded benchmark thresholds;

7.3.1.7 A numeric effluent limitation guideline has been exceeded;

7.3.1.8 A numeric effluent limitation guideline exceedance is back in compliance.

7.3.2 **When You Can Discontinue Submission of Monitoring Data.** Once you have completely fulfilled applicable monitoring requirements, you are no longer required to report monitoring results using Net-DMR. If you have only partially fulfilled your benchmark monitoring and/or impaired waters monitoring requirements (e.g., your four quarterly average is below the benchmark for some, but not all, parameters; you did not detect some, but not all, impairment pollutants), you must continue to report your results in Net-DMR for the remaining monitoring requirements. If the EPA Regional Office grants you a waiver per Part 7.1, you must submit paper reporting forms by the same deadline.

7.3.3 **State or Tribal Required Monitoring Data.** See Part 9 for specific reporting requirements applicable to individual states or tribes.

7.3.4 **Submission Deadline for Indicator and Benchmark Monitoring Data.** For both indicator and benchmark monitoring, you are required to submit sampling results to EPA no later than 30 days after receiving your complete laboratory results for all monitored discharge points for each monitoring period that you are required to collect samples, per Part 4.2.1. and Part 4.2.2. If you collect samples during multiple storm events in a single quarter (e.g., due to adverse weather conditions, climates with irregular stormwater discharges, or areas subject to snow), you are required to submit all sampling results for each storm event to EPA within 30 days of receiving all laboratory results for the event. Or, for any of your monitored discharge points that did not have a discharge within the reporting period, using Net-DMR, you must report that no discharges occurred for that discharge point no later than 30 days after the end of the reporting period.

7.4 Annual Report

You must submit an Annual Report to EPA via NeT-MSGP, per Part 7.2, by January 30th for each year of permit coverage containing information generated from the past calendar year. You must include the following information in the Annual Report:

7.4.1 A summary of your past year's routine facility inspection documentation required (Part 3.1.6). In addition, if you are an operator of an airport facility (Sector S) that is subject to the airport effluent limitations guidelines and are complying with the Part 8.S.8.1 effluent limitation through the use of non-urea-containing deicers, provide a statement certifying that you do not use pavement deicers containing urea. (Note: Operators of airport facilities that are complying with Part 8.S.8.1 by meeting the numeric effluent limitation for ammonia do not need to include thisstatement.)

7.4.2 A summary of your past year's visual assessment documentation (see Part 3.2.3);

7.4.3 A summary of your past year's corrective action and any required AIM documentation (see Part 5.3). If you have not completed required corrective action or AIM responses at the time you submit your annual report, you must describe the status of any outstanding corrective action(s) or AIM responses. Also describe any incidents of noncompliance in the past year or currently ongoing, or if none, provide a statement that you are in compliance with the permit.

Your Annual Report must also include a statement, signed and certified in accordance with Appendix B, Subsection 11.

7.5 Numeric Effluent Limitations Exceedance Report

If follow-up monitoring per Part 4.2.3.3 exceeds a numeric effluent limit, you must submit an Exceedance Report to EPA no later than 30 days after you have received your laboratory results. Send the Exceedance Report to the applicable EPA Regional Office listed in Part 7.8, and report the monitoring data through Net-DMR. Your report must include the following:

7.5.1 NPDES ID;

7.5.2 Facility name, physical address and location;

7.5.3 Name of receiving water;

7.5.4 Monitoring data from this and the preceding monitoring event(s);

7.5.5 An explanation of the situation, including what you have done and intend to do (should your corrective actions not yet be complete) to correct the violation;

7.5.6 An appropriate contact name and phone number.

7.6 Additional Standard Recordkeeping and Reporting Requirements

In addition to the reporting requirements stipulated in Part 7, you are also subject to the standard permit reporting provisions of Appendix B, Subsection 12. You must submit the following reports to the applicable EPA Regional Office listed in Part 7.8, as applicable. If you discharge through an MS4, you must also submit these reports to the MS4 operator (identified pursuant to Part 6.2.2).

7.6.1 24-hour reporting (see Appendix B, Subsection 12.F) – You must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours from the time you become aware of the circumstances;

7.6.2 5-day follow-up reporting to the 24-hour reporting (see Appendix B, Subsection 12.F) – A written submission must also be provided within five days of the time you become aware of the circumstances;

7.6.3 Reportable quantity spills (see Part 2.1.2.4) – You must provide notification, as required under Part 2.1.2.4, as soon as you have knowledge of a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity;

7.6.4 Planned changes (see Appendix B, Subsection 12.A) – You must give notice to EPA promptly, no fewer than 30 days prior to making any planned physical alterations or additions to the permitted facility that qualify the facility as a new source or that could significantly change the nature or significantly increase the quantity of pollutants discharged;

7.6.5 Anticipated noncompliance (see Appendix B, Subsection 12.B) – You must give advance notice to EPA of any planned changes in the permitted facility or activity which you anticipate will result in noncompliance with permit requirements;

7.6.6 Compliance schedules (see Appendix B, Subsection 12.F) – Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date;

7.6.7 Other noncompliance (see Appendix B, Subsection 12.G) – You must report all instances of noncompliance not reported in your Annual Report, compliance schedule report, or 24-hour report at the time monitoring reports are submitted; and

7.6.8 Other information (see Appendix B, Subsection 12.H) – You must promptly submit facts or information if you become aware that you failed to submit relevant facts in your NOI, or that you submitted incorrect information in your NOI or in any report.

7.7 Record Retention Requirements

You must retain copies of your SWPPP (including any modifications made during the term of this permit), additional documentation requirements pursuant to Part 6.5 (including documentation related to any corrective actions or AIM responses taken pursuant to Part 5), all reports and certifications required by this permit, monitoring data, and records of all data used to complete the NOI to be covered by this permit, for a period of at least three years from the date that your coverage under this permit expires or is terminated.

7.8 Addresses for Reports

Permit Part	EPA Region	Areas Covered	Address
7.8.1	1	Connecticut Massachusetts New Hampshire Rhode Island Vermont	U.S. EPA Region 1 Water Division Stormwater and Construction Permits Section 5 Post Office Square, Ste. 100 (06-1) Boston, MA 02109-3912
7.8.2	2	New Jersey New York	U.S. EPA Region 2 NPDES Stormwater Program 290 Broadway, 24th Floor New York, NY 10007-1866
		Puerto Rico Virgin Islands	U.S. EPA Region 2 Caribbean Environmental Protection Division NPDES Stormwater Program City View Plaza II – Suite 7000 48 Rd. 165 Km 1.2 Guaynabo, PR 00968-8069
7.8.3	3	Delaware District of Columbia Maryland Pennsylvania Virginia West Virginia	U.S. EPA Region 3 NPDES Permits Section, MC 3WD41 1650 Arch Street Philadelphia, PA 19103
7.8.4	4	Alabama Florida Georgia Kentucky Mississippi North Carolina	U.S. EPA Region 4 Water Division NPDES Stormwater Program Atlanta Federal Center 61 Forsyth Street SW Atlanta, GA 30303-3104

Permit Part	EPA Region	Areas Covered	Address
		South Carolina Tennessee	
7.8.5	5	Illinois Indiana Michigan Minnesota Ohio Wisconsin	U.S. EPA Region 5 NPDES Program Branch 77 W. Jackson Blvd. MC WP16J Chicago, IL 60604-3507
7.8.6	6	Arkansas Louisiana Oklahoma Texas New Mexico (except see Region 9 for Navajo lands, and see Region 8 for Ute Mountain Reservation lands)	U.S. EPA Region 6 Permitting Section (WD-PE) 1201 Elm Street, Suite 500 Dallas, TX 75270
7.8.7	7	Iowa Kansas Missouri Nebraska	U.S. EPA Region 7 NPDES Stormwater Program 11201 Renner Blvd Lenexa, KS 66219
7.8.8	8	Colorado Montana North Dakota South Dakota Wyoming Utah (except see Region 9 for Goshute Reservation and Navajo Reservation lands) The Ute Mountain Reservation in New Mexico The Pine Ridge Reservation in Nebraska	EPA Region 8 Storm Water Program MC: 8P-W-WW 1595 Wynkoop Street Denver, CO 80202-1129

Permit Part	EPA Region	Areas Covered	Address
7.8.9	9	Arizona California Hawaii Nevada Guam American Samoa The Commonwealth of the Northern Mariana Islands The Goshute Reservation in Utah and Nevada The Navajo Reservation in Utah New Mexico, and Arizona The Duck Valley Reservation in Idaho Fort McDermitt Reservation in Oregon	U.S. EPA Region 9 Water Division NPDES Stormwater Program (WTR-2-3) 75 Hawthorne Street San Francisco, CA 94105-3901
7.8.10	10	Alaska Idaho Oregon (except see Region 9 for Fort McDermitt Reservation) Washington	U.S. EPA Region 10 Water Division NPDES Stormwater Program (19-C04) 1200 6th Avenue, Suite 155 Seattle, WA 98101-3188
7.8.11	State and Tribal Addresses		See Part 9 (states and tribes) for the addresses of applicable states or tribes that require submission of information to their agencies.

Part 8 – Sector-Specific Requirements for Industrial Activity

Subpart G – Sector G – Metal Mining

You must comply with Part 8 sector-specific requirements associated with your primary industrial activity and any co-located industrial activities, as defined in Appendix A. The sector- specific requirements apply to those areas of your facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

Note: Where compliance with a requirement in a separate exploration permit, mining permit, reclamation plan, Surface Mining Control and Reclamation Act (SMCRA) requirements, etc. will result in you fully meeting any requirement in this Subpart, you are considered to have complied with the relevant requirement in this Subpart. You must include documentation in your SWPPP describing your rationale for concluding that any particular action on your part is sufficient to comply with the corresponding requirement in this Subpart.

8.G.1 Covered Stormwater Discharges

The requirements in Subpart G apply to stormwater discharges associated with industrial activity from Metal Mining facilities, including mines abandoned on Federal lands, as identified by the SIC Codes specified under Sector G in Table D-1 of Appendix D. Coverage is required for metal mining facilities that discharge stormwater contaminated by contact with, or that has come into contact with, any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of the operation.

8.G.1.1 ***Covered Discharges from Inactive Facilities.*** All stormwater discharges.

8.G.1.2 ***Covered Discharges from Active and Temporarily Inactive Facilities.*** Only the stormwater discharges from the following areas are covered:

- Waste rock and overburden piles if composed entirely of stormwater and not combined with mine drainage;
- Topsoil piles;
- Offsite haul and access roads;
- Onsite haul and access roads constructed of waste rock, overburden or spent ore if composed entirely of stormwater and not combining with mine drainage;
- Onsite haul and access roads not constructed of waste rock, overburden or spent ore except if mine drainage is used for dust control;
- Discharges from tailings dams or dikes when not constructed of waste rock or tailings and no process fluids are present;
- Discharges from tailings dams or dikes when constructed of waste rock or tailings and no process fluids are present, if composed entirely of stormwater and not combining with mine drainage;
- Concentration building if no contact with material piles;
- Mill site if no contact with material piles;
- Office or administrative building and housing if mixed with stormwater from industrial area;
- Chemical storage area;

- Docking facility if no excessive contact with waste product that would otherwise constitute mine drainage;
- Explosive storage;
- Fuel storage;
- Vehicle and equipment maintenance area and building;
- Parking areas (if necessary);
- Power plant;
- Truck wash areas if no excessive contact with waste product that would otherwise constitute mine drainage;
- Unreclaimed, disturbed areas outside of active mining area;
- Reclaimed areas released from reclamation requirements prior to December 17, 1990;
- Partially or inadequately reclaimed areas or areas not released from reclamation requirements.

8.G.1.3 ***Covered Discharges from Earth-Disturbing Activities Conducted Prior to Active Mining Activities.*** All stormwater discharges.

8.G.1.4 ***Covered Discharges from Facilities Undergoing Reclamation.*** All stormwater discharges.

8.G.2 Limitations on Coverage

8.G.2.1 ***Prohibition of Stormwater Discharges.*** Stormwater discharges not authorized by this permit: discharges from active metal mining facilities that are subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

Note: Stormwater discharges from these sources are subject to 40 CFR Part 440 if they are mixed with other discharges subject to Part 440. In this case, they are not eligible for coverage under this permit. Discharges from overburden/waste rock and overburden/waste rock-related areas are not subject to 40 CFR Part 440 unless they: drain naturally (or are intentionally diverted) to a point source; and (2) combine with "mine drainage" that is otherwise regulated under the Part 440 regulations. For such sources, coverage under this permit would be available if the discharge composed entirely of stormwater does not combine with other sources of mine drainage that are not subject to 40 CFR Part 440, and meets the other eligibility criteria contained in Part 1.1 of the permit. Operators bear the initial responsibility for determining if they are eligible for coverage under this permit, or must seek coverage under another NPDES permit. EPA recommends that operators contact the relevant NPDES permit issuance authority for assistance to determine the nature and scope of the "active mining area" on a mine-by-mine basis, as well as to determine the appropriate permitting mechanism for authorizing such discharges.

8.G.2.2 ***Prohibition of Non-Stormwater Discharges.*** Not authorized by this permit: adit drainage, and contaminated springs or seeps discharging from waste rock dumps that do not directly result from precipitation events (see also the standard Limitations on Coverage in Part 1.1.3). (EPA includes these prohibited non-stormwater discharges here solely as a helpful reminder to the operator that the only non-stormwater discharges authorized by this permit are at Part 1.2.2)

8.G.3 Definitions

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

8.G.3.1 ***Mining operations.*** For this permit, mining operations are grouped into two distinct categories, with distinct effluent limits and requirements applicable to each: a) earth-disturbing activities conducted prior to active mining activities); and b) active mining activities, which includes reclamation. "Mining operations" can occur at both inactive mining facilities and temporarily inactive mining facilities.

8.G.3.2 ***Earth-disturbing activities conducted prior to active mining activities.*** Consists of two classes of earth-disturbing (i.e., clearing, grading and excavation) activities:

a. activities performed for purposes of mine site preparation, including: cutting new rights of way (except when related to access road construction); providing access to a mine site for vehicles and equipment (except when related to access road construction); other earth disturbances associated with site preparation activities on any areas where active mining activities have not yet commenced (e.g., for heap leach pads, waste rock facilities, tailings impoundments, wastewater treatment plants); and

b. construction of staging areas to prepare for erecting structures such as to house project personnel and equipment, mill buildings, etc., and construction of access roads. Earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining are considered to be "construction" and have additional effluent limits in Part 8.G.4.2.

8.G.3.3 ***Active mining activities.*** Activities related to the extraction, removal or recovery, and benefication of metal ore from the earth; removal of overburden and waste rock to expose mineable minerals; and site reclamation and closure activities. All such activities occur within the "active mining area." Reclamation involves activities undertaken, in compliance with applicable mined land reclamation requirements, to return the land to an appropriate post-mining contour and land use in order to meet applicable federal and state reclamation requirements. In addition, once earth-disturbing activities conducted prior to active mining activities have ceased and all related requirements in Part 8.G.4 have been met, and a well-delineated "active mining area" has been established, all activities (including any clearing, grading, and excavation) that occur within the active mining area are "active mining activities."

8.G.3.4 ***Active mining area.*** A place where work or other activity related to the extraction, removal or recovery of metal ore is being conducted, except, with respect to surface mines, any area of land on or in which grading has been completed to return the earth to desired contour and reclamation work has begun.

Note: Earth-disturbing activities described in the definition in Part 8.G.3.2 that occur on areas outside the active mining area (e.g., for expansion of the mine into undeveloped territory) are considered "earth-disturbing conducted prior to active mining activities", and must comply with the requirements in Part 8.G.4.

8.G.3.5 ***Inactive metal mining facility.*** A site or portion of a site where metal mining and/or milling occurred in the past but there are no active mining activities occurring as defined above, and where the inactive portion is not covered by an active mining permit issued by the applicable state or federal agency. An inactive metal mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an NPDES industrial stormwater permit.

8.G.3.6 ***Temporarily inactive metal mining facility.*** A site or portion of a site where metal mining and/or milling occurred in the past but currently are not being actively undertaken, and the facility is covered by an active mining permit issued by the applicable state or federal agency.

8.G.4 Requirements Applicable to Earth-Disturbing Activities Conducted Prior to Active Mining Activities

Stormwater discharges from earth-disturbing activities conducted prior to active mining activities (defined in Part 8.G.3.2) are covered under this permit. For such earth-disturbing activities, you must comply with all applicable requirements in Parts 1-9 of the MSGP except for the technology-based effluent limits in Part 8.G.5 and Part 2.1.2, the inspection requirements in Part 8.G.7 and Part 3, and the monitoring requirements in Part 8.G.8 and Part 4.

Authorized discharges from areas where earth-disturbing activities have ceased and stabilization as specified in Part 8.G.4.1.9 or 8.G.4.2.11, where appropriate, has been completed (stabilization is not required for areas where active mining activities will occur), are no longer subject to the Part 8.G.4 requirements. At such time, authorized discharges become subject to all other applicable requirements in the MSGP, including the effluent limits in Parts 2.1.2 and 8.G.5, the inspection requirements in Parts 3 and 8.G.7, and the monitoring requirements in Parts 4 and 8.G.8.

8.G.4.1 ***Technology-Based Effluent Limits Applicable to All Earth-Disturbing Activities Conducted Prior to Active Mining Activities.*** The following technology-based effluent limits apply to authorized discharges from all earth-disturbing activities conducted prior to active mining activities defined in Part 8.G.3.2(a) and 8.G.3.2(b). These limits supersede the technology-based limits listed in Part 2.1.2 and Part 8.G.5 of the MSGP.

8.G.4.1.1 ***Erosion and sediment control installation requirements.***

- By the time construction activities commence, install and make operational downgradient sediment controls, unless this timeframe is infeasible. If infeasible you must install and make such controls operational as soon as practicable or as soon as site conditions permit.
- All other stormwater controls described in the SWPPP must be installed and made operational as soon as conditions on each portion of the site allows.

8.G.4.1.2 ***Erosion and sediment control maintenance requirements. You must:***

- Ensure that all erosion and sediment controls remain in effective operating condition.
- Wherever you determine that a stormwater control needs maintenance to continue operating effectively, initiate efforts to fix

the problem immediately after its discovery, and complete such work by the end of the next work day.

- When a stormwater control must be replaced or significantly repaired, complete the work within 7 days, unless infeasible. If 7 days is infeasible, you must complete the installation or repair as soon as practicable.

8.G.4.1.3 **Perimeter controls.** You must:

- Install sediment controls along those perimeter areas of your disturbed area that will receive stormwater, except where site conditions prevent the use of such controls (in which case, maximize their installation to the extent practicable).
- Remove sediment before it accumulates to one-half of the above-ground height of any perimeter control.

8.G.4.1.4 ***Sediment track-out.*** For construction vehicles and equipment exiting the site directly onto paved roads, you must:

- Use appropriate stabilization techniques to minimize sediment track-out from vehicles and equipment prior to exit;
- Use additional controls to remove sediment from vehicle and equipment tires prior to exit, where necessary;
- Remove sediment that is tracked out onto paved roads by end of the work day.

Note: EPA recognizes that some fine grains may remain visible on the surfaces of off-site streets, other paved areas, and sidewalks even after you have implemented sediment removal practices. Such “staining” is not a violation of Part 8.G.4.1.4.

8.G.4.1.5 ***Soil or sediment stockpiles.*** You must:

- Minimize erosion of stockpiles from stormwater and wind via temporary cover, if feasible.
- Prevent up-slope stormwater flows from causing erosion of stockpiles (e.g., by diverting flows around the stockpile).
- Minimize sediment from stormwater that runs off of stockpiles, using sediment controls (e.g., a sediment barrier or downslope sediment control).

8.G.4.1.6 ***Sediment basins.*** If you intend to install a sediment basin to treat stormwater from your earth-disturbing activities, you must:

- Provide storage for either (1) the 2-year, 24-hour storm, or (2) 3,600 cubic feet per acre drained.
- Prevent erosion of (1) basin embankments using stabilization controls (e.g., erosion control blankets), and (2) the inlet and outlet points of the basin using erosion controls and velocity dissipation devices.

8.G.4.1.7 **Minimize dust.** You must minimize the generation of dust through the appropriate application of water or other dust suppression techniques that minimize pollutants being discharged into surface waters.

8.G.4.1.8 ***Restrictions on use of treatment chemicals.*** If you intend to use sediment treatment chemicals at your site, you are subject to the following minimum requirements:

- Use conventional erosion and sediment controls prior to and after application of chemicals;
- Select chemicals suited to soil type, and expected turbidity, pH, flow rate;
- Minimize the discharge risk from stored chemicals;
- Comply with state/local requirements;
- Use chemicals in accordance with good engineering practices and specifications of chemical supplier;
- Ensure proper training;
- Provide proper SWPPP documentation.

If you plan to use cationic treatment chemicals (as defined in Appendix A), you are ineligible for coverage under this permit, unless you notify your applicable EPA Regional Office in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

8.G.4.1.9 ***Site stabilization requirements for earth-disturbing activities performed for purposes of mine site preparation as defined in 8.G.3.2(a) (i.e., not applicable to construction of staging areas for structures and access roads as defined in 8.G.3.2(b)).*** You must comply with the following stabilization requirements except where the intended function of the site accounts for such disturbed earth (e.g., the earth disturbances will become actively mined, or the controls implemented at the active mining area effectively control the disturbance) (although you are encouraged to do so within the active mining area, where appropriate):

- *Temporary stabilization of disturbed areas.* Stabilization measures must be initiated immediately in portions of the site where earth-disturbing activities performed for purposes of mine site preparation (as defined in 8.G.3.2(a)) have temporarily ceased, but in no case more than 14 days after such activities have temporarily ceased. In arid, semi-arid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after earth-disturbing activities performed for purposes of mine site preparation has temporarily ceased, temporary vegetative stabilization measures must be initiated as soon as practicable. Until temporary vegetative stabilization is achieved, interim measures such as erosion control blankets with an appropriate seed base and tackifiers must be employed. In areas of the site where earth-disturbing activities performed for purposes of mine site preparation have permanently ceased prior to active mining, temporary stabilization measures must be implemented to minimize mobilization of sediment or other pollutants until active mining activities commence.
- *Final stabilization of disturbed areas.* Stabilization measures must be initiated immediately where earth-disturbing activities performed for purposes of mine site preparation (as defined in 8.G.3.2(a)) have permanently ceased, but in no case more than 14 days after the earth- disturbing activities have permanently ceased. In arid, semi-

arid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after earth-disturbing activities have permanently ceased, final vegetative stabilization measures must be initiated as soon as possible. Until final stabilization is achieved, temporary stabilization measures, such as erosion control blankets with an appropriate seed base and tackifiers, must be used.

8.G.4.2 ***Additional Technology-Based Effluent Limits Applicable Only to the Construction of Staging Areas for Structures and Access Roads.*** The following technology-based effluent limits apply to authorized discharges from earth-disturbing activities associated with the construction of staging areas and the construction of access roads, as defined in Part 8.G.3.2(b). These limits supersede the technology-based limits listed in Part 2.1.2 and Part 8.G.5 of the MSGP. These limits do not apply to earth-disturbing activities performed for purposes of mine site preparation (as defined in 8.G.3.2(a)).

8.G.4.2.1 **Area of *disturbance*.** You must minimize the amount of soil exposed during construction activities.

8.G.4.2.2 ***Erosion and sediment control design requirements***. You must:

- Design, install and maintain effective erosion and sediment controls to minimize the discharge of pollutants from construction activities. Account for the following factors in designing your erosion and sediment controls:
  - The expected amount, frequency, intensity and duration of precipitation;
  - The nature of stormwater discharges and run-on at the site, including factors such as impervious surfaces, slopes and site drainage features;
  - The range of soil particle sizes expected to be present on the site.
- Direct discharges from your stormwater controls to vegetated areas of your site to increase sediment removal and maximize stormwater infiltration, including any natural buffers, unless infeasible. Use velocity dissipation devices if necessary to prevent erosion when directing stormwater to vegetated areas.
- If any stormwater flow becomes or will be channelized at your site, you must design erosion and sediment controls to control both peak flowrates and total stormwater volume to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.
- If you install stormwater conveyance channels, they must be designed to avoid unstabilized areas on the site and to reduce erosion, unless infeasible. In addition, you must minimize erosion of channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters during discharge conditions through the use of erosion controls and velocity dissipation devices within and along the length of any constructed stormwater conveyance channel, and at any outlet to provide a non-erosive flow velocity.

8.G.4.2.3 **Natural Buffers.** For any stormwater discharges from construction activities within 50 feet of a water of the U.S., you must comply with one of the following compliance alternatives:

1. Provide a 50-foot undisturbed natural buffer between construction activities and the water of the U.S.; or
2. Provide an undisturbed natural buffer that is less than 50 feet supplemented by additional erosion and sediment controls, which in combination, achieve a sediment load reduction that is equivalent to a 50-foot undisturbed natural buffer; or
3. If it is infeasible to provide an undisturbed natural buffer of any size, implement erosion and sediment controls that achieve a sediment load reduction that is equivalent to a 50-foot undisturbed natural buffer.

There are exceptions when buffer requirements do not apply:

- There is no stormwater discharge from construction disturbances to a water of the U.S;
- The natural buffer has already been eliminated by preexisting development disturbances;
- The disturbance is for the construction of a water-dependent structure or construction approved under a CWA section 404 permit;
- For linear construction projects, you are not required to comply with the requirements if there are site constraints provided that, to the extent feasible, you limit disturbances within 50 feet of a water of the U.S. and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from any disturbances within 50 feet of a water of the U.S.

See EPA's industrial stormwater website under "Fact Sheets and Guidance" for information on complying with these alternatives: https://www.epa.gov/npdes/stormwater-discharges-industrial-activities.

8.G.4.2.4 **Soil *or sediment stockpiles***. In addition to the requirements in Part 8.G.4.1.5, you must locate any piles outside of any natural buffers established under Part 8.G.4.2.3.

8.G.4.2.5 ***Sediment basins***. In addition to the requirements in Part 8.G.4.1.6, you must locate sediment basins outside of any surface waters and any natural buffers established under Part 8.G.4.2.3, and you must utilize outlet structures that withdraw water from the surface, unless infeasible.

8.G.4.2.6 ***Native topsoil preservation.*** You must preserve native topsoil removed during clearing, grading, or excavation, unless infeasible. Store topsoil in a manner that will maximize its use in reclamation or final vegetative stabilization (e.g., by keeping the topsoil stabilized with seed or similar measures). This requirement does not apply if the intended function of the disturbed area dictates that topsoil be disturbed or removed.

8.G.4.2.7 ***Steep slopes.*** You must minimize the disturbance of steep slopes. The permit does not prevent or prohibit disturbance on steep slopes.

Depending on site conditions and needs, disturbance on steep slopes may be necessary (e.g., a road cut in mountainous terrain; for grading steep slopes prior to erecting the mine office). Where steep slope disturbances are necessary, you can minimize the disturbances to steep slopes through the implementation of a number of standard erosion and sediment control practices, such as by phasing disturbances in these areas and using stabilization practices specifically for steep grades.

8.G.4.2.8 ***Soil compaction.*** Where final vegetative stabilization will occur or where infiltration practices will be installed, you must either restrict vehicle/ equipment use in these areas to avoid soil compaction or use soil conditioning techniques to support vegetative growth. Minimizing soil compaction is not required where compacted soil is integral to the functionality of the site.

8.G.4.2.9 ***Dewatering Practices.*** You are prohibited from discharging ground water or accumulated stormwater that is removed from excavations, trenches, foundations, vaults or other similar points of accumulation, unless such waters are first effectively managed by appropriate controls (e.g., sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, or filtration systems). Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control. (An uncontaminated discharge is a discharge that meets applicable water quality standards.)

You must also meet the following requirements for dewatering activities:

- Discharge requirements:
  - No discharging visible floating solids or foam;
  - Remove oil, grease and other pollutants from dewatering water via an oil-water separator or suitable filtration device (such as a cartridge filter);
  - Utilize vegetated upland areas of the site, to the extent feasible, to infiltrate dewatering water before discharge. In no case shall waters of the U.S. be considered part of the treatment area;
  - Implement velocity dissipation devices at all points where dewatering water is discharged;
  - Haul backwash water away for disposal or return it to the beginning of the treatment process; and
  - Clean or replace the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.
- Treatment chemical restrictions: If you use polymers, flocculants or other chemicals to treat dewatering water, you must comply with the requirements in Parts 8.G.4.1.8.

8.G.4.2.10 ***Pollution prevention requirements.***

- *Prohibited discharges* (this non-exhaustive list of prohibited non-stormwater discharges is included here as a reminder that only the only authorized non-stormwater discharges are those enumerated in Part 1.2.2):
  - Wastewater from washout of concrete;
  - Wastewater from washout and cleanout of stucco, paint, form

release oils, curing compounds, and other construction materials;
  - Fuels, oils, or other pollutants used for operation and maintenance of vehicles or equipment;
  - Soaps, solvents, or detergents used in vehicle or equipment washing;
  - Toxic or hazardous substances from a spill or other release.
- *Design and location requirements:* Minimize the discharge of pollutants from pollutant sources by:
  - Minimizing exposure;
  - Using secondary containment, spill kits, or other equivalent measures;
  - Locating pollution sources away from surface waters, storm sewer inlets, and drainageways;
  - Cleaning up spills immediately (do not clean by hosing area down).
- *Pollution prevention requirements for wash waters:* Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
- *Pollution prevention requirements for the storage, handling, and disposal of construction products, materials, and wastes:* Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to stormwater. Minimization of exposure is not required in cases where the exposure to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

8.G.4.2.11 ***Site Stabilization requirements for the construction of staging areas for structures and access roads as defined in 8.G.3.2(b***) (i.e., not applicable to earth-disturbing activities performed for purposes of mine site preparation as defined in 8.G.3.2(a)). You must comply with the following stabilization requirements, except where the intended function of the site accounts for such disturbed earth (e.g., the area of construction will become actively mined, or the controls implemented at the active mining area effectively control the disturbance):

- By no later than the end of the next work day after construction work in an area has stopped permanently or temporarily ("temporarily" means the land will be idle for a period of 14 days or more but earth-disturbing activities will resume in the future), immediately initiate stabilization measures;
- If using vegetative measures, by no later than 14 days after initiating stabilization:
  - Seed or plant the area, and provide temporary cover to protect the planted area;
  - Once established, vegetation must be uniform, perennial (if final stabilization), and cover at least 70% of stabilized area based on

density of native vegetation.

- If using non-vegetative stabilization, by no later than 14 days after initiating stabilization:
  - o Install or apply all non-vegetative measures;
  - o Cover all areas of exposed soil.

Note: For the purposes of this permit, EPA will consider any of the following types of activities to constitute the initiation of stabilization: 1. Prepping the soil for vegetative or non-vegetative stabilization; 2. Applying mulch or other non-vegetative product to the exposed area; 3. Seeding or planting the exposed area; 4. Starting any of the activities in # 1 – 3 on a portion of the area to be stabilized, but not on the entire area; and 5. Finalizing arrangements to have stabilization product fully installed in compliance with the applicable deadline for completing stabilization.

Exceptions:

- Arid, semi-arid (if construction occurs during seasonally dry period), or drought-stricken areas:
  - o Within 14 days of stopping construction work in an area, install any necessary non-vegetative stabilization measures;
  - o Initiate vegetative stabilization as soon as conditions on the site allow;
  - o Document the schedule that will be followed for initiating and completing vegetative stabilization;
  - o Plant the area so that within 3 years the 70% cover requirement is met.
- Sites affected by severe storm events or other unforeseen circumstances:
  - o Initiate vegetative stabilization as soon conditions on the site allow;
  - o Document the schedule that will be followed for initiating and completing vegetative stabilization;
  - o Plant the area so that so that within 3 years the 70% cover requirement is met.

8.G.4.3 ***Water Quality-Based Requirements Applicable to Earth-Disturbing Activities Conducted Prior to Active Mining Activities.***

The following water quality-based limits apply to earth-disturbing activities conducted prior to active mining activities defined in Part 8.G.3.2(a) and 8.G.3.2(b), in addition to the water quality-based limits in Part 2.2 of the MSGP.

Stricter requirements apply if your site will discharge to an impaired water or a water that is identified by your state, tribe, or EPA as a Tier 2 or Tier 2.5 for antidegradation purposes:

- More rapid stabilization of exposed areas: Complete initial stabilization activities within 7 days of stopping earth-disturbing work.
- More frequent site inspections: Once every 7 days and within 24 hours of a storm event of 0.25 inches or greater.

8.G.4.4 *Inspection Requirements Applicable to Earth-Disturbing Activities Conducted Prior to Active Mining Activities.*

The following requirements supersede the inspection requirements in Part 3 and 8.G.7 of the MSGP for earth-disturbing activities conducted prior to active mining activities defined in Part 8.G.3.2(a) and 8.G.3.2(b).

8.G.4.4.1 *Inspection frequency*

- At least once every 7 calendar days, or
- Once every 14 calendar days and within 24 hours of a storm event of 0.25 inches or greater.

Note:

- o Inspections only required during working hours;
- o Inspections not required during unsafe conditions; and
- o If you choose to inspect once every 14 days, you must have a method for measuring rainfall amount on site (either rain gauge or representative weather station)

Note: To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day.

Note: You are required to specify in your SWPPP which schedule you will be following.

Note: "Within 24 hours of the occurrence of a storm event" means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

8.G.4.4.2 *Reductions in inspection frequency.*

- Stabilized areas: You may reduce the frequency of inspections to once per month in any area of your site where stabilization has occurred pursuant to Part 8.G.4.1.9 or 8.G.4.2.11.
- Arid, semi-arid, and drought stricken areas: If earth-disturbing activities are occurring during the seasonally dry period or during a period in which drought is predicted to occur, you may reduce inspections to once per month and within 24 hours of a 0.25 inch storm event.
- Frozen conditions: You may temporarily suspend or reduce inspections to once per month until thawing conditions occur if frozen conditions are continuous and disturbed areas have been stabilized. For extreme conditions in remote areas, e.g., where transit to the site is perilous/restricted or temperatures are routinely below freezing, you may suspend inspections until the conditions are conducive to safe access, and more frequent inspections can resume.

8.G.4.4.3 **Areas to be inspected.** You must at a minimum inspect the all of the following areas:

- Disturbed areas;
- Stormwater controls and pollution prevention measures;
- Locations where stabilization measures have been implemented;
- Material, waste, borrow, or equipment storage and maintenance areas;
- Areas where stormwater flows;
- Points of discharge.

8.G.4.4.4 ***What to check for during inspections.*** At a minimum you must check:

- Whether all stormwater controls are installed, operational and working as intended;
- Whether any new or modified stormwater controls are needed;
- For conditions that could lead to a spill or leak;
- For visual signs of erosion/sedimentation at points of discharge.

If a discharge is occurring, check:

- The quality and characteristics of the discharge;
- Whether controls are operating effectively.

8.G.4.4.5 **Inspection report.** Within 24 hours of an inspection, complete a report that includes:

- Inspection date;
- Name and title of inspector(s);
- Summary of inspection findings;
- Rainfall amount that triggered the inspection (if applicable);
- If it was unsafe to inspect a portion of the site, include documentation of the reason and the location(s);
- Each inspection report must be signed;
- Keep a current copy of all reports at the site or at an easily accessible location.

8.G.5 Technology-Based Effluent Limits for Active Mining Activities

Note: These requirements do not apply for any discharges from earth-disturbing activities conducted prior to active mining as defined in 8.G.3.2(a) or 8.G.3.2(b).

8.G.5.1 ***Employee training***. (See also Part 2.1.2.8) Conduct employee training at least annually at active and temporarily inactive facilities.

8.G.5.2 ***Stormwater controls.*** Apart from the control measures you implement to meet your Part 2 technology-based effluent limits, where necessary to minimize pollutant discharges in stormwater, implement the following control measures at your site. The potential pollutants identified in Part 8.G.6.3 shall determine the priority and appropriateness of the control measures selected. For mines subject to dust control requirements under state or county air quality permits, provided the requirements are equivalent, compliance with such air permit dust requirements shall constitute compliance with the dust control effluent limit in Part 2.1.2.10.

Stormwater diversions: Divert stormwater away from potential pollutant sources through implementation of control measures such as the following, where determined to be feasible (list not exclusive): interceptor or diversion controls (e.g., dikes, swales, curbs, berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

Capping: When capping is necessary to minimize pollutant discharges in stormwater, identify the source being capped and the material used to construct the cap.

Treatment: If treatment of stormwater (e.g., chemical or physical systems, oil - water separators, artificial wetlands) is necessary to protect water quality, describe the type and location of treatment used. Passive and/or active treatment of stormwater is encouraged, where feasible. Treated stormwater may be discharged as a stormwater source regulated under this permit provided the discharge is not combined with discharges subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

8.G.5.3 ***Discharge testing.*** (See also Part 6.2.3.4) Test or evaluate all discharge points covered under this permit for the presence of specific mining-related but unauthorized non-stormwater discharges such as seeps or adit discharges, or discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 440), such as mine drainage or process water. Alternatively (if applicable), you may keep a certification with your SWPPP consistent with Part 8.G.6.6.

8.G.6 Additional SWPPP Requirements for Mining Operations

Note: The requirements in Part 8.G.6 are not applicable to inactive metal mining facilities.

8.G.6.1 ***Nature of industrial activities***. (See also Part 6.2.2) Briefly document in your SWPPP the mining and associated activities that can potentially affect the stormwater discharges covered by this permit, including a general description of the location of the site relative to major transportation routes and communities.

8.G.6.2 ***Site map***. (See also Part 6.2.2) Document in your SWPPP the locations of the following (as appropriate): mining or milling site boundaries; access and haul roads; outline of the drainage areas of each stormwater discharge points within the facility with indications of the types of discharges from the drainage areas; location(s) of all permitted discharges covered under an individual NPDES permit; outdoor equipment storage, fueling, and maintenance areas; materials handling areas; outdoor manufacturing, outdoor storage, and material disposal areas; outdoor chemicals and explosives storage areas; overburden, materials, soils, or waste storage areas; location of mine drainage (where water leaves mine) or other process water; tailings piles and ponds (including proposed ones); heap leach pads; off-site points of discharge for mine drainage and process water; surface waters; boundary of tributary areas that are subject to effluent limitations guidelines; and location(s) of reclaimed areas.

8.G.6.3 ***Potential pollutant sources.*** (See also Part 6.2.3) For each area of the mine or mill site where stormwater discharges associated with industrial activities occur, identify the types of pollutants (e.g., heavy metals, sediment) likely to be present in significant amounts. Consider these factors: the mineralogy of the ore and waste rock (e.g., acid forming); toxicity and quantity of chemicals used, produced, or discharged; the likelihood of contact with stormwater; vegetation of site (if any); and history of significant leaks or spills of toxic or hazardous pollutants. Also include a summary of any existing ore or waste rock or overburden characterization data and test results for potential generation of acid rock. If any new data is acquired due to changes in ore type being mined, update your SWPPP with this information.

8.G.6.4 ***Documentation of control measures.*** Document all control measures that you implement consistent with Part 8.G.5.2. If control measures are implemented or planned but are not listed in Part 8.G.5.2 (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in your SWPPP. If you are in compliance with dust control requirements under state or county air quality permits, you must include (or summarize, as necessary) what the state or county air quality permit dust control requirements are and how you've achieved compliance with them.

8.G.6.5 ***Employee training***. All employee training(s) must be documented in the SWPPP.

8.G.6.6 ***Certification of permit coverage for commingled non-stormwater discharges***. If you are able, consistent with Part 8.G.5.3 above, to certify that a particular discharge composed of commingled stormwater and non-stormwater is covered under a separate NPDES permit, and that permit subjects the non-stormwater portion to effluent limitations prior to any commingling, retain such certification with your SWPPP. This certification must identify the non-stormwater discharges, the applicable NPDES permit(s), the effluent limitations placed on the non-stormwater discharge by the permit(s), and the points at which the limitations are applied.

8.G.7 Additional Inspection Requirements *(See also Part 3.1)*

Except for earth-disturbing activities conducted prior to active mining activities as defined in Part 8.G.3.2(a) and 8.G.3.2(b), which are subject to Part 8.G.4.4, inspect sites at least quarterly unless adverse weather conditions make the site inaccessible. Sites which discharge to waters designated as Tier 2 or 2.5 or waters which are impaired for sediment or nitrogen must be inspected monthly. See Part 8.G.8.5 for inspection requirements for inactive and unstaffed sites.

8.G.8 Monitoring and Reporting Requirements (See also Part 4)

Note: There are no Part 8.G.8 monitoring and reporting or impaired waters monitoring requirements for inactive and unstaffed sites.

8.G.8.1 Indicator Monitoring (See also Part 4.2.1)

Table 8.G-1 identifies indicator monitoring that applies to the specific subsectors of Sector G. This indicator monitoring applies to both your primary industrial activity and any co-located industrial activities.

Table 8.G-1		
Subsector (You may be subject to requirements for more than one sector/subsector)	**Indicator Monitoring Parameter**	**Indicator Monitoring Threshold**
Applies to all Sector G (Subsectors G1 and G2) facilities with stormwater discharges from paved surfaces that will be initially sealed or re-sealed with coal-tar sealcoat where industrial activities are located during coverage under this permit	Polycyclic Aromatic Hydrocarbons (PAHs)*	Report Only/ No thresholds or baseline values

* Monitoring is required for the 16 individual PAHs identified at Appendix A to 40 CFR Part 423: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, benzo[g,h,i]perylene, indeno[1,2,3-c,d]pyrene, and dibenz[a,h]anthracene.

8.G.8.2 *Benchmark Monitoring for Active Copper Ore Mining and Dressing Facilities.*

Table 8.G-2 identifies benchmarks that apply to active copper ore mining and dressing facilities. These benchmarks apply to both your primary industrial activity and any co- located industrial activities.

Table 8.G-2		
Subsector (You may be subject to requirements for more than one sector/subsector)	**Parameter**	**Benchmark Monitoring Concentration**
Subsector G1. Active Copper Ore Mining and Dressing Facilities (SIC 1021)	Total Suspended Solids (TSS)	100 mg/L
	Nitrate plus Nitrite Nitrogen	0.68 mg/L
	Chemical Oxygen Demand (COD)	120 mg/L

8.G.8.3 ***Benchmark Monitoring Requirements for Discharges From Waste Rock and Overburden Piles at Active Metal Mining Facilities.*** For discharges from waste rock and overburden piles, perform benchmark monitoring once in the first year for the parameters listed in Table 8.G-3, and twice annually in all subsequent years of coverage under this permit for any parameters for which the benchmark has been exceeded. You are also required to conduct analytic monitoring for the parameters listed in Table 8.G-4 in accordance with the requirements in Part 8.G.8.4. The Director may also notify you that you must perform additional monitoring to accurately characterize the quality and quantity of pollutants discharged from your waste rock and overburden piles.

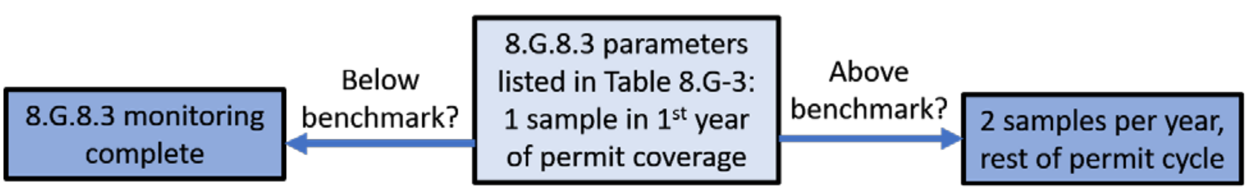


Table 8.G-3.		
Subsector (Discharges may be subject to requirements for more than one sector/subsector)	**Parameter**	**Benchmark Monitoring Concentration**
Subsector G2. Iron Ores; Copper Ores; Lead and Zinc Ores; Gold and Silver Ores; Ferroalloy Ores, Except Vanadium; and Miscellaneous Metal Ores (SIC Codes 1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099) (Note: when analyzing hardness for a suite of metals, it is more cost effective to add analysis of calcium and magnesium, and have hardness calculated than to require hardness analysis separately)	Total Suspended Solids (TSS)	100 mg/L
	Turbidity	50 NTU
	pH	6.0-9.0 s.u.
	Hardness (as $CaCO_3$; calc. from Ca, Mg)[2]	no benchmark value
	Total Recoverable Antimony	640 µg/L
	Total Recoverable Arsenic (freshwater) Total Recoverable Arsenic (saltwater)[1]	150 µg/L 69 µg/L
	Total Recoverable Beryllium	130 µg/L
	Total Recoverable Cadmium (freshwater)[2] Total Recoverable Cadmium (saltwater)[1]	Hardness Dependent 33 µg/L
	Total Recoverable Copper (freshwater) Total Recoverable Copper (saltwater)[1]	5.19 µg/L 4.8 µg/L
	Total Recoverable Lead (freshwater)[2] Total Recoverable Lead (saltwater)[1]	Hardness Dependent 210 µg/L
	Total Recoverable Mercury (freshwater) Total Recoverable Mercury (saltwater)[1]	1.4 µg/L 1.8 µg/L
	Total Recoverable Nickel (freshwater)[2] Total Recoverable Nickel (saltwater)[1]	Hardness Dependent 74 µg/L
	Total Recoverable Selenium (freshwater) Total Recoverable Selenium (saltwater)[1]	1.5 µg/L for still/standing (lentic) waters; 3.1 µg/L for flowing (lotic) waters 290 µg/L
	Total Recoverable Silver (freshwater)[2] Total Recoverable Silver (saltwater)[1]	Hardness Dependent 1.9 µg/L
	Total Recoverable Zinc (freshwater)[2] Total Recoverable Zinc (saltwater)[1]	Hardness Dependent 90 µg/L

[1]Saltwater benchmark values apply to stormwater discharges into saline waters where indicated.
[2] The freshwater benchmark values of some metals are dependent on water hardness. For these parameters,

permittees must determine the hardness of the receiving water (see Appendix J, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 4.2.2.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. Hardness Dependent Benchmarks follow in the table below:

Freshwater Hardness Range	**Cadmium** (µg/L)		**Lead** (µg/L)	**Nickel** (µg/L)	**Silver** (µg/L)	**Zinc** (µg/L)
0-24.99 mg/L	0.49		14	145	0.37	37
25-49.99 mg/L	0.73		24	203	0.80	52
50-74.99 mg/L	1.2		45	314	1.9	80
75-99.99 mg/L	1.7		69	418	3.3	107
100-124.99 mg/L	2.1		95	518	5.0	132
125-149.99 mg/L	2.6		123	614	7.1	157
150-174.99 mg/L	3.1		152	707	9.4	181
175-199.99 mg/L	3.5		182	798	12	204
200-224.99 mg/L	4.0		213	888	15	227
225-249.99 mg/L	4.4		246	975	18	249
250+ mg/L	4.7		262	1019	20	260

8.G.8.4 ***Additional Analytic Monitoring Requirements for Discharges From Waste Rock and Overburden Piles at Active Metal Mining Facilities.*** In addition to the monitoring required in Part 8.G.8.3 for discharges from waste rock and overburden piles, you must also conduct monitoring for additional parameters based on the type of ore you mine at your site. The schedule for monitoring for this Part 8.G.8.4 is the same as specified in Part 8.G.8.3: once in the first year for the parameters listed in Table 8.G-4 (except radium and uranium), and twice annually in all subsequent years of coverage under this permit for any parameters for which the benchmark has been exceeded. Where a parameter in Table 8.G-4 is the same as a pollutant you are required to monitor for in Table 8.G-3 (i.e., for all of the metals), you must use the corresponding benchmark in Table 8.G-3 and you may use any monitoring results conducted for Part 8.G.8.3 to satisfy the monitoring requirement for that parameter for Part 8.G.8.4. For radium and uranium, which do not have corresponding benchmarks in Table 8.G-3, there are no applicable benchmarks. For radium and uranium, you must monitor quarterly (as identified in Part 4.1.7) for your first four full quarters of permit coverage commencing no earlier than [insert 90 days after permit effective date], after which you may discontinue monitoring for these two parameters.

Table 8.G-4. Additional Monitoring Requirements for Discharges from Waste Rock and Overburden Piles

Supplemental Requirements			
	Pollutants of Concern		
Type of Ore Mined	**Total Suspended Solids (TSS)**	**pH**	**Metals, Total**
Tungsten Ore	X	X	Arsenic, Cadmium (H), Copper, Lead (H), Zinc (H)
Nickel Ore	X	X	Arsenic, Cadmium (H), Copper, Lead (H), Zinc (H)
Aluminum Ore	X	X	Iron
Mercury Ore	X	X	Nickel (H)
Iron Ore	X	X	Iron (Dissolved)

Table 8.G-4. Additional Monitoring Requirements for Discharges from Waste Rock and Overburden Piles			
Supplemental Requirements			
	Pollutants of Concern		
Type of Ore Mined	**Total Suspended Solids (TSS)**	**pH**	**Metals, Total**
Platinum Ore			Cadmium (H), Copper, Mercury, Lead (H), Zinc (H)
Titanium Ore	X	X	Iron, Nickel (H), Zinc (H)
Vanadium Ore	X	X	Arsenic, Cadmium (H), Copper, Lead (H), Zinc (H)
Molybdenum	X	X	Arsenic, Cadmium (H), Copper, Lead (H), Mercury, Zinc (H)
Uranium, Radium, and Vanadium Ore	X	X	Chemical Oxygen Demand, Arsenic, Radium (Dissolved and Total), Uranium, Zinc (H)

Note: An "X" indicated for TSS and/or pH means that you are required to monitor for those parameters. (H) indicates that hardness must also be measured when this pollutant is measured.

8.G.8.5 ***Inactive and Unstaffed Sites – Conditional Exemption from No Exposure Requirements for Quarterly Visual Assessments and Routine Facility Inspections.*** As a Sector G facility, if you are seeking to exercise a waiver from the quarterly visual assessment and routine facility inspection requirements for inactive and unstaffed sites (including temporarily inactive sites), you are conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to stormwater" in Parts 3.1.5 and 3.2.4.4. This exemption is conditioned on the following:

- If circumstances change and your facility becomes active and/or staffed, this exception no longer applies and you must immediately begin complying with the quarterly visual assessment requirements; and
- EPA retains the authority to revoke this exemption and/or the monitoring waiver where it is determined that the discharge causes, has a reasonable potentialto cause, or contributes to an instream excursion above an applicable water quality standard, including designated uses.

Subject to the two conditions above, if your facility is inactive and unstaffed, you are waived from the requirement to conduct quarterly visual assessments and routine facility inspections. You must still do an annual site inspection in accordance with Part 3.1. You are encouraged to inspect your site more frequently where you have reason to believe that severe weather or natural disasters may have damaged control measures or increased discharges.

Table 8.G-5. Applicability of the Multi-Sector General Permit to Stormwater From Active Mining and Dressing Sites, Temporarily Inactive Sites, and Sites Undergoing Reclamation	
Discharge/Source of Discharge	**Note/Comment**
Piles	
Waste rock/overburden	Covered under the MSGP if composed entirely of stormwater and not combined with mine drainage. See note below.
Topsoil	--

Table 8.G-5. Applicability of the Multi-Sector General Permit to Stormwater From Active Mining and Dressing Sites, Temporarily Inactive Sites, and Sites Undergoing Reclamation	
Discharge/Source of Discharge	**Note/Comment**
Roads constructed of waste rock or spent ore	
Onsite haul roads	Covered under the MSGP if composed entirely of stormwater and not combined with mine drainage. See note below.
Offsite haul and access roads	--
Roads not constructed of waste rock or spent ore	
Onsite haul roads	Covered under the MSGP except if mine drainage is used for dust control.
Offsite haul and access roads	--
Milling/concentrating	
Runoff from tailings dams and dikes when constructed of waste rock/tailings	Covered under the MSGP except if process fluids are present and only if composed entirely of stormwater and not combined with mine drainage. See Note below.
Runoff from tailings dams/dikes when not constructed of waste rock and tailings	Covered under the MSGP except if process fluids are present.
Concentration building	Covered under the MSGP If stormwater only and no contact with piles.
Mill site	If stormwater only and no contact with piles.
Ancillary areas	
Office and administrative building and housing	Covered under the MSGP if mixed with stormwater from the industrial area.
Chemical storage area	--
Docking facility	Covered under the MSGP except if excessive contact with waste product that would otherwise constitute mine drainage.
Explosive storage	--
Fuel storage (oil tanks/coal piles)	--
Vehicle and equipment maintenance area/building	--
Parking areas	Covered under the MSGP but coverage unnecessary if only employee and visitor-type parking.
Power plant	
Truck wash area	Covered under the MSGP except when excessive contact with waste product that would otherwise constitute mine drainage.
Reclamation-related areas	
Any disturbed area (unreclaimed)	Covered under the MSGP only if not in active mining area.
Reclaimed areas released from reclamation requirements prior to Dec. 17, 1990	--
Partially/inadequately reclaimed areas or areas not released from reclamation requirements	--

Note: Stormwater from these sources are subject to the NPDES program for stormwater unless mixed with discharges subject to 40 CFR Part 440 that are regulated by another permit prior to mixing. Non-stormwater discharges from these sources are subject to NPDES permitting and may be subject to the effluent limitation guidelines under 40 CFR Part 440. Discharges from overburden/waste rock and overburden/waste rock-related areas are not subject to 40 CFR Part 440 unless: (1) it drains naturally (or is intentionally diverted) to a point source; and (2) combines with "mine drainage" that is otherwise regulated under the Part 440 regulations. For such sources, coverage under this permit would be available if the discharge composed entirely of stormwater does not combine with other sources of mine drainage that are not subject to 40 CFR Part 440, as well as meeting other eligibility criteria contained in Part 1.1 of the permit.

Operators bear the initial responsibility for determining the applicable technology-based standard for such discharges. EPA recommends that operators contact the relevant NPDES permit issuance authority for assistance to determine the nature and scope of the "active mining area" on a mine-by-mine basis, as well as to determine the appropriate permitting mechanism for authorizing such discharges.

8.G.9 Termination of Permit Coverage

8.G.9.1 ***Termination of Permit Coverage for Sites Reclaimed After December 17, 1990***. A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is no longer required to maintain coverage under this permit. If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part 8.G.3.3.

8.G.9.2 ***Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990.*** A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if: (1) stormwater that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state water quality standards, soil disturbing activities related to mining at the sites or portion of the site have been completed, (3) the site or portion of the site has been stabilized to minimize soil erosion, and (4) as appropriate depending on location, size, and the potential to contribute pollutants to stormwater discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

Appendix B: Delegation of Authority Forms

Perpetua Resources Corp.
405 S. 8th Street, Ste. 201
Boise, ID 83702
Tel:208.9013060
www.perpetuaresources.com

MEMO

Subject: Delegation of Authority Form
From: Alan Haslam
To: Kyle Fend
Date: May 2021

Delegation of Authority Form

I, Alan Haslam, hereby designate the person or specifically described position below to be a Duly Authorized Representative for the purpose of overseeing compliance with environmental requirements, including the U.S EPA's Multi-Sector General Permit (MSGP) for stormwater discharges at Perpetua Resources Idaho, Inc.'s Stibnite Gold Project. The Duly Authorized Representative is authorized to sign any reports, Plans and all other documentation required by the permit.

Kyle Fend (name of Person or Position)

Perpetua Resources Idaho, Inc. (Company)

13181 Hwy 55, PO Box 429 (Address)

Donnelly, ID 83615 (City, State, Zip)

208-901-3047 (Phone)

By signing this Authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix B, Part B.11.A of the MSGP and that the Duly Authorized Representative above meets the definition of a Duly Authorized Representative as described in MSGP Appendix B, Part B.11.B.

"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 contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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: Alan Haslam

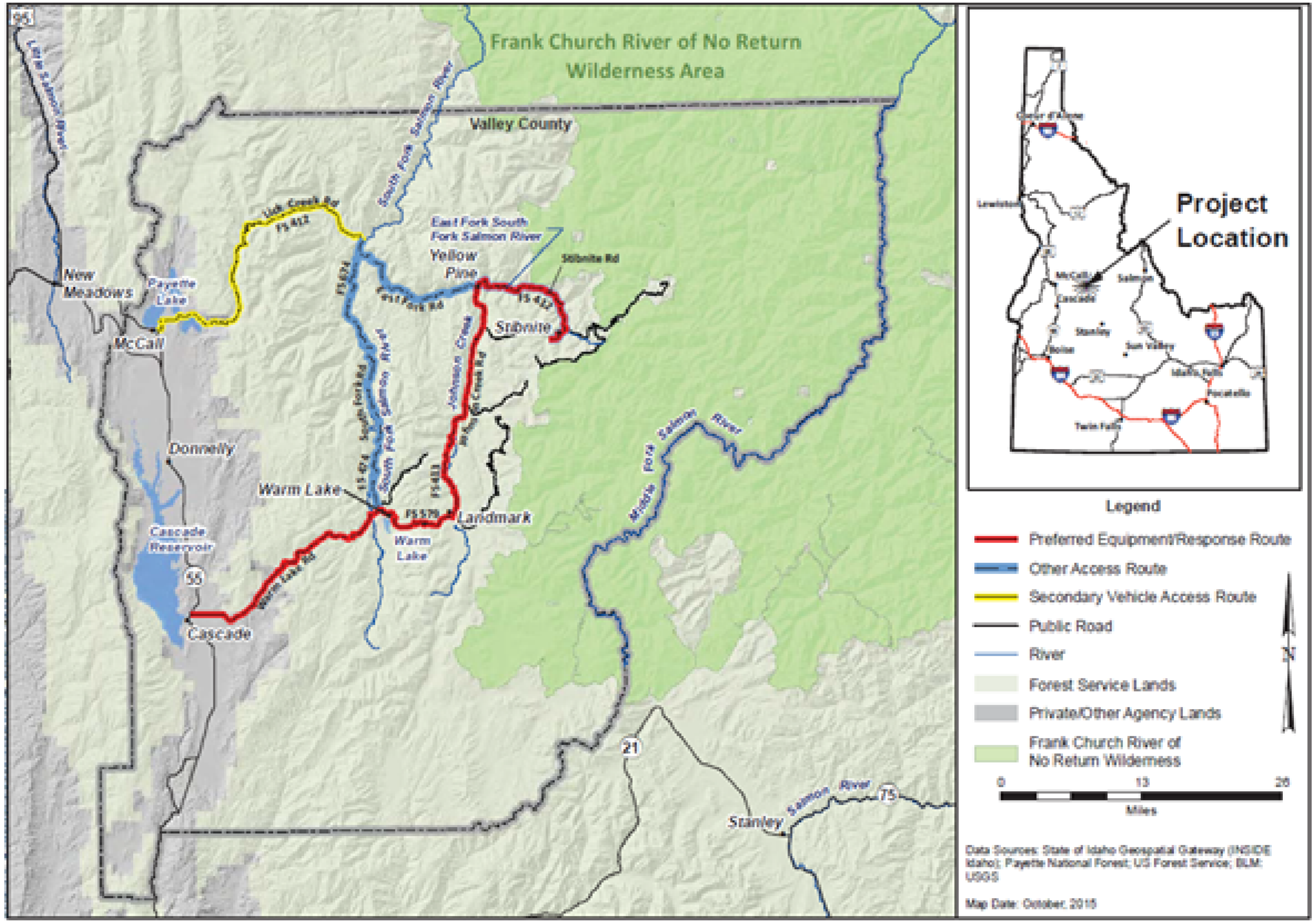
Company: Perpetua Resources Idaho, Inc.

Title: Vice President of Permitting

Signature: Alan D. Haslam

Date: May 27, 2021

Appendix C: Site Maps



LOCATION MAP

REVISION	DATE

Perpetua Resources

Perpetua Resources Idaho, Inc.- Stibnite Gold Project

SWPPP Figure 1:

SITE LOCATION MAP

Aquionix EHS Services

5545 W. 56th Ave.
Arvada, CO 80002
303-289-7520
www.aquionix.com

DESIGNED BY: Midas/Perpetua

DRAWN BY: Midas/Perpetua

DATE DRAWN:

D:\ArcGIS_AutoCAD\Perpetua -3230\mxds

LOCATION MAP

MAP FEATURES

- Perennial Flowline
- Ephemeral Flowline
- Intermittent Flowline
- Artificial Path
- Canal Ditch
- Pipeline

REVISION	DATE

Perpetua Resources

Perpetua Resources Idaho, Inc.- Stibnite Gold Project
SWPPP Figure 2:

SURROUNDING WATERS OVERVIEW MAP

DESIGNED BY: MT (Aquionix)

SCALE: 1:75,000

DRAWN BY: MT (Aquionix)

DATA FRAME COORD SYSTEM: WGS_1984_Web _Mercator_Auxiliary_Sphere

DATE DRAWN: 5/3/2021

Aquionix EHS Services
5545 W. 56th Ave.
Arvada, CO 80002
303-289-7520
www.aquionix.com

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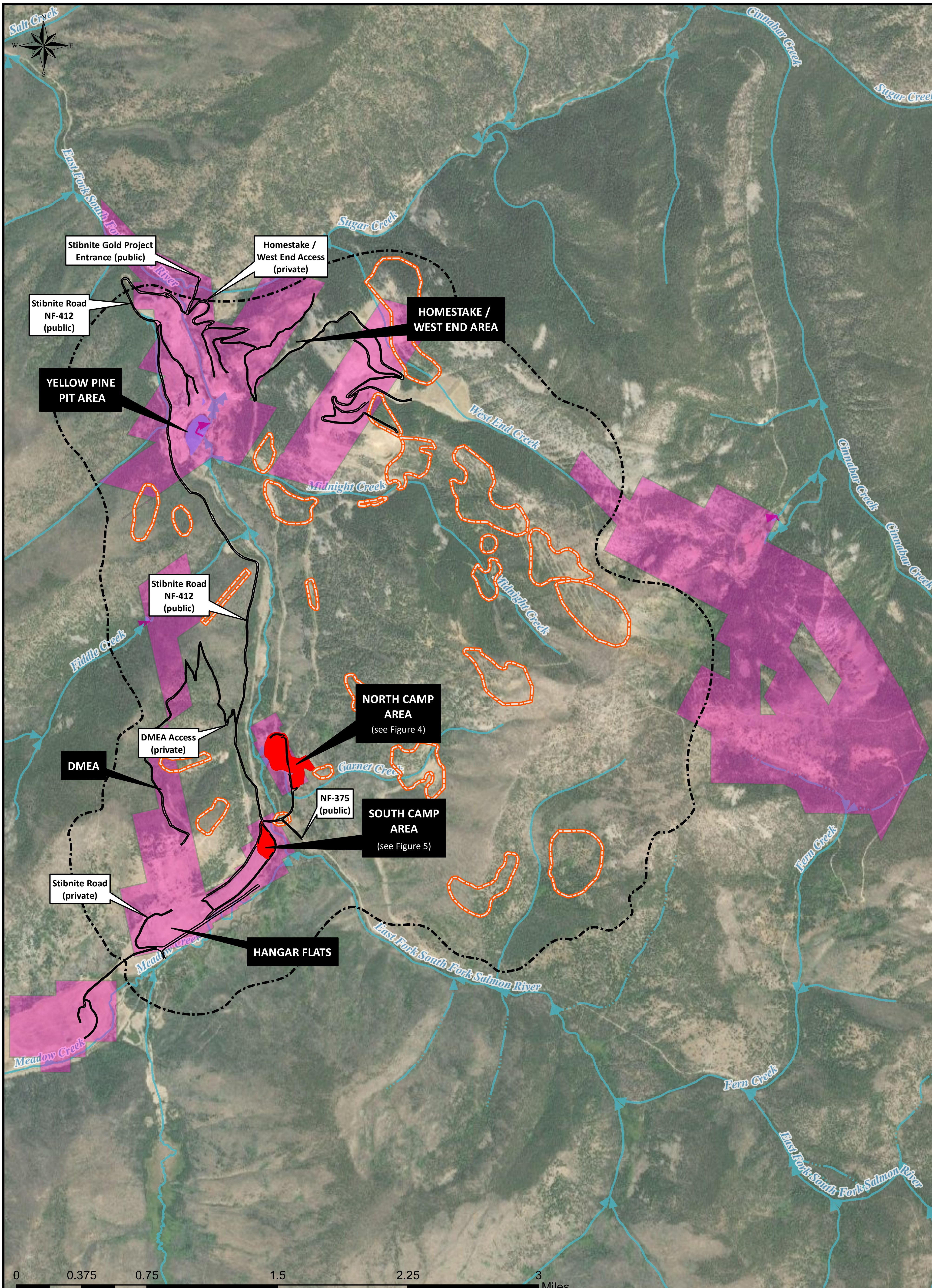

MAP FEATURES

- Project Area Boundary (Approx.)
- Private Land
- Lake
- Perennial Stream/River
- Intermittent Stream/River
- Artificial Path
- Canal Ditch
- Industrial Activity Area
- Potential Exploration Area
- Perpetua Road

NOTES

(1) North Camp Industrial Activity Area approximately 14 acres

(2) South Camp Industrial Activity Area approximately 4.8 acres

REVISION	DATE

Perpetua Resources

Perpetua Resources Idaho, Inc. - Stibnite Gold Project

SWPPP Figure 3:

PROPERTY EXTENT MAP

Aquionix
EHS Services

5545 W. 56th Ave.
Arvada, CO 80002
303-289-7520
www.aquionix.com

DESIGNED BY: MT (Aquionix)

DRAWN BY: MT (Aquionix)

DATE DRAWN: 5/27/2021

SCALE: 1:32,500

DATA FRAME COORD SYSTEM: WGS_1984_Web_Mercator_Auxiliary_Sphere

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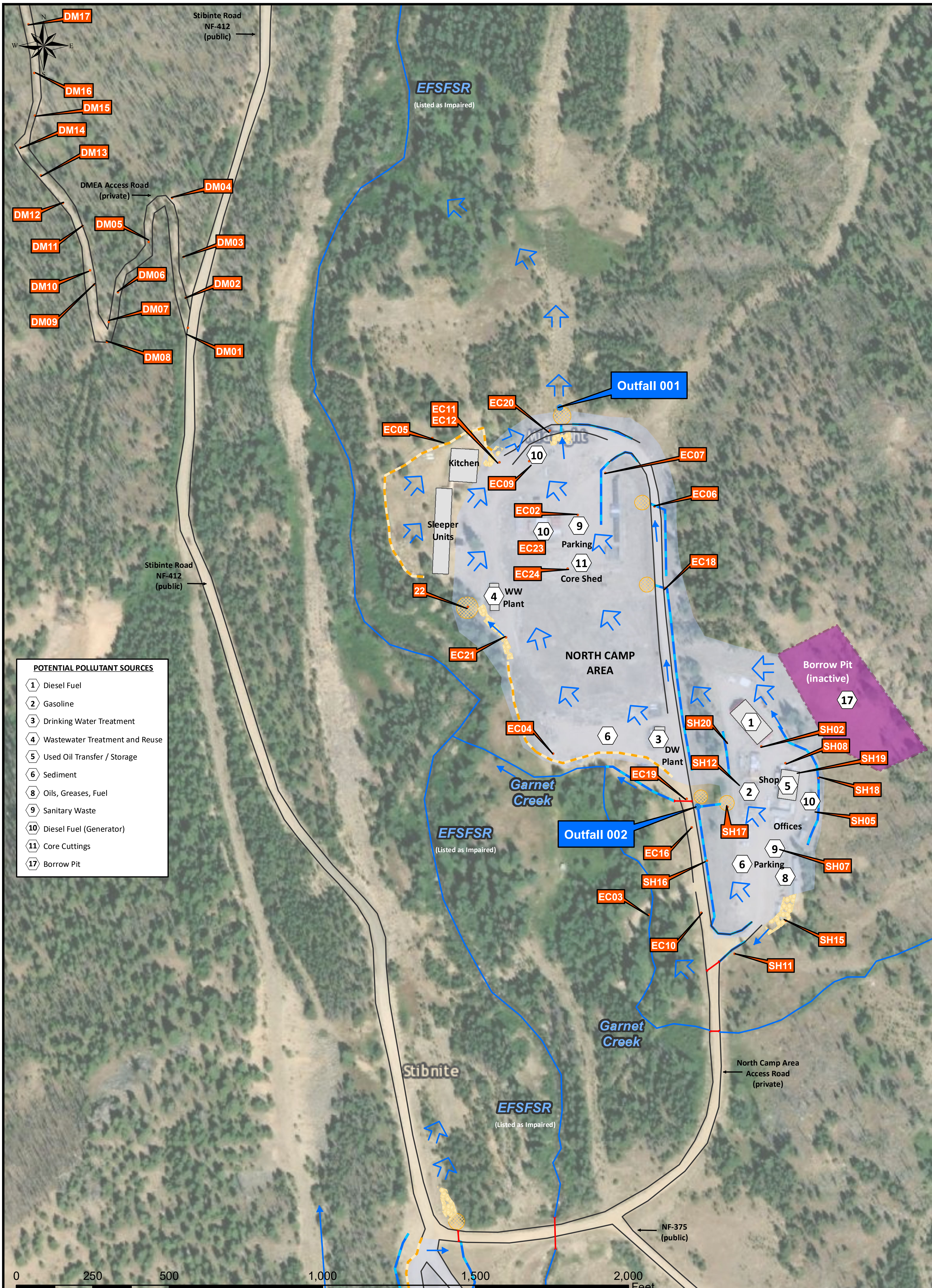

MAP FEATURES

	Surface Flow (Conc.)		Industrial Activity Area
	Surface Flow (Sheet)		Borrow Pit (approx.)
1	Potential Pollutant Source		Sediment Pond
	Stormwater Outfall		Swale
	Culvert		Berm
	Building		Rip-Rap
	Stream		Mulch Mat
	BMP / Control Measure		

NOTES

(1) Refer to SWPPP for PPS details

(2) Refer to Control Measures Inspection Form in SWPPP for BMP / Control Measure details

(3) Refer to SWPPP for information on Impaired Waters (303(d) listed)

REVISION	DATE

Perpetua Resources

Perpetua Resources Idaho, Inc. - Stibnite Gold Project

SWPPP Figure 4:

NORTH CAMP AREA DETAIL MAP

Aquionix
EHS Services

5545 W. 56th Ave.
Arvada, CO 80002
303-289-7520
www.aquionix.com

DESIGNED BY: MT (Aquionix)	SCALE: 1:3,500
DRAWN BY: MT (Aquionix)	DATA FRAME COORD SYSTEM: WGS_1984_Web _Mercator_Auxiliary_Sphere
DATE DRAWN: 5/3/2021	

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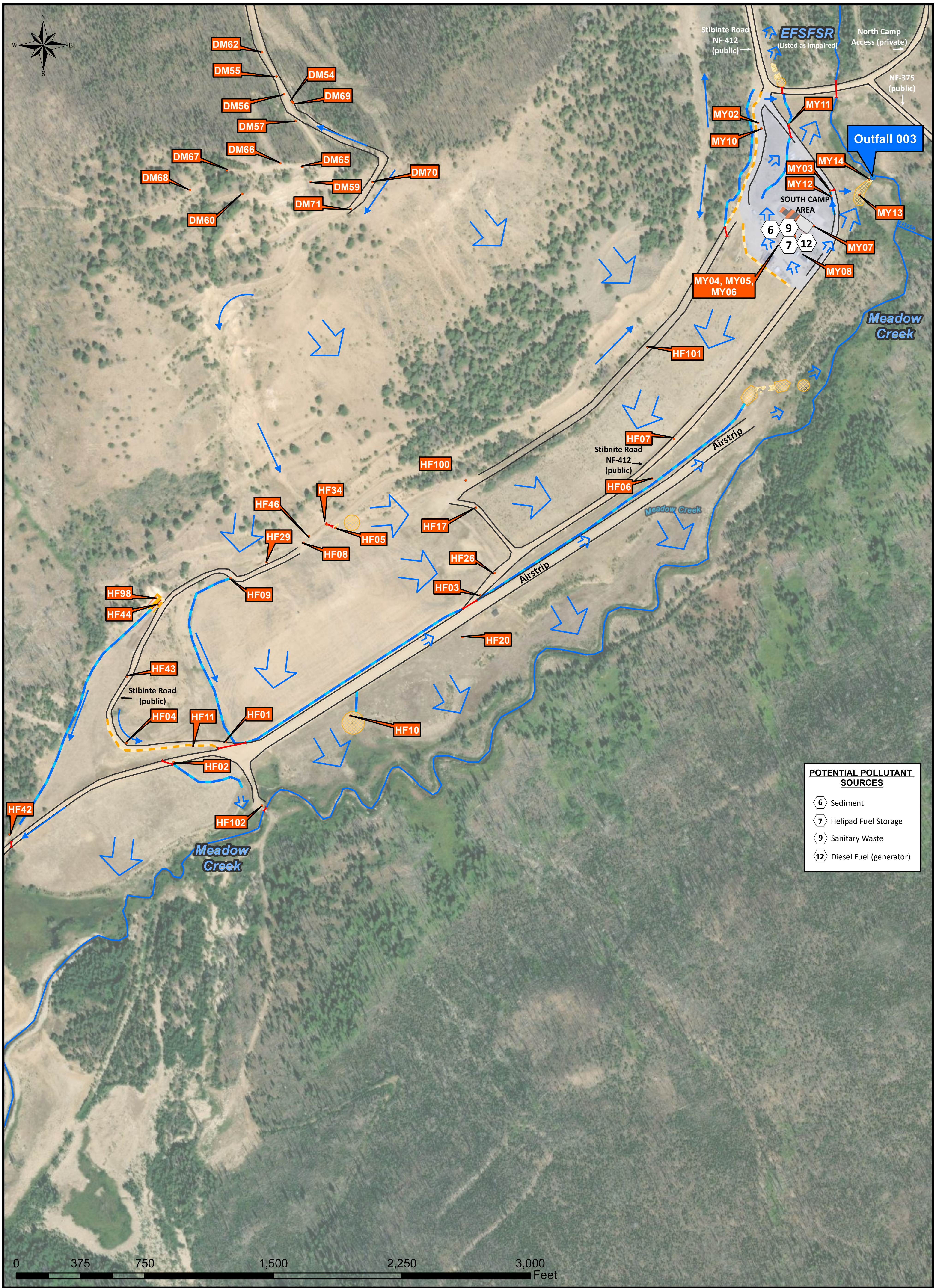

MAP FEATURES

Surface Flow (Conc.)		Industrial Activity Area	
Surface Flow (Sheet)		Helipad	
Potential Pollutant Source		Sediment Pond	
Stormwater Outfall		Swale	
Culvert		Berm	
Building		Rip-Rap	
Stream		Mulch Mat	
BMP / Control Measure			

NOTES

(1) Refer to SWPPP for PPS details

(2) Refer to Control Measures Inspection Form in SWPPP for BMP / Control Measure details

(3) Refer to SWPPP for information on Impaired Waters (303(d) listed)

REVISION	DATE
Updated layout; Added HF102	7/19/2021

Perpetua Resources

Perpetua Resources Idaho, Inc. - Stibnite Gold Project

SWPPP Figure 5:

SOUTH CAMP AREA DETAIL MAP

Aquionix EHS Services
5545 W. 56th Ave.
Arvada, CO 80002
303-289-7520
www.aquionix.com

DESIGNED BY: MT (Aquionix)

DRAWN BY: MT (Aquionix)

DATE DRAWN: 5/3/2021

SCALE: 1:6,200

DATA FRAME COORD SYSTEM: WGS_1984_Web_Mercator_Auxiliary_Sphere

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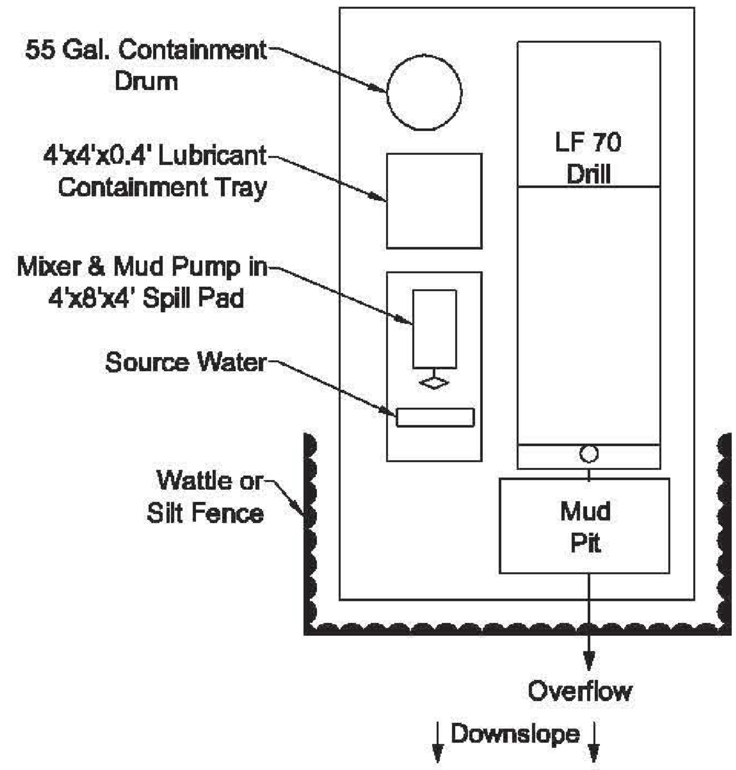

Figure 5a. Typical Track/Helicopter Core Drill Pad Layout SCALE: NTS

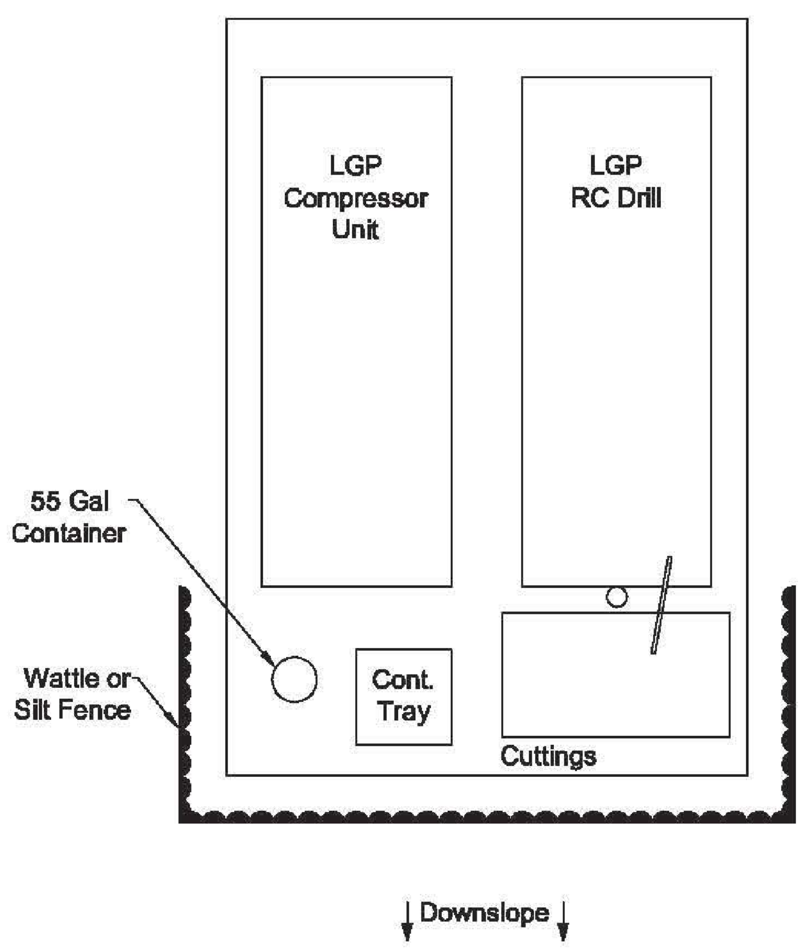

Figure 5b. Typical LGP Reverse Core (RC) Drill Pad Layout SCALE: NTS

Figure 5. Drill Pad Detail

Midas Gold Idaho, Stibnite Gold Exploration Project

REVISION	DATE

Perpetua Resources

Perpetua Resources Idaho, Inc. - Stibnite Gold Project

SWPPP Figure 6:

DRILL PAD DETAIL MAP (EXAMPLE)

Aquionix EHS Services

5545 W. 56th Ave.
Arvada, CO 80002
303-289-7520
www.aquionix.com

DESIGNED BY: Midas / Perpetua

DRAWN BY: Midas / Perpetua

DATE DRAWN:

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Appendix D: IDEQ Control Measure Sheets

Catalog of
Stormwater Best Management Practices
for Idaho Cities and Counties

September 2005

Idaho Department of Environmental Quality
Water Quality Division
1410 N. Hilton
Boise, ID
(208) 373-0502
www.deq.idaho.gov

Timing of Construction BMP 1

Description

Schedule and sequence construction work and erosion control applications so that they occur under optimal conditions--that is, during periods when the potential for erosion is lowest. Proper timing will minimize erosion and also maximize the effectiveness of control methods.

Applications

This measure applies to almost any ground-disturbing activity, but it is especially relevant to large construction projects and any areas where work activities can be planned to coincide with periods of low erosion potential, such as during dry weather. The period May 15 through November 1 is recommended as the best time for initiating construction activities and completing soil stabilization in most of Idaho. When construction during the wet season is unavoidable, use other BMPs described in this catalog to control erosion, such as any of the slope protection techniques.

Limitations

Drainage area - unlimited	Maximum slope – unlimited
Minimum bedrock depth - N/A	Minimum water table – N/A
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – no	

Targeted Pollutants

Sediment

Design Parameters

- Construction work involving soil disturbance or exposure should be scheduled during seasonal low-runoff periods under favorable soil moisture conditions whenever possible.
- Erosion controls should be installed in stages to protect completed work and minimize exposed soils.
- Sediment collection systems should be installed prior to activities expected to produce sediment.
- Slope stabilization measures should be initiated within 14 calendar days after construction activities in that portion of the site where earthmoving activities have temporarily or permanently ceased.
- Consider site characteristics and permit conditions when deciding what kind of erosion control devices to incorporate into a construction project. Select measures that can be installed without disrupting critical timing or sequencing of other construction or erosion control activities.
- Identify the locations and dimensions for all erosion control and stormwater management measures as clearly as possible on the site plans. This will help ensure effectiveness and proper timing of installation or implementation.

Construction Guidelines

- Develop a scheduling/sequencing plan that addresses the following timing considerations. If using a Critical Path Method (CPM) for scheduling, incorporate the erosion control and stormwater management practices into the CPM.

- Work activities that leave a site most susceptible to erosion should be scheduled for periods when the potential for erosion is lowest.
- Allow time to install sediment collection systems, drainage systems, and runoff diversion devices before beginning ground-disturbing work in a given area.
- Plan to install and maintain effective soil stabilization measures as work progresses, not just at the completion of all construction.
- Conduct work in units or stages so that some portions of the project site are final-graded and ready for seeding each time an approved season of seeding arrives. (See BMP 2-Staging Areas).

Maintenance

Continually monitor site conditions and progress of work. Update the project work schedule to maintain appropriate timing and sequencing of construction and control applications.

Staging Areas BMP 2

Description

This BMP includes measures for collecting runoff from a staging area, materials storage site, or industrial activity area or for diverting water flow away from such areas so that pollutants do not mix with clean stormwater runoff. Various flow diversion structures, called stormwater conveyances, can be used to contain runoff on site, to channel it around the industrial area, or to carry pollutant-laden water directly to a treatment device or facility. Several options are available:

Stormwater Conveyances: This term includes many kinds of channels, gutters, drains, and sewers. Stormwater conveyances can be either temporary or permanent. They are constructed or lined with many different materials, including concrete, clay tiles, asphalt, plastics, metals, riprap, compacted soils, and vegetation. The type of material used depends on the use of the conveyance.

Dikes or Berms: Diversion dikes or berms are ridges built to block runoff from passing beyond a certain point. Temporary dikes are usually made with compacted soil or compost. More permanent ones are constructed out of concrete, asphalt, or other durable materials.

Diversion dikes are used to prevent the flow of stormwater runoff onto construction or staging/storage areas. Limiting the flow across these areas reduces the volume of stormwater that may carry pollutants from the area and may, therefore, require treatment. This method is suitable for sites where significant volumes of stormwater runoff tend to flow onto active materials handling or equipment staging sites and other construction areas.

Graded Areas and Pavement: Land surfaces can be graded, or graded and paved, so that stormwater runoff is directed away from construction activity areas. The slope of the grade allows the runoff to flow, but keeps it from washing over areas that may be contaminated with pollutants. Like conveyances and dikes, grading can prevent runoff from entering construction areas and becoming contaminated with pollutants from these areas. Grading can be a permanent or temporary control measure.

Applications

Stormwater Conveyances: Stormwater conveyances can be used for two different purposes. The first is to keep uncontaminated stormwater from getting into areas of a construction site where it may become contaminated. This can be accomplished by collecting the stormwater in a conveyance and directing the flow away from those areas. Secondly, conveyances can be used to collect stormwater downhill from construction areas and keep it separate from runoff that has not been in contact with those areas. When potentially contaminated stormwater is collected in a conveyance like this, it can be directed to a treatment device or another facility on the site if desired.

Other beneficial aspects of stormwater conveyances include:
- Prevention of temporary flooding at industrial sites.
- Low maintenance.
- Erosion-resistant conveyance of stormwater runoff.
- Long-term control of stormwater flows.

Dikes or Berms: Typically, dikes are built on slopes just uphill from an active construction area together with some sort of a conveyance, such as a swale. The conveyance is necessary to keep the water away from the dike so that the water will not pool and seep through the dike. See BMP 41-Earth Dike.

Some advantages of diversion dikes are that they:
- Effectively limit stormwater flows over industrial site areas.
- Can be installed at any time.
- Are economical, temporary structures when built from soil on site.
- Can be converted from temporary to permanent at any time.

Graded Areas and Pavement: Grading is appropriate for any construction site where outdoor activities may pollute stormwater runoff--parking lots or outdoor storage areas, for example. Grading is often used in conjunction with coverings, buffer zones, and other practices to reduce the runoff velocity, increase infiltration of uncontaminated runoff, or direct pollutant-laden runoff to stormwater treatment facilities. Grading and paving are relatively inexpensive and easy to implement.

Limitations

Drainage area - unlimited	Maximum slope – 15%
Minimum bedrock depth - N/A	Minimum water table – N/A
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – yes	

Stormwater Conveyances:
Once the stormwater is concentrated in conveyances, it should be routed through stabilized structures all the way to its discharge to a receiving water or other stormwater BMP.
- May increase flow rates.
- May be impractical if there are space limitations.
- May be expensive to install, especially for small facilities or after a site has already been constructed.

Dikes and Berms
- Are not suitable for large drainage areas unless there is a gentle slope.
- May require maintenance after heavy rains.

Graded Areas and Pavement
- May be uneconomical to re-grade and resurface large areas.
- May not be effective during heavy precipitation.

Targeted Pollutants

Sediment

Design Parameters

Stormwater Conveyances: In planning for stormwater conveyances, consider the amount and speed of the typical stormwater runoff. Also, consider the stormwater drainage patterns, so that channels may be located to collect the most flow and can be built to handle the amount of water they will receive. When deciding on the type of material for the conveyance, consider the resistance of the material, its durability, and its compatibility with any pollutants it may carry.

Conveyance systems are most easily installed when a facility is first being constructed. Where possible, use existing grades to decrease costs. Grades should be positive to allow for the continued movement of the runoff through the conveyance system; however, grades should not create an increase in velocity that causes an increase in erosion. Consider the materials used for lining the conveyance and the types of outlet controls provided.

Dikes and Berms: In planning for the installation of dikes, consider the slope of the drainage area, the height of the dike, the amount of runoff it will need to divert, and the type of conveyance that will be used with the dike. Steeper slopes result in higher volumes of runoff and higher velocities, which the dike should be capable of handling. Remember that dikes are limited in their ability to manage large volumes of runoff. See BMPs 41-Earth Dike for additional parameters.

Graded Areas and Pavement: When designing graded and paved areas, be sure to consider both control and containment of runoff flows. The grading should control the uncontaminated flow by diverting it around areas that may have pollutants. The grading should also contain the contaminated flows or divert them to treatment facilities.

Construction Guidelines

Stormwater Conveyances: Specific construction methods apply to the type of conveyance being used.

Dikes and Berms: Ideally, dikes are installed before construction activity begins. However, dikes can be easily constructed at any time. Temporary dikes (usually made of dirt) generally only last for 18 months or less, but they can be made into permanent structures by stabilizing them with vegetation. Slope protection such as vegetation is crucial for preventing the erosion of the dike.

Graded Areas and Pavement: Staging/storage areas should be designated prior to the start of construction.

Maintenance

- It is best to inspect stormwater conveyances within 24 hours of a rainstorm and remove debris promptly. Make daily inspections during periods of prolonged rainfall, since heavy storms may clog or damage the conveyances. It is important to repair damage to these structures as soon as possible.

- Dikes should be inspected regularly for damage. This is especially important after storm events since a heavy rain may wash parts of a temporary dike away. Any necessary repairs should be made immediately to make sure the structure continues to function effectively.
- Inspect unpaved, graded areas to check for gullies and other signs of erosion. Inspect paving regularly for cracks that may allow contaminants to seep into the ground. Also, check to make sure that the drains receiving the discharge from the paved area remain free of clogged sediment or other debris so that the water does not back up into areas where pollutants may be.

Preservation of Existing Vegetation BMP 3

Description

Protect existing vegetation (including trees, grasses, and other plants) by preventing disturbance or damage to specified areas of a construction site or right-of-way. Preserving natural vegetation provides buffer zones and stabilized areas, which help control erosion, protect water quality, and enhance aesthetic benefits. This practice minimizes the amount of bare soil exposed to erosive forces.

Applications

This technique is applicable to all types of sites. Areas where preserving vegetation can be particularly beneficial are floodplains, wetlands, stream banks, steep slopes, and other areas where other structural erosion controls would be difficult to establish, install, or maintain. Compared to newly planted or seeded areas, preserving natural vegetation has many advantages:

- It can handle higher quantities of stormwater runoff than newly seeded areas.
- It does not require time to establish (it is effective immediately).
- It has greater filtering capacity because the vegetation and root structure are usually denser in preserved natural vegetation than in newly seeded or base areas.
- It usually requires less maintenance, watering, and chemical application (e.g., fertilizer, pesticides) than planting new vegetation.

It also:

- Enhances aesthetics.
- Provides areas for infiltration, thus reducing the quantity and velocity of stormwater runoff.
- Allows areas where wildlife can remain undisturbed.
- Provides noise buffers and screens for on-site operations.

Limitations

Drainage area - unlimited	Maximum slope – unlimited
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – no	

Preservation of natural vegetation may be impractical in some situations because:

- It may constrict the area available for construction activities.
- It may not be cost-effective in areas with high land values.

Targeted Pollutants

Sediment

Design Parameters

- Successful preservation of vegetation requires good planning and site management to minimize the impact of construction activities on existing vegetation. The areas to be preserved should be identified in the plans and clearly marked in the field before any site disturbance begins. Clearly mark all trees to be preserved, and protect against ground disturbance within the dripline of each marked tree.

The dripline marks the edge of the tree's foliage where drips from rainfall would drop. Most of the tree's roots lie within the dripline and are vulnerable to damage.

- Preserving natural vegetation may affect some aspects of staging, work sequencing, and construction cost. In addition, control measures may be needed around the perimeter of the preserved area to maintain adequate water flow and drainage and to prevent damage from excessive erosion or sedimentation. Be sure to consider these and related factors when preparing the project site plan and project cost estimates.
- Consider the use of design exceptions to enable preservation of natural vegetation in certain areas where it would typically be removed and where its preservation would not pose safety problems.

Construction Guidelines

- Check the project plans for areas designated for preservation of natural vegetation. Keep all construction equipment, materials, and waste out of the designated areas.
- Do not modify existing drainage patterns through or into any preservation area unless specifically directed by the plans or approved by the local permitting authority.
- Perform maintenance activities as needed to ensure that the vegetation remains healthy and able to aid in erosion control and sediment collection.

Maintenance

Inspect at regular intervals to make sure the preserved vegetated areas remain undisturbed and are not being overwhelmed by sediment. Implement maintenance or restorative actions as needed. Proper maintenance is important to ensure healthy vegetation that can control erosion. Different species, soil types, and climatic conditions will require different maintenance activities such as mowing. Maintenance should be performed regularly, especially during construction.

Clearing Limits BMP 4

Description

Minimize the total amount of bare soil exposed to erosive forces by (1) controlling the amount of ground that is cleared and grubbed at one time in preparation for construction, and (2) limiting the amount of time that bare ground may remain exposed before slope protection or stabilization measures are put into place. This measure, in conjunction with appropriate timing (avoiding the rainy season), can reduce erosion and sedimentation.

Applications

Any areas where vegetation should be removed to facilitate construction. This practice should be a design consideration of all projects. It may be necessary to carefully coordinate land clearing, grading, and erosion control measures--see BMP 1-Timing of Construction.

Limitations

Drainage area - unlimited	Maximum slope – unlimited
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – no	

Targeted Pollutants

Sediment

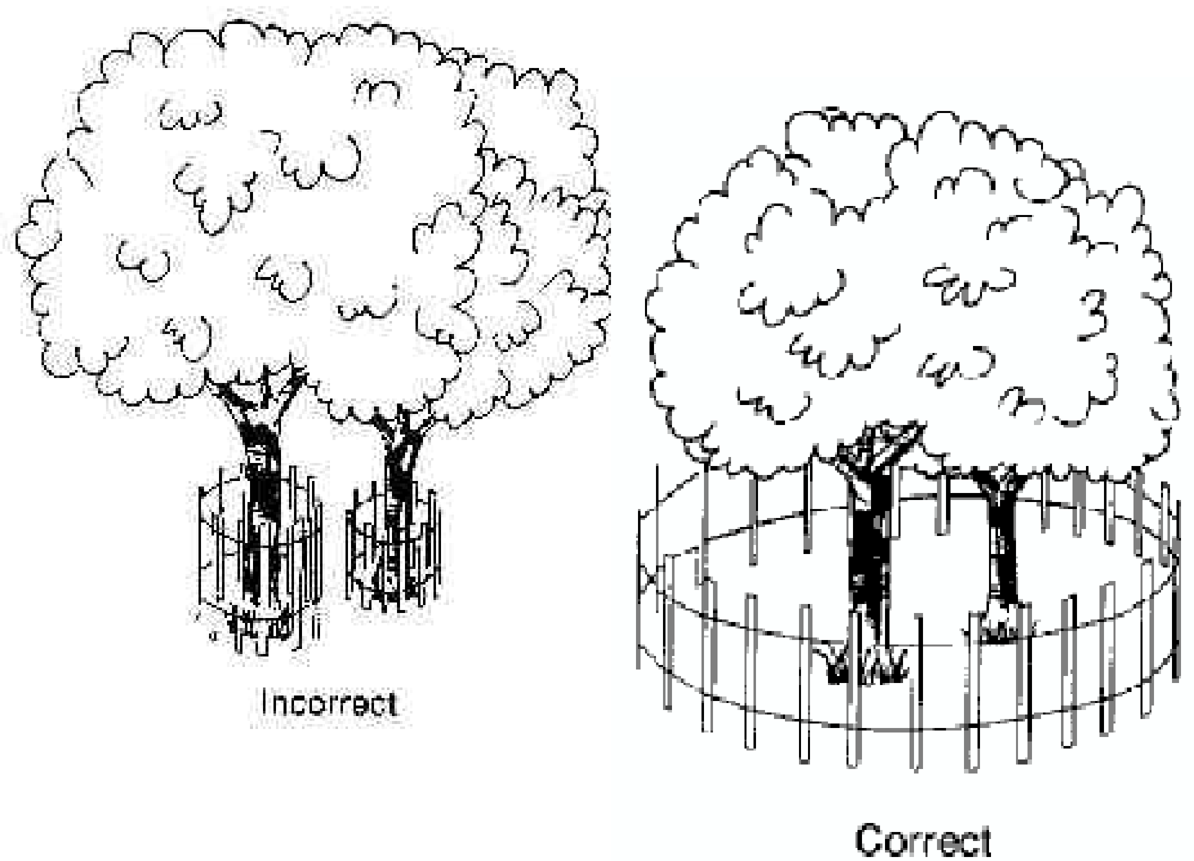
Design Parameters

- Evaluate the erosion potential of the project site (based on slope, soil type, intended season of work, use of heavy equipment).
- Based on the above analysis, establish the maximum allowable area that may be exposed at one time. The project site plan should clearly specify the maximum allowable exposure area.
- Initiate slope protection and reclamation as work progresses to help minimize the amount of disturbed soil.
- In all cases, stabilization measures should be initiated within 14 days after ceasing work in a given area or as soon as practicable during seasonally arid periods.

Construction Guidelines

- Do not disturb any areas that are not actually needed for the specified construction or related staging activities. See BMP 3-Preservation of Existing Vegetation.
- Conduct work in units or stages so that construction and stabilization take place promptly after clearing and grubbing and as much of the site as possible is ready for seeding each time the specified seeding season arrives.
- Implement soil stabilization measures concurrently with the progress of clearing and grading work to minimize the length of time that bare ground lies exposed to erosion.
- At the approach of a designated seeding season, be prepared to seed all portions of the project that are ready for seeding (as required).

Maintenance Conduct periodic inspections to check for unnecessary ground disturbance. Also check for clearing and grubbing beyond the contractor's capability and progress in keeping grading and pollution control measures current (in accordance with accepted work schedule).



Barrier should be installed at the drip line of tree branches.

Stabilization of Construction Entrance/Exit BMP 5

Description

A temporary sediment removal device--normally a pad of crushed rock or stone--can be installed at the approach from a construction site to a public roadway to stabilize the road. This BMP is used to limit sediment tracking from vehicles and equipment leaving the construction site onto public rights-of-way and streets.

Applications

A stabilized construction entrance is appropriate in the following locations:

- Wherever vehicles are entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk or parking area.
- At any unpaved entrance/exit location where there is risk of transporting mud or sediment onto paved roads.

Limitations

Drainage area - unlimited
Minimum bedrock depth – 3 ft
NRCS soil type - ABCD
Drainage/flood control – no

Maximum slope – 15%
Minimum water table – N/A
Freeze/thaw – good

Targeted Pollutants

- Sediment
- Phosphorus
- Trace Metals
- Hydrocarbons

Design Parameters

Width: The width should be at least 10 ft but not less than the full width of points where ingress or egress occurs. At sites where traffic volume is high, the entrance should be wide enough for two vehicles to pass safely. Flare the entrance where it meets the existing road to provide a sufficient turning radius.

Length: The minimum length should be 50 ft except on a single-residence lot where a 30 ft minimum would apply.

Depth: Total depth of rock should be at least 6 in.

Aggregate: Fractured

stone 2 to 8 in. diameter (for the base layer) and crushed stone 2 in. diameter or reclaimed or recycled concrete equivalent (for the top layer).

Geotextile (filter fabric): Most installations will include geotextile (filter fabric) with the products placed over the entire area to be covered with aggregate. Work on single residential lots will generally not need geotextile unless there is potential for excessive erosion, a high water table, or other risk factor. The geotextile should be a woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The geotextile should be inert to commonly encountered chemicals, hydrocarbons, mildew, and rot resistant.

Drainage: Runoff from a stabilized construction entrance should drain to a sediment trap or a sediment basin. Piping of surface water under the entrance should be provided as needed. If piping is impossible, install a mountable berm with 5:1 slopes.

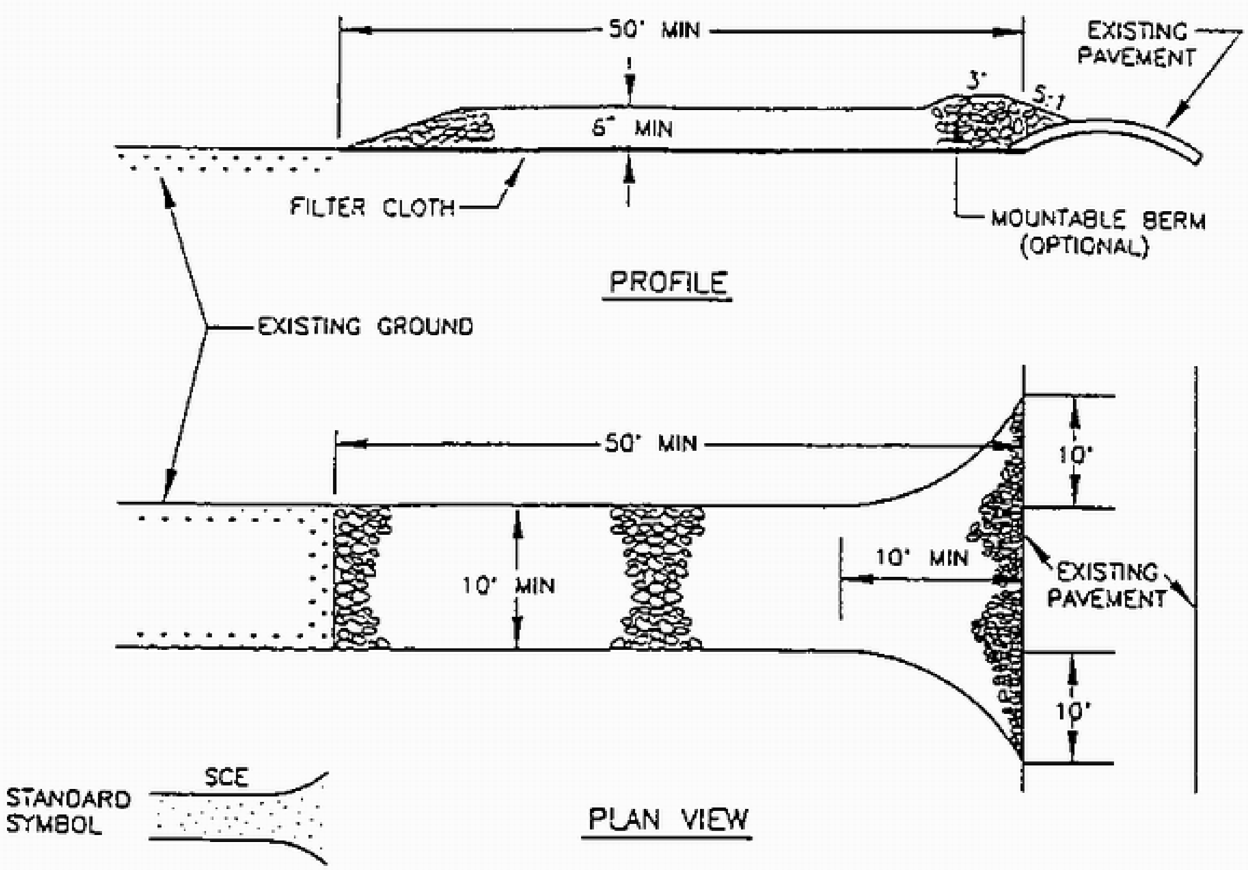
Dust Control: Dust control should be provided at all times (see BMP 7-Dust Control).

Construction Guidelines

- Clear all vegetation, roots, and all other obstructions in preparation for grading.
- Prior to placing geotextile (filter fabric), make sure that the entrance is properly graded and compacted.
- To reduce maintenance and loss of aggregate, place geotextile over the existing ground before placing the stone for the entrance.
- Place a 1 ft layer of fractured stone over the entire width and length of the entrance.
- Place a 4 in. layer of 2 in. crushed stone over the base layer.

Maintenance

- The entrance should be maintained in a condition that will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with additional 2 in. stone (as conditions demand) and repair or cleaning of any structures used to trap sediment.
- All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains should be removed immediately. When necessary, vehicle wheels should be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it should be done on an area stabilized with aggregate that drains into an approved sediment trap.
- Trapped sediment should be removed from the site or stabilized on site and prevented from entering storm drains, ditches, or waterways. Disturbed soil areas resulting from removal should be permanently stabilized.
- The stabilized construction entrance may be removed after final site stabilization is achieved or after the temporary BMPs are no longer needed.



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE–USE 2" STONE OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH–AS REQUIRED, BUT NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS–NOT LESS THAN 6 INCHES.
4. WIDTH–10 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. FILTER CLOTH–WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER WILL NOT BE REQUIRED ON A SINGLE FAMILY RESIDENCE LOT.
6. SURFACE WATER–ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE–THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING–WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	STABILIZED CONSTRUCTION ENTERANCE	STANDARD DRAWING
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Erosion Prevention on Temporary Roads BMP 6

Description

Any of several measures can be used to control erosion and sedimentation originating with haul roads, detours, access roads, and other unpaved or temporary roadbeds associated with a construction project. Possible measures include:

Road Placement: Place temporary roads as far as possible away from streams, surface waters or wetlands.

Open-Top Box Culvert: A wooden culvert installed across the road grade to convey surface runoff and roadside ditch flows to the downslope side. Open-top box culverts are useful for collecting surface runoff and ditch flows and channeling this water across the road without eroding the drainage system or road surface.

Waterbar (or Cross Ditch): A cut and berm built at a downward angle across the roadway, extending from the cutbank to the opposite fill shoulder. Waterbars reduce erosion by diverting stormwater runoff from the road surface and directing it to a safe discharge area.

Road Sloping: Constructing the road with an outward slope of 1 to 2% from the cut slope to the fill slope. Sloped roads are designed to divert surface water off the entire road surface so that water does not concentrate in any specific location.

Rolling Dip: Constructing the road with shallow, outward-sloping dips or undulations to collect surface runoff and con roads where erosion of the roadbed and fill slope is unlikely due to low runoff volume or intensity.

Rolling Dip: Used as a runoff diversion measure to prevent erosion of the road surface. Rolling dips are effective on long inclines to keep stormwater from flowing directly down the road, where it may cause gullying and other damage to the road surface and grade.

Level Spreader: Useful where concentrated runoff from bare ground or other unstabilized areas can be diverted onto stabilized areas under sheet flow conditions. Level spreaders are often placed at the outlets of diversion dikes or runoff interception trenches to control runoff, dissipate water velocity, and disperse the water over a broad surface area. Level spreaders are relatively inexpensive to install. They may be used on slopes of 3:1 or flatter.

Limitations

Drainage area - unlimited
Minimum bedrock depth – 3 ft
NRCS soil type - ABCD
Drainage/flood control – no
Maximum slope – 15%
Minimum water table - N/A
Freeze/thaw – good

Open-Top Box Culvert: Generally, box culverts are not required on grades of 6% or less and are ineffective under continuous or recurrent use where cleaning is sporadic.

Waterbar: Suitable only for light-use, low-maintenance, unpaved roads.

Road Sloping: Suitable only for low-traffic haul roads where runoff volume and intensity are low.

Rolling Dip: Not suitable on road grades steeper than 5% .

Level Spreader: Level spreaders are not recommended for use in most situations. They are not suitable on slopes steeper than 3:1 or where the soils are easily erodible. They should be constructed only on natural soils, not on fill material. Level spreaders cannot handle large quantities of sediment-laden stormwater. If altered by erosion or other disturbance, they may "short circuit" and actually concentrate flows into small streams instead of spreading the flows into sheet flow.

Targeted Pollutants

Sediment
Phosphorus
Trace Metal
Hydrocarbons

Design Parameters

Open-Top Box Culvert: Box culverts can be built from logs lumber discarded guardrail or corrugated steel. They are installed at a skewed angle downgrade across the roadway, with the discharge end extending 6 to 12 in beyond the surface of the roadbed.
Spacing between culverts should be in accordance with recommended cross

drainage spacing in Table 6-1. Where recommended spacing is less than 33 ft, the road should be paved with gravel or crushed rock.

Waterbar: Waterbars are generally constructed using a blade-equipped tractor or by hand. The size of the waterbar depends on the amount of precipitation in the area, the soil erodibility, and anticipated traffic.

- The waterbar should extend from the cutbank side of the road completely across to the fillslope side.
- Cut dimensions: Up to 16 in deep across road, 8 to 16 in deep at outlet, 3 to 4 ft wide.
- Berm dimensions and orientation: 1 to 2 ft high 5 in minimum height, skewed at angle of 30^o to 40^o across road.
- Spacing between bars: Use Table 6-1 for recommended cross drain spacing on low to moderately steep topography.
- Discharge: Runoff should not be directed onto fill material without proper energy dissipation and drainage away from the fill.

Geotextile (filter fabric): Most installations will include geotextile (filter fabric) with the properties listed in Table 6-2, placed over the entire area to be covered with aggregate. Work on single residential lots will generally not need geotextile unless there is potential for excessive erosion, a high water table or other risk factor. The geotextile should be a woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The geotextile should be rot resistant and inert to commonly encountered chemicals, hydrocarbons, mildew.

Road Sloping: The slope should be approximately 1 to 2% from the cut slope outward to the fill slope. Berms on the outside of the road should be limited or removed to allow water to flow off the road surface. Provide sediment collection or erosion-control measures at the toe of the fill slope to prevent excessive erosion and sediment transport.

Rolling Dip: (applies to roads greater that 150 ft long only)The dip should be approximately 1 ft below the surface plane of the road. The upgrade approach to the bottom of the dip should be approximately 66 ft long. The downgrade approach to the bottom of the dip should be approximately 23 ft long. Align the dip across the road at nearly a 90^o angle, and slope it outward approximately 5% .

Construction Guidelines

Open-Top Box Culvert: Construct a box-like frame (three-sided, open-topped) of logs, lumber, discarded guardrail, or corrugated steel. Install it flush with the road surface, skewed at an angle downgrade across the roadway. Set the inflow end at the same grade as the side ditches on the road and extend it into the cut bank. The discharge end should extend 6 to 12 in. beyond the surface of the roadbed and should be directed onto vegetated ground or riprap or into another erosion-control structure such as a sediment trap or catch basin.

Waterbar: Cut each waterbar into solid soil to a minimum depth of 6 in. next to the cutbank and 8 in. at the road shoulder, with an adverse grade on the downroad or downgrade side of the waterbar. Build a continuous, firm berm of soil, at least 6 in. above normal grade, parallel to the waterbar cut on its downhill side. Include a bank tie-in point, cut 6 to 12 in. into the roadbed. For added stability, the bar may be compacted with a nonerosive fill material. The completed waterbar should extend across the full roadway width, aligned at an angle of 30^o to 40^o relative to the roadway. A dissipation or filter device (such as riprap or silt fence) may be needed below the waterbar to control erosion and trap sediment.

Road Sloping: Road sloping is built into the road during construction. Install erosion- and sediment-control measures downslope before completing the finish grade of the sloped road. Then construct the outward slope of 1 to 2% , as specified in the contract plans.

Rolling Dip: Rolling dips are built into the road, during construction, following the natural contours of the land. Install erosion and sediment measures at the low point of the dip (drainage outfall to fill slope) before final grading to direct stormwater discharge from the dip. Construct the dip according to the specifications shown in the contract plans. If not specified, make the dip 1 ft deep, with a 23 ft-long approach on the downgrade side and a 66 ft-long approach on the upgrade side.

Maintenance

Inspect all devices regularly according to provisions of the contract or project site plan. Make repairs promptly to avoid progressive damage. Remove accumulated sediments as necessary to ensure proper functioning.

Open-Top Box Culvert: Clean and repair the culverts on a regular basis. Remove sediments and other debris that may block drainage flow or decrease structural efficiency.

Waterbar: Properly constructed bars should require little or no maintenance. However, all waterbars need to be open at the lower end so water can easily flow away from the roadway. Hand shovel work may be necessary following high runoff periods or severe storms to ensure unrestricted flow.

Road Sloping: Minor regrading may be required to maintain slope angle.

Rolling Dip: Outflows should be kept free of debris to prevent ponding.

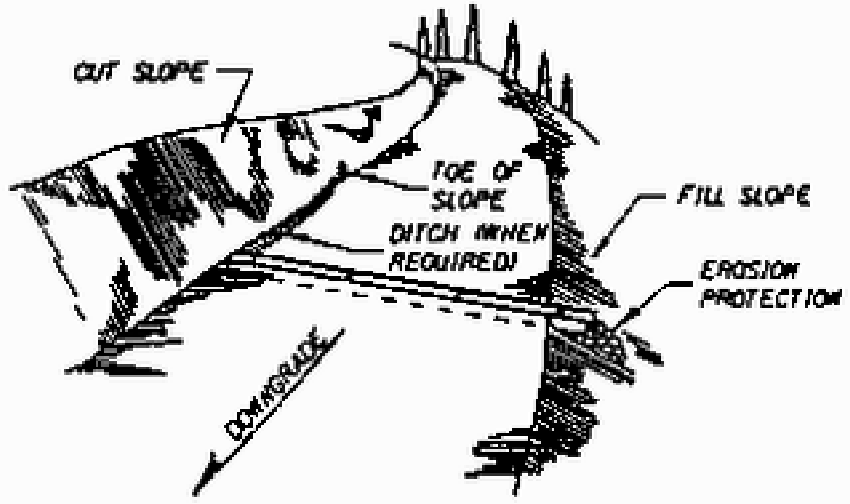
Table 6-1. Recommended Cross Drain Spacing (Source: ITD, 1994)

Road Grade (percent)	Spacing Between Open-Top Culverts, feet (meters)
2 to 5	300 to 500 (90 to 150)
6 to 10	200 to 300 (60 to 90)
11 to 15	100 to 200 (30 to 60)
16 to 20	<100 (<30)

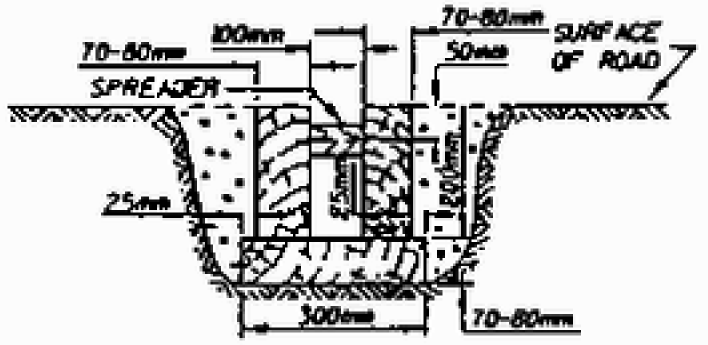
Table 6-2. Geotextile Properties by Road Type

Geotextile Properties	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Brust Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 modified
Equivalent Opening Size	40-80	40-80	US Std Sieve CW-02215
Aggregate Depth (in.)	6	10	--

[1]Light Duty Road: Are sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.
[2]Heavy Duty Road: Are sites with only rough grading, and where most ravel would be multi-axle vehicles. Trevira Spunbond 1135, Miraft 600X, or equivalent.
[3]Geotextiles not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

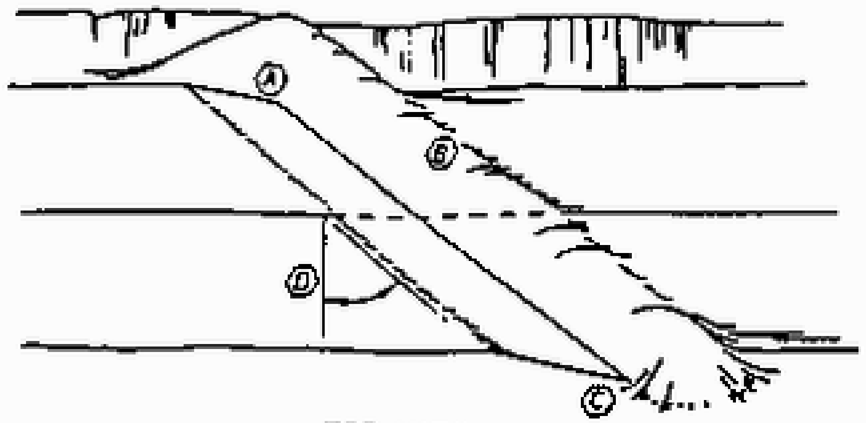


PERSECTIVE VIEW

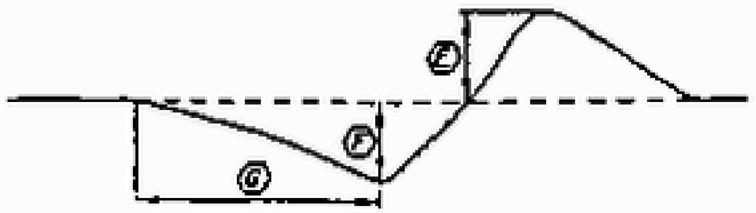


END VIEW

OPEN-TOP BOX CULVERT



TOP VIEW

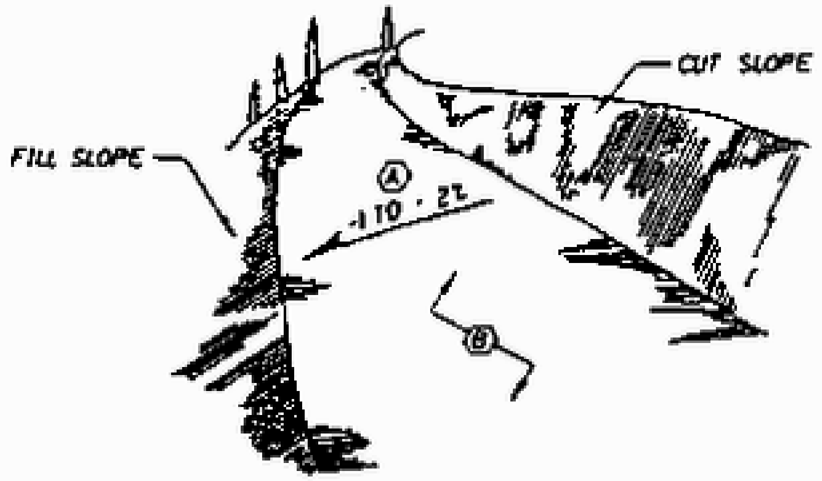


A. BANK TIE-IN POINT CUT 150 TO 300 mm INTO ROADBED.
B. CROSS DRAIN BERM HEIGHT ABOUT 0.5 m ABOVE ROAD BED.
C. DRAIN OUTLET CUT 200 TO 400 mm INTO ROAD.
D. ANGLE DRAIN 30° TO 40° DOWNGRADE WITH ROAD CENTERLINE.
E. HEIGHT UP TO 0.6 m.
F. DEPTH TO 0.5 m.
G. 1.0 TO 1.2 m.

CROSS SECTION AT CENTER LINE

WATERBAR (OR CROSS-DITCH)

(SEE NOTE NO. 2)

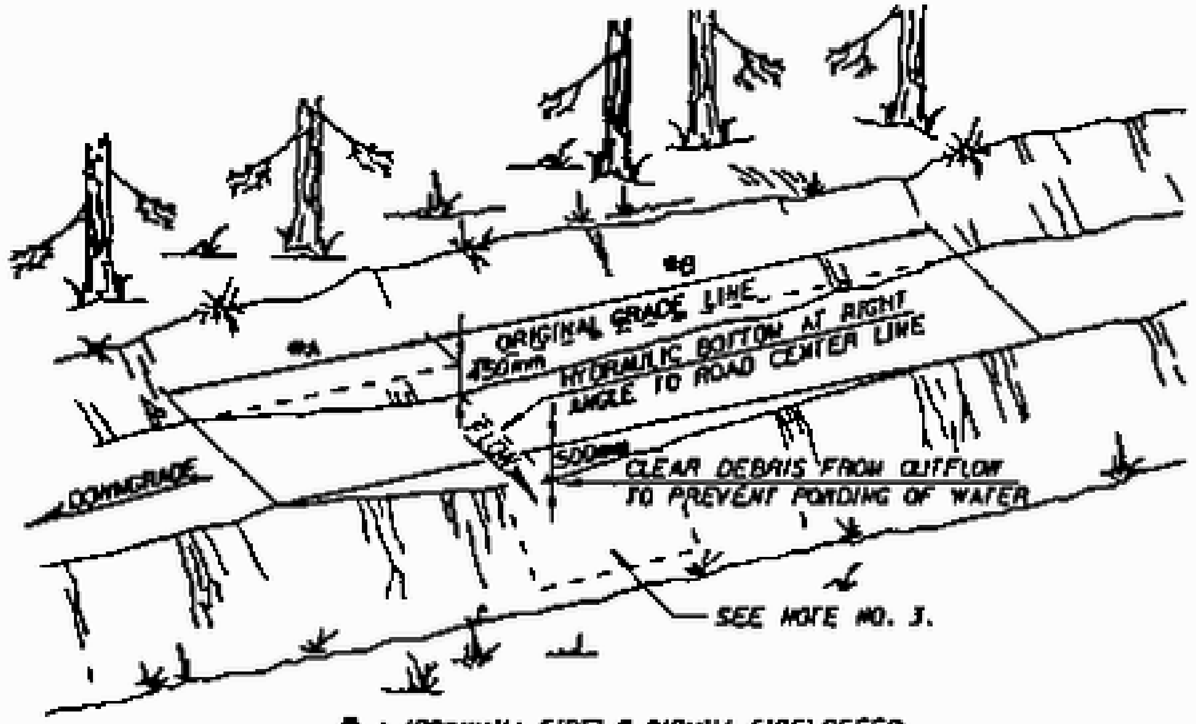


A. DIVERT RUNOFF ACROSS ROAD SURFACE FROM TOE OF CUT SLOPE TO FILL SLOPE.
B. ROAD SURFACE MUST BE RELATIVELY EVEN TO PREVENT PUDDLING & EROSION.

ROAD SLOPING

ROLLING DIP DIMENSION TABLE

% DOWNGRADE	A (DOWNHILL)	B (UPHILL)
0% TO 4%	10.5	20
4% TO 6%	7.5	23
6% TO 8%	4.5	26



* A (DOWNHILL SIDE), B (UPHILL SIDE) REFER TO THE ROLLING DIP DIMENSION TABLE.

ROLLING DIP DETAIL

NOTES

1. ALL OF THE INSTALLATIONS SHOWN ON THIS DRAWING SHALL BE USED IN CONJUNCTION WITH ITD CATALOG OF STORM WATER BEST MANAGMENT PRACTICES (BMPs) FOR HIGHWAY CONSTRUCTION AND MAINTENANCE.

2. CONSTRUCT WATERBARS OR CROSS DITCHES ONLY ON UNPAVED HAUL ROADS WITH LIMITED OR NO TRAFFIC. THE DEVICE CONFIGURATION SHOULD BE ADJUSTED TO FIELD CONDITIONS.

3. A SEDIMENT FILTERING DEVICE SHALL BE PLACED AT OUTFLOW OF A ROLLING DIP.

4. ALL DIMENSIONS AND DISTANCES ARE IN METERS UNLESS OTHERWISE NOTED AND ALL THE DETAILS SHOWN ARE NOT DRAWN TO ANY SCALE.

Dust Control BMP 7

Description

This BMP describes products or measures used for reducing or preventing wind erosion by protecting the soil surface, roughening the surface, and reducing the surface wind velocity. Several dust control treatments are described below. Other methods are also available.

Vegetative Cover: For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control (see BMP 21-Seeding and BMP 22-Sodding).

Mulch (including gravel mulch): When properly applied, mulch offers a fast, effective means of controlling dust (see BMP 15-Mulching).

Spray-On Adhesive: Asphalt emulsions, latex emulsions, or resin in water can be sprayed onto mineral soil to control dust (see BMP 16-Hydromulching).

Sprinkling: The site may be sprinkled with water until the surface is wet. Sprinkling is especially effective for dust control on haul roads and other traffic routes.

Stone: Stone or gravel used to stabilize construction roads and disturbed soils can also be effective for dust control and reduce soil losses from those areas by up to 80% .

Surface Roughening: Tilling or discing the surface of disturbed soils to produce a rough surface or ridges which when perpendicular to prevailing winds can reduce soil losses due to wind by 80% (see BMP 25-Slope Roughening).

Barriers: A board fence, wind fence, sediment fence, or similar barrier can control air currents and blowing soil. All of these fences are normally constructed of wood. Perennial grass and stands of existing trees may also serve as wind barriers. Barriers prevent erosion by obstructing the wind near the ground and preventing the soil from blowing off site.

Applications

The above measures for dust control should be used when open, dry areas of soil are anticipated on the site. Clearing and grading activities create the opportunity for large amounts of dust to become airborne. Therefore, one or several dust control measures should be considered prior to clearing and grading. In many cases, water erosion control measures incorporated into the project will indirectly prevent wind erosion. As a standard practice, any exposed area should be stabilized using vegetation to prevent both wind and water erosion. When rainfall is insufficient to establish vegetative cover, mulching is an effective way of conserving moisture, preventing surface crusting, reducing runoff and erosion, and helping to establish vegetation. It is a critical treatment on sites with erosive slopes.

Limitations

Drainage area – N/A	Maximum slope – 5%
Minimum bedrock depth – N/A	Minimum water table - N/A
NRCS soil type – N/A	Freeze/thaw – N/A
Drainage/flood control – no	

Vegetative measures may not be practical during dry periods unless a reliable supply of establishment water is available. Other methods should be stipulated in the project contract to ensure that dust control is not overlooked.
Barriers (such as walls or fences) can be part of the long-term dust control strategy in arid and semiarid areas, but they are not a substitute for permanent stabilization.

Targeted Pollutants

Sediment
Trace Metals
Hydrocarbons

Design Parameters

Dust Prevention: The best method of controlling dust is to prevent dust production. This can best be accomplished by limiting the amount of bare soil exposed at one time. In project design, identify all areas where ground disturbance will not be allowed. Design and locate haul roads, detours, and staging areas to avoid unnecessary exposure of bare ground and avoid using areas that are the most susceptible to wind erosion.

In the stormwater site plan, specify staging or work sequencing techniques that minimize the risk of wind erosion from bare soil. In most cases, this will require a change from traditional construction techniques that allow large areas to be disturbed at the outset of construction and to remain exposed for long periods of time.

Vegetative Cover: Follow recommended seeding and planting specifications. If site conditions are favorable, use an extended seeding season to ensure that seeding becomes established over as much of the project as possible before winter shutdown or substantial completion. Specify the use of establishment water to accelerate vegetative stabilization if other means of long-term slope protection are not feasible.

Mulch: Apply according to the design parameter for BMP 16-Hydromulching.

Sprinkling: Apply at a rate of 3 gallons per acre so that the soil is wet but not saturated or muddy and so that no dust is being generated.

Stone: At ingress/egress to public highways, apply as indicated in BMP 5-Stabilization of Construction Entrance. For detours, haul roads, or temporary traffic routes through the construction site, provide a layer of fractured stone 2 to 4 in. thick and 1 to 2 in. in diameter.

Surface Roughening: Tilling or discing should leave 6 in. (minimum) furrows, preferably perpendicular to the prevailing wind direction, to gain the greatest reduction in wind erosion. If the surface cannot be furrowed perpendicular to the prevailing wind direction, roughening the surface by using a ripper/scarifier (grader) or a ripper (cat) will produce the desired result of a 6 in. irregular surface.

Barriers: A wind barrier generally protects soil downwind for a distance of 10 times the height of the barrier. If additional protection is needed, use other methods in conjunction with the barrier.

Construction Guidelines

Site Assessment: Assess the potential problem of wind erosion and dust generation at the project site. Consider the soil type, prevailing wind direction, and the effect of other prescribed erosion control measures.

Use Preventive Strategies Wherever Possible:
- Minimize amount of bare ground exposed at one time.
- Minimize amount of ground disturbance occurring when wind erosion is highest.

Implement Dust Control Measures as Needed:
- Provide stabilized roadway to minimize amount of dust generated by construction vehicles and highway traffic (gravel, pave, or moisten the bare areas of the highway or detour route).
- Apply protective materials to exposed areas (e.g., stone, mulch, adhesive/ emulsions).
- Install barriers to prevent dust from blowing off site.
- Establish vegetation at the earliest possible opportunity (using establishment water if necessary to ensure viability).
- Keep haul roads, detours, and other bare areas moist by sprinkling them with water.
- Perform street sweeping, as needed.

Maintenance

- Dust control requires constant attention: it is not a one-time or once-in-awhile activity. Dust control sprinkling may have to be done several times a day during hot, dry weather.
- Areas protected by mulch, adhesive emulsions, or barriers need to be checked at regular intervals according to the inspection schedule set forth in the stormwater plan. Remove sediments that accumulate behind any sediment fence or barrier when the accumulation reaches one half the height of the barrier. Dispose of the sediments only in an approved location (not in wetlands or where they will contribute to pollution at the disposal site).

Apply chemical controls (emulsions and resins) at the manufacturer's specified rates and in accordance with all federal, state, and local regulations governing their use. Chemical products should be stored, handled, and disposed of in accordance with all applicable regulations and department policies.

Cover for Materials and Equipment BMP 8

Description

This BMP includes partial or total physical enclosure of materials, equipment, process operations, or activities. Covering prevents stormwater from coming into contact with potential pollutants and reduces material loss from wind blowing. Tarpaulins, plastic sheeting, roofs, buildings, and other enclosures are examples of covering that are effective in preventing stormwater pollution. Covering can be temporary or permanent.

Applications

Covering is a simple, effective, and usually inexpensive way of reducing or preventing pollution. It is appropriate for outdoor material storage piles, such as stockpiles of dry materials, topsoil, spoils piles, gravel, sand, compost, sawdust, wood chips, and building materials. It is also effective where containers of liquids or solids are stored or transferred. Although it may be too expensive to cover or enclose all construction activities, the high-risk parts of a site can often be separated and covered. For example, chemical preparation areas, vehicle maintenance and washing areas, storage areas for chemically treated products and toxic wastes (e.g., used oils).

Limitations

Drainage area – N/A	Maximum slope – N/A
Minimum bedrock depth – N/A	Minimum water table – N/A
NRCS soil type – N/A	Freeze/thaw – N/A
Drainage/flood control – no	

- Covering alone may not protect exposed materials from contact with stormwater runoff/run-on.
- Requires frequent inspections. Consider curbing or an elevated platform to prevent pollution from run-on water.

Targeted Pollutants

Sediment
Trace Metals
Hydrocarbons

Design Parameters

- In selecting an appropriate covering, evaluate the strength and longevity of the covering, as well as its compatibility with the materials or items being enclosed. Cost, aesthetics, weather conditions, drainage patterns, and size of the stockpiles or storage area are other factors affecting the choice of covering.
- In designing a covering for materials, remember to provide adequate access for loading, handling, and transfer. Cost considerations may justify a less-than-optimum access arrangement in some cases. For instance, tarpaulins and plastic sheeting have to be removed or rearranged to allow continued access as materials are depleted, but they are less expensive than a permanent structure such as a roof or shed.
- Climate or weather conditions also influence the choice or design of a covering. Tarpaulins and sheeting may be difficult to keep secured in

extremely windy areas.

- Where a permanent structure is indicated for a particular area or activity, consider building a roof instead of a complete enclosure. This will reduce costs and may also eliminate the need for ventilation and lighting systems that could be needed in a building.
- Consider the nature of the materials being enclosed, especially if they pose environmental or safety dangers. Materials that are biological, flammable, explosive, or chemically reactive require special ventilation and temperature control measures.
- Covering alone may not protect exposed materials from stormwater contact. Where stormwater run-on is a potential problem, place the material on an elevated, impermeable surface or build curbing around the outside of the materials to prevent pollution of stormwater from adjacent areas.

Construction Guidelines

Tarpaulins and Plastic Sheeting: Obtain enough fabric or sheeting to cover the indicated volume or area. Anchor the edges of the covering with stakes, tie-down ropes, large rocks, tires, or other readily available, heavy objects. Maintain an overlap of 3 ft along the borders and securely anchor the overlap area so that it does not separate (through wind or other causes).

Roofs, Sheds, and Buildings: Construct according to plans or drawings in accordance with existing building codes and departmental standards for such construction.

Maintenance

Frequently inspect coverings for damage and general wear. Repair or replace them immediately, as needed.

Stockpile Management BMP 9

Description

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials such as Portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure-treated wood.

Applications

Implement in all projects that stockpile soil and other materials.

Limitations

Drainage area – N/A
Minimum bedrock depth - N/A
NRCS soil type – N/A
Drainage/flood control – no
Maximum slope – N/A
Minimum water table - N/A
Freeze/thaw – good

Targeted Pollutants

Sediment

Construction Guidelines

General

- Locate stockpiles a minimum of 50 ft away from concentrated flows of stormwater, drainage courses, and inlets.
- Protect all stockpiles from stormwater run-on using a temporary perimeter sediment barrier such as berms, dikes, fiber rolls, silt fences, sandbags, or gravel bags.
- Implement wind erosion control practices as appropriate on all stockpiled material.
- Place bagged materials on pallets and under cover.

Protection of Non-Active Stockpiles

- Soil stockpiles: During the rainy season, soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times. During the non-rainy season, soil stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.
- Stockpiles of PCC rubble, AC, asphalt concrete rubble, aggregate base, or aggregate sub base: During the rainy season, the stockpiles should be covered or protected with a temporary sediment perimeter barrier at all times. During the non-rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.
- Stockpiles of "cold mix": During the rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable material at all times. During the non-rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable materials prior to the onset of precipitation.
- Stockpiles/storage of pressure-treated wood: During the rainy season, pressure-treated wood should be covered with plastic or comparable

material at all times. During the non-rainy season, pressure-treated wood should be covered with plastic or comparable material at all times.

Protection of Active Stockpiles

- All stockpiles should be protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of "cold mix" should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Maintenance

- Inspect and verify that BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are underway, inspect weekly during the rainy season and at 2-week intervals in the non-rainy season to verify continued BMP implementation.
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.

Spill Prevention and Control BMP 10

Description

This BMP describes methods of minimizing exposure of pollutants to stormwater runoff by enclosing any drips, overflows, leaks, and other liquid material releases or by isolating pollutant spills from stormwater runoff. There are numerous spill containment methods, ranging from large structural barriers to simple, small drip pans. The benefits vary based on cost, maintenance requirements, and the size of spill control. Three possible options are discussed below:

Containment Diking: Temporary or permanent polyurethane or plastic berms, concrete berms, or retaining walls designed to hold spills. Diking is one of the best protective measures against stormwater pollution because it surrounds the area of concern and holds the spill, keeping spill materials separated from the stormwater outside of the diked area. Diking is one of the most common types of spill containment. Also see BMP 41-Earth Dike and BMP 43-Temporary Berms.

Curbing: Like containment diking, curbing is a barrier that surrounds an area of concern. It prevents spills or leaks from being released to the environment by routing runoff to treatment or control areas. The terms "curbing" and "diking" are sometimes used interchangeably, but curbing is usually small scale and cannot contain large spills like diking can. As with diking, common materials for curbing include earth, concrete, synthetic materials, metal, or other impenetrable materials. Asphalt is also a common material used in curbing.

Drip Pans: Pans used to contain very small volumes of leaks, drips, and spills. Drip pans can be depressions in concrete, asphalt, or other impenetrable materials, or they can be made of metals, plastic, or any material that does not react with the dripped chemicals. Empty or discarded containers may be used as drip pans. Catch drips so that the materials or chemicals can be cleaned up easily or recycled before they can contact stormwater. Drip pans can be a temporary or permanent measure.

Applications

Containment Diking: Diking can be used at any construction site, but it is most commonly used for controlling large spills or releases from liquid storage areas and liquid transfer areas. It is an effective containment method around tank truck loading and unloading areas. Proper diking contains spills, leaks, and other releases and prevents them from flowing into runoff conveyances, nearby streams, or infiltration into groundwater. It also allows for proper disposal and/or recycling of materials captured within the dike.

Curbing: Curbing is usually small scale; it cannot contain large spills like diking can. However, many facilities use curbing to contain small areas used for handling and transferring liquid materials.
Curbing is already a common practice. It is inexpensive, easy to install, and

provides excellent control of run-on. As with diking, materials spilled within a curbed area can be collected for proper disposal and/or recycling.

Drip Pans: Drip pans can be used at any site where valves and piping are present and the potential for small-volume leakage and dripping exist. Although leaks and drips should be repaired and eliminated as part of preventive maintenance programs, drip pans can provide a temporary solution where repair or replacement should be delayed. In addition, drip pans can be an added safeguard when they are positioned beneath areas where leaks and drips may occur.

Drip pans are inexpensive, easy to install, and simple to operate. They allow for reuse or recycling of the collected material.

Limitations

Drainage area - N/A
Minimum bedrock depth – N/A
NRCS soil type - N/A
Drainage/flood control – no
Maximum slope – N/A
Minimum water table – N/A
Freeze/thaw – N/A

Containment Diking:

- May be too expensive for some smaller facilities.
- Requires maintenance.
- Could collect polluted stormwater, with possible infiltration to ground water.

Curbing:

- Not effective for holding large spills.
- May require more maintenance than diking.

Drip Pans:

- Suitable only for small volumes.
- Should be inspected and cleaned frequently.
- Should be secured during poor weather conditions.
- Requires that personnel be trained in proper disposal methods so that contents are not disposed of improperly.

Targeted Pollutants

Trace Metals
Hydrocarbons

Design Parameters

Containment Diking:
Size: For tank truck loading and unloading operations, the diked area should be capable of holding an amount equal to any single tank truck compartment.

Materials: Materials used to construct the dike should be strong enough to safely hold spilled materials. The materials used usually depend on what is available on-site and the substance to be contained. Dikes may be made of earth (i.e., soil or clay), concrete, synthetic materials (liners), metal, or other impervious materials. Containment dikes may need to be designed with impervious materials to prevent leaking or pollution of stormwater, surface water, and ground water supplies.

In general, strong acids and bases may react with metal containers, concrete, and some plastics. So where spills may consist of these substances, other alternatives should be considered. Some of the more reactive organic chemicals may also need to be contained with special liners. If uncertain about the suitability of certain dike construction materials, refer to the *Material Safety Data Sheet* (MSDS) for the chemical being contained.

Curbing: When using curbing for runoff control, protect the berm by limiting traffic and installing reinforced berms in areas of concern. Materials spilled within a curbed area can be tracked outside of that area when personnel and equipment leave the area. This tracking can be minimized by grading within the curbing to direct the spilled materials to a downslope side of the curbed area. This will keep the materials away from personnel and equipment that pass through the area. It will also allow the materials to accumulate in one area, making cleanup much easier. Manual or mechanical methods, such as those provided by sump systems, can be used to remove accumulated material from a curbed area.

Drip Pans: When using drip pans, consider local weather conditions, the location of the drip pans, materials used for the drip pans, and how the pans will be cleaned. The location of the drip pan is important. Because drip pans should be inspected and cleaned frequently, they should be easy to reach and remove. Take special care to avoid placing drip pans in precarious positions such as next to walkways or on an uneven surface. Drip pans in these locations are easily overturned and may present a safety or environmental hazard. Weather is also an important factor. Heavy winds and rainfall can move or damage drip pans because the pans are small and lightweight. To prevent this, secure the pans by installing or anchoring them. Drip pans may be placed on platforms or behind wind blocks or may be tied down.

Maintenance

Cleaning guidelines should be included in the maintenance plan for all methods of spill prevention and control.

Containment Diking: Inspect containment dikes during or after significant storms or spills to check for washouts or overflows. In addition, regular testing to ensure that dikes are capable of holding spills is recommended. Soil dikes may need to be inspected on a more frequent basis.

Changes in vegetation, inability of the structure to retain stormwater, dike erosion, or soggy areas indicate problems with the dike's structure. Damaged areas should be patched and stabilized immediately, where necessary. Earthen dikes may require special maintenance of vegetation, such as mowing and irrigation.

When evaluating the performance of the containment system, pay special attention to the overflow system, since it is often the source of uncontrolled leaks. If overflow systems do not exist, accumulated stormwater should be released periodically. Polluted stormwater should be treated prior to release. Mechanical parts (such as pumps) or manual systems (slide gates, stopcock valves) may require regular cleaning and maintenance.

Curbing: Since curbing is sized to contain small spill volumes, frequent maintenance is needed to prevent overflow of any spilled materials. Inspect all curbed areas regularly and clean clogging debris. Repair the curb by patching or replacing it as needed to ensure effective functioning. Inspections should be conducted before forecasted rainfall events and immediately after storm events. If spilled or leaked materials are observed, cleanup should start immediately to allow space for future spills. In addition, prompt cleanup of spilled materials will prevent dilution by rainwater, which can adversely affect recycling opportunities.

Drip Pans: For drip pans to be effective, site operators should pay attention to the pans and empty them when they are nearly full. Because of their small holding capacities, drip pans will easily overflow if not emptied. Also, recycling efforts can be affected if stormwater accumulates in drip pans and dilutes the spilled material. It is important to have clearly specified and easily followed practices of reuse, recycle and/or disposal, especially the disposal of hazardous materials. Consider dumping the drip pan contents into a nearby larger-volume storage container and periodically recycling the contents of the storage container.

Frequent inspection of the drip pans is necessary due to the possibility of leaks in the pan itself. Also check for random leaking of piping or valves and for irregular, slow drips that may increase in volume. Conduct inspections before forecasted rainfall events to remove accumulated materials. Empty accumulations immediately after each storm event.

Vehicle/Equipment Washing & Maintenance BMP 11

Description

A typical vehicle/equipment washing and maintenance system is a lined, depressed area that collects the water used in washing off the trucks, cars, or other construction vehicles/equipment, and drains the wastewater into a collection or treatment system.

Applications

A wash-down area is used on projects where the soil is silty or heavy in clay, and has the likelihood of transporting dirt and mud off site. Projects that will take place over the course of the rainy season and areas where water is expected to be encountered (high ground water table) in the normal course of the project should be considered as candidates.

Limitations

Drainage area - N/A
Minimum bedrock depth – N/A
NRCS soil type - N/A
Drainage/flood control – no
Maximum slope – 5%
Minimum water table - N/A
Freeze/thaw – N/A

Washing vehicles generates liquid, semi-solid, and solid wastes. These wastes should be contained on-site or treated to prevent pollution of surface and ground water.

Off-site: Treatment is required for all discharges to waters of the state since it could be contaminated with degreasers, hydrofluoric acid, hydrochloric acid, nitric acid, phosphoric acid, oil, hydraulic fluids, lubrication, and engine cleaning solvents. Waters of the state include all surface waters (canals, rivers, ponds, streams and lakes), and all ground water. Contact the local permitting authority to determine proper treatment and disposal methods.

On-site: If wash-water discharge to a sediment pond is the system of choice, sufficient acreage is required for the operation.

Targeted Pollutants

Sediment
Phosphorus
Trace Metals
Hydrocarbons

Design Parameters

- Detergents used on site in Idaho for vehicle washing should not contain phosphates. Phosphates are a plant nutrient that can cause excessive growth of aquatic plants when discharged into a stream or lake.
- A stabilized construction entrance (BMP 5), used to reduce off-site tracking of mud, dirt and rocks, should be installed at the vehicle wash/maintenance area. Washing and maintenance should be conducted in disturbed areas (staging areas) but should not be conducted in a cut or fill area until grading has been performed or where there will be a high volume of construction traffic. Highly erodible soils or frequently wet areas should be avoided.

Off-site discharge options:

- Lagoon: Pond-like structure that works on the principle of evaporation is easy to install and requires low maintenance. There is a need to be aware of safety issues (fencing the area from the public).
- Land application system: Large land area is required. This alternative is the lowest in out-of-pocket cost.
- Filtering and recycling of wash water: A good option for conservation measures. Initially, expense would be high. Monitoring of the operation would be more intensive.
- Municipal wastewater treatment plant: This option is available only in areas where a municipal wastewater treatment plant exists and the operation is capable of handling the load. This is the best option for limiting liability for larger construction projects.

Construction Guidelines

Designate an area that can be graded and bermed. The design should collect wastewater for evaporation or direct it to an off-site containment or treatment system. A lined pond should be used where pollutants such as oil, grease, fuels, etc., may reach the high-ground water table.

Maintenance

Check that the system controls are working as designed. Clean up sediments that have been tracked by vehicles onto nearby roadways.

Waste Management BMP 12

Description

This BMP entails meeting the regulatory requirements of hazardous waste management that includes hazardous waste determination; acquiring an EPA identification number; accumulation; record keeping reporting; and transportation manifesting. Good housekeeping will minimize the contribution of pollutants to stormwater discharges by handling and storing hazardous materials on site in a clean and orderly manner.

Applications

Compliance with applicable regulations will protect human health and the environment from hazardous waste generated by construction activities, reduce liability, and prevent unnecessary interruptions to schedules (i.e., project shut down due to environmental investigations/enforcement actions). The first step in preventing pollution of stormwater runoff is to maintain a clean and orderly work environment. This will reduce the possibility of accidental spills.

Common sense is the simplest and most inexpensive method to utilize. Improving the operation and maintenance of industrial machinery, material storage practices, material inventory controls, routine and regular clean-up, maintenance activities in work areas, and providing educational programs for employees regarding these practices will assist in reaching these goals.

Limitations

Drainage area - N/A	Maximum slope – N/A
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - N/A	Freeze/thaw – N/A
Drainage/flood control – no	

Carelessness and poor judgment often result in problems associated with the disposal of hazardous materials. Not being fully aware of all the hazards at the site could increase the potential for mishandling of such wastes, resulting in stormwater contamination.

Targeted Pollutants

Sediment
Trace Metals

Design Parameters

Select a designated waste collection area on site. Secure an adequate number of containers with lids or covers. If possible, provide a covered area or spill containment pallets. Arrange for waste collection before containers overflow (additional containers and more frequent pick-ups will be needed during the demolition phase). Provide immediate cleanup in case of a spill. Assure that waste is transported and disposed of at an approved facility. A liner, concrete pad, berm, etc., should be utilized to keep waste separated and to contain accidental spills so that stormwater runoff is not polluted. Provide labels and signs for the area to educate contractors about proper storage and handling and to comply with regulatory requirements.

Construction Guidelines

The best way to avoid polluting runoff from outside material storage areas is to prevent stormwater run-on or rain from coming in contact with the materials.

These are some of the methods that can be utilized to accomplish this:

- Identify, control, and enforce storage and disposal/stockpile areas
- Provide a barrier such as a liner, concrete pad or berm
- Protect the storage area by:
  - ✓ Storing the material indoors
  - ✓ Covering the area with a roof
  - ✓ Covering the material with a temporary covering
- Engineer safeguards such as:
  - ✓ Overflow protection devices
  - ✓ Protective guards around tanks, storage area, etc.

Maintenance

- Regularly pick up and dispose of all garbage and waste material.
- Make sure equipment is working properly.
- Routinely inspect for leaks or conditions that could lead to discharges of chemicals and contact with stormwater:
  - ✓ External corrosion and structural failure
  - ✓ Installation problems
  - ✓ Evidence of spills or overfills
- Locate storage areas away from direct traffic routes.
- Stack according to directions to avoid damage due to improper weight distribution.
- Store likes together, separate incompatible wastes.
- Assign hazardous material inventory to a limited number of people.
- Keep up-to-date inventory of all hazardous materials and wastes.
- Identify all chemical substances present at the work site.
- Label all containers with name, hazards, handling, and first-aid information.
- Mark those that require special instructions.
- Cleanup of liquid or dry material spills.
- Provide initial and annual training for employees on the hazards and the proper handling procedures.
- Do not mix products together unless specifically recommended.
- Use the entire product before disposing of container.
- Do not remove original product label from container.

Concrete Waste Management BMP 13

Description

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting off-site washout, performing on-site washout in a designated area, and training employees and subcontractors.

Applications

Concrete pours, such as foundation, footing or pile sites

Limitations

Drainage area – N/A	Maximum slope – N/A
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - BCD	Freeze/thaw – good
Drainage/flood control – no	

Off-site washout of concrete wastes may not always be possible.

Targeted Pollutants

Concrete waste

Construction Guidelines

The following practices will help reduce stormwater pollution from concrete wastes:

- Avoid mixing excess amounts of fresh concrete or cement on site.
- Perform washout of concrete trucks off site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Avoid dumping excess concrete in non-designated dumping areas.

For on-site washout:

- Locate washout area at least 50 ft from storm drains, open ditches, or water bodies. Construct a temporary pit or bermed area with a paved or gravel approach to capture liquid and solid waste.
- Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed of properly.
- When washing concrete to remove fine particles and expose the aggregate, drain the water to a bermed or level area.
- Avoid washing sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile or dispose in the trash.
- Train employees and subcontractors in proper concrete waste management.

Maintenance

- Inspect subcontractors to ensure that concrete wastes are being properly managed.
- If using a temporary pit, dispose hardened concrete on a regular basis.

Sanitary/Septic Waste Management BMP 14

Description

Prevent the discharge of pollutants to stormwater from sanitary/septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

Applications

All construction sites where portable facilities are used.

Limitations

Drainage area – N/A	Maximum slope – N/A
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - N/A	Freeze/thaw – N/A
Drainage/flood control – N/A	

No major limitations.

Targeted Pollutants

Nutrients
Bacteria

Approach

Sanitary and septic wastes should be disposed of in accordance with state and local requirements. Some of these requirements are listed below:

- Locate sanitary facilities in a convenient location.
- Avoid discharging or burying untreated raw wastewater.
- Ensure that temporary septic systems treat wastes to appropriate levels before discharging.
- If using an on-site disposal system (OSDS) such as a septic system, comply with local health agency requirements.
- Ensure that temporary sanitary facilities that discharge to the sanitary sewer system are properly connected. This practice will help eliminate illicit discharges.
- If discharging to the sanitary sewer, contact the local wastewater treatment plant for their requirements.
- Ensure that a licensed service maintains sanitary/septic facilities in good working order.
- Portable units may need to be staked or secured to a fixed object.

Maintenance

- Inspect facilities regularly.
- Arrange for regular waste collection.

Mulching **BMP 15**

Description

Mulching is a temporary soil stabilization or erosion control practice where materials such as straw, grass, grass hay, compost, wood chips or wood fibers are placed on or incorporated into the soil surface. In addition to stabilizing soils, mulching can reduce the velocity of stormwater runoff over an area. When used together with seeding or planting, mulching can aid in plant growth by holding the seed, fertilizers, and topsoil in place, by helping to retain moisture, and by insulating against extreme temperatures.

Mulching protects the soil surface from splash erosion. It retards runoff, traps sediment, and creates more favorable conditions to assist germination and the early development of plants. The following natural and synthetic (stabilizers) mulches are suitable for use at construction sites:
Vegetative materials: wheat straw, rye straw, barley straw, grass hay
Wood products: wood cellulose fibers, wood chips, bark, sawdust
Other organic materials: leaves, peat, manure, compost
Rock products: gravel, slag, crushed stone
Fabricated mulch: jute, burlap, coconut (coir), excelsior, Kraft paper string
Synthetic mulch: asphalt, vinyl, plastics, latex, rubber, adhesives or "tackifiers."

Applications

- Mulch is an immediate, effective, and inexpensive means of controlling dust and erosion and aiding revegetation of construction sites. It provides immediate protection to soils that are exposed and that are subject to heavy erosion; it retains moisture (which may minimize the need for watering); and it requires no removal because of natural deterioration of most mulching materials.
- Mulch is often used alone in areas where temporary seeding cannot be used because of the season or climate. It may be used in conjunction with other treatments for increased effectiveness. Use of mulch may or may not require a binder, netting, or tacking agent to hold the mulch in place. On steep slopes and critical areas such as waterways, mulch matting is used with netting or anchoring to hold it in place.
- To aid in establishing vegetation, mulch seeded and planted areas where slopes are steeper then 2:1, where runoff is flowing across the area, or when seedlings need protection from bad weather. If the mulching effect is to be maintained longer than 3 months, the preferred mulch is vegetative material. Wheat straw is the most preferred vegetative material, followed by rye straw, barley straw, or grass hay.
- Wood chips are suitable for areas that will not be closely mowed and around ornamental plantings. Chips decompose slowly and do not require tacking, but they should be treated with nitrogen to prevent nutrient deficiency. Wood chips can be very inexpensive if they are obtained from trees cleared on the site. Chips should not be used on slopes greater than 6% because they tend to wash down slopes.

- Bark mulch is suitable for areas planted with grasses that will not be closely mowed. The bark may be applied mechanically or by hand.

- Crushed stone and gravel mulches are appropriate for dust control and soil protection on low-use dirt roads, driveways, and other areas of light vehicular activity within the construction site.

Limitations

Drainage area – 2 ac.	Maximum slope – 50%
Minimum bedrock depth – N/A	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – fair
Drainage/flood control – no	

Disadvantages of mulch include the following:

- It may delay germination of some seeds because cover reduces the soil surface temperature.
- Mulch can be easily blown or washed away by runoff if not secured or incorporated. Lightweight mulch, such as straw, requires matting, crimping, or other methods to hold it in place.
- Some mulch materials, such as wood chips, may absorb nutrients necessary for plant growth.
- Straw mulch provides organic matter as it breaks down and is incorporated into the soil. If applications are too heavy, however, soil nutrient levels (especially nitrogen) may decline during the period of decomposition. Therefore, prescribed application rates of both the straw mulch and the specified fertilizer should be strictly followed. The use of a fertilizer low in phosphorus is recommended.
- Synthetic spray-on materials are not recommended except for temporary dust/erosion control or for steep, rocky slopes where other mulches and mechanical methods cannot be effectively applied. The synthetic mulches may create impervious surfaces and can have adverse effects on water quality.
- Avoid applying mulch as the only control on long slopes. Break up concentrated flows on these slopes using recommended methods in other BMPs.

Targeted Pollutants

Sediment
Phosphorus

Design Parameters

Stone and gravel:

- After the gravel or stone is applied, construction traffic may move over it. Areas that become compacted or depressed should be remulched to the same level as the remaining area to prevent flows from the site from becoming channelized into these depressions.
- Upon completion of activities on the site, the gravel or stone mulch may be left in place during revegetation operations.
- When used for driveways or dirt roads, a filter blanket should be placed under the gravel.

Straw:

- Straw mulch forms a loose layer when applied over a loose soil surface. To protect the mulch from wind drifting and water damage, it should be stabilized by covering it with netting, such as jute, or by spraying it with a tacking agent. Straw mulch should cover the entire seeded area or exposed slope. The mulch should extend into existing vegetation or stabilized areas on all sides to prevent wind or water damage which may start at the edges of the mulched area
- The straw fibers should be applied to form a uniform cover of loose straw through which 20% or less of the original ground surface can be seen. No large clumps of unscattered straw should exist after application.
- On small slopes, straw mulch should be applied by hand broadcasting to a uniform depth of 2 to 3.1 in. On larger slopes, straw can be blown onto the slope to achieve a uniform cover of 2 to 3.1 in.

Wood chips:
- Due to bacterial action during decomposition, nutrient concentrations in the soil may be depressed under a layer of wood chips. Because of this, applications should not exceed the specified thickness that would cause a marked decline in some soil nutrients for longer periods.
- When using wood chips to mulch revegetation projects, the specified application of fertilizer should be increased approximately 25% to replenish soil nutrients lost due to breakdown of wood chips.

Effectiveness of mulches:
- Crushed stone and gravel mulches retain their effectiveness indefinitely if properly applied and protected from compacting traffic. Sediment generation reduction is estimated at 70 to 90%, and nutrient generation reduction at 50 to 70%.
- Straw mulches react similarly to hydromulches, as they break down fairly rapidly. However, straw is twice as effective and at about half the cost of hydromulches. Sediment reduction by straw mulch without vegetation is 90 to 95% for a few months. It drops to 70 to 90% in 6 months, and further to 40 to 60% in 2 years, and 10 to 30% after that. Nutrient reductions are estimated at 60 to 80% for a few months, 50 to 70% in 6 months, 20 to 50% up to 2 years, and 0 to 10% beyond 2 years.
- Wood chips deteriorate more slowly than wood fiber and, therefore, retain their effectiveness longer. Sediment reductions of 90 to 95% can be expected for 1 year, 80 to 90% up to 2 years, and 50 to 60% beyond 2 years. Nutrient reductions of 60 to 80%, 50 to 70% , and 30 to 50% are estimated for the same period.

Construction Guidelines

- Seeding (temporary or permanent) can take place prior to or concurrent with mulching. Other surface runoff control measures should be installed prior to seeding and mulching. If seed is applied prior to mulch, mulch should be applied to seeded areas immediately after seeding.
- Mulches should not be applied when free surface water is present, but may be applied to damp ground.

- The choice of materials for mulching will be based on the type of soil to be protected, site conditions, season, and economics.

Straw mulch: The straw should be stabilized to prevent it from being damaged by water or wind (blown away). Use one of the following methods to apply straw mulch:

- Hand punching can be used on small sites, sites with rock and stone on the surface, sites with slopes that are steeper than 3:1, or sites that have been wattled. Take care not to damage wattling or planted vegetation. Use a spade or shovel to punch the straw into the slope until all areas have straw standing perpendicularly to the slope and embedded at least 4 in. into the slope. The bunches of straw should resemble the tufts of a toothbrush.
- Roller punching can be used on large, gently sloping sites without significant outcroppings of rock and stone. Roller punching should not be used on sites that have been wattled (unless there is adequate space between lines of wattling) or on planted sites. A roller equipped with straight studs not less than 6 in., from 4 to 6 in. wide, and approximately 3/4 in. thick, will best accomplish the desired effect. Studs should stand approximately 8 in. apart and should be staggered. All corners should be rounded to prevent withdrawing the straw from the soil. Vegetative planting may be conducted following roller punching.
- Crimper punching involves specially designed straw-crimping rollers. These are suitable for use wherever roller punching can be used. The crimpers consist of serrated disk blades, set 4 to 8 in. apart, that force straw mulch into the soil. Crimping should be done in two directions with the final pass conducted across the slope rather than up and down it.
- Tacking agents may be used on any type of site, but are best used only on very stony or rocky soils or small, steep slopes. Apply 28.5 ft^3/ac. of the tacking agent or its equivalent over the straw mulch. Agents that are neutral or nearly neutral in color and of demonstrated effectiveness for the soils and climate of the application area are acceptable.
- Matting may be used on large, steep areas that cannot be punched with a roller. Jute or wood excelsior on plastic netting should be applied over unpunched straw according BMP 18-Matting.

Maintenance

Inspect all mulched areas periodically (according to the inspection interval prescribed in the project site stormwater plan and after runoff-producing storm events. Repair damaged areas of the mulch immediately. Reseed or replant such areas, if necessary, before replacing the mulch cover. Straw mulch and other organic products do not have to be removed when the vegetation becomes established.

Table 15-1 shows the various mulches and their application rates.

Table 15-1. Guide to Mulch Materials, Rates and Uses				
Mulch Material	Quality Standards	Application Rate 1100 ft^2	Depth and Coverage	Remarks
Gravel, slag, or crushed stone	Washed, 3/4 to 11/2 in. diameter with at least 30% of it larger than 3/4 in. diameter	280 ft^3 (or more to ensure 90% coverage at 2.5 tons/1100 ft^2	2.75 to 3.1 in. uniform covering	Excellent mulch for short slopes around woody plants and ornamentals. Use where subject to foot traffic. Approximately 42.5 lb/ft
Hay or straw	Air dried, free of unwanted seeds and coarse material. Fibers should not be chopped or ground to reduce fiber length. Minimum fiber length - 8 in.	88 TO 110 lb (2 to 3 bales)	2 to 3.1 in. to form a uniform mat through which 20 to 40% of the original ground surface can be seen.	Use where the mulching effect is to be maintained for >3 months. Subject to blowing unless kept moist, punched, or tacked down. Most common and widely used mulching material. Can be used in critical erosion areas.
Wood fiber cellulose	Dyed material should not contain any growth inhibiting factors	22 to 33 lb		If used on critical areas, double the normal application rate. Apply with hydromulch. No tie-down required. Packaged in 110 lb bags
Wood chips	Do not use kiln-dried or air-dried material. Chip size 1/2 x 1 1/2 in. diameter and 1/10 to 1/2 in. thick		2.75 to 3.1 in. uniform depth	Applying at over the specified thickness may markedly reduce soil nutrients for a long time. Increase fertilizer 25% with wood chip mulch on revegetation sites.
Compost	Odorless or earthy smell	5.3 to 53 ft^3	2 to 3.1 in. uniform depth	Inexpensive, but may not be available in some areas.

Hydromulching BMP 16

Description

Hydraulic mulching (hydromulching) is a process where wood fiber mulch, processed grass, hay, or straw mulch are applied with a tacking agent in a slurry with water to provide temporary stabilization of bare slopes or other bare areas. This mulching method provides uniform, economical slope protection. It may be combined with hydroseeding as a revegetation method (see BMP 21-Seeding).

Applications

Hydromulching is an effective way to increase water retention (thereby reducing erosion) for 6 months or up to 1 year. Beyond 1 year, the effectiveness drops off. Hydraulic mulching can be applied to areas that are within about 200 ft of a road or that can otherwise be reached by truck. Small roadside slopes and large, relatively flat areas are well adapted to this method. When adequate moisture exists, the slurry can be combined with seed and fertilizer to initiate stabilization and revegetation in a single application (see BMP 3-Preservation of Existing Vegetation). The mulch usually lasts about 1 year. The growing vegetation is needed to provide continued stabilization.

Limitations

Drainage area – 2 ac.	Maximum slope – 15%
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – fair
Drainage/flood control – no	

- Loses effectiveness after 1 year.
- Only suited for physically stable slopes (at natural angle of repose, or less).
- Avoid hydromulching on long uninterrupted slopes. Break up concentrated flows with other BMPs, such as BMP 26-Gradient Terracing or BMP 32-Check Dams.

Targeted Pollutants

Sediment
Phosphorus

Design Parameters

Effectiveness: Hydromulching initially reduces sediment generation by 70 to 80% as compared to sediment production off bare slopes. Within 2 years, the breakdown of wood fiber will have reduced its effectiveness to 40 to 60%. Beyond that time, only 10 to 30% effectiveness can be expected, and the mulch should be replaced. Nutrient generation is typically reduced 50 to 70% for 6 months, 20 to 50 percent up to 2 years, and 0 to 10% beyond 2 years.

Equipment: The hydraulic mulching machine should be equipped with a gear-driven pump and a paddle agitator. Agitation by recirculation from the pump is not acceptable. Agitation should be sufficient to produce homogeneous slurry of tacking agent and mulch (and seed fertilizer, if used).

Application rates: Apply the water at a minimum rate of 3000 gallons per acre. Tacking agent should be applied at 28.5 ft^3 of wet ingredients per acre. When seeding is combined with hydraulic mulching, be sure to include an appropriate specified formulation at the specified rate. Legume seeds should be pellet inoculated with the appropriate bacteria. Inoculation rates should be four times that required for dry seeding.

Construction Guidelines

- The time allowed between placement of seed in the hydraulic mulcher and the emptying of the hydraulic mulcher tank should not exceed 30 minutes.
- Wood fiber may be dyed to aid in uniform placement. Dyes should not stain concrete or painted surfaces nor injure plant or animal life when applied at the manufacturer’s recommended rate.
- Application of the slurry should proceed until a uniform cover is achieved. The applicator should not be directed at one location for too long a period of time or the applied water will cause erosion.

Maintenance

Hydromulched slopes should be inspected periodically for damage due to wind, water, or human disturbance. Repair all damaged areas immediately using hydromulching at the original specifications or straw mulch.

Geotextile BMP 17

Description

Geotextiles are porous fabrics known in the construction industry as filter fabrics, road rugs, synthetic fabrics, construction fabrics, or simply fabrics. Geotextiles are manufactured by weaving or bonding fibers made from synthetic materials such as polypropylene, polyester, polyethylene, nylon, polyvinyl chloride, glass, and various mixtures of these materials.

The material is applied from a roll and anchored into place to provide a continuous sheet over the exposed slope or surface. This sheeting reduces raindrop impact and surface erosion on disturbed soils. It can also protect new vegetation and aid in growth and establishment of vegetation by retarding evaporation of soil moisture. They can also be used on benched slopes.

Geotextiles are used for a variety of purposes as separators or reinforcement, for filtration and drainage, and for erosion control on slopes or stream banks. Matting or netting made of biodegradable materials (such as jute, wood fiber, straw, coconut, paper, or cotton) can be used for many of these same purposes, but it tends to be less durable. These products are discussed separately under BMP 18-Matting.

Applications

Geotextiles are an effective tool to prevent surface erosion and promote rapid establishment of a permanent (or temporary) vegetative cover. The two main applications are for slope protection and as a flexible channel lining. For slope protection applications, the fabrics are useful in preventing the loss of topsoil, thereby reducing surface erosion and promoting establishment of vegetative cover. They should be given serious consideration where slope, high flows, or other factors prevent use of organic matting.

Used alone, geotextiles can function as erosion control matting to stabilize channels and swales or to protect recently planted seedlings until they become established. They may be placed in ditches or along stream banks to protect new plantings if more elaborate measures, such as riprap or rock revetments, are not appropriate. The purpose of this application is to protect the integrity of the ditch or stream while permanent vegetative cover becomes established.

Geotextiles are also used as separators. An example of such a use is geotextile as a separator between riprap and soil. This "sandwiching" prevents the soil from being eroded from beneath the riprap. The following are some of the primary advantages of using geotextiles:

- Relatively low cost for many applications.
- Ease and convenience for many applications.
- Quick and effective protection against erosion problems.
- Design methodologies are available for many uses.
- A wide variety of geotextile products are available to match specific needs.
- Synthetic geotextiles may be removed and reused if economically

feasible.

- Better resistance to high-flow situations than organic matting.

Limitations

Drainage area – 100 ac.	Maximum slope – 100%
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – no	

- Effectiveness may be reduced drastically if the fabric is not properly selected, designed, or installed.
- Many synthetic geotextiles are sensitive to light and should be protected prior to installation.
- Geotextiles that are not biodegradable should not be used where their presence or appearance is aesthetically unacceptable.
- Should not be placed on 50% slopes if they are to be covered with overlying material.

Targeted Pollutants

Sediment

Design Parameters

Maximum slope steepness: Products are available for up to 50% slopes.

Durability/decomposition: Some synthetic geotextiles persist a very long time and should be considered a permanent measure. Others remain effective for less than 1 year. Those types designed to assist in establishment of vegetation will eventually photo-degrade or decompose. If a short-term, degradable product is needed, see BMP 18-Matting.

Materials: In determining how much fabric is needed, allow for an overlap of 4 in. on both sides of each roll and 3 ft at the ends of rolls. Also, the fabric should extend beyond the edge of the exposed area at least 1 ft at the sides and 3 ft at the top and bottom. Staples should be of 1/10 in. diameter (or heavier) steel wire. Allow for a spacing of approximately 5 ft apart along the sides and center of each roll and not more than 1 ft apart along upper end of a roll or at the overlap of two rolls.

Construction Guidelines

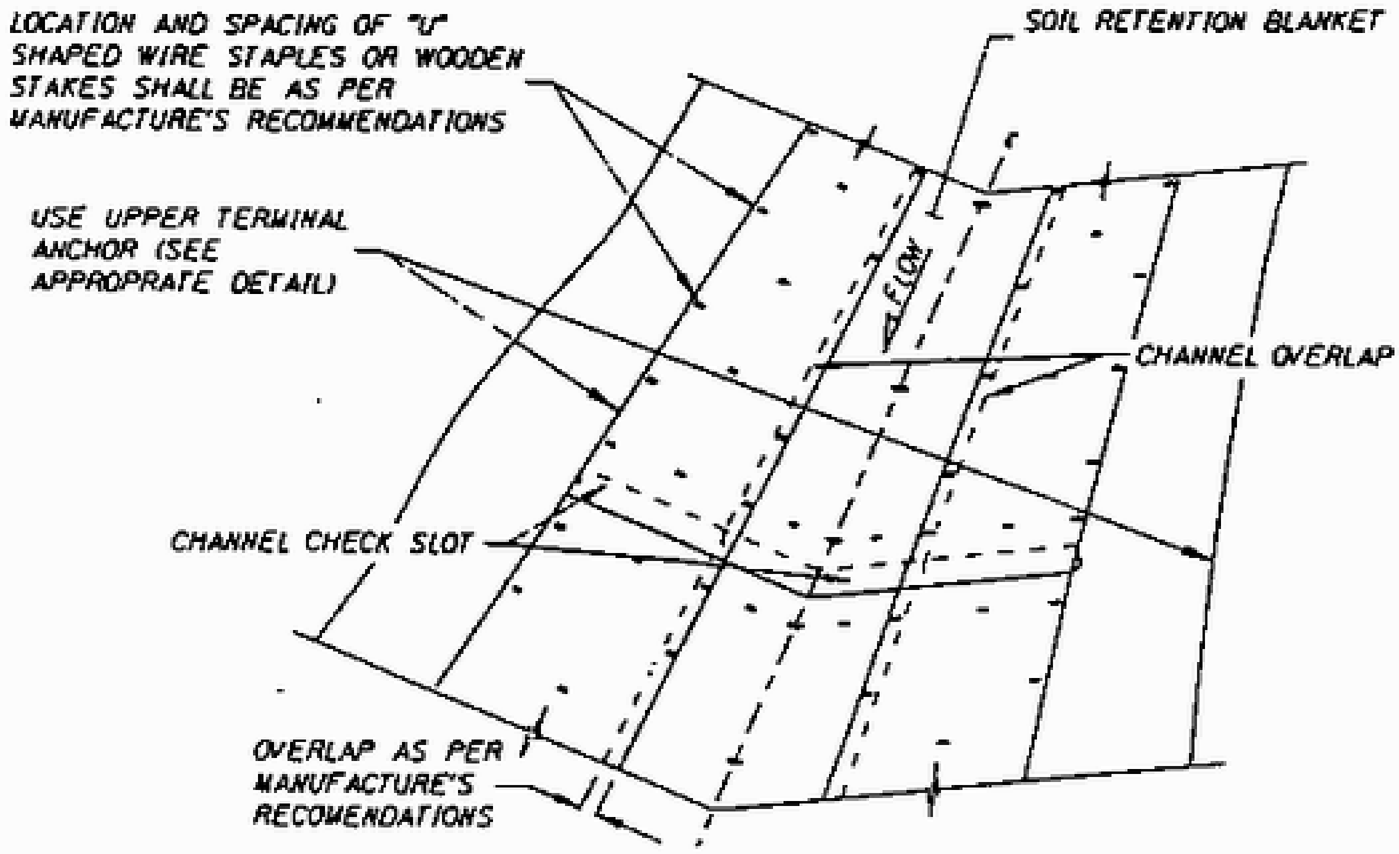
- The soil should be reasonably smooth. Fill and compact any rills and gullies. Remove protruding rocks and other obstructions.
- Apply the individual rolls up and down the slope, from the top to the bottom--never along the contour.
- Overlap the sides of rolls at least 4 in., and make sure there is at least a 3 ft overlap when an uphill roll joins to a downhill roll. The uphill roll should overlie the downhill roll.
- Extend the fabric beyond the edge of the mulched or seeded area at least 1 ft at the sides and 3 ft at the top and bottom of the area. If existing vegetation or structures mark the boundaries of the area, the fabric should continue into the stable vegetated area or to the edge of the structure.
- At the top of the area, bury the end of each roll in a trench at least 8 in. deep. The trench should then be backfilled and tamped.
- Staples should be driven perpendicularly into the slope face. Place them

approximately 5 ft apart down the sides and center of the roll, and not more than 1 ft apart at the upper end of a roll or at the end overlap of two rolls.

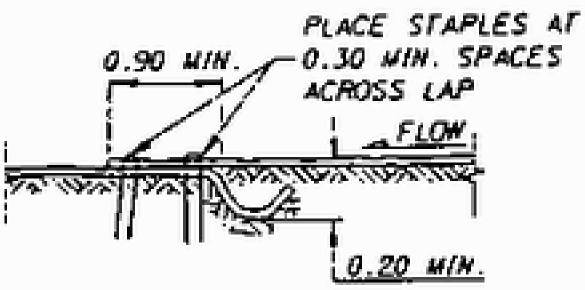
- Be sure the fabric makes uniform contact with the slope face underneath. No "bridging" of rills or gullies should be allowed.

Maintenance

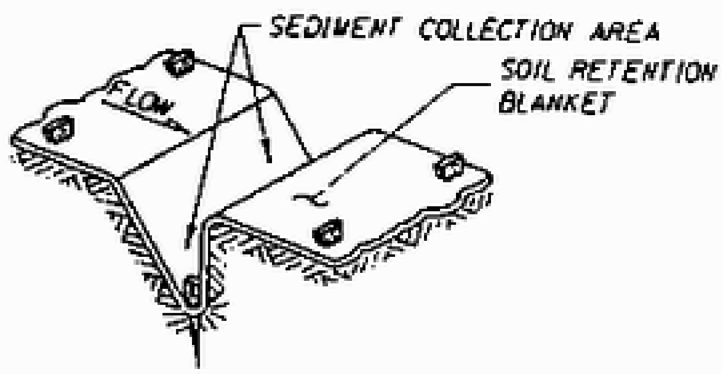
- Inspect weekly or monthly and within 24 hours after each runoff-producing storm. To assure proper functioning, complete one inspection during the first runoff-producing event after installation. If fabric sheeting is damaged or missing, replace it immediately to restore full protection. Also inspect to ensure that channelization and erosion is not occurring underneath fabric (sediment outwash is the most visible sign of this.)
- Products used for temporary control may be removed and reused, if this can be done without leaving the area susceptible to erosion.



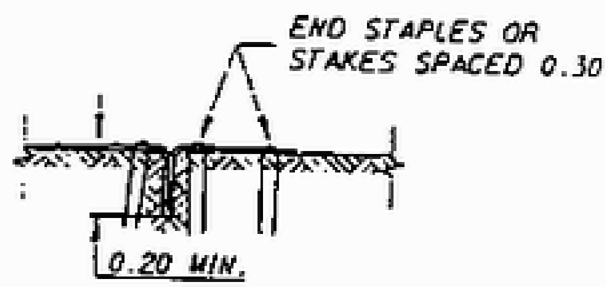
CHANNEL INSTALLATION



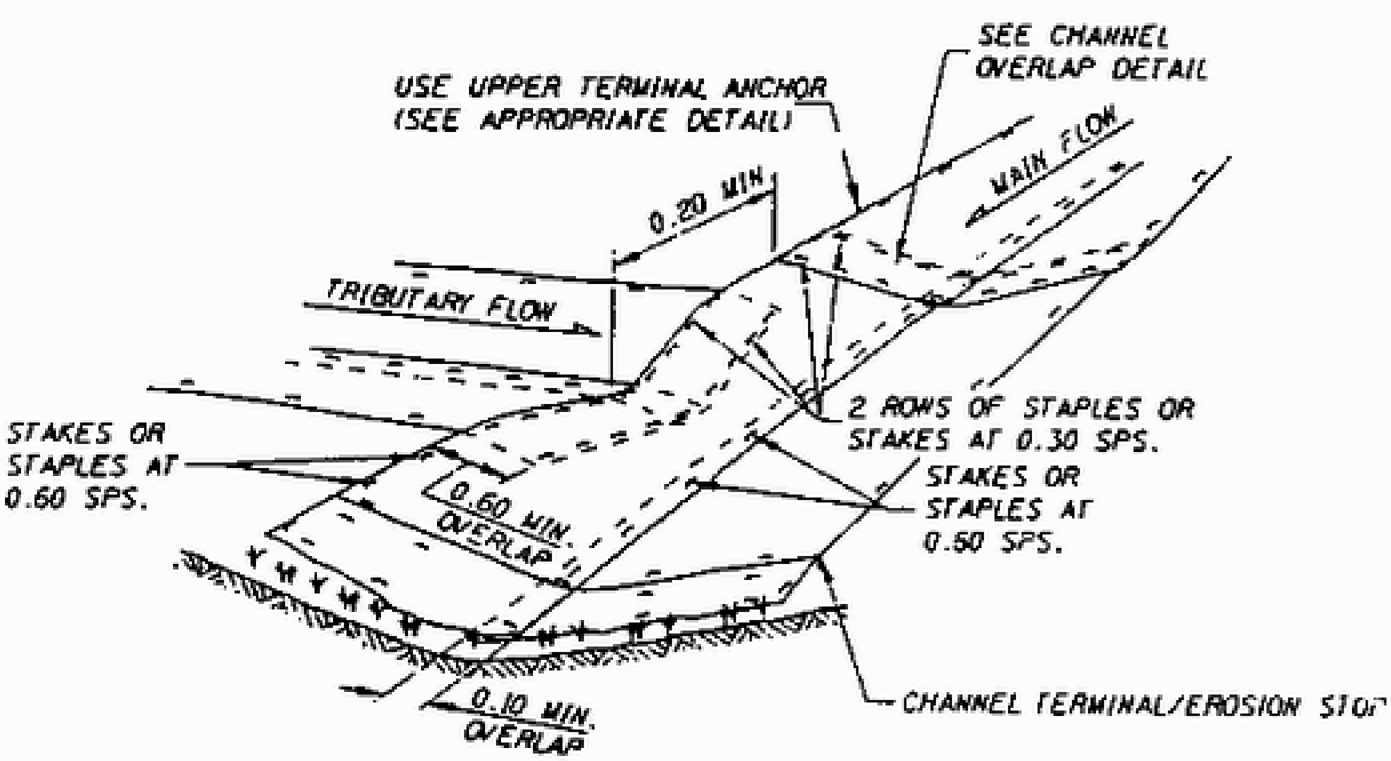
CHANNEL OVERLAP



CHANNEL CHECK SLOT



CHANNEL TERMINAL/EROSION STOP



CHANNEL INTERSECTION

Matting BMP 18

Description

Matting is a porous net or fibrous sheet that is laid over the ground surface for slope stabilization and erosion control or to hold mulch in place and protect it against wind or water damage. Matting and netting are sometimes classified as geotextiles (see BMP 17-Geotextile), but in this catalog, matting is considered to be materials made from biodegradable materials including straw, coconut (coir), jute, wood fiber (excelsior), paper, and cotton. Some of these organic materials may be held in place by plastic netting.

Applications

A wide variety of matting materials may be used for erosion control. Most are of two main types: woven, such as jute, and bonded to plastic, such as excelsior. Application examples for these two types are listed below.

Jute matting: Jute matting or netting is available as a heavy fiber net that is generally purchased in rolls and is stapled/anchored to slopes to provide a uniform covering. This covering protects mulches, provides additional water-holding capacity, and aids in moderating environmental fluctuations near the ground surface (as does a mulch).

Jute matting can be applied over straw, grass hay, wood fiber, or manure mulches when wind or water damage would occur without a protective net. Matting is the best single method for protecting the integrity of a mulched area. It may be applied alone as an alternative to straw or wood fiber mulches on flat sites for dust control and seed germination enhancement, but should not be applied alone where runoff quantities are significant.

Wood fiber (Excelsior) matting: Wood fiber matting is made by bonding wood excelsior fibers to a paper or plastic reinforcing net. The matting is generally purchased in rolls and stapled to slopes to provide a uniform covering which can protect mulches, provide enhanced water-holding capacity, and aid in moderating environmental fluctuations near the ground surface.

Plastic netting: Plastic netting (photo/biodegradable) is a monolithic plastic cloth-like material. It is used primarily to hold straw and other materials in place. Plastic netting is more durable than jute or wood fiber matting. It is much easier to handle and requires less labor, but it has no mulch capabilities itself. Plastic netting alone provides no soil stabilization or erosion control. It is best used to hold down mulches until vegetation becomes established.

Matting can be useful in the following circumstances:

- Construction sites becoming temporarily inactive (inactive period greater than 2 weeks and less than 1 year).
- Graded areas receiving permanent revegetation treatment by seeding.
- Bare areas receiving permanent revegetation treatment by seeding.

Limitations

Drainage area – 100 ac.
Minimum bedrock depth – 2 ft
NRCS soil type - ABCD
Drainage/flood control – no
Maximum slope – 100%
Minimum water table - N/A
Freeze/thaw – good

- Should not be used where overland water flow will exceed 6.5 ft/s. Because of the following characteristics of plastic netting and wood fiber matting, jute matting, straw or straw coconut matting are preferred.
- Plastic netting does not function as mulch (as does jute matting) since it does not absorb water. When plastic netting is used to anchor straw mulch, it increases the effectiveness of the mulch, but it does not provide direct control of erosion and sedimentation or nutrient generation. Straw mulch rates should be increased 25% when plastic netting is used instead of jute or straw.
- Wood fiber matting is more difficult to put in place than jute, and it is less predictable in controlling erosion. Properly applied, it can be as effective as jute matting at sediment and nutrient reduction. However, it is often 10 to 20% less effective.

Targeted Pollutants

Sediment

Design Parameters

- Jute matting should be fiber cloth of a uniform plain weave, undyed and unbleached single jute yarn, 3 to 4 ft wide and weighing an average 0.4 lb per linear foot of cloth with a tolerance of plus or minus 5%. It should have approximately 78 warp ends per width of cloth and 45 weft ends per linear meter of cloth. The yarn should be of a loosely twisted construction having an average twist of not less than 6.3 turns per 4 in. and should not vary in thickness by more than half of its normal diameter.
- Wood fiber matting should consist of machine-produced mats of curled wood excelsior, of which 80% have a 8 in. or longer fiber length. It should be of consistent thickness with the fiber evenly distributed over the entire area of the blanket (backing). The topside of each blanket should be covered with a 1 x 3 in. weave of twisted Kraft paper or biodegradable plastic mesh that has a high wet strength. Blankets should be fire and smolder resistant and contain no chemical additives. Blankets should be in rolls 3 to 4 ft wide and 130 to 200 ft long.
- Plastic netting with mesh opening from 1/10 x 1/10 in. to 1/5 x 1/5 in. should be applied over straw mulch similarly to the method specified below for jute matting.

Effectiveness: Jute matting acts similarly to straw mulch or hydromulch. Sediment reduction is typically 70 to 90% for up to 6 months, 40 to 60% for up to 2 years, and 10 to 30% beyond 2 years. Nutrient reduction is estimated at 50 to 70% for 6 months, 20 to 50% for up to 2 years, and 0 to 10% beyond 2 years.

Due to the difficulty of proper application, wood excelsior matting has a more variable effectiveness than straw, jute, or hydromulch. Properly applied, it can be as effective. Sediment reduction should range from 50 to 90%, 20 to 60%, and 0 to 30% in 6 months, 2 years, and beyond 2 years, respectively. Nutrient reductions for the same time periods are estimated to be 30 to 70%, 10 to 50%, and 0 to 10%.

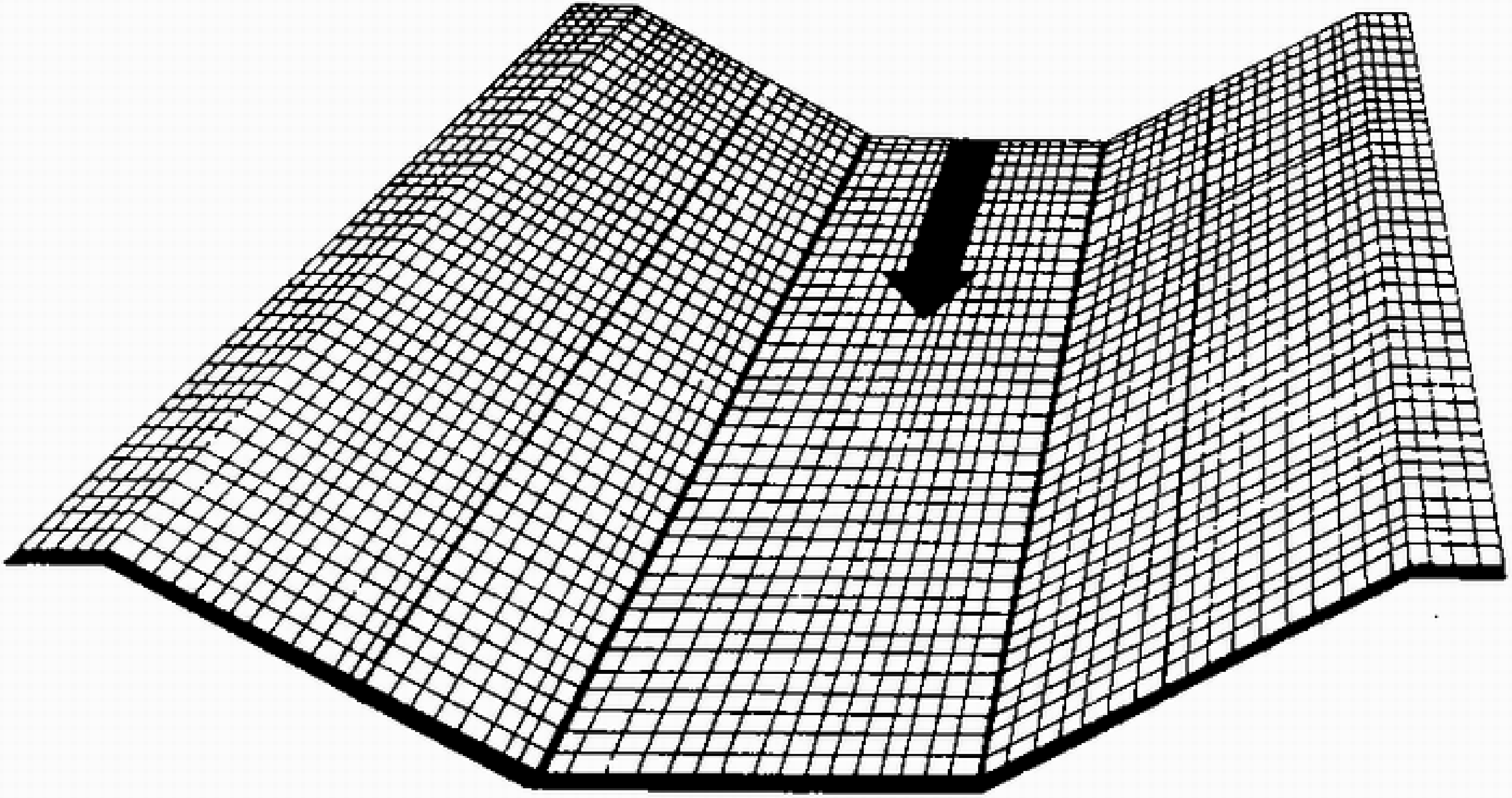
Construction Guidelines

The following guidelines apply to all matting and netting installations:

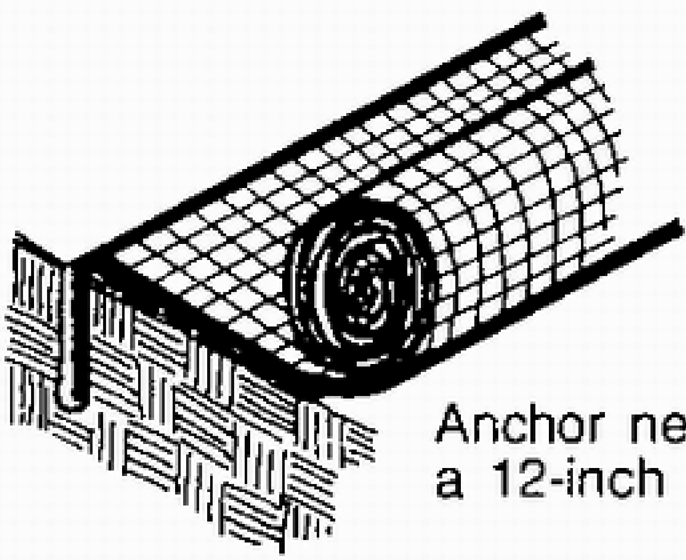
- The soil should be reasonably smooth. Fill and compact any gullies and rills. Rocks, vegetation or other obstructions that rise above the level of the soil should be removed.
- After site preparation and seeding (if any), the rolls of netting or matting should be rolled onto the surface from the top of the slope to the bottom of the slope. It is preferred that rolls are not constructed in a horizontal direction across the slope face. The rolling should follow water flow direction.
- At the top of the area, bury the end of each roll in a trench at least 8 in. deep. The trench should then be backfilled and tamped.
- Overlap the sides of rolls at least 4 in., and make sure that there is at least a 3 ft overlap when an uphill roll joins to a downhill roll. The uphill roll should overlie the downhill roll.
- Extend the matting beyond the edge of the mulched or seeded area at least 1 ft at the sides and 3 ft at the top and bottom of the area. If existing vegetation or structures mark the boundaries of the area, the matting should continue into the stable vegetated area or to the edge of the structure.
- Staples should be driven perpendicularly into the slope face. Place them approximately 3 ft apart down the sides and center of the roll, and not more than 1 ft apart at the upper end of a roll or at the end overlap of two rolls.
- Staples should be of heavy gauge wire (7/100 in. diameter or greater), bent into a "U" shape, with legs at least 6 in. long, and a 1 in. crown. Use longer staples and greater frequency in loose or sandy soil.
- Be sure the matting makes uniform contact with the slope face underneath. No “bridging” of rills or gullies should be allowed.
- If wood fiber matting is to be applied without other mulches, the minimum thickness of mat should be 1.5in. If the mat is to be applied over other mulches, the minimum mat thickness should be 0.5in.

Maintenance

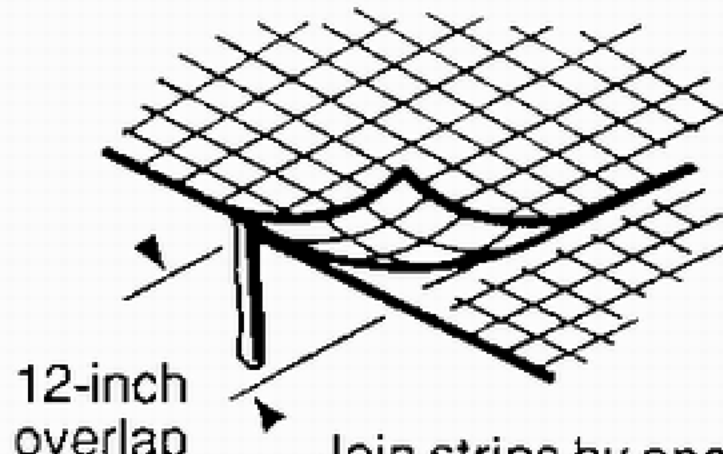
Inspect at regular intervals and after each runoff-producing storm event. Make repairs as necessary to restore complete coverage and full effectiveness of the matting or netting.



In channels, roll out strips of netting parallel to the direction of flow and over the protective mulch.



Anchor netting in a 12-inch trench



Join strips by anchoring and overlapping.

Soil Binders BMP 19

Description

Polyacrylamide (PAM) is a chemical that can be applied to disturbed soils at construction sites to reduce erosion and improve settling of suspended sediment.

PAM increases the soil's available pore volume, thus increasing infiltration and reducing the quantity of stormwater runoff that can cause erosion. Suspended sediment from PAM-treated soils exhibit increased flocculation over untreated soils. The increased flocculation aids in their deposition, thus reducing stormwater runoff turbidity and improving water quality.

Applications

PAM is suitable for use on disturbed soil areas that discharge to a sediment trap or sediment basin. PAM is typically used in conjunction with other BMPs to increase their performance. PAM can be applied to the following areas:

- Rough graded soils that will be inactive for a period of time
- Final graded soils before application of final stabilization (e.g., paving, planting, mulching)
- Temporary haul roads prior to placement of crushed rock surfacing
- Compacted soil road base
- Construction staging, materials storage, and layout areas
- Soil stockpiles
- Areas that will be mulched

Limitations

Drainage area – unlimited	Maximum slope – unlimited
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – fair
Drainage/flood control – no	

- PAM should not be directly applied to water or allowed to enter a water body.
- Do not use PAM on a slope that flows into a water body without passing through a sediment trap or sediment basin.
- PAM will work when applied to saturated soil but is not as effective as applications to dry or damp soil.
- PAM designated for erosion and sediment control should be "water soluble" or "linear" or "non-cross linked."

Targeted Pollutants

Sediment

Application Guidelines

- PAM should be used in conjunction with other BMPs and not in place of other BMPs, including both erosion and sediment controls.
- Stormwater runoff from PAM treated soils should pass through a sediment control BMP prior to discharging to surface waters.
  - ✓ When the total drainage area is greater than or equal to 5 acres, PAM treated areas should drain to a sediment basin.

✓ Areas less than 5 acres should drain to sediment control BMPs, such as a sediment trap, or a minimum of three check dams per acre. The total number of check dams used should be maximized to achieve the greatest amount of settlement of sediment prior to discharging from the site. Each check dam should be spaced evenly in the drainage channel.

- Do not add PAM to water discharging from the site.
- On PAM treated sites, the use of silt fence and fiber rolls should be maximized to limit the discharges of sediment to sediment traps and sediment basins.
- All areas no being actively worked on should be covered and protected from rainfall. PAM should not be the only cover BMP used.
- PAM can be applied to wet soil, but dry soil is preferred due to less sediment loss.
- Proper application and re-application plans are necessary to ensure total effectiveness of PAM usage.
- PAM, combined with water, is very slippery and can be a safety hazard. Care should be taken to prevent spills of PAM powder onto paved surfaces. During an application of PAM, prevent over spray from reaching pavement, as pavement will become slippery. If PAM powder gets on skin or clothing, wipe it off with a rough towel rather than washing with water; this only makes cleanup messier and longer.

Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at 2-week intervals during the non-rainy season.
- Areas where erosion is evident should be repaired and BMPs re-applied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require re-application of BMPs.
- PAM should be reapplied on actively worked areas after a 48-hour period if PAM is to remain effective.
- Reapplication is not required unless PAM-treated soil is disturbed or unless turbidity levels show the need for an additional application.
- If PAM treated soil is left undisturbed a reapplication may be necessary after 2 months.
- More PAM applications may be required for steep slopes, silty and clayey soil (USDA Classification Type “C” and “D” soils), long grades, and high precipitation areas.
- When PAM is applied first to bare soil and them covered with straw, a reapplication may not be necessary for several months.

Topsoiling BMP 20

Description

Topsoiling is the placement of topsoil or other suitable plant growth material over disturbed lands to provide a suitable soil medium for vegetative growth and a supply of native or locally occurring seeds and propagules. Topsoiling may involve bringing in soils from off site or merely replacing fertile topsoil that was stripped and stockpiled during earlier site development activities.

Applications

Topsoiling is recommended on slopes 2:1 or flatter where the native soil is unsuitable for vegetative growth. It is an effective way of improving plant establishment on sites where moisture, nutrients, or pH levels are low, or where the remaining soil is too shallow to support root systems.

Limitations

Drainage area – unlimited	Maximum slope – 50%
Minimum bedrock depth – 3 ft	Minimum water table – 2 ft
NRCS soil type – N/A	Freeze/thaw – fair
Drainage/flood control – no	

Be careful not to apply topsoil over a subsoil of contrasting texture. For instance, clay-like topsoil placed over a sandy soil may cause the topsoil to slough as water flows between the two soil layers of different permeability. Also, topsoil should not be applied when the subsoil is frozen or extremely wet.

Targeted Pollutants

Sediment

Design Parameters

Plan to maintain the existing or established grade of the subsoil. The topsoil should be uniformly distributed at a minimum compacted depth of 2 in. on slopes 3:1 or steeper, and 4 in. deep on flatter slopes. The soil should be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or other mixture approved by an agronomist. It should be free of subsoil, refuse, sticks, noxious weed seeds, other extraneous materials, and stones larger than 1.5 in. diameter.

Topsoil can either be obtained commercially or stripped, stockpiled, and replaced on the construction site. Stockpiled topsoil should undergo a laboratory analysis to determine organic content, pH, and soluble salts. A pH of 6.0 to 7.5 and organic content of not less than 1.5% by weight is recommended. Where soil pH is less than 6.0, lime may be applied to adjust pH to 6.5 or higher. Any soils having soluble salt content greater than 500 parts per million should not be used.

If desired, it is possible to place a thin layer of topsoil 1.2 to 2 in. thick on benched slopes. In such applications, it is important not to apply so much topsoil that the value of the benches is destroyed. This method is especially valuable on rocky benches, especially on south- or west-facing slopes, however, proper placement of the soil is often a problem. In some cases, soil has been bucketed onto slopes. This produces an uneven spread and the

Seeding BMP 21

Description

Permanent Seeding means growing a long-term or permanent vegetative cover (plants) on disturbed areas or areas that need assistance in revegetation. The purpose of permanent seeding is to reduce erosion and sedimentation and to establish desirable competitive ground cover for wildlife habitat and ease of roadside maintenance. This practice uses prescribed perennial grasses, legumes and native shrubs or wild flowers that will hold the soils, reduce stormwater runoff and act as a bio-filtering system on long-term basis.

The guidelines given in this fact sheet for design, construction and maintenance can also be used to install temporary seeding on construction sites.

Applications

Temporary seeding should be considered as slope protection and erosion control practice for construction sites. Permanent seeding should be considered for any disturbed area where all construction or maintenance activities have ceased or been finalized and is now ready for permanent vegetative cover. Typical areas subject to permanent vegetative cover are all areas disturbed by new construction, reconstruction and maintenance, and materials source site and areas in need of revegetation.

The primary advantages of seeding are:

- It establishes good soil stabilization.
- It prevents soil erosion and sedimentation.
- It contains and filters stormwater runoff.

Additional advantages specific to permanent seeding are:

- It provides wildlife ground cover and habitat.
- It competes with undesirable vegetation and noxious weeds.
- It provides aesthetic qualities.
- It reduces the cost of maintenance.

Limitations

Drainage area – unlimited	Maximum slope – 5%
Minimum bedrock depth – 2 ft	Minimum water table – 2 ft
NRCS soil type – N/A	Freeze/thaw – fair
Drainage/flood control – no	

Permanent vegetative ground cover will take several years before sufficient establishment takes place. Establishment will occur quicker in high precipitation areas, usually over 20 in., as opposed to the arid or semi-arid regions of the state. Permanent seeding should be conducted in conjunction with various forms of mulching, matting, and annual grass (cereal grain) as a nurse crop.

Other factors that contribute to the success or failure of permanent seeding are:

- Seeding should be done at the proper time of year.
- Proper application of fertilizers as prescribed will contribute to the success of the seeding.
- Once seeded, the site should not be disturbed.
- Irrigation may have to be used in low precipitation area (arid/semi-arid) for establishment.

Targeted Pollutants

Sediment
Phosphorus
Trace metals

Design Parameters

Conduct all permanent seeding and fertilizing in accordance with local requirements. See Volume 4, Appendix C, Stormwater Plant Materials for additional guidelines.

Construction Guidelines

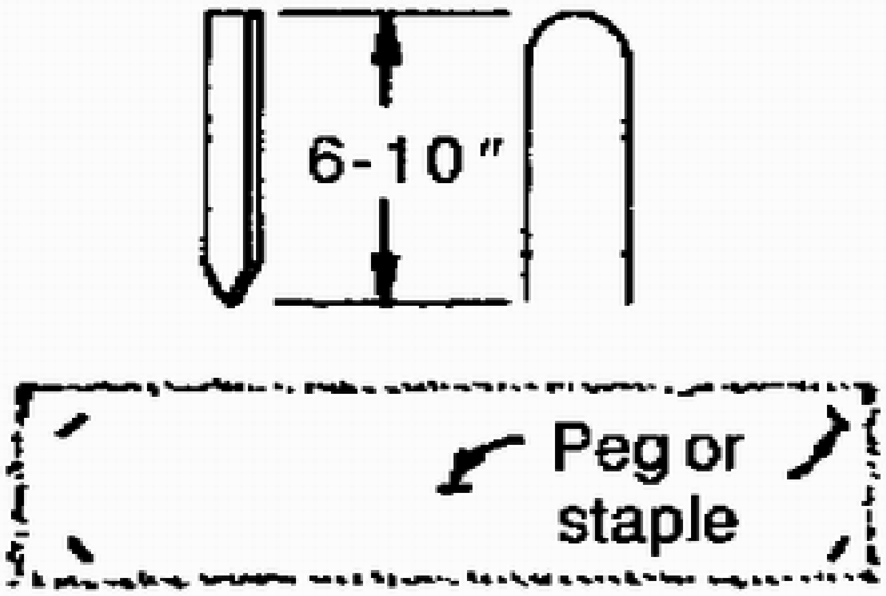
Permanent seeding is the last phase of reclaiming any disturbed soils.

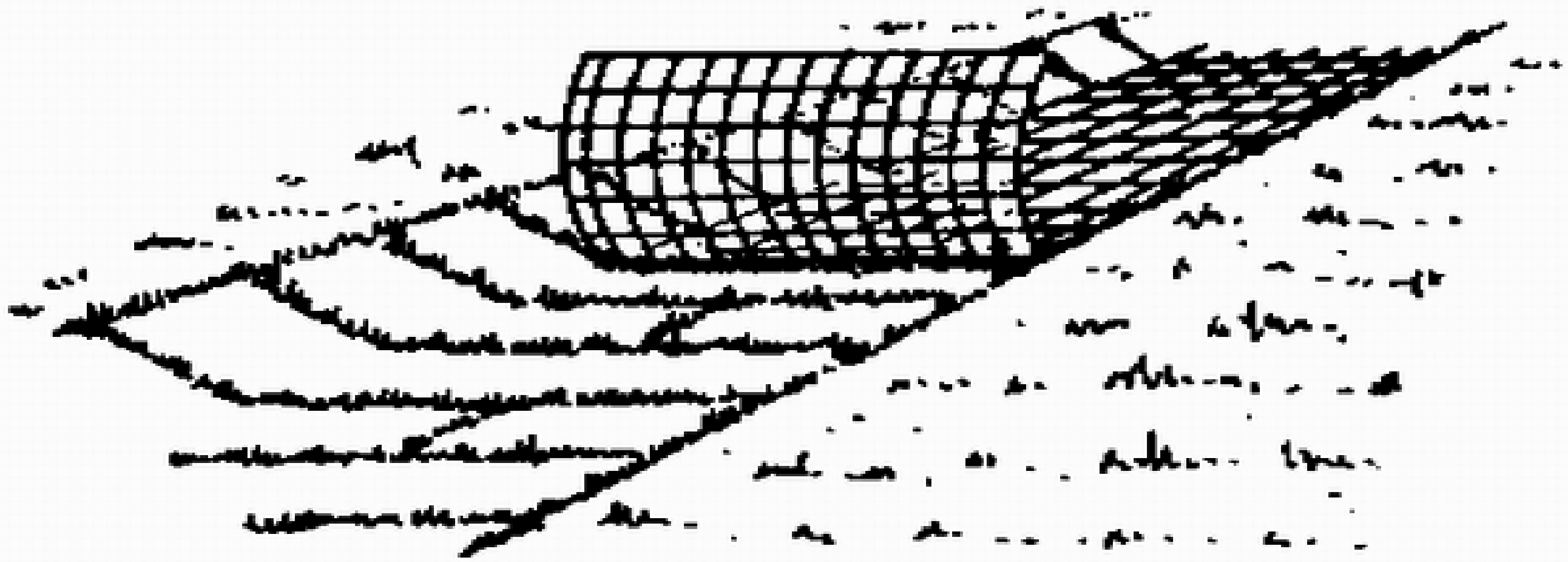
Maintenance

- Inspect all seeded areas on a regular basis and after each major storm event to check for areas where corrective measures may have to be made.
- Indicate which areas need to be reseeded or where other remedial actions are necessary to assure establishment of permanent seeding.
- Continue monitoring of the site/area until permanent vegetation is established.

Lay sod across the direction of flow.

Use pegs or stables to fasten sod firmly at the ends of strips and in the center, or every 3-4′ if the strips are long. When ready to mow, drive pegs or staples flush with the ground.





In critical areas, secure sod with netting and staples.

Planting BMP 23

Description

Planting is the process of establishing vegetation by setting out plants that have been grown to a specified size or age. The plants may be potted in plastic tubes or in containers of various sizes, root wrapped, or may be bare rootstock.

Plantings are often specified for aesthetic purposes (landscaping) but can serve various erosion control functions as well. The living trees and shrubs in a planted area will grow large enough to provide soil stabilization and erosion control benefits sooner than the seeds of woody species can germinate and grow to effective size.

The use of trees and shrubs also provides greater aesthetic and biological diversity and, in many areas, is more compatible with vegetation on lands adjoining the planted site.

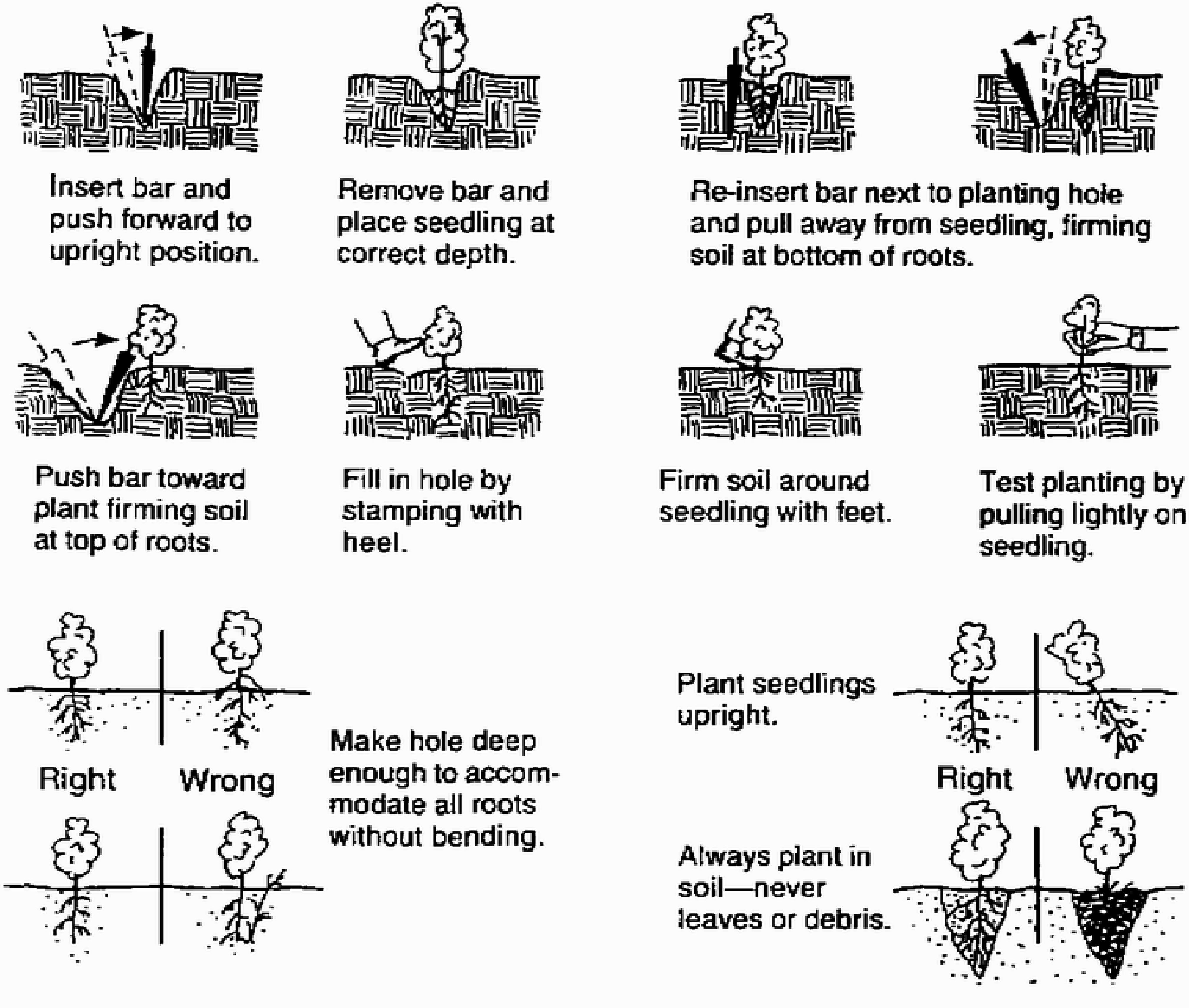
Also refer to Volume 4, Appendix C: Stormwater Plant Materials, for additional design guidance regarding using landscaping to maximize water quality benefits.

Applications

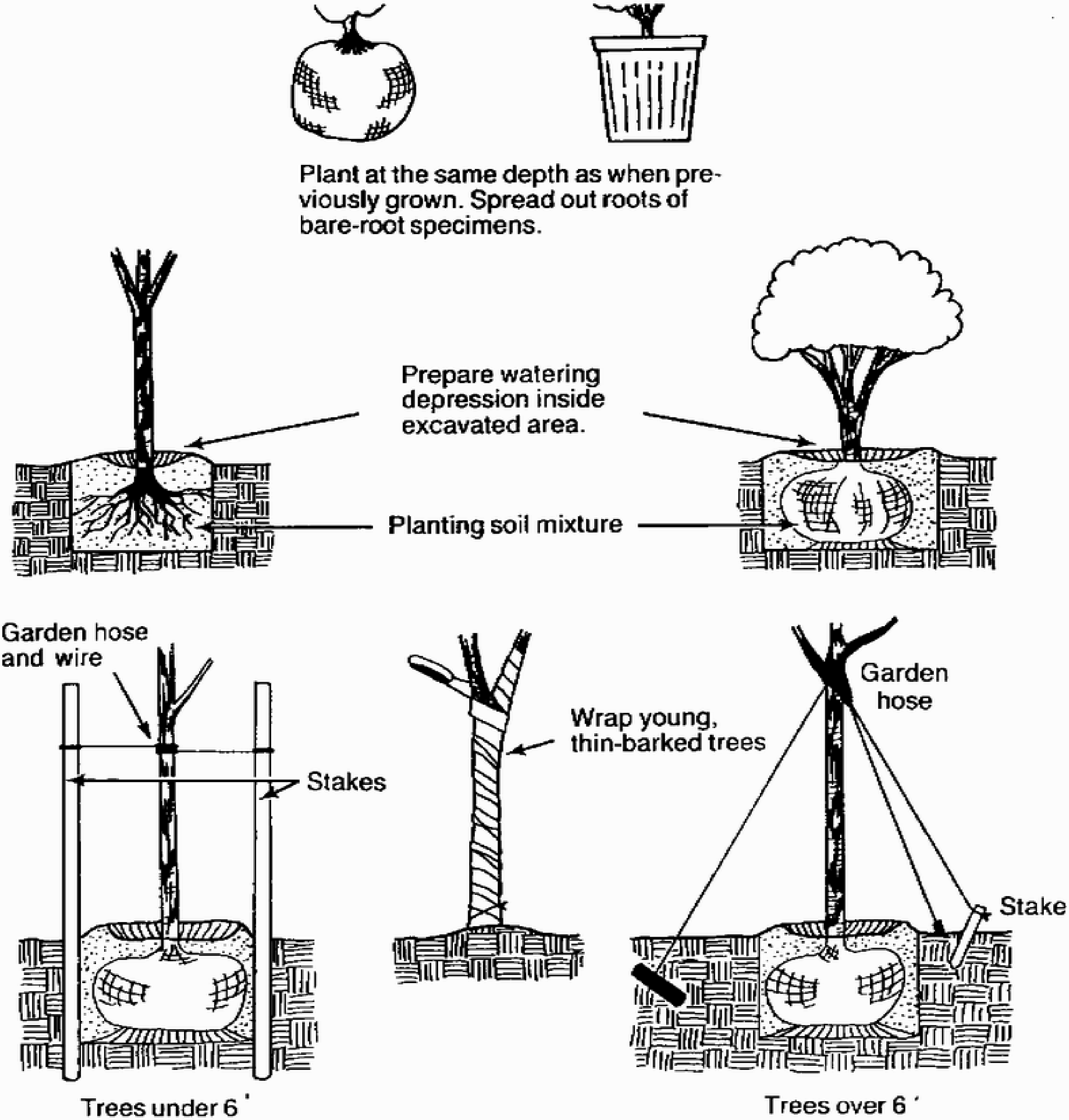
- Planting is the preferred method of revegetation in many situations where seeding and other slope treatments are either not effective or not appropriate as permanent measures. Such areas may include the following:
- Any finished slope that will remain undisturbed for at least 10 years, especially if the area is bordered by forests, wetlands or other naturally occurring woody vegetation. On such sites, trees and shrubs may be the desirable vegetation from a long-term perspective, but they may be very difficult or unreliable to establish from seed.
- Extremely rocky slopes or sites: If natural vegetation is present in significant amounts, such areas are difficult to seed and mulch effectively. Plantings can be used to provide additional stabilization.
- Streets or materials source sites that have been abandoned permanently.
- All types of landscaping, including urban thoroughfares, interchanges, and residential streets where landscape aesthetics are a concern.
- Wetlands and wildlife habitat areas: in such areas, it may be critical to plant the desired species initially so that the site is not overrun by weeds or undesirable plant species that detract from the intended use of the site.
- Areas where the higher rate of transpiration for trees and shrubs (compared to grasses and forbs) helps remove excess moisture from the soil.

Limitations

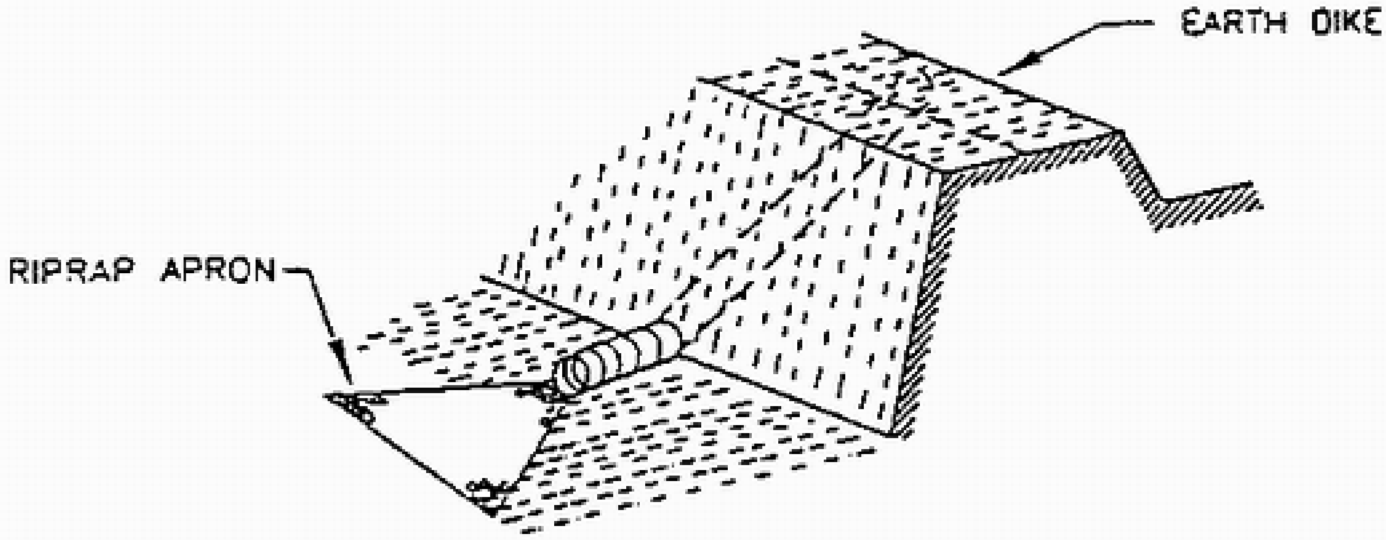
Drainage area – unlimited	Maximum slope – 50%
Minimum bedrock depth – 3 ft	Minimum water table – 3 ft
NRCS soil type – ABCD	Freeze/thaw – fair
Drainage/flood control – no	



Planting bare-root seedlings (modified from Va. Div. of Forestry).

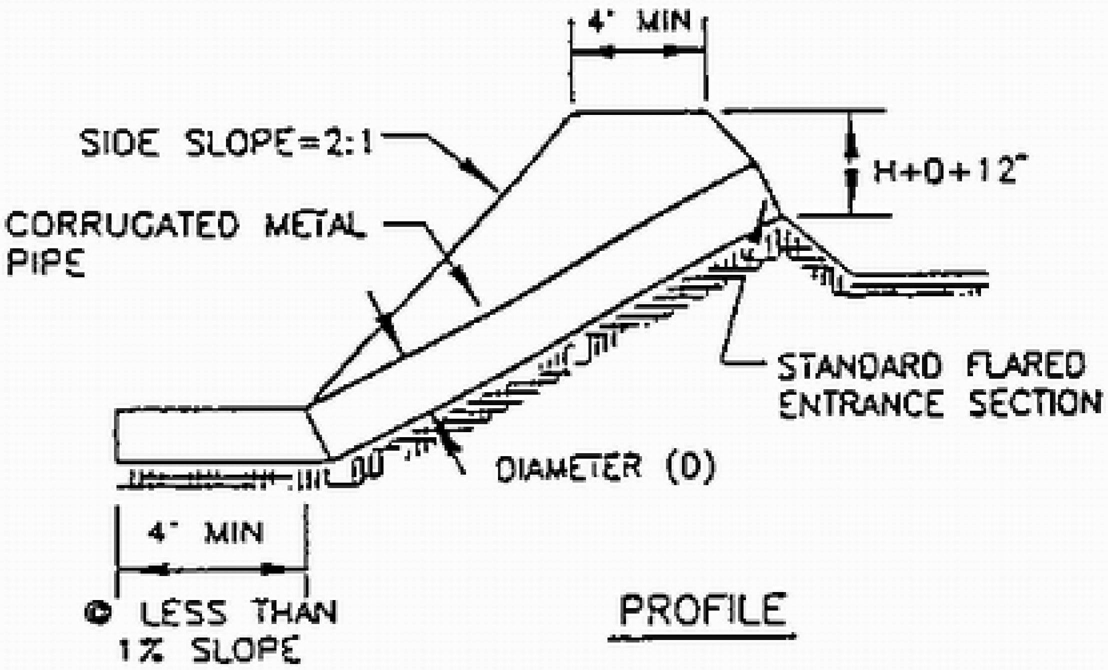

Plant at the same depth as when previously grown. Spread out roots of bare-root specimens.
Prepare watering depression inside excavated area.
Planting soil mixture
Garden hose and wire
Stakes
Wrap young, thin-barked trees
Garden hose
Stake
Trees under 6 ′
Trees over 6 ′

PIPE SLOPE DRAIN (RIGID)

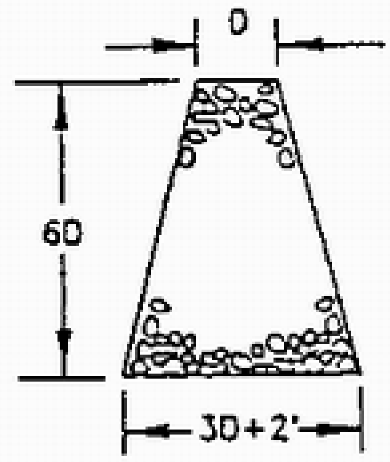


PERSPECTIVE VIEW

GSS-2
PSD-DIAM
STANDARD SYMBOL



PROFILE



RIPRAP SHALL CONSIST OF 6" DIAMETER STONE PLACED AS SHOWN AND SHALL BE A MINIMUM OF 12" IN THICKNESS.

RIPRAP APRON PLAN

NOTE. SIZE DESIGNATION IS: PSD-PIPE DIAMETER
(ie. PSD-12 = PIPE SLOPE DRAIN WITH 12" DIAMETER PIPE)

CONSTRUCTION SPECIFICATIONS

1 THE PIPE SLOPE DRAIN SHALL HAVE A SLOPE OF 3% OR STEEPER.

2 TOP OF THE EARTH DIKE OVER THE INLET PIPE AND ALL DIKES CARRYING WATER TO THE PIPE SHALL BE AT LEAST ONE FOOT HIGHER THAN THE TOP OF THE PIPE.

3 ADD 0.3 FOOT TO DIKE HEIGHT FOR SETTLEMENT.

4 SOIL AROUND AND UNDER THE SLOPE PIPE SHALL BE HAND TAMPED IN 4 INCH LIFTS.

5 THE PIPE SHALL BE CORRUGATED METAL PIPE WITH WATERTIGHT 12 INCH CONNECTING BANDS OR FLANGE CONNECTIONS.

6 RIPRAP TO BE 4-8 INCHES IN A LAYER AT LEAST 8 INCHES IN THICKNESS AND PRESSED INTO THE SOIL.

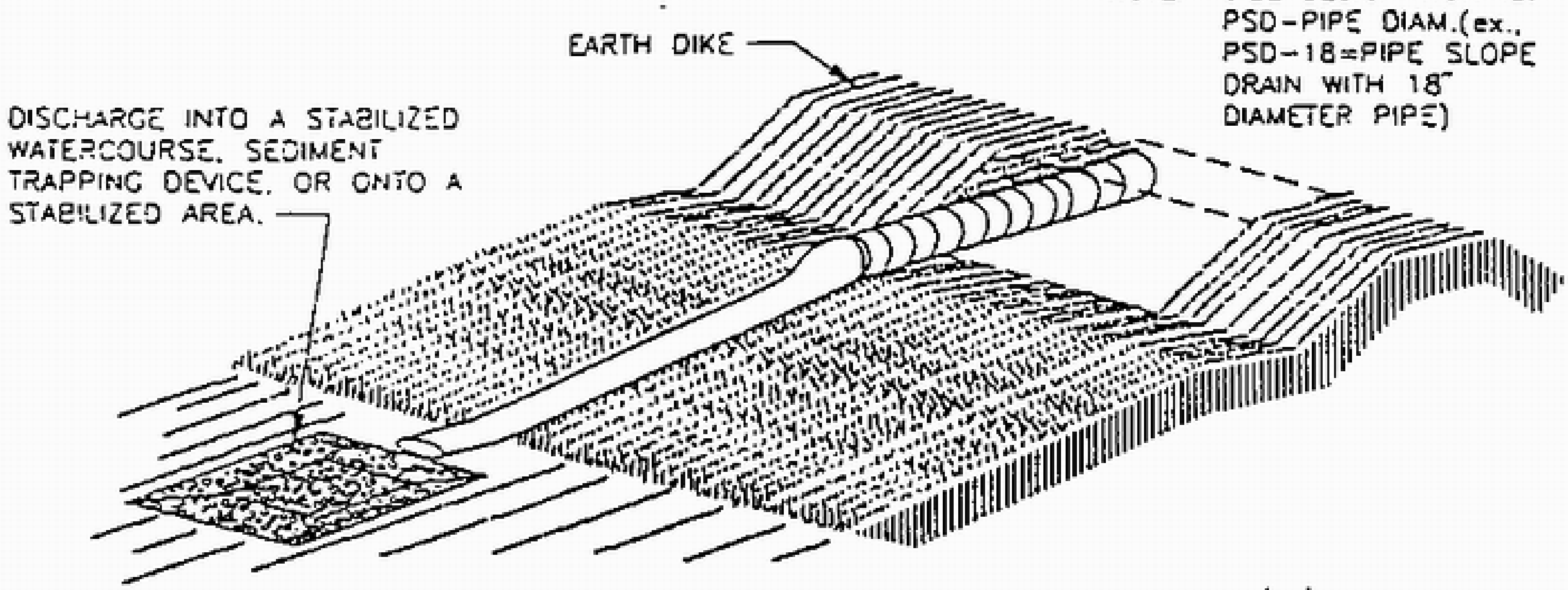
7 PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

MAXIMUM DRAINAGE AREA: 5 ACRES

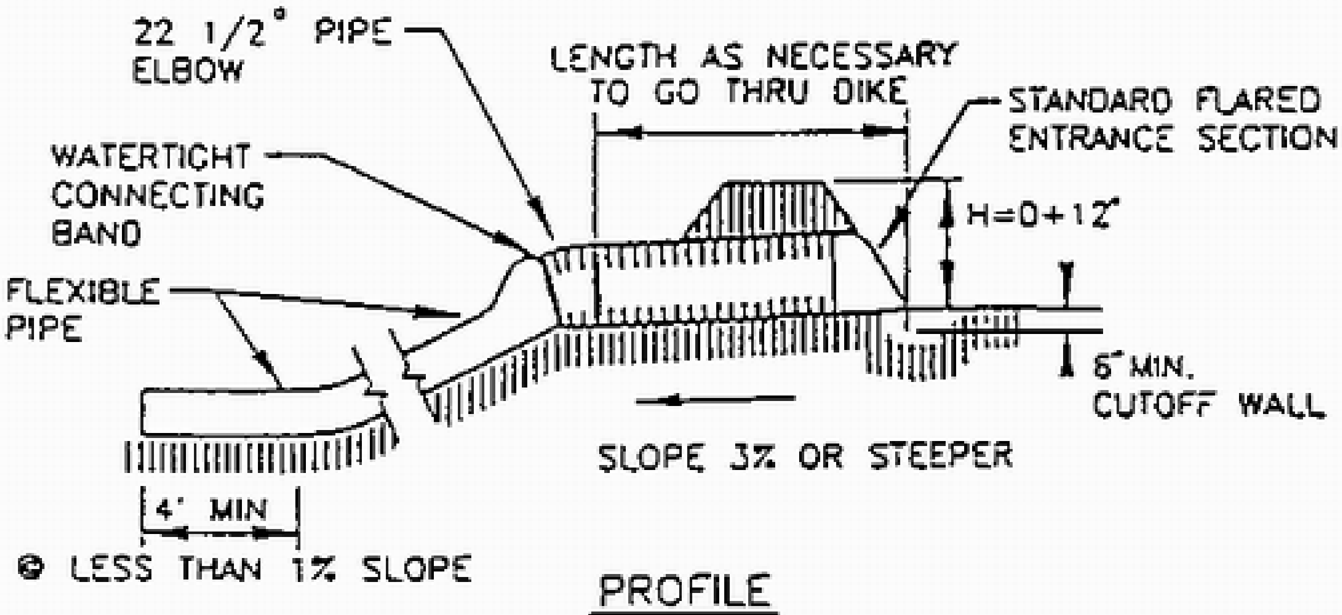
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	GRADE STABILIZATION STRUCTURE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		GSS-2

PIPE SLOPE DRAIN (FLEXIBLE)*

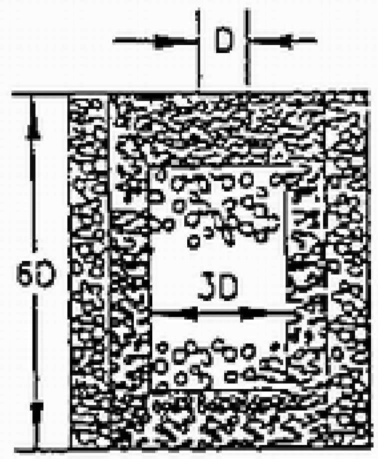
NOTE. SIZE DESIGNATION IS: PSD-PIPE DIAM.(ex., PSD-18=PIPE SLOPE DRAIN WITH 18" DIAMETER PIPE)



PERSPECTIVE VIEW



PROFILE



RIPRAP SHALL CONSIST OF 6" DIAMETER STONE PLACED AS SHOWN. DEPTH OF APRON SHALL EQUAL THE PIPE DIAMETER AND RIPRAP SHALL BE A MINIMUM OF 12" IN THICKNESS.

RIPRAP APRON PLAN

CONSTRUCTION SPECIFICATIONS

1. THE INLET PIPE SHALL HAVE A SLOPE OF 3% OR STEEPER.
2. THE TOP OF THE EARTH DIKE OVER THE INLET PIPE AND THOSE DIKES CARRYING WATER TO THE PIPE SHALL BE AT LEAST 1' HIGHER AT ALL POINTS THAN THE TOP OF THE INLET PIPE.
3. THE INLET PIPE SHALL BE CORRUGATED METAL PIPE WITH WATERTIGHT CONNECTING BANDS.
4. THE FLEXIBLE TUBING SHALL BE THE SAME DIAMETER AS THE INLET PIPE AND SHALL BE CONSTRUCTED OF A DURABLE MATERIAL WITH HOLD-DOWN GROMMETS SPACED 10' ON CENTERS.
5. THE FLEXIBLE TUBING SHALL BE SECURELY FASTENED TO THE CORRUGATED METAL PIPE WITH METAL STRAPPING OR WATERTIGHT CONNECTING COLLARS.
6. THE FLEXIBLE TUBING SHALL BE SECURELY ANCHORED TO THE SLOPE BY STAKING AT THE GROMMETS PROVIDED.
7. A RIPRAP APRON SHALL BE PROVIDED AT THE OUTLET. THIS SHALL CONSIST OF 6" DIAMETER STONE PLACED AS SHOWN ON THE ABOVE DRAWING.
8. THE SOIL AROUND AND UNDER THE INLET PIPE AND ENTRANCE SECTION SHALL BE HAND TAMPED IN 4" LIFTS TO THE TOP OF THE EARTH DIKE.
9. FOLLOW-UP INSPECTION AND ANY NEEDED MAINTENANCE SHALL BE PERFORMED AFTER EACH RAIN EVENT.

* DRAINAGE AREA MUST NOT EXCEED 5 ACRES.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	GRADE STABILIZATION STRUCTURE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		GSS-3

Slope Roughening BMP 25

Description

Slope roughening entails establishing a rough soil surface by creating horizontal grooves, furrows, depressions, or steps running parallel to the slope contour over the entire face of a slope. This reduces the speed of runoff, increases infiltration, and traps sediment. It also helps establish vegetative cover by reducing runoff velocity and providing stable, level areas where seedlings can take hold and grow. This measure may be used prior to seeding/planting and should be applied using appropriate machinery.

Alternately, in some cases, leaving the slope in a roughened condition will control erosion and provide suitable rooting areas for plant seedlings better than a finely graded slope. Other measures, such as flow diversion should be used to keep erosion from occurring while vegetation is being established.

Applications

Slope and surface roughening provide simple, inexpensive, and immediate short-term erosion control for bare soil where vegetative cover is not yet established. The practice is appropriate for all slopes, although different methods are used depending on the steepness of the slope, the type of slope (cut or fill), soil and rock characteristics, future mowing and maintenance requirements, and type of equipment available. All slopes steeper than 3:1 and greater than 5 ft vertical height require roughening and may also require terracing, grooving, or furrowing prior to seeding.

Limitations

Drainage area – 1 ac.	Maximum slope – 20%
Minimum bedrock depth – 3 ft	Minimum water table – 5 ft
NRCS soil type - BCD	Freeze/thaw – good
Drainage/flood control – no	

This BMP is limited to slopes in medium to highly cohesive soils or in soft rock that can be excavated without ripping. Slope angle should be gentle enough to permit access to heavy equipment. The method is not applicable for use in moraines and other depositional soils. In addition, serration is of limited effectiveness in anything more than a gentle rain, and it is only a temporary measure. If the roughening is washed away in a heavy storm, the surface will have to be reroughened and reseeded. This BMP is not a stand-alone measure; it should be implemented in conjunction with other BMPs.

Targeted Pollutants

Sediment

Design Parameters

Slope roughening can be used with seeding, planting, and temporary mulching to stabilize an area. For steeper slopes and slopes that will be left roughened for longer period of time, try a combination of surface roughening and vegetative stabilization. Surface roughening should be applied immediately after grading activities have ceased (temporarily or permanently) in an area. Different methods can be used to roughen the slope surface. They include stair-step grading, grooving (using disks, spring harrows, or teeth on a front-end loader), and tracking (driving a crawler tractor up and down a slope, leaving the cleat imprints perpendicular to the slope). The selection of an appropriate method depends on the grade of the slope, mowing requirements after vegetative cover is established, whether the slope was formed by cutting or filling, and type of equipment available.

Slopes steeper than 2:1: Any slope steeper than 2:1 should be terraced or stair-step graded, with benches wide enough to retain sediment eroded from the slope above (see BMP 26-Gradient Terracing).

Slopes between 3:1 and 2:1: Cut slopes with a gradient steeper than 3:1 but less than 2:1 should be stair-step graded or groove cut. Stair-step grading works well with soils containing large amounts of small rock. Each step catches material discarded from above and provides a level site where vegetation can grow. Stairs should be wide enough to work with standard earth-moving equipment. Any implement that can be safely operated on the slope, including those described above, can do grooving. Grooves should not be less than 3 in. deep or more than 16 in. apart.

Fill slopes with a gradient steeper than 3:1 but less than 2:1 should be compacted every 12 in. of depth. The face of the slope should consist of loose, uncompacted fill 4 to 6 in. deep that can be left rough or can be grooved as described above, if necessary.

It is important to avoid excessive compacting of the soil surface, especially when tracking because soil compaction inhibits vegetation growth and causes higher runoff speed. Therefore, it is best to limit roughening with tracked machinery to sandy soils that do not compact easily and to avoid tracking on clay soils.

Slopes flatter than 3:1: Any cut or filled slope that will be mowed should have a gradient less than 3:1. Such a slope can be roughened with shallow grooves parallel to the slope contour by using normal tilling. Grooves should be close together (less than 10 in. and not less than 1 in. deep).

Construction Guidelines

Timing of work: To slow erosion, slope or surface roughening should be done as soon as possible after the vegetation has been removed from the slope. The roughened areas should be seeded as quickly as possible, preferably within 7 days after serration/roughening if weather conditions or water availability permits. In material that ravels or sloughs readily, delay the revegetation effort until at least 30 days after slope serration.

On slopes composed of material that weathers rapidly, slope roughening should be completed early in the summer. This will allow material to slough off the step face prior to fall seeding or planting so it does not smother the seeds or seedlings.

Equipment: Various types of heavy equipment of various kinds can be successfully used for slope roughening:

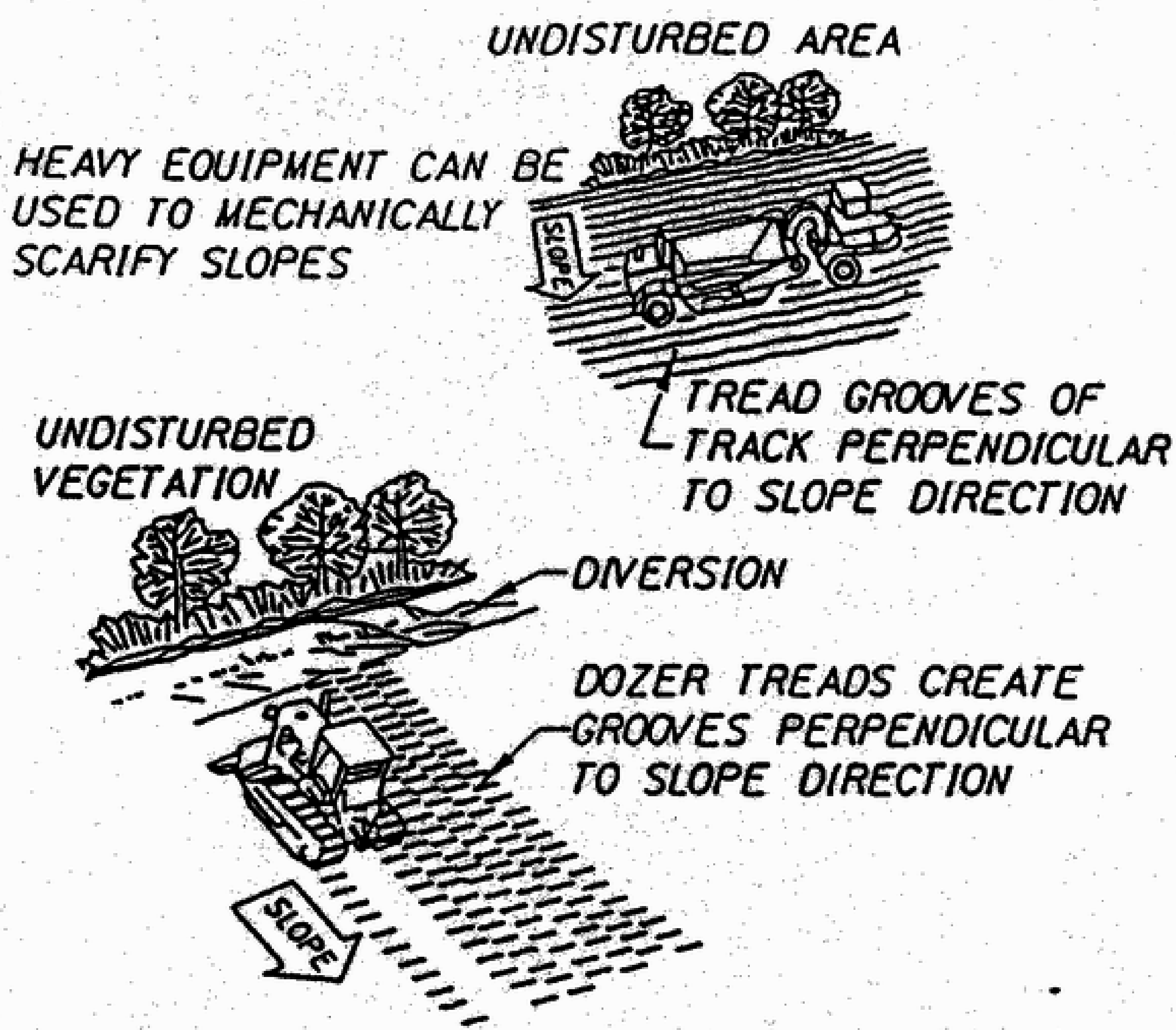
- A front-end loader equipped with disks, harrows, or teeth can make grooves across the slope.
- Driving a crawler tractor up and down the slope will make cleat imprints perpendicular to the slope.
- A dozer, equipped with a special blade containing a series of square grooves and positioned at the same angle as the cut, can serrate the slope along the contours.

Methods:

- Fill slopes constructed with highly erodible soils or soils containing high-clay contents should be minimally compacted prior to establishing a roughened surface. However, excessive compaction of the surface soil is undesirable because of reduction in infiltration and suppression of vegetation rooting.
- Make the grooves or depressions approximately horizontal (or parallel the roadway grade if its profile grade is less than 2%).
- Excavate each series of grooves in the opposite direction from the preceding series to minimize buildup of loose material at the ends of the steps or cuts.
- Loose material collected at the ends of steps should be removed and the ends blended into the natural ground surface.
- If encountering rock that is too hard to rip, try to blend the grooves into the rock.
- Remove materials which fall into the ditchline or roadway and any rock fragments larger than one-third the shelf width.
- Construct a slope bench at the bottom of the slope face.

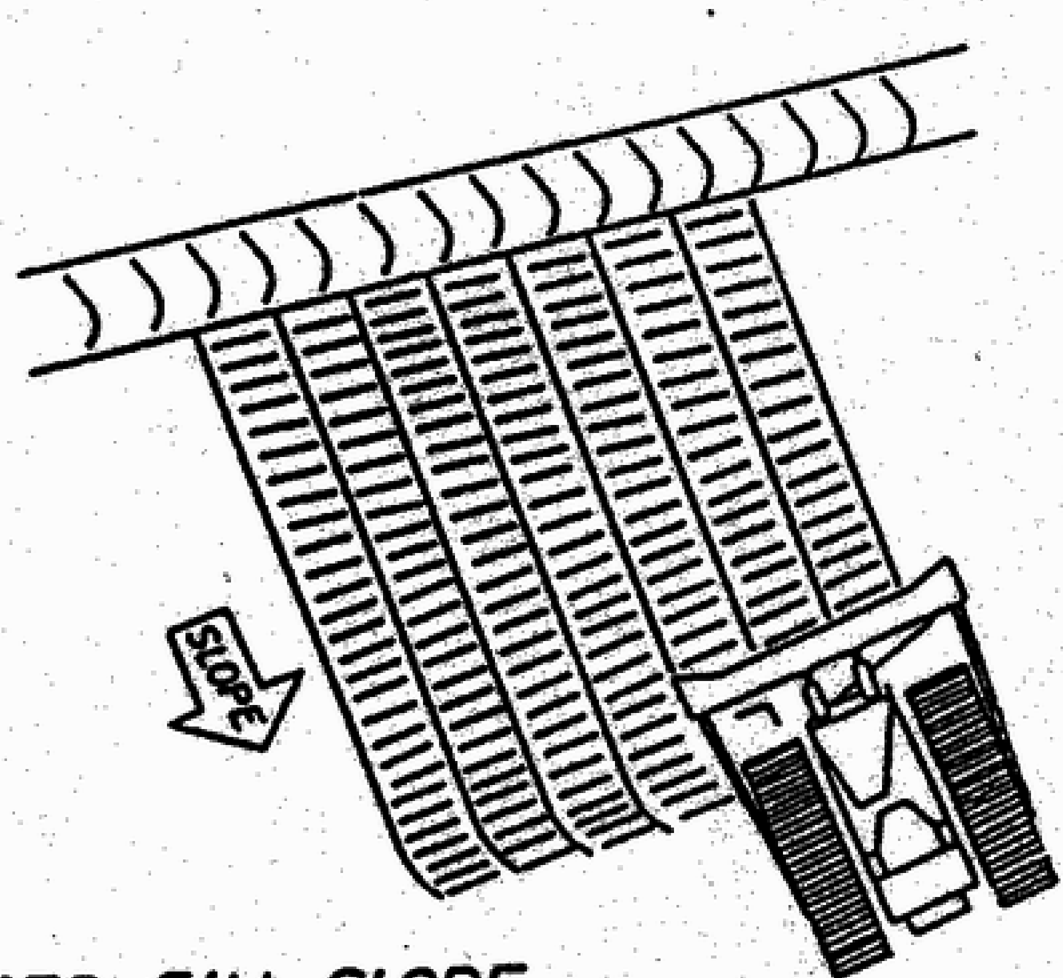
Maintenance

Inspect the slopes periodically for damage from surface runoff and seepage and inspect after each runoff-producing storm. Damage caused by construction-related activities should be repaired as soon as possible. If rills appear (small watercourses that have steep sides and are usually less than 4 in. deep), they should be immediately filled, and the slope should be promptly regraded and adequately protected.



UNVEGETATED SLOPES SHOULD BE TEMPORARILY
SCARIFIED TO MINIMIZE RUNOFF VELOCITIES

SURFACE ROUGHENING



SCARIFIED FILL SLOPE

Gradient Terracing BMP 26

Description

Gradient terracing is a term used to describe an earth embankment or ridge-and-channel arrangement constructed along the face of a slope at regular intervals. Gradient terraces are constructed at a positive grade. They reduce erosion damage by capturing surface runoff and directing it to a stable outlet at a speed that minimizes erosion.

Applications

Gradient terraces are usually limited to use on long, steep slopes that have a water erosion problem or where it is anticipated that water erosion will be a problem. They are used for reducing runoff velocity and increasing the distance of overland runoff flow. They hold moisture better than do smooth slopes, and they minimize sediment loading of surface runoff.

Limitations

Drainage area – 10 ac.	Maximum slope – 50%
Minimum bedrock depth – 6 ft	Minimum water table – 8 ft
NRCS soil type - BCD	Freeze/thaw – good
Drainage/flood control – yes	

Gradient terraces should not be constructed on excessively steep slopes or in areas with sandy or rocky soils. They will be effective only where suitable runoff outlets will be available. Gradient terraces may significantly increase cut and fill costs and cause sloughing if too much water infiltrates the soil.

Targeted Pollutants

Sediment

Design Parameters

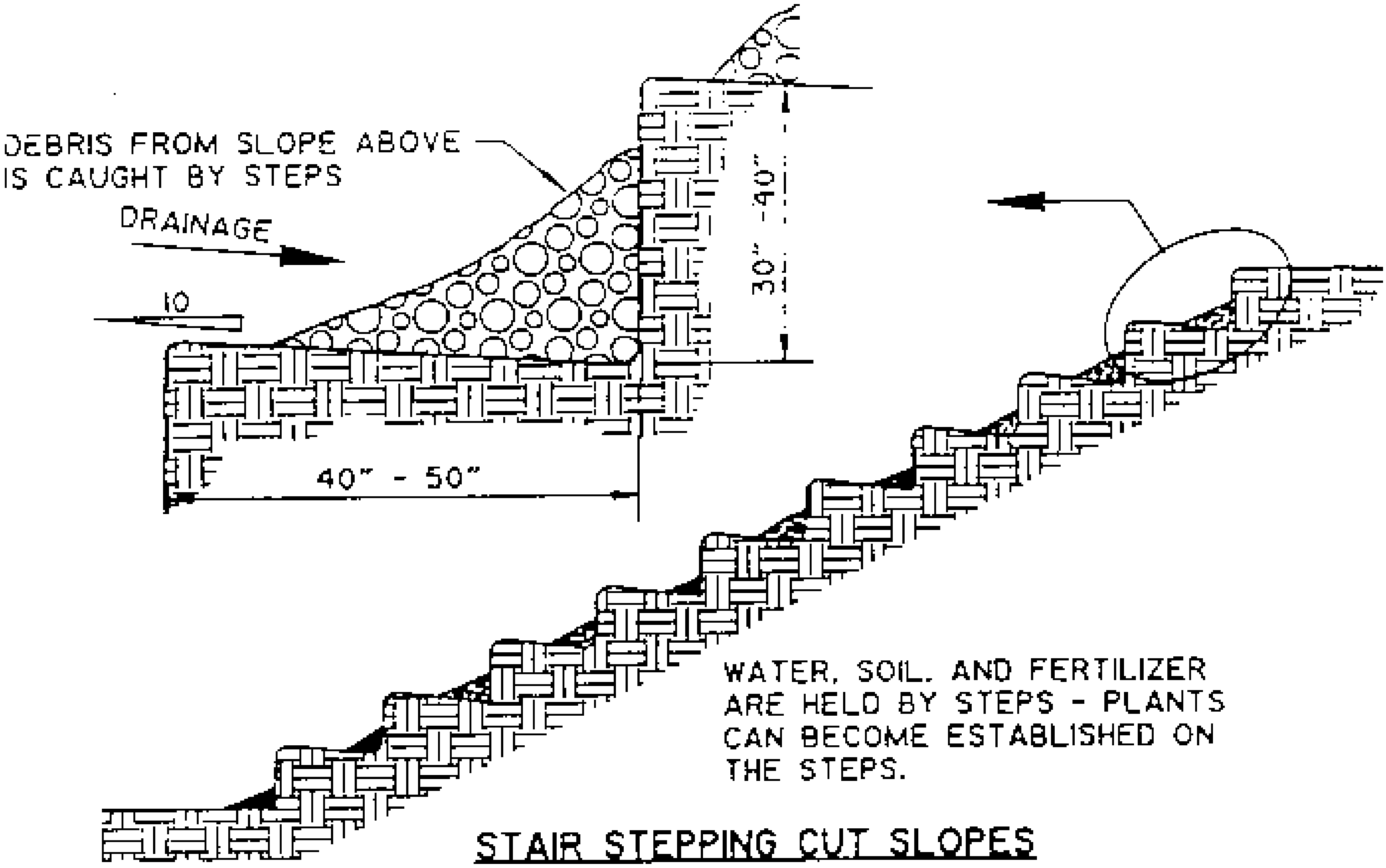
Gradient terraces should be designed and installed according to a plan determined by an engineering survey and layout. It is important that gradient terraces are designed with adequate outlets, such as a grassed waterway, vegetated area, or tile outlet. In all cases, the outlet should direct the runoff from the terrace system to a point where the outflow will not cause erosion or other damage. Vegetative cover should be used in the outlet where possible. The design elevation of the water surface of the terrace should not be lower than that at the junction of the outlet area when both are operating at design flow. Terraces can be constructed with linings to carry water to the outlet and can be used with a dike or similar measure above the terrace to divert runon from reaching the terraced slope.

Construction Guidelines

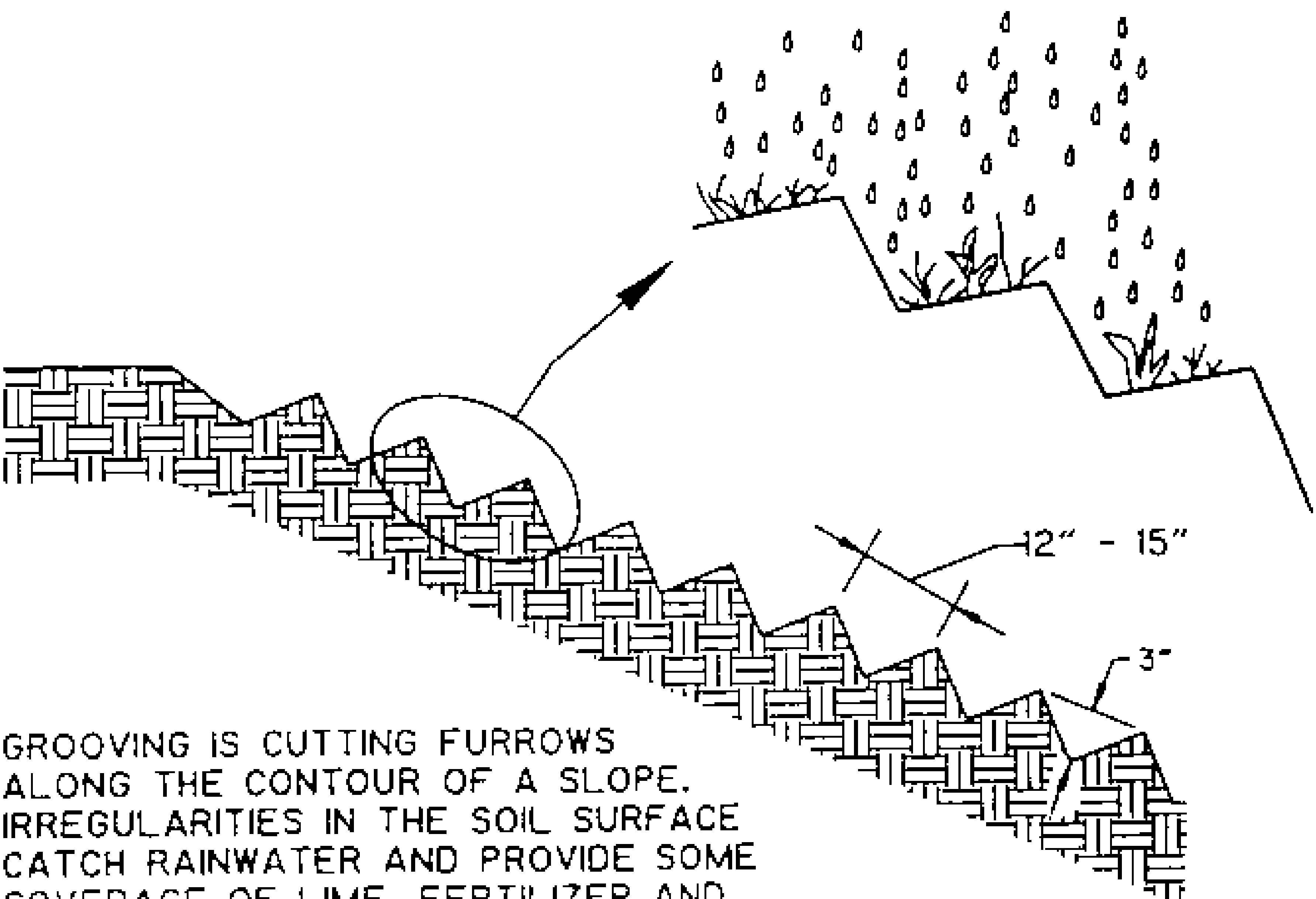
Construction of gradient terraces should be completed using equipment that is capable of meeting the specification established in the construction plans.

Maintenance

Inspect the gradient terraces regularly during project construction and inspect them after any major storm. If used as a permanent BMP, inspect at least once a year after project completion and after major storms. Evaluate whether the terrace is functioning effectively as a runoff collection and diversion device and note whether other stabilization measures (including vegetation) are performing effectively. Take prompt action as needed to ensure proper drainage and slope stability.



STAIR STEPPING CUT SLOPES



GROOVING IS CUTTING FURROWS ALONG THE CONTOUR OF A SLOPE. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND PROVIDE SOME COVERAGE OF LIME, FERTILIZER AND SEED.

GROOVING SLOPES

Temporary Channel Liners BMP 28

Description

Channel liners are geosynthetic materials or jute matting used to line the bottom or banks of ditches or channels to prevent or reduce erosion, and, to some degree, to capture sediment.

Applications

Channel liners can be left in place until a more permanent BMP is put in place, (i.e., riprap) or can assist in holding the soil until permanent seeding is established. Complete contact of the channel liner with the surface of the soil is necessary to keeping water flowing over, not under, the liner.

Limitations

Drainage area – Dependent on product used
Minimum bedrock depth - N/A
NRCS soil type – N/A
Drainage/flood control – no
Maximum slope – Dependent on product used
Minimum water table - N/A
Freeze/thaw – good

- Channel liners should never be used in live streams unless approved by the appropriate state and federal authorities.
- Channel liners are not suitable when used in ditches or channels with steep sides or where the soils are gravelly or not compacted~~,~~ because the soil may not hold the liner in place.

Targeted Pollutants

Sediment

Design Parameters

- Stable inlets and outlets should be designed and constructed prior to construction of channel liners.
- Channel liners should be installed on side slopes of 3H/1V or flatter and in channels with a low-flow velocity. The material (geosynthetic or jute matting) should be porous, long lasting (longer than 1 year) and flexible.

Construction Guidelines

Follow manufacturer's installation recommendations and the following general guidelines:

- Site preparation: Shape, grade, and compact the bottom and banks as required for a smooth fit. Remove rocks, clods, sticks, and other materials that prevent positive contact with the soil surface. Complete contact of channel liner with the soil surface is critical for satisfactory performance.
- Side ditches or channels: Treat in the same manner as the main ditch or channel.
- Channel liner applications: Start at the upstream end of the channel and continue down grade.
- Channel liner overlap: At least 3 ft with the end of the upstream liner overlapping the top of the next lower liner. The top end of the lower liner should be buried at least 6 in.. Both the top and bottom liner should be securely anchored in the area of the overlap. The outer edges of the channel liner should be buried in a trench at least 1 ft and properly anchored.

the gabion in such a manner that strength and flexibility at the point of connection is at least equal to that of the mesh.

- Where the length of the gabion exceeds its horizontal width, the gabion should be equally divided by diaphragms, of the same mesh and gage as the body of the gabions, into cells whose length does not exceed the horizontal width. The gabion should be furnished with the necessary diaphragms secured in proper position on the base section in such a manner that no additional tying at this juncture will be necessary.
- All perimeter edges should be securely selvedged or bound so that the joints formed by tying the selvedges have the same strength as the body of the mesh.
- The fill material for the wire gabions should be rock ranging in size from a minimum of 4 in to a maximum of 8 in, both measured in the greatest dimension. Rock should be sound, durable, well graded, and should be obtained from a source approved by the Project Engineer.

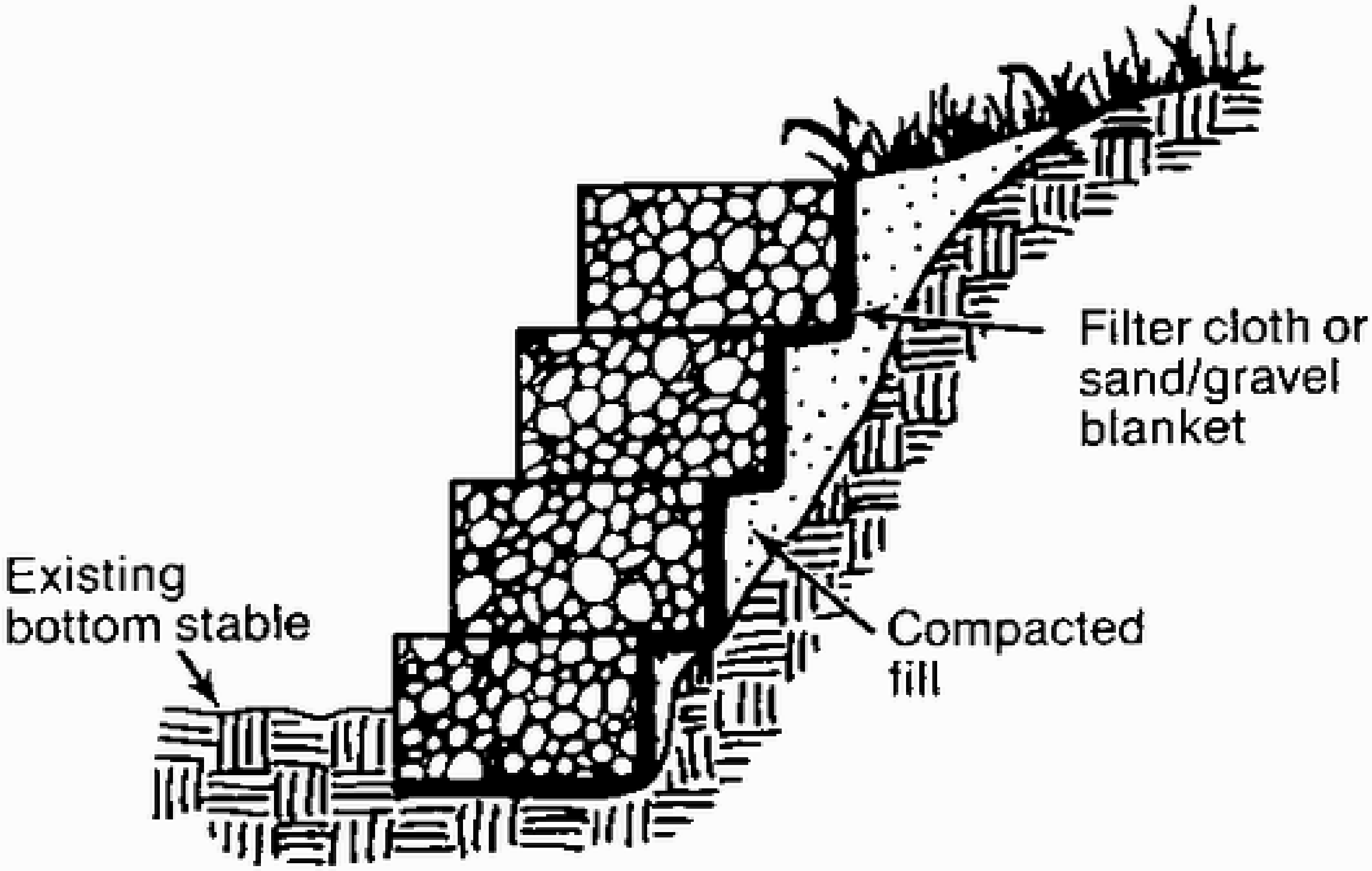
Construction Guidelines

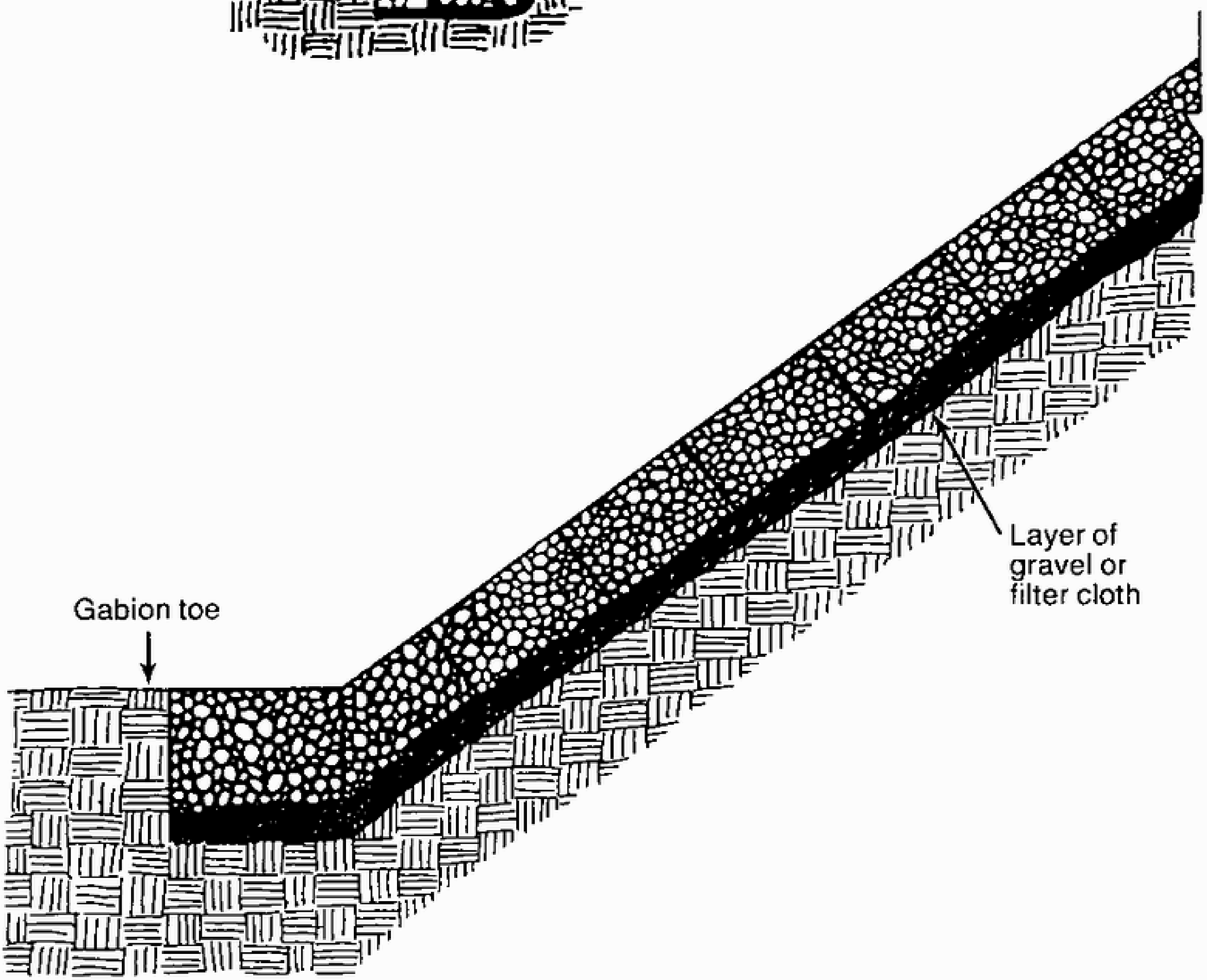
- Empty gabion baskets should be placed on a smooth, firm foundation excavated as directed by the plans. Each row, tier, or layer of baskets should be reasonably straight and should conform to the line and grade shown on the plans or established by the Project Engineer. The empty gabion baskets should be fastened to the adjacent baskets along the top and vertical edges. Each layer should be fastened to the underlying layer along the front, back and ends. Fastening should be performed in the same manner as provided for assembling the gabion units.
- Unless otherwise indicated on the plans, the vertical joints between basket units of adjacent tiers or layers, along the length of the structure, should be staggered by at least one cell.
- Before filling each gabion with rock, all kinks and folds in the wire mesh should be removed and all baskets should be properly aligned. A standard fence stretcher, chain fall or steel rod, may be used to stretch the wire baskets and hold alignment.
- The gabion cells should be carefully filled with rock placed by hand/machine in such a manner that the alignment of the structure will be maintained and so as to avoid bulges and to minimize voids. All exposed rock surface should have a reasonably smooth and neat appearance. No sharp rock edges should project through the wire mesh.
- The gabion cells in any row or layer should be filled in stages so that local deformations may be avoided. At no time should any cell be filled to a depth exceeding 12 in. more than any adjacent cell.
- The layer of rock should completely fill the gabion basket so that the lid will bear on the rock when it is secured. The lid should be joined to the sides, ends, and diaphragms in the same manner as specified for joining the vertical edges. The gabion basket lid should be secured so that no more than 1in. gap remains at any connection.
- Gabion rows or layers not completed at the end of each shift should have the last gabion filled with rock tied internally as an end gabion.
- The area behind the gabion structure should be backfilled with granular material. Geotextile, if required, should be spread uniformly over the back of the gabion structure as shown on the plans. Joining edges of the

geotextile should be overlapped a minimum of 12 in. and should be anchored in position with approved anchoring devices. The contractor should place the backfill material in a manner that will not tear, puncture, or shift the geotextile.

Maintenance

- Inspect regularly and after each major storm. Check for signs of undercutting or other instability.
- Repair damaged areas immediately to restore designed effectiveness and to prevent damage or erosion of the slope or stream bank.
- Check wire of cages for rusting and wear. Repair where possible or replace.


Filter cloth or
sand/gravel
blanket
Existing
bottom stable
Compacted
fill


Layer of
gravel or
filter cloth
Gabion toe

Riprap Slope and Outlet Protection BMP 30

Description

Riprap slope and outlet protection is created by an arranged layer or pile of rock placed over the soil surface on slopes and at or below storm drain outfalls or temporary dikes. Riprap used as slope protection protects against erosion and dissipates the energy of runoff or surface water flow. Outlet protection reduces the speed of concentrated stormwater flows, thereby reducing erosion or scouring at stormwater outlets. In addition, outlet protection lowers the potential for downstream erosion. This type of protection can be achieved through a variety of techniques, including stone or riprap outlet structures and armored scour holes installed below the storm drain outlet.

Applications

For slope protection, use riprap or blanketed slopes. Outlet protection should be installed at the outlets of all pipes, culverts, catch basins, sediment basins, ponds, interceptor dikes, and swales or channel sections where the velocity of flow may cause erosion in the receiving channel. Outlet protection should also be used at outlets where the velocity of flow at the design capacity may result in plunge pools (small, permanent pools located at an inlet or outfall). Outlet protection should be installed early during construction activities, but may be added at any time, as necessary.

Limitations

Drainage area – 5 ac.	Maximum slope – 40%
Minimum bedrock depth - N/A	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – no	

The minimum particle size of the rock should be sized for the maximum expected velocity of flow out of the outlet and the soil conditions where the outlet will be located.

Targeted Pollutants

Sediment

Design Parameters

The design of rock outlet protection depends entirely on the location. Pipe outlets at the top of cuts or on slopes steeper than 10%, cannot be protected by rock aprons or riprap sections due to reconcentration of flows and high velocities encountered after the flow leaves the apron.

Tailwater depth: Tailwater depth immediately below the pipe outlet should be determined for the design capacity of the pipe. If the tailwater depth is less than half the diameter of the outlet pipe and the receiving stream is wide enough to accept divergence of the flow, it should be classified as a minimum tailwater condition. If the tailwater depth is greater than half the pipe diameter and the receiving stream will continue to confine the flow, it should be classified as a maximum tailwater condition. Pipes which outlet onto flat areas with no defined channel may be assumed to have a minimum tailwater condition.

Apron Size: The apron length and width should be determined according to the tailwater condition. If the pipe discharges directly into a well-defined channel, the apron should extend across the channel bottom and up the channel banks to an elevation 1 ft above the maximum tailwater depth or to the top of the bank, whichever is less. The upstream end of the apron, adjacent to the pipe should have a width two (2) times the diameter of the outlet pipe, or conform to pipe end section if used.

Bottom Grade: The outlet protection apron should be constructed with no slope along its length. There should be no overfall at the end of the apron. The elevation of the downstream end of the apron should be equal to the elevation of the receiving channel or adjacent ground.

Alignment: The outlet protection apron should be located so that there are no bends in the horizontal alignment.

Materials: The outlet protection may be done using rock riprap, grouted riprap or gabions (BMP 29-Gabions). Riprap size should be based on calculated shear stress. It should be composed of a well-graded mixture of stone size so that 50% of the pieces, by weight, should be larger than the d50 size determined by using the charts. A well-graded mixture as used herein is defined as a mixture composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone size in such a mixture should be 1.5 times the d50 size. Gabions to be installed in stream banks should be designed and installed according to Rule #9.3 of the *Stream Channel Alterations, Rules and Regulations and Minimum Standards*, Idaho Department of Water Resources, 1978.

Thickness: The minimum thickness of the riprap layer should be 1.5 times the maximum tone diameter for d50 of 15 in. or less; and 1.2 times the maximum tone size for d50 greater than 15 in. Table 30 lists some examples.

Stone Quality: Stone for riprap should consist of field stone or rough unhewn quarry stone. The stone should be hard and angular and of a quality that will not disintegrate on exposure to water or weathering. The specific gravity of the individual stones should be at least 2.5.

Recycled concrete equivalent may be used provided it has a density of at least 150 pounds per cubic ft and does not have any exposed steel or reinforcing bars.

Filter: A filter is a layer of material placed between the riprap and the underlying soil surface to prevent soil movement into and through the riprap. Riprap should have a filter placed under it in all cases.

A filter can be of two general forms: A gravel layer or a plastic filter cloth. The plastic filter cloth can be woven or non-woven monofilament yarns and should meet these base requirements: thickness 10-60 mils, grab strength 90-120 lbs; and should conform to ASTM D-1777 and ASTM D-1682.

Gravel filter blanket, when used, should be designed by comparing particle sizes of the overlying material and the base material. Design criteria are available in any soils or civil engineering reference or from the National Resources Conservation Service.

Construction Guidelines

- The subgrade for the filter, riprap, or gabion should be prepared to the required lines and grades. Any fill required in the subgrade should be compacted to a density of approximately that of the surrounding undisturbed material.
- The rock or gravel should conform to the specified grading limits when installed respectively in the riprap or filter.
- Filter cloth should be protected from punching, cutting, or tearing. Any damage other than an occasional small hole should be repaired by placing another piece of cloth over the damaged part or by completely replacing the cloth. All overlaps whether for repairs or for joining two pieces of cloth should be a minimum of 1 ft.
- Stone for the riprap or gabion outlets may be placed by equipment. Both should be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for riprap or gabion outlets should be delivered and placed in a manner that will insure that it is reasonably homogenous with the smaller stones and spalls filling the voids between the larger stones. Riprap should be placed in a manner to prevent damage to the filter blanket or filter cloth. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
- Complete construction of the outlet protection before allowing erosive flows to pass through the outlet.

Maintenance

Once a riprap outlet has been installed, the maintenance needs are relatively low. Inspect after heavy storms and high flows for scouring under the outlet and dislodged stones, and repair damage promptly. For dikes, maintain the area upstream of the outlet structure so that accumulated sediments can be removed when they reach a depth of one-third the height of the dike, or 12 in., whichever is less.

Table 30-1. Rock Riprap Sizes and Thickness

Unit shear stress (lb/ft^2)	D_{50} (in.)	d_{max} (in.)	Minimum blanket thickness (in.)
0.67	2	4	6
2.00	6	9	14
3.00	9	14	20
4.00	12	18	27
5.00	15	22	32
6.00	18	27	32
7.80	21	32	38
8.00	24	36	43

Unit shear stress calculated as T = yds
where:
T = shear stress in lb/ft^2
y = unit weight of water, 62.4 lb/ft^3
d = flow depth in ft
s = channel gradient in ft/ft

Design Procedure and Examples

- Investigate the downstream channel to assure that non-erosive velocities can be maintained.
- Determine the tailwater condition at the outlet to establish which curve to use.
- Enter the appropriate chart with the depth of flow and discharge velocity to determine the riprap size and apron length required. It is noted that references to pipe diameter in the charts are based on full flow. For other than full pipe flow, the parameters of depth of flow and velocity should be used.
- Calculate apron width at the downstream end if a flared section is to be employed.

Example 1: *Pipe Flow (full) with discharge to unconfined section*
A circular conduit is flowing full:
Q = 280 cfs, diam. = 66 in., tailwater (surface) is 2 ft above pipe invert, (minimum tailwater condition)
Read d_{50} = 1.2 ft, and apron length 38 ft
Apron width = diam. + L_a = 5.5 + 38 = 43.5 ft

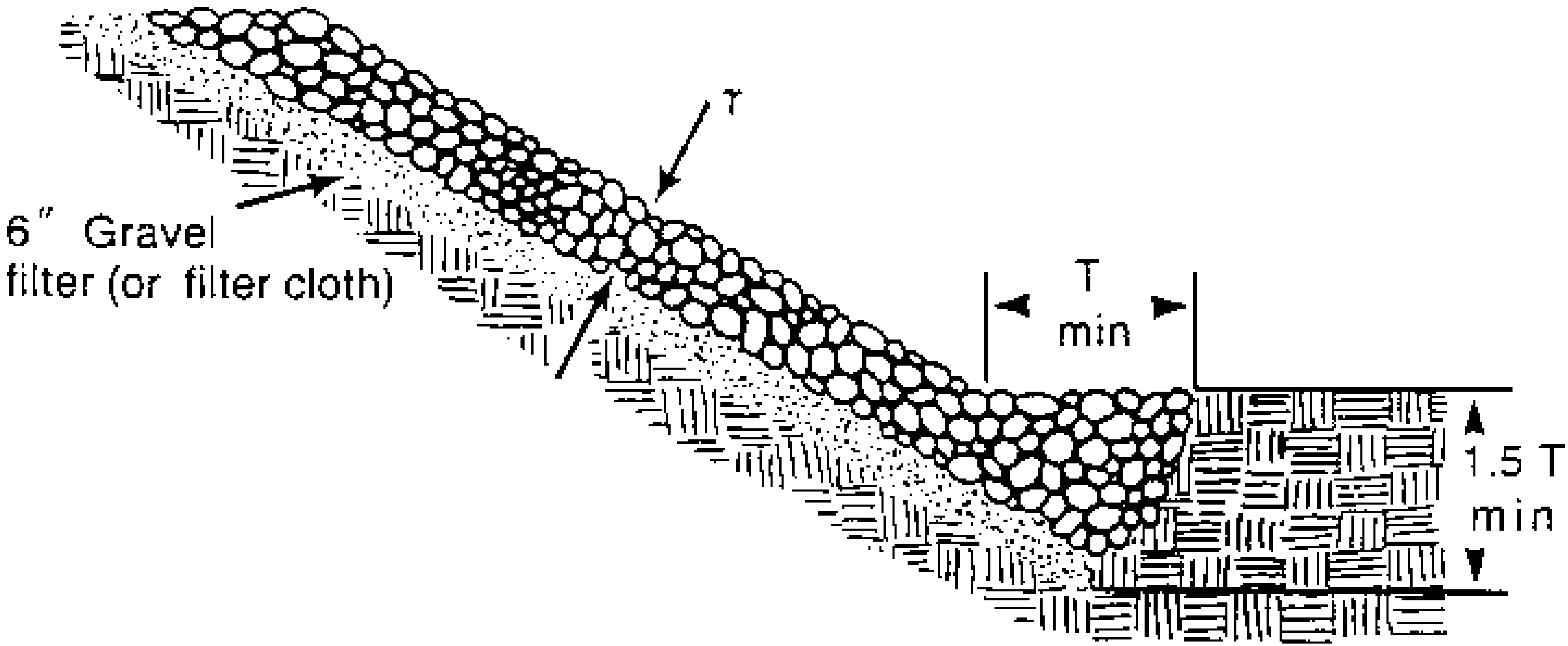
Example 2: *Box Flow (partial) with high tailwater*
A box conduit discharging under partial flow conditions. A concrete box 5.5 x 10 ft is flowing 5.0 ft deep, Q = 600 cfs and tailwater surface is 5 ft above invert (Max. tailwater condition).

$$V = \frac{Q}{A} = \frac{600}{5\text{x}10} = 12 \text{ fps}$$

At the intersection of the curve d = 60 in. and V = 12 fps, read d_{50} = 0.4 ft
Then reading to the d = 60 in. curve, read apron length = 40 ft
Apron width, W = conduit width + 0.04 L_a = 10+(0.4) (40) = 26 ft

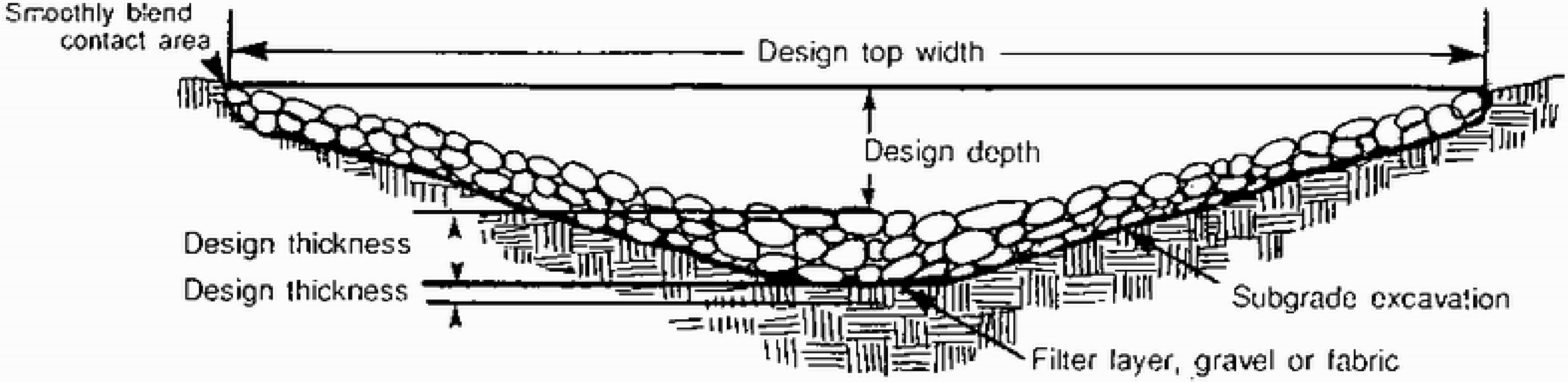
Example 3: *Open Channel Flow with Discharge to Unconfined Section*
A trapezoidal concrete channel 5 ft wide with 2:1 side slopes is flowing 2 ft deep, Q = 180 cfs (velocity = 10 fps) and the tailwater surface downstream is 0.8 ft (minimum tailwater condition).
At intersection of the curve d-24 ft and V = 10 fps, read d_{50} = 0.7 ft
Then reading up to the d = 24 in. curve, read apron length = 22 ft
Apron width, W = bottom of width of channel + L_a = 5 + 22 = 27 ft

Example 4: *Pipe flow (partial) with discharge to a confined section*
A 48 in. pipe is discharging with a depth of 3 ft, Q = 100 cfs, and discharge velocity of 10 fps (established from partial flow analysis) to a confined trapezoidal channel with a 2 ft bottom, 2:1 side slopes, n = .04, and grade of 0.6%.
Calculation of the downstream channel (by Manning's Equation) indicates a normal depth of 3.1 ft and normal velocity of 3.9 fps.
Since the receiving channel is confined, the maximum tailwater condition controls.
At the intersection of d = 36 in. and v = 10 fps, Read d_{50} = 0.3 ft
Reading up to the d = 36 in. curve, read apron length = 30 ft
Since the maximum flow depth in this reach is 3.1 ft that is the minimum depth of riprap to be maintained for the entire length.

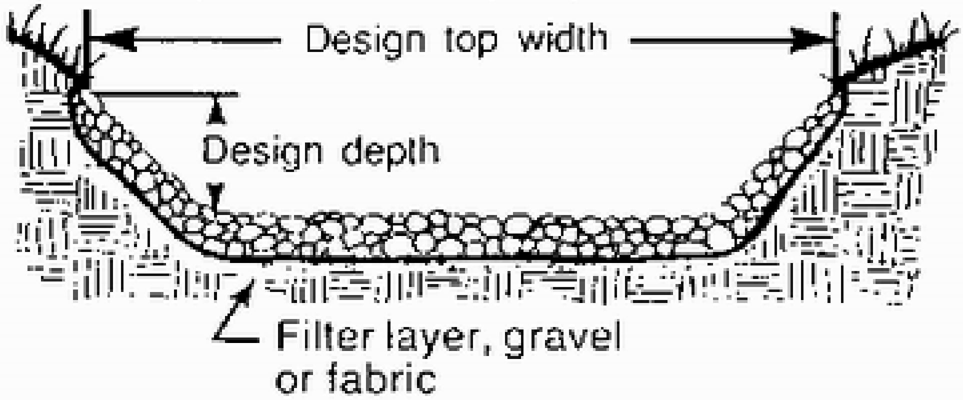


T
6" Gravel
filter (or filter cloth)
T
min
1.5 T
min

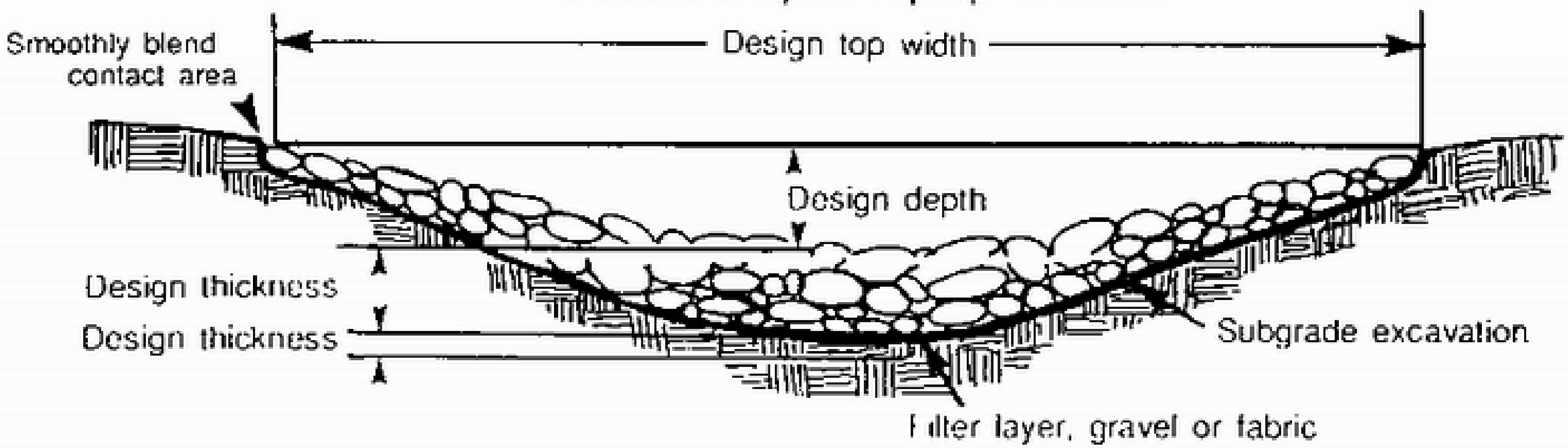
V-shaped Riprap Channel

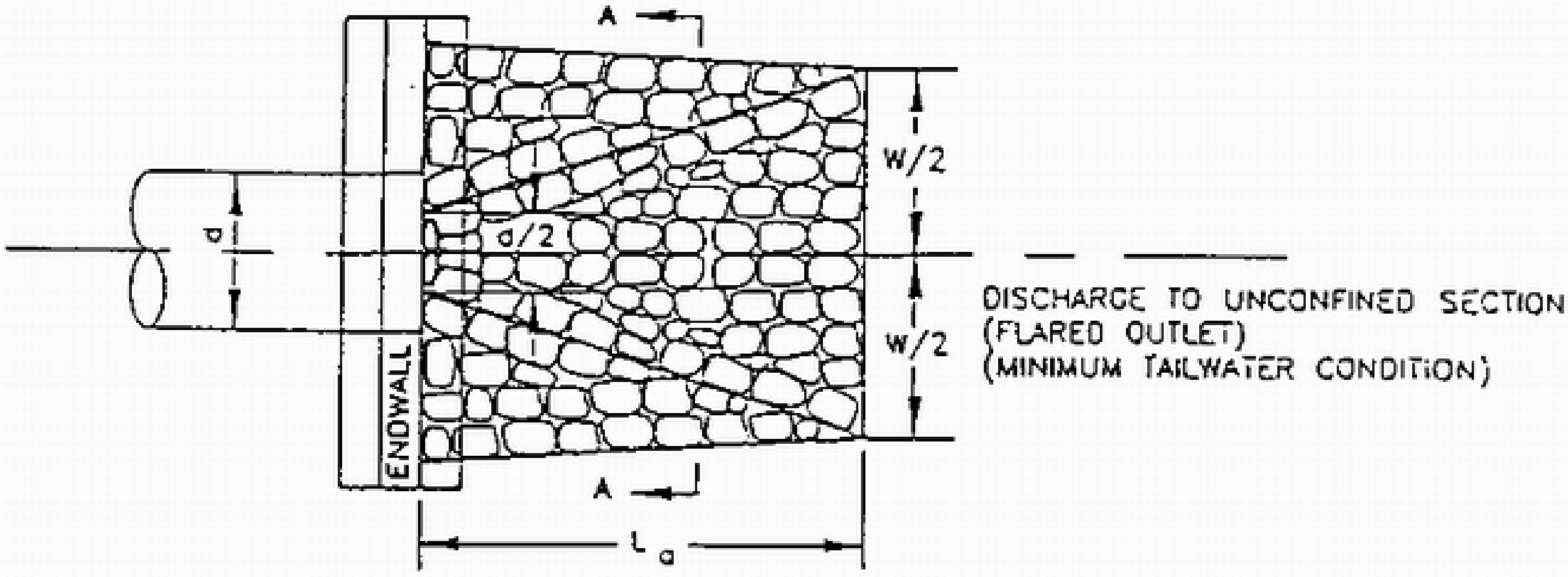


Trapezoidal Riprap Channel

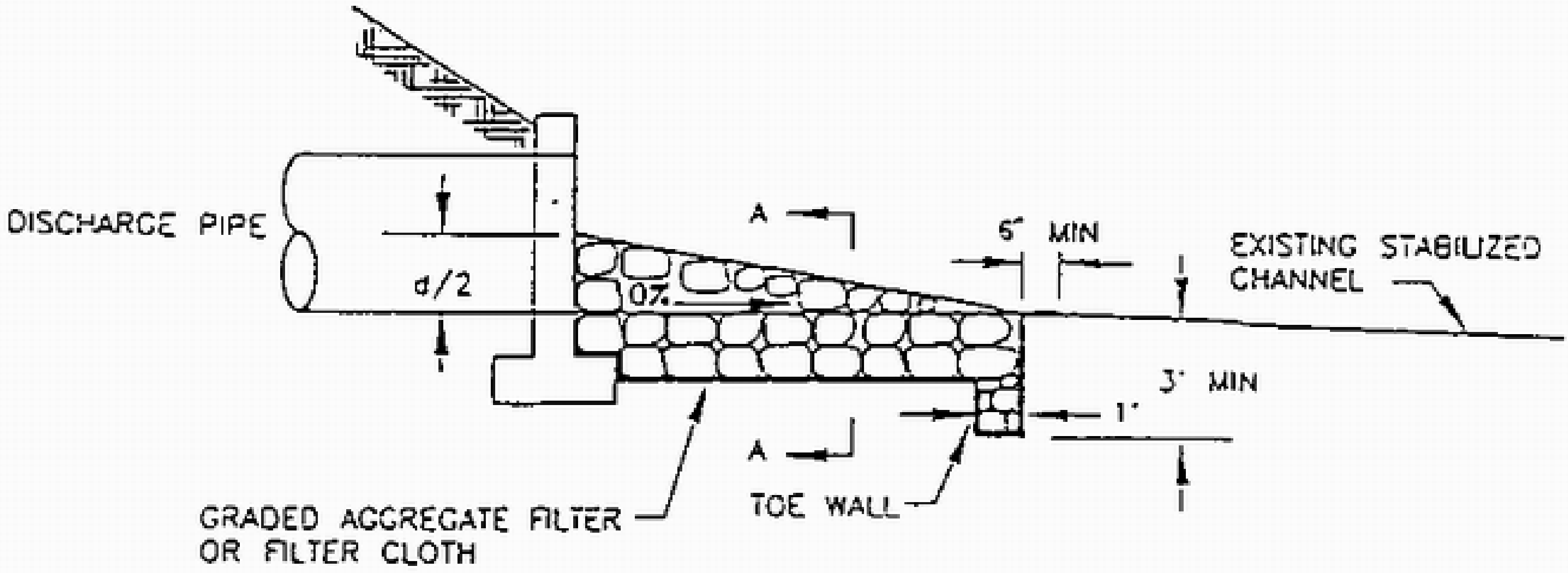


Parabolic-shaped Riprap Channel

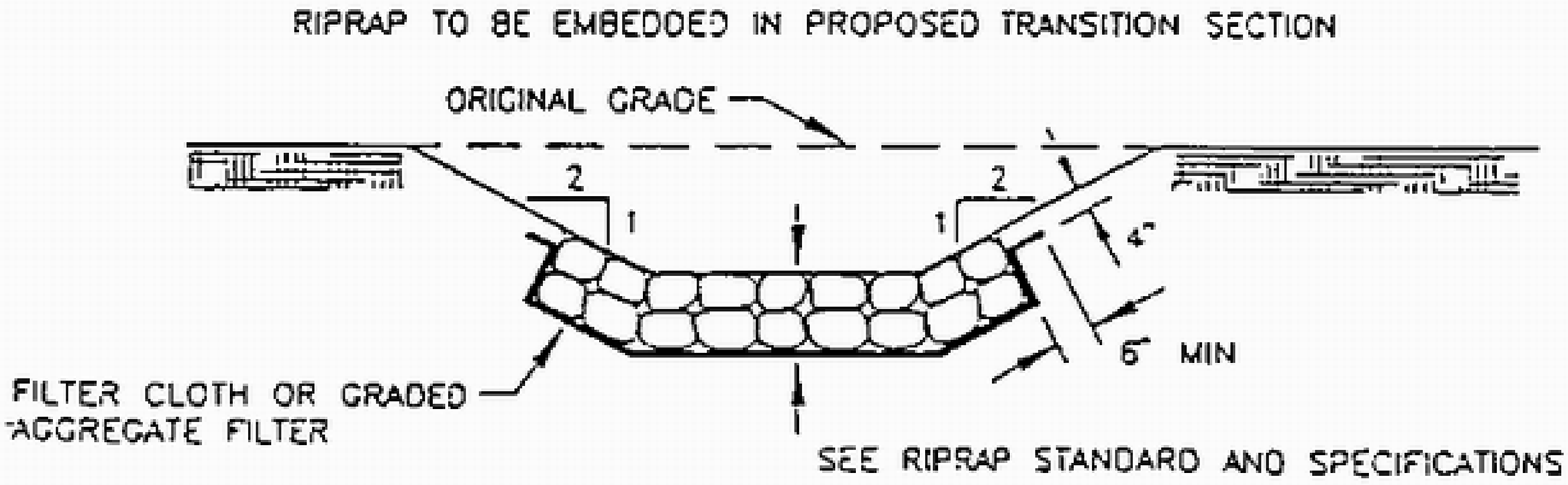




PLAN VIEW

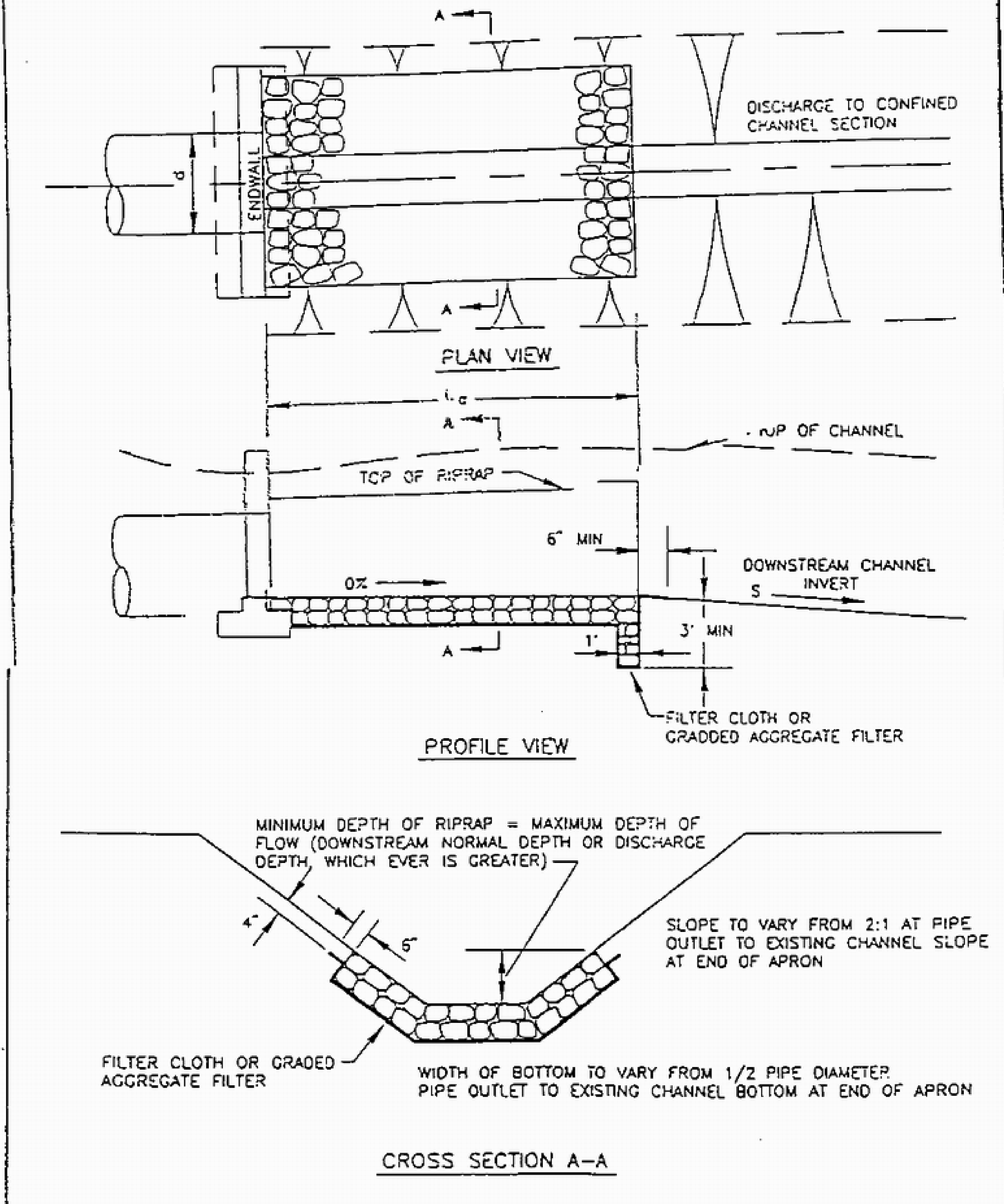


PROFILE VIEW

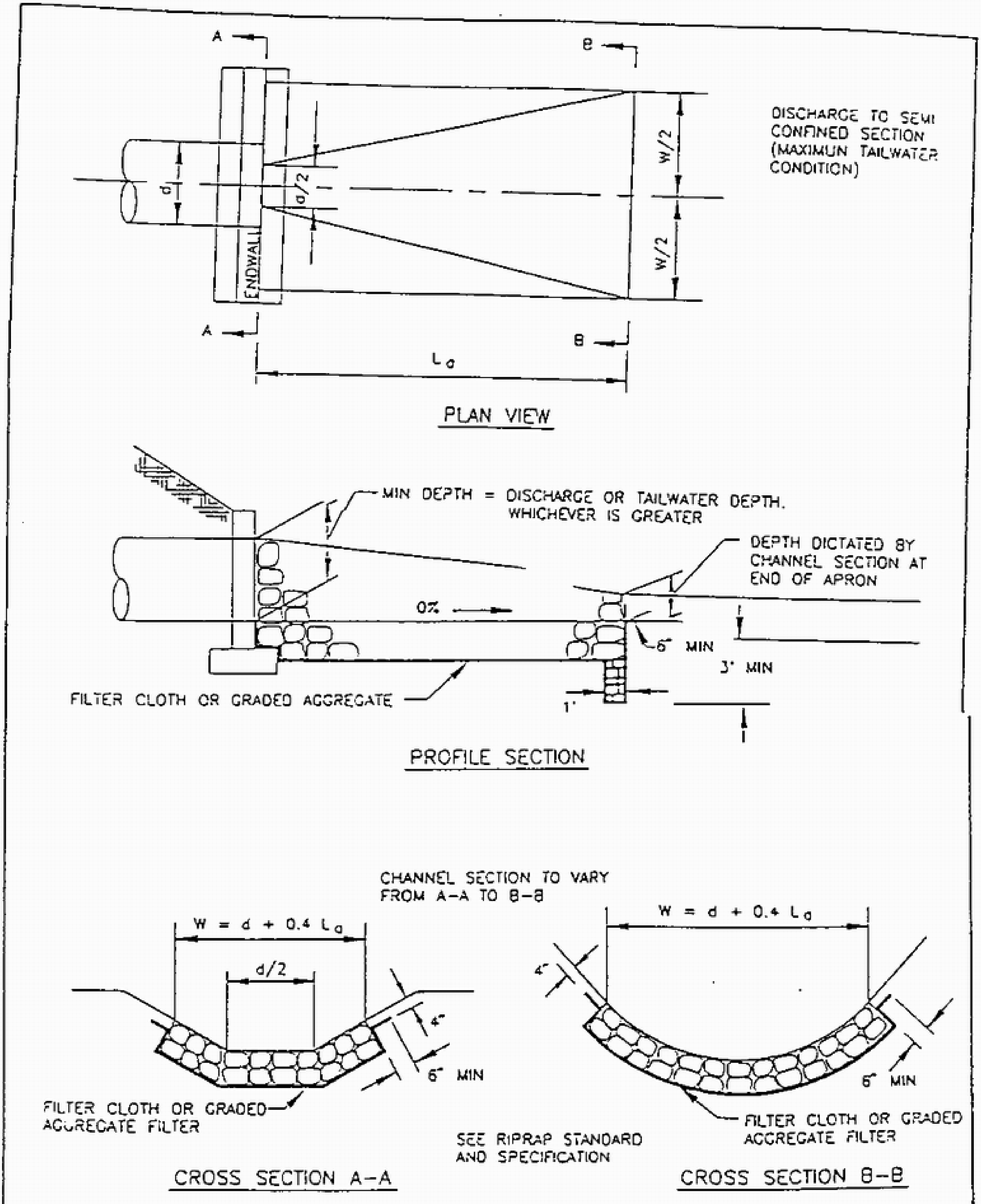


CROSS SECTION A–A

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	RIPRAP OUTLET PROTECTION – I	STANDARD DRAWING
TOOTHMAN–ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		ROP–I



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	RIPRAP OUTLET PROTECTION - II	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		ROP-II



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	RIPRAP OUTLET PROTECTION - III	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		ROP-III

Inlet Protection BMP 31

Description

Inlet protection consists of a filtering measure placed around an inlet or drain to trap sediment and prevent the sediment from entering the storm drain system. Additionally, it serves to prevent the silting-in of inlets, storm drainage systems, or receiving channels. Inlet protection may be composed of gravel and stone with a wire mesh filter, block and gravel, or sod. Manufactured products are also available that are designed to trap silt and sediment at the point of entry to a storm drain. Inserts can include bags, racks, baskets and other materials that hang down into a catch basin or inlet. Inserts are made from filter fabric, wire mesh, metal plates, various types of plastic products and combinations of these and other materials. Care should be taken not to cause flooding with diverted flow.

Applications

- Inlet protection is appropriate for small drainage areas (less than 1 ac.) where storm drains will be ready for use before the drainage area reaches final stabilization. Storm drain inlet protection is also used where:
  - ✓ A permanent storm drain structure is being constructed on site and there is danger of sediment silting it in before permanent site stabilization.
  - ✓ There is a threat of sediment silting in an inlet that is in place prior to permanent stabilization.
  - ✓ Ponding around the inlet structure could be a problem to traffic on site.
- Block and gravel filters can be used where velocities are higher. They may be used with most types of inlets where overflow capability is needed and in areas of heavy flows (238 gal/min or greater).
- Gravel and mesh filters can be used where flows are higher and in locations subject to disturbance by site traffic. This type of protection may be used with most inlets where overflow capability is needed and in areas of heavy flows (238 gal/min or greater).
- Sod inlet filters are usually used where sediments in the stormwater runoff are low.
- Gravel and mesh filters and block and gravel filters should not be used in the right of way unless there is sufficient space to avoid a traffic hazard.

Limitations

Drainage area – 1 ac.	Maximum slope – 5%
Minimum bedrock depth – 2 ft	Minimum water table – 2 ft
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – no	

- Consider sandbags (BMP 43-Temporary Berms) in situations where anchoring is not possible (e.g., paved road surfaces).
- Inlet protection is a high maintenance item compared with other more permanent measures.
- These devices require additional upslope BMPs to be effective.

Targeted Pollutants

Sediment

Design Parameters

Several different designs are in use and the configurations vary. The following design considerations apply to most of inlet protection. Some additional concerns apply to only one or two of the types.

Drainage area: Not to exceed 1 ac. Overland flow to the inlet should be no greater than 240 gal/min.

Slope gradient: The drainage area should be fairly flat, with slopes of 5% or less. With filter fabric designs, the area immediately surrounding the inlet should not exceed a slope of 1%.

Sump: Where possible, a block-and-gravel protection device should be provided with a sediment-trapping sump 12 to 20 in. deep as measured from the crest of the inlet. Side slopes should be 2:1. The recommended volume of excavation is 860 ft^3/ac. of ground disturbed.

Orientation: To achieve maximum trapping efficiency in gravel-and-mesh or block-and-gravel traps; the longest dimension of the basin should be oriented toward the longest inflow area.

Materials for excavated gravel inlet protection:

- Hardware cloth or wire mesh with 2/5 to 3/5 in. openings
- Washed gravel 0.8 to 4 in. diameter

Materials for block and gravel inlet protection:

- Hardware cloth or wire mesh with 2/5 to 3/5 in. openings
- Filter fabric (see the fabric specifications for silt fence, BMP 36-Silt Fence)
- Concrete blocks 4 to 12 in. wide
- Washed gravel 0.8 to 4 in. diameter

Inlet Inserts:
Devices should be installed as per the manufacturer's instruction meeting the following criteria:

- Devices should be installed as a point protection or in series as a perimeter sediment control BMP prior to any site grading activity.
- Installation should not block flows from filtering into the inlet or catch basin.
- Fabrics or other materials should be sized to handle projected site runoff and sediment load flows. Filter fabric should not be used alone as inlet protection.
- Devices should be installed without protruding parts that could be a traffic, worker, or pedestrian hazard.
- Retrieval edges, cords, bars, chains or other mechanisms should be flagged or marked for retrieval under submerged conditions.

Construction **Gravel and mesh**:

Guidelines

- Remove any obstructions to excavating and grading. Excavate sump area, grade slopes, and properly dispose of soil.
- Secure the inlet grate to prevent seepage of sediment-laden water.
- Place wire mesh over the drop inlet so the wire extends a minimum of 1ft beyond each side of the inlet structure. Overlap the strips of mesh if more than one is necessary.
- Place filter fabric over the mesh, extending it at least 1 ft beyond the inlet opening on all sides. Ensure that weep holes in the inlet structure are protected by filter fabric and gravel.
- Place stone or gravel over the fabric/wire mesh to a depth of at least 20 in.

Block and gravel:

- open ends of the block should face outward, not upward, and the ends of adjacent blocks should abut. Lay one block on each side of the structure on its side to allow for dewatering of the pool.
- The block barrier should be at least 12 in. high and may be up to a Secure the inlet grate to prevent seepage of sediment-laden water.
- Place wire mesh over the drop inlet so the wire extends a minimum of 12 to 20 in. beyond each side of the inlet structure. Overlap the strips of mesh if more than one is necessary.
- Place filter fabric (optional) over the mesh and extend it at least 20 in. beyond the inlet structure.
- Place concrete blocks over the filter fabric in a single row lengthwise on their sides along the sides of the inlet. Excavate the foundation a minimum of 2 in. below the crest of the inlet. The bottom row of blocks should be against the edge of the structure for lateral support.
- The maximum of 24 in. high. It may be from 4 to 12 in. deep, depending on the size of block used.
- Prior to backfilling, place wire mesh over the outside vertical end of the blocks so that stone does not wash down the inlet.
- Place gravel against the wire mesh to the top of the blocks.

Swale, ditch line or yard inlet protection:

- Excavate completely around inlet to a depth of 18 in. below notch elevation.
- Drive 2 x 4 post 1 ft into ground at four corners of inlet. Place nail strips between posts on ends of inlet. Assemble top portion of 2 x 4 frame using overlap joint shown. Top of frame (weir) should be 6 in. below edge of roadway adjacent to inlet.
- Stretch wire mesh tightly around frame and fasten securely. Ends should meet at post.
- Stretch filter cloth tightly over wire mesh, the cloth should extend from top of frame to 18 in. below inlet notch elevation. Fasten securely to frame. Ends should meet at post, be overlapped and folded, then fastened down.
- Backfill around inlet in compacted 6 in. layers until layer of earth is even with notch elevation on ends and top elevation on sides.
- If the inlet is not in a low point, construct a compacted earth dike in the ditch line below it. The top of the dike is to be at least 6 in. higher than

the top of frame (weir).

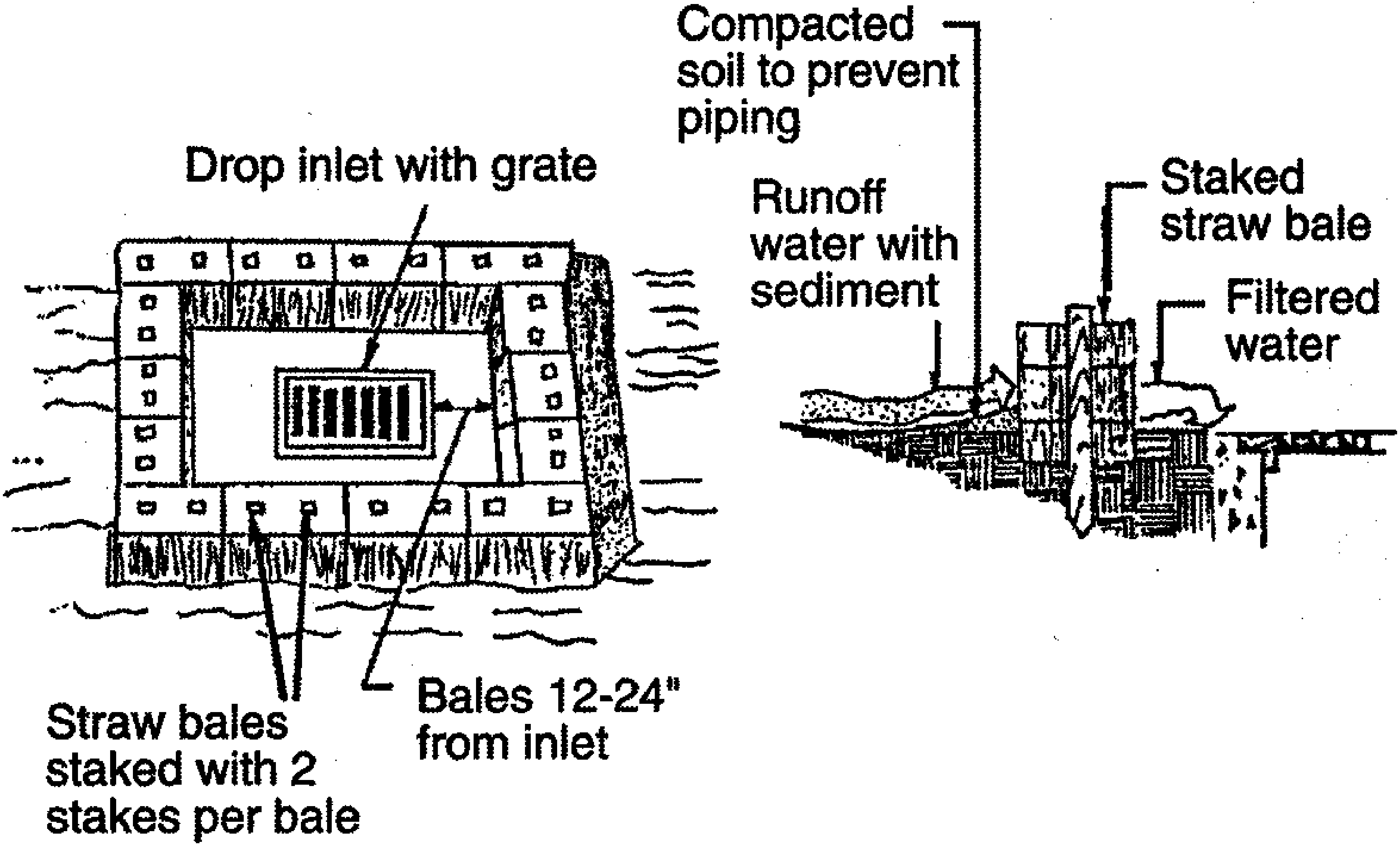
- This structure should be inspected frequently and the filter fabric replaced when clogged.

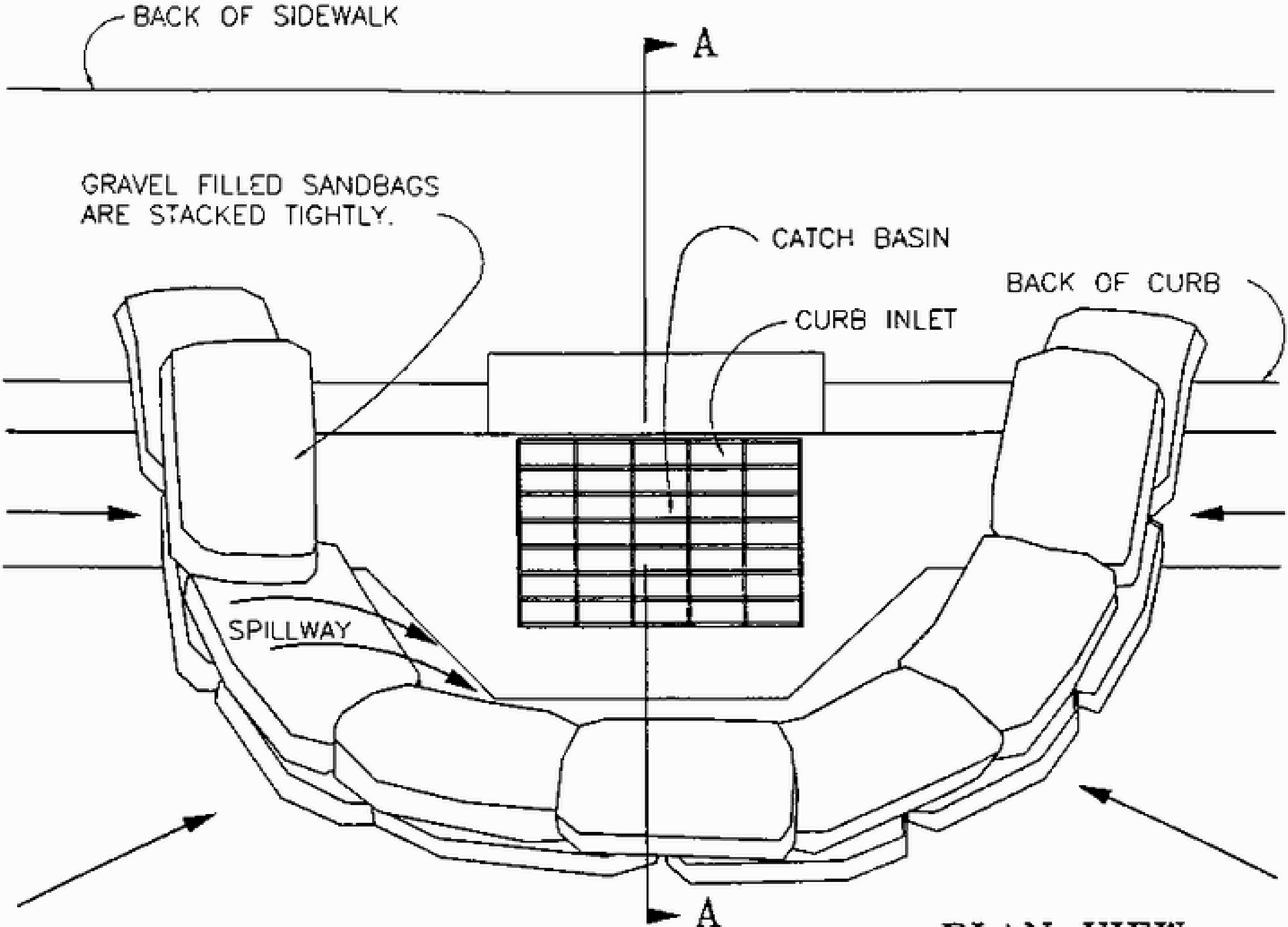
Curb Inlet Protection:

- Attach a continuous piece of wire mesh (30 in. minimum width by throat length plus 4 ft) to the 2 x 4 in. weir (measuring throat length plus 2 ft) as shown on the standard drawing.
- Place a piece of approved filter cloth (40-85 sieve) of the same dimensions as the wire mesh over the wire mesh and securely attach to the 2 in. of 4 in. weir.
- Securely nail the 2 x 4 in. weir to 9 in. long vertical spacers to be located between the weir and inlet face (maximum 6 ft apart).
- Place the assembly against the inlet throat and nail (minimum 2 ft) lengths of 2 x 4 in. to the top of the weir at spacer locations. These 2 x 4 in. anchors should extend across the inlet top and be held in place by gravel-filled bags or alternate weight.
- The assembly should be placed so that the end spacers are a minimum 1 ft beyond both ends of the throat opening.
- Form the wire mesh and filter cloth to the concrete gutter and against the face of curb on both sides of the inlet. Place clean 2 in. stone over the wire mesh and filter fabric in such a manner as to prevent water from entering the inlet under or around the filter cloth.
- This type of protection should be inspected frequently and the filter cloth and stone replaced when clogged with sediment.
- Assure that storm flow does not bypass inlet by installing temporary earth or asphalt dikes directing flow into inlet.

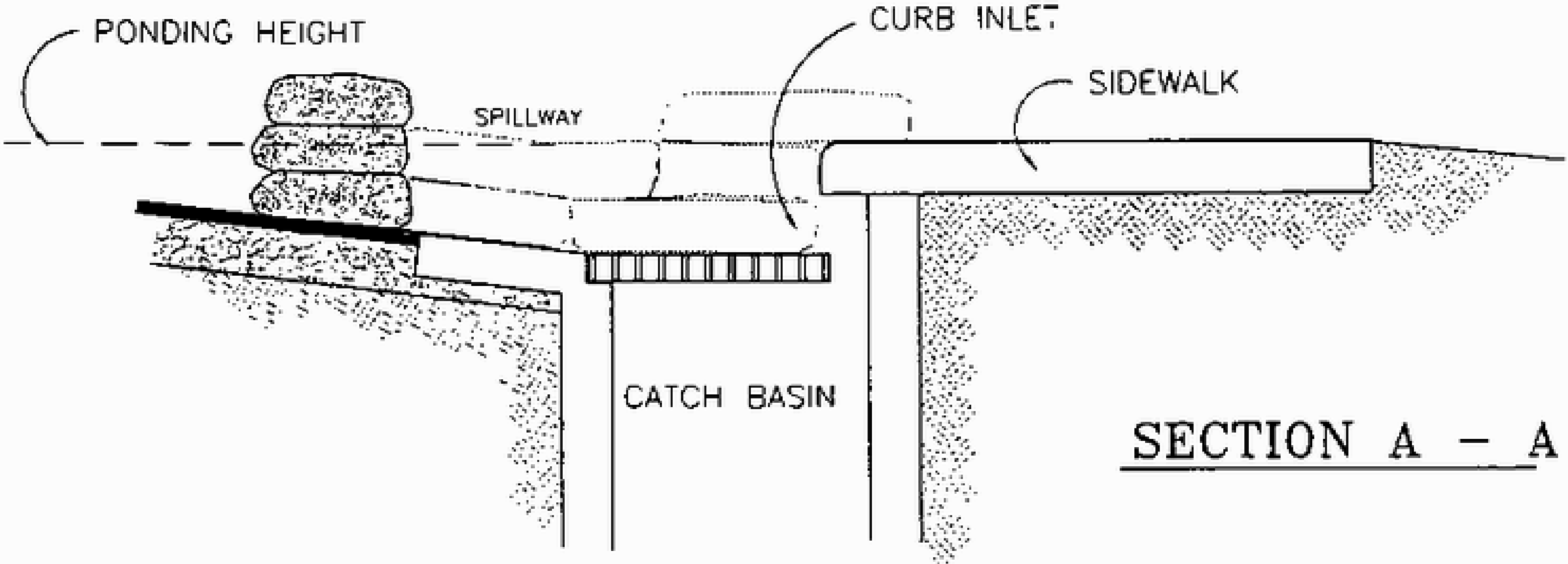
Maintenance

- Inspect regularly and after every storm. Make any repairs necessary to ensure the measure is in good working order.
- Remove accumulated sediment and restore the trap to its original dimensions when sediment has accumulated to half the design depth of the trap. All sediments removed should be disposed of properly.
- On gravel-and-mesh devices, clean (or remove and replace) the stone filter if it becomes clogged.
- Replacement of inlet inserts should be per manufacturer’s instructions or when device no longer drains. At no time should devices be punctured or otherwise modified to bypass.
- Unless cleaned for reuse as a permanent site control or cleaned and left to biodegrade, all inlet inserts should be removed after construction is completed (or after permanent vegetation is established).
- Inlet protection should remain in place and operational up to 30 days after the drainage area is completely stabilized.


Drop inlet with grate
Straw bales staked with 2 stakes per bale
Bales 12-24" from inlet
Compacted soil to prevent piping
Runoff water with sediment
Staked straw bale
Filtered water



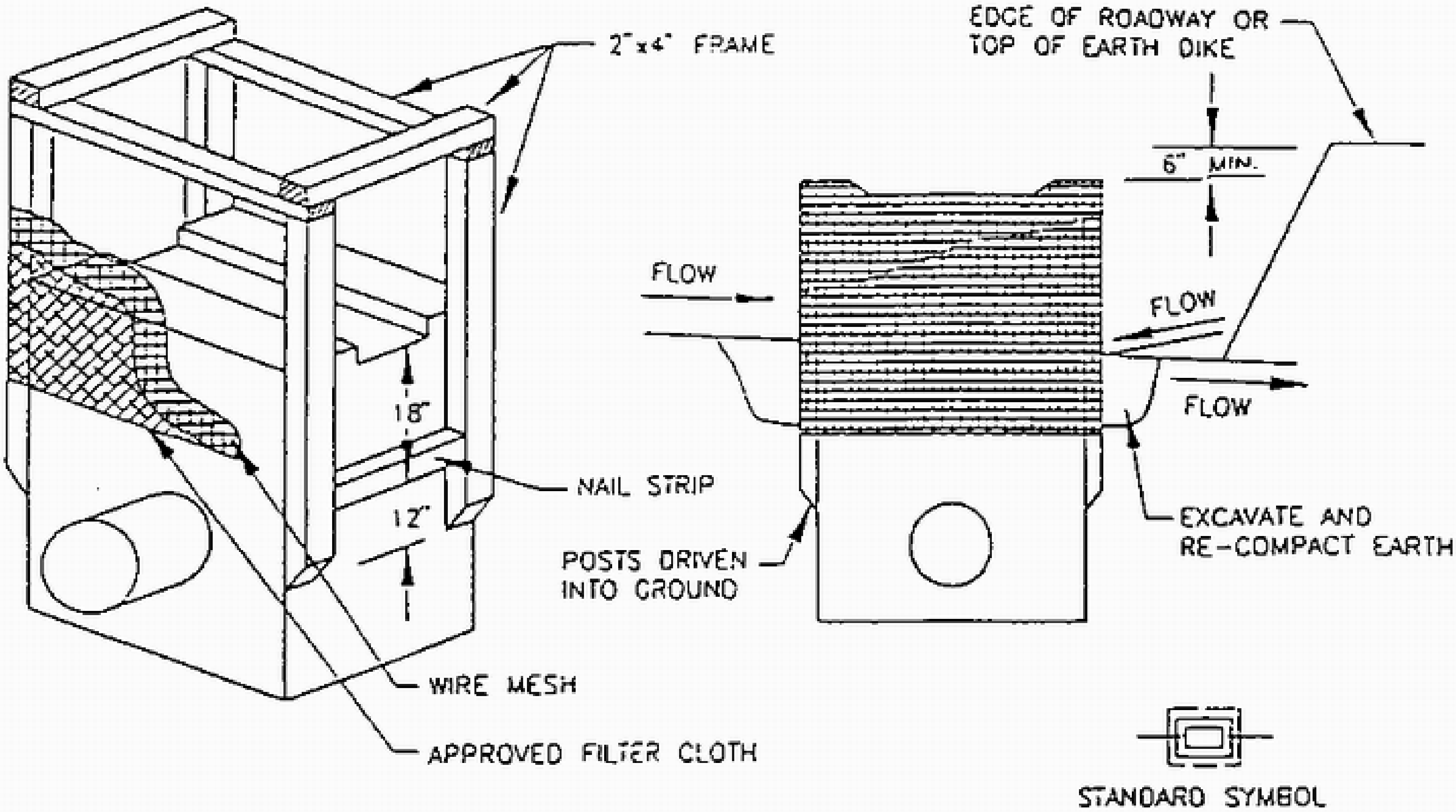
PLAN VIEW



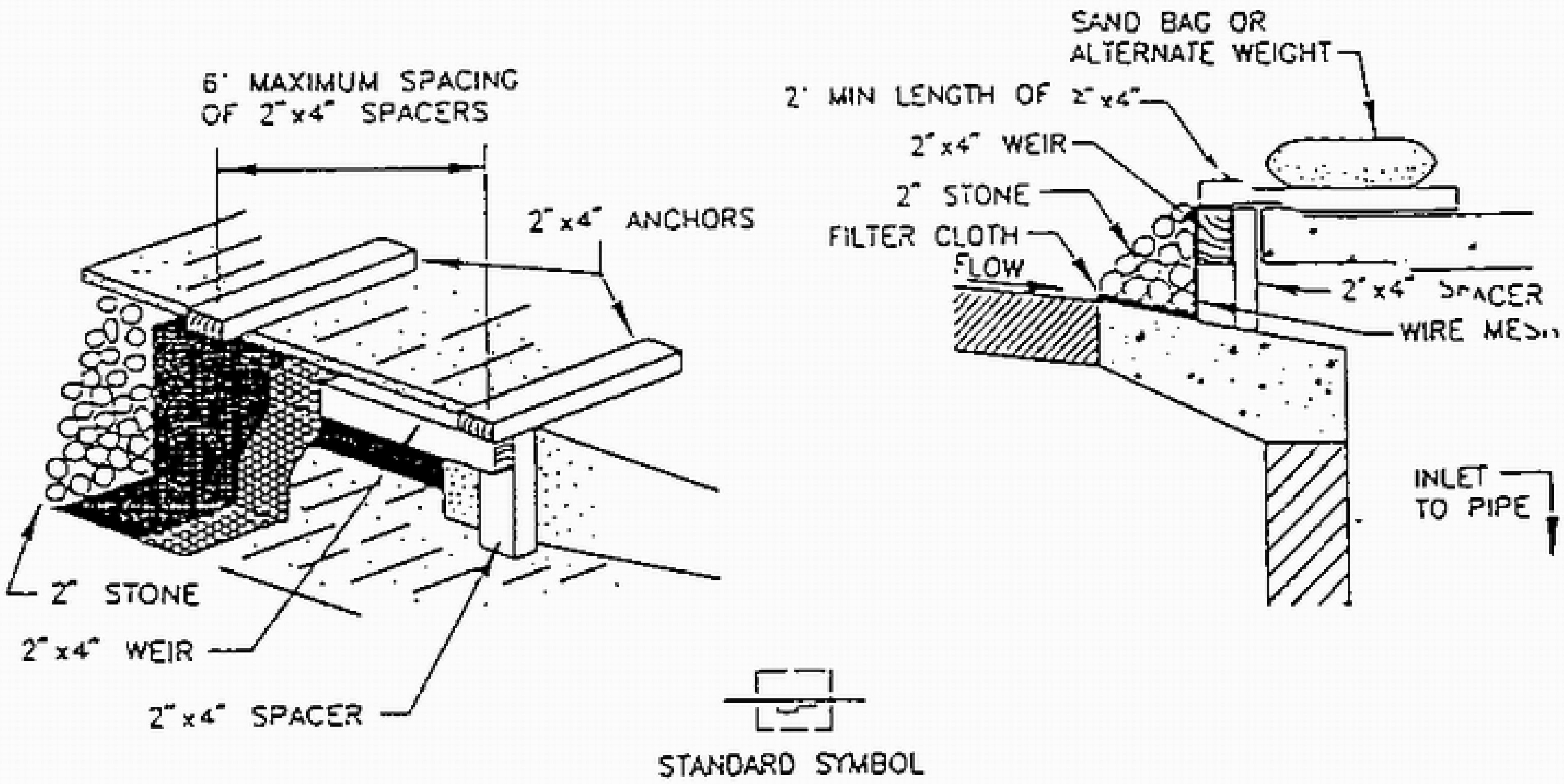
SECTION A – A

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, OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC, ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
3. LEAVE ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.
4. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

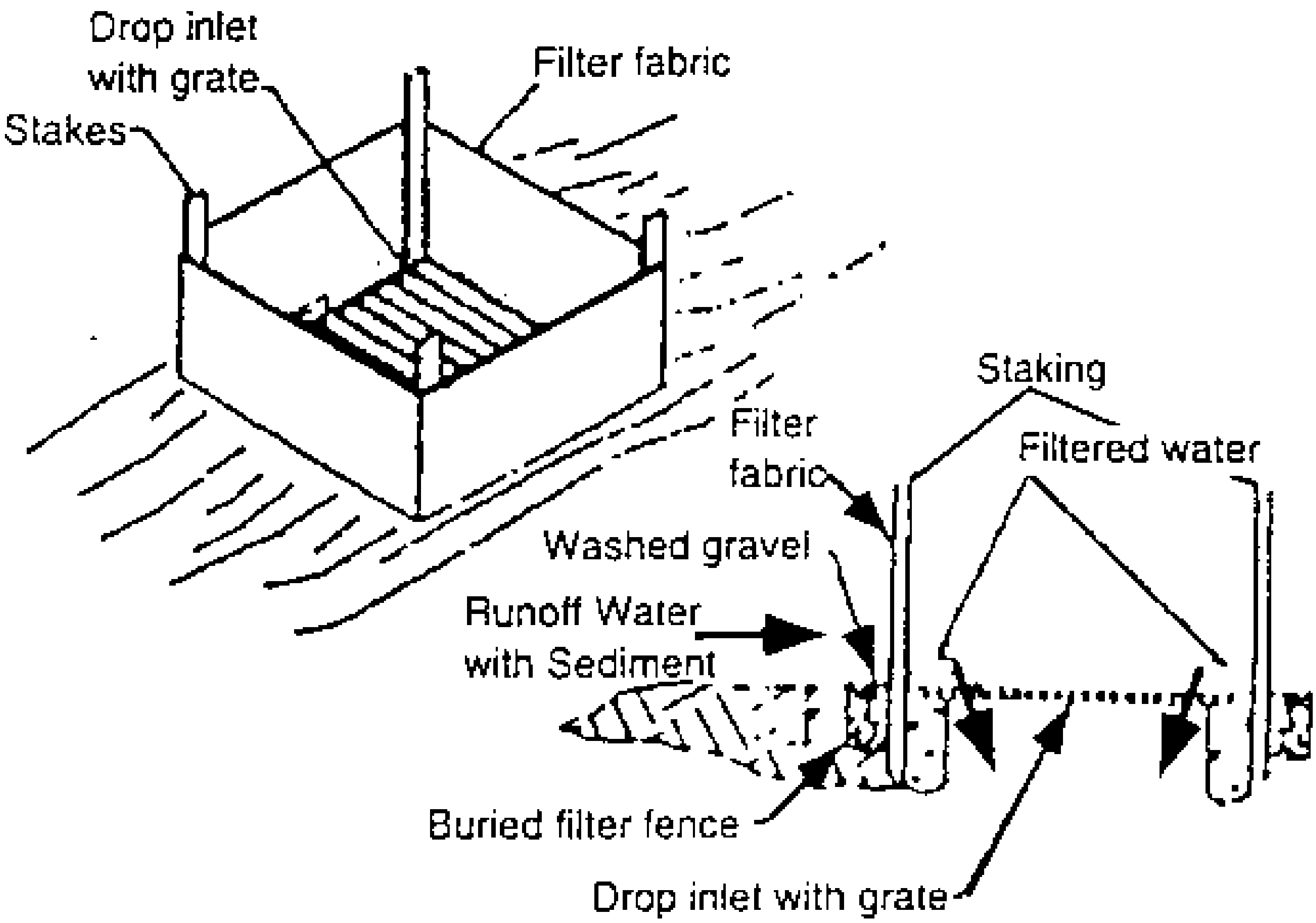


SWALE INLET PROTECTION DETAIL

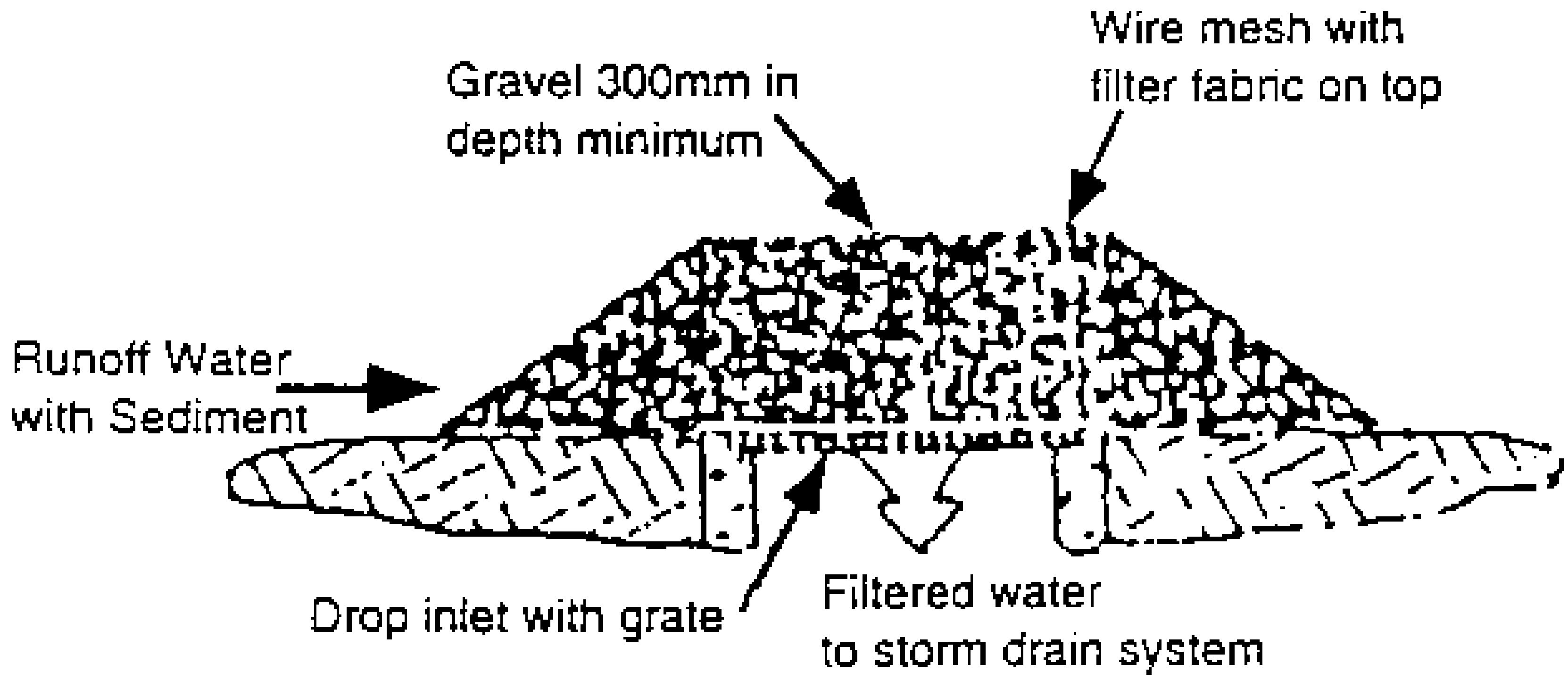


CURB INLET PROTECTION DETAIL

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	INLET PROTECTION DETAIL	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		IPD-1



FILTER FABRIC FENCE INLET FILTER



GRAVEL AND WIRE MESH FILTER SECTION

Check Dams BMP 32

Description

Check dams are small dams constructed in open channels, swales, or drainageways. Check dams may be temporary or permanent barriers made of logs and brush, straw bales, stone, or other materials. A triangular silt dike is a geotextile-encased check dam that consists of a urethane foam core encased in geotextile material. Check dams are used to reduce or prevent excessive bank and bottom erosion by reducing the gradient or runoff velocity.

Applications

Check dams are often used in natural or constructed channels or swales where adequate vegetation cannot be established promptly. They are used below small drainage structures (smaller than 36 in. pipe culverts) but may be used below large structures if a diversion ditch cannot be used. Log and brush check dams should be placed where they will not cause flooding and where they can be left in place.

An array of three-dimensional manufactured barriers is also available: triangular and burrito-shaped, prefilled and fillable on-site, reusable and disposable, and temporary and more-or-less permanent. Triangular silt dikes are temporary, reusable barriers consisting of a triangular urethane foam core covered by permeable, woven geotextile fabric. From 16 to 20 in. wide at the base and usually 8 to 10 in. high, the silt dike is typically used at the toe of a slope to contain sediment from runoff or perpendicular to the flow of water in a drainage ditch.

Limitations

Drainage area – 10 ac.
Minimum bedrock depth – 2 ft
NRCS soil type - ABCD
Drainage/flood control – yes
Maximum slope – 50%
Minimum water table - N/A
Freeze/thaw – good

Check dams should never be placed in live streams unless approved by appropriate local, state and/or federal authorities.

Targeted Pollutants

Sediment

Design Parameters

- The drainage area above the check dam should be between 1 and 4 acres.
- The dams should be spaced so that the toe of the upstream dam is never any higher than the top of the downstream dam. Excavating a sump immediately upstream from the check dam improves its effectiveness.
- Maximum height should be 2 ft. The center of the dam should be 16 to 10 in. lower than either edge, to form a weir for the outfall.
- The check dam should be as much as 20 in. wider than the banks of the

channel to prevent undercutting as overflow water re-enters the channel.

- Provide outlet stabilization below the lowest check dam (where the risk of erosion is greatest) and consider the use of channel linings or protection such as plastic sheeting or riprap where there may be significant erosion or prolonged submergence.
- Materials:
  - ✓ Stone 2 to 16 in. in diameter
  - ✓ Logs 6 to 8 in. in diameter
  - ✓ Sandbags filled with pea gravel
  - ✓ Filter fabric meeting the standard specifications (see BMP 36-Silt Fence)
- The logs should be driven into the ground a minimum of 28 in..

Construction Guidelines

Rock check dams: Place the stones on filter fabric either by hand or using appropriate machinery; do not simply dump them in place. Keep the side slopes 1:2 or flatter. Lining the upstream side of the dam with a layer of 0.8 to 1.1 in. gravel and 12 in. deep is a suggested option for additional channel protection.

Log check dams: Logs should be firmly embedded in the ground. Intermingled brush and logs or filter cloth may be attached to the upstream side of the dam to retard the flow and trap additional sediment. If a filter cloth is used, it should be securely stapled to the top of the dam and adequately anchored in the streambed.

Sandbag check dams: Be sure that all bags are securely sealed. Place the bags by hand or use appropriate machinery to place them in an interlocking pattern.

Gravel-filled burlap bags: Gravel-filled burlap bags may be used for temporary check dams in areas of concentrated flow. Fold the burlap bag flaps under the bags in a direction away from the water flow. Construct gravel bag check dams such that the crest of the downstream check dam is approximately level with the toe of the upstream check dam. Install check dams so the side end points are higher than the centerline crest. Erosion caused by high flows around the edges should be corrected immediately.

Triangular silt dike: The flexibility of the materials in triangular silt dikes allows them to conform to all channel configurations.

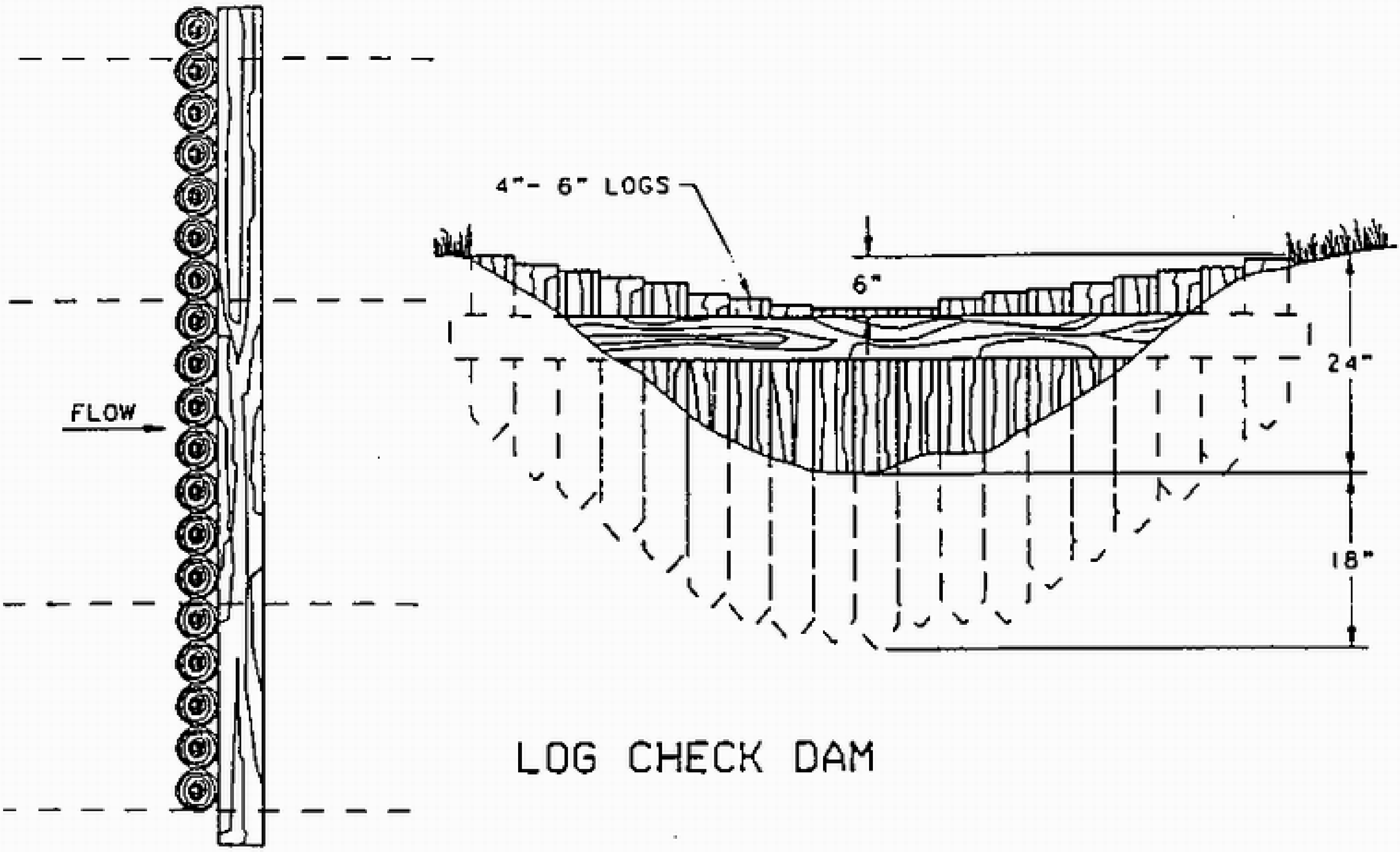
- They can be fastened to soil with staples or rock and pavement with adhesives.
- They have been used to build temporary sediment ponds, diversion ditches, concrete wash out facilities, curbing, water bars, level spreaders, and berms.

Riprap may be necessary on the downstream side of the dam to protect the streambed from scour.

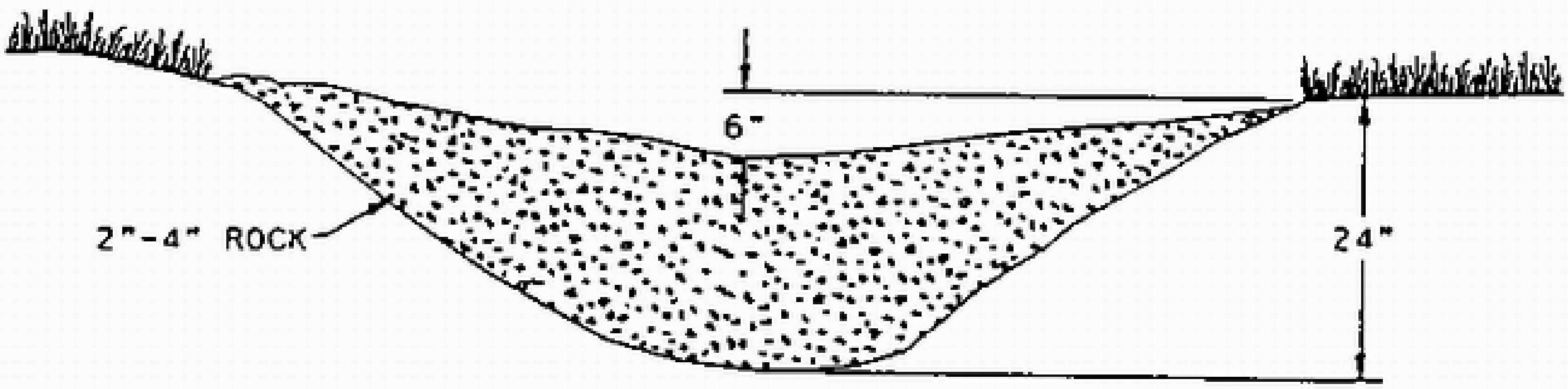
Maintenance

- Inspect the check dams regularly and after every runoff-producing storm. Make any repairs necessary to ensure the measure is in good working order.

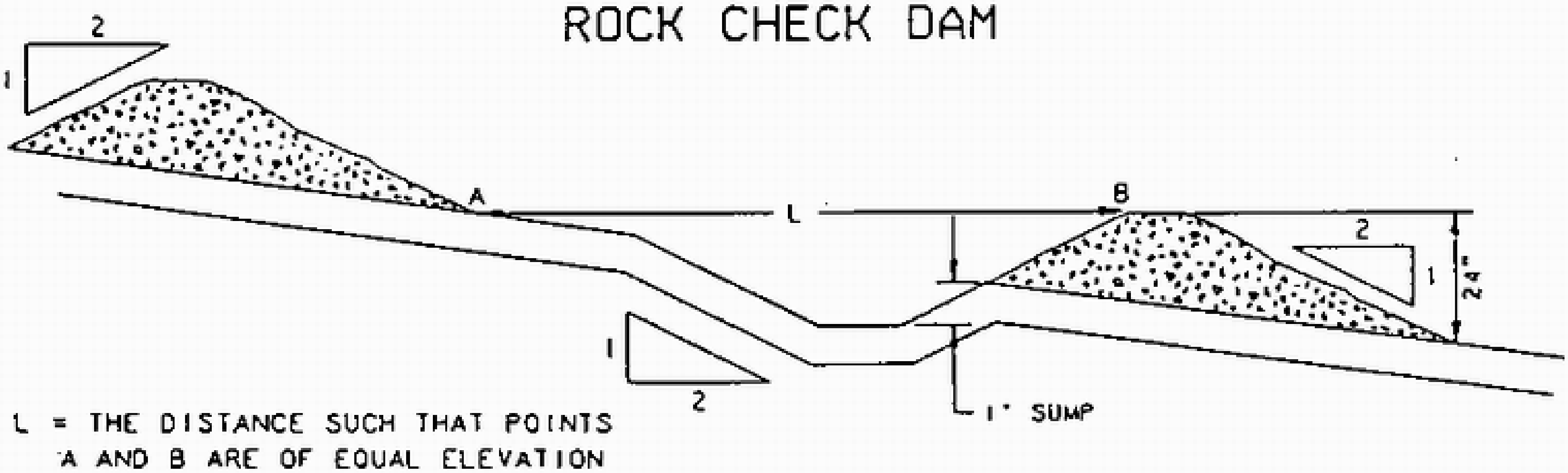
- Remove accumulated leaves and sediments from behind the dam when they reach a depth of one-half the original height of the dam. Dispose of all materials properly so they do not contribute to pollution problems at the disposal site.
- Restore stone as necessary for the dams to maintain their correct height.
- On sandbag dams, inspect the sandbag fabric for signs of deterioration.



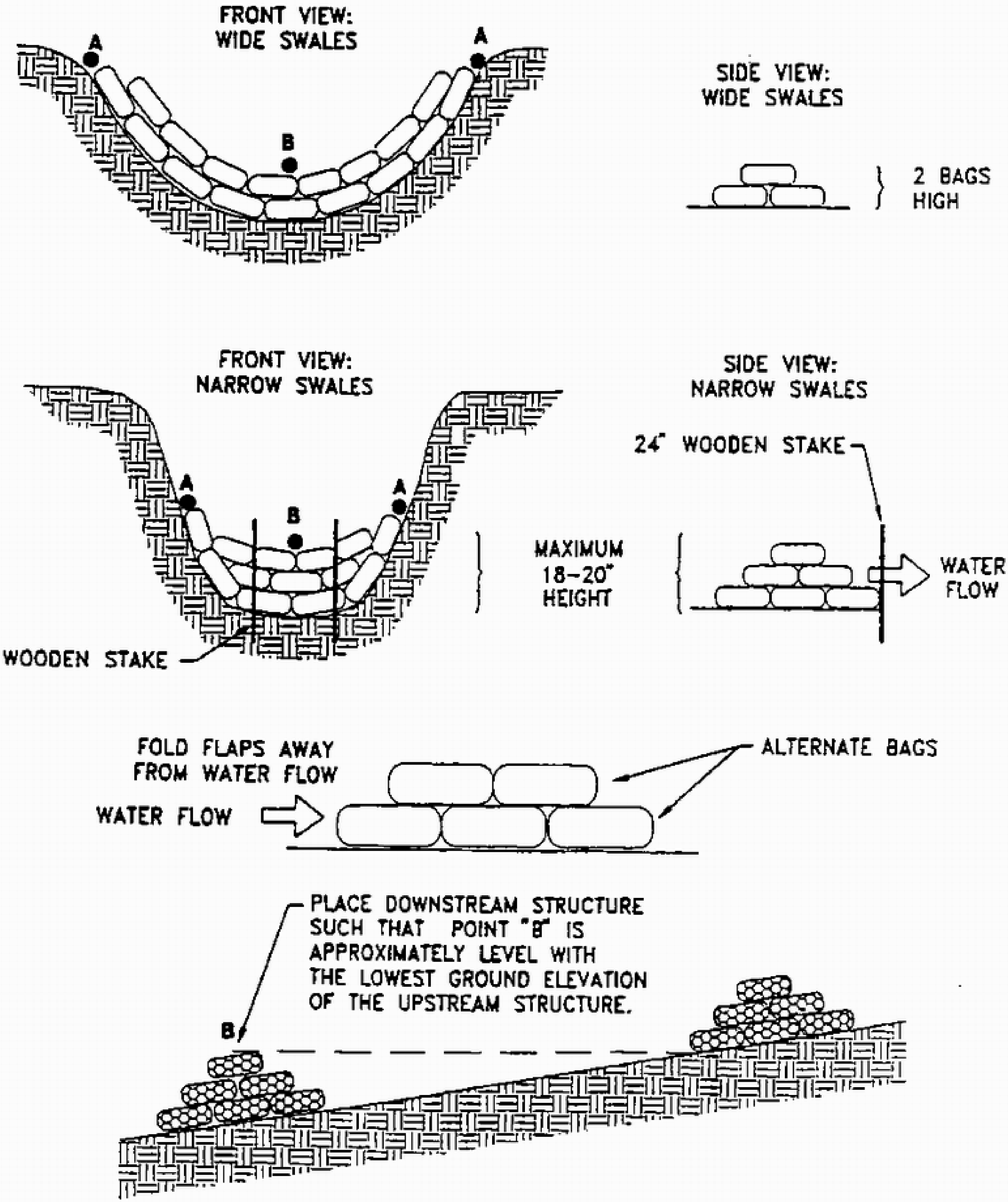
LOG CHECK DAM



ROCK CHECK DAM



SPACING BETWEEN CHECK DAMS


FRONT VIEW:
WIDE SWALES
A
A
B
SIDE VIEW:
WIDE SWALES
2 BAGS
HIGH
FRONT VIEW:
NARROW SWALES
A
A
B
WOODEN STAKE
MAXIMUM
18-20"
HEIGHT
SIDE VIEW:
NARROW SWALES
24" WOODEN STAKE
WATER
FLOW
FOLD FLAPS AWAY
FROM WATER FLOW
WATER FLOW
ALTERNATE BAGS
PLACE DOWNSTREAM STRUCTURE
SUCH THAT POINT "B" IS
APPROXIMATELY LEVEL WITH
THE LOWEST GROUND ELEVATION
OF THE UPSTREAM STRUCTURE.
B

Temporary Stream Crossing BMP 33

Description

A temporary stream crossing is a bridge or culvert across a stream or watercourse for short-term use by construction vehicles or heavy equipment. Vehicles moving over unprotected stream banks will damage the bank, thereby releasing sediments and degrading the stream bank. A stream crossing provides a means for construction vehicles to cross streams or watercourses without moving sediment to streams, without damaging the streambed or channel, and without causing flooding.

Applications

- A temporary stream crossing is used when heavy equipment should be moved from one side of a stream channel to another, or where light-duty construction vehicles have to cross the stream channel frequently for a short period of time. Temporary stream crossings should be installed only when it is necessary to cross a stream and a permanent crossing is not feasible or not yet constructed.
- The specific loads and the stream conditions will dictate what type of stream crossing to employ.
- Where available materials and designs are adequate to bear the expected loadings, bridges are the preferred method to cross a stream as they provide the least obstruction to flows and fish migration.
- Culverts are the most common type of stream crossings and are relatively easy to construct. A pipe (to carry the stream flow) is laid into the channel and covered by gravel

Limitations

Drainage area – N/A	Maximum slope – N/A
Minimum bedrock depth – 2 ft	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – yes	

- Bridges are expensive to design and install. These costs may make it difficult to justify using a bridge as a temporary crossing in some situations.
- Culverts cause greater disturbance during installation and removal. In sensitive stream systems, these impacts may not be justifiable.
- Always attempt to minimize or eliminate the need to cross streams. Temporary stream crossings are a direct source of pollution; therefore, every effort should be made to use an alternate method such as a longer detour. When it is absolutely necessary to cross a stream, a well-planned approach will minimize damage to the stream bank and reduce erosion.
- Use of the following stream crossing measures below the high-water mark of a stream or other water body (waters of the U.S.) should be carefully evaluated due to Section 404 permit requirements. If the project will remain a Categorically Excluded (Cat-Ex) project, you may proceed if the situation is discussed in the Cat-Ex. Otherwise, Section 404 permitting (401 Certification) may be required. The design of temporary stream crossings involves extensive knowledge of hydrologic processes and, therefore, should be designed by a Professional Engineer.

Targeted Pollutants

Sediment
Hydrocarbons

Design Parameters

General:
In-stream excavation should be limited to only that necessary to allow installation of the temporary bridge or culvert as described below:

- Temporary bridges pose the least potential for creating barriers to aquatic migration. The construction of a temporary bridge or culvert should not cause a significant water level difference between the upstream and downstream water surface elevations.
- The temporary waterway crossing should be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the centerline of the stream at the intended crossing location.
- The centerline of both roadway approaches should coincide with the crossing alignment centerline for a minimum distance of 50 ft from each bank of the waterway being crossed. If physical or right-of-way restraints preclude the 50 ft minimum, a shorter distance may be provided. All fill materials associated with the roadway approach should be limited to a maximum height of 2 ft above the existing flood plain elevation.
- A water diverting structure such as a swale should be constructed (across the roadway on both roadway approaches) 50 ft (maximum) on either side of the waterway crossing. This will prevent roadway surface runoff from directly entering the waterway. The 50 ft is measured from the top of the waterway bank. Design criteria for this diverting structure should be in accordance with the BMP fact sheet in this catalog for the individual design standard of choice. If the roadway approach is constructed with a reverse grade away from the waterway, a separate diverting structure is not required.
- All crossings should have one traffic lane. The minimum width should be

12 ft with a maximum width of 20 ft.
- All temporary crossings should be removed within 14 calendar days after the structure is no longer needed.

Materials:
- No earth or soil materials should be used for construction within the waterway channel. (3/4 in. to 4 in.), also referenced as AASHTO designation No. 1, the minimum acceptable aggregate size for temporary crossings. Larger aggregates will be allowed.
- Filter cloth is a fabric consisting of either woven or nonwoven plastic, polypropylene, or nylon and is used to distribute the load, retain fines, allow increased drainage of the aggregate and reduce mixing of the aggregate with the subgrade soil. Filter cloths, such as Mirafi, Typar, Adva Filter, Polyfilter X, or an approved equivalent, should be used as required by the specific method.

Considerations for Choosing a Specific Method (Bridge or Culvert):
The following criteria for erosion and sediment control should be considered when selecting a specific temporary access waterway crossing standard method:
- Select standard design methods that will least disrupt the existing terrain of the stream reach. Consider the effort that will be required to restore the area after the temporary crossing is removed.
- Locate the temporary crossing where there will be the least disturbance to the soils of the existing waterway banks. When possible locate the crossing at the point receiving minimal surface runoff.
- The physical constraints of a site may preclude the selection of one or more of the standard methods.
- The time of year may preclude the selection of one or more of the standard methods due to fish spawning or migration restrictions.
- Vehicular loads, traffic patterns, and frequency of crossings should be considered in choosing a specific method.
- The standard methods will require various amounts of maintenance. The bridge method should require the least maintenance, whereas the ford method will probably require more intensive maintenance.
- Ease of removal and subsequent damage to the waterway should be primary factors in considering the choice of a standard method.

Temporary Bridge
- This is the preferred method for temporary access waterway crossings. Normally, bridge construction causes the least disturbance to the waterway bed and banks when compared to culverts.
- Most bridges can be quickly removed and reused.
- Temporary access bridges pose the least chance for interference with fish migration when compared to the other temporary access waterway crossings.

Temporary Culvert

- A temporary access culvert is a structure consisting of a section(s) of circular pipe, pipe arches, or oval pipes of reinforced concrete, corrugated
- metal, or structural plate, which is used to convey flowing water through the crossing.
- Temporary culverts are used where (1) the channel is too wide for normal bridge construction, or (2) anticipated loading may prove unsafe for single span bridges.
- Temporary culverts can be salvaged and reused.

Construction Guidelines

Temporary Bridge

- Construction, use, or removal of a temporary access bridge will not normally have any time-of-year restrictions since construction, use, or removal should not affect the stream or its banks.
- A temporary bridge structure should be constructed at or above bank elevation to prevent the entrapment of floating materials and debris.
- Abutments should be placed parallel to and on stable banks.
- Bridges should be constructed to span the entire channel. If the channel width exceeds 8 ft (as measured from top-of-bank to top-of-bank) then a footing, pier or bridge support may be constructed within the waterway. One additional footing, pier or bridge support will be permitted for each additional 8-ft width of the channel. However, no footing, pier or bridge support will be permitted within the channel for waterways less than 8 ft wide.
- Stringers should either be logs, sawn timber, prestressed concrete beams, metal beams, or other approved materials.
- Decking materials should be of sufficient strength to support the anticipated load. All decking members should be placed perpendicular to the stringers, butted tightly, and securely fastened to the stringers. Decking materials should be butted tightly to prevent any soil material tracked onto the bridge from falling into the waterway below.
- Run planking (optional) should be securely fastened to the length of the span. One run plank should be provided for each track of the equipment wheels. Although run planks are optional, they may be necessary to properly distribute loads.
- Curbs or fenders may be installed along the outer sides of the deck. Curbs or fenders are an option that will provide additional safety.
- Bridges should be securely anchored at only one end using steel cable or chain. Anchoring at only one end will prevent channel obstruction in the event that floodwaters float the bridge. Acceptable anchors are large trees, large boulders, or driven steel anchors. Anchoring should be sufficient to prevent the bridge from floating downstream and possibly causing an obstruction to the flow.
- All areas disturbed during installation should be stabilized within 14 calendar days of that disturbance.

Temporary Culvert

- All culverts should be strong enough to support their cross sectional area under maximum expected loads.
- The size of the culvert pipe should be the largest pipe diameter that will

fit into the existing channel without major excavation of the waterway channel or without major approach fills. If a channel width exceeds 3 ft, additional pipes may be used until the cross sectional area of the pipes is greater than 60% of the cross sectional area of the existing channel. The minimum size culvert that may be used is a 12-in. diameter pipe.

- The culvert(s) should extend a minimum of 1 ft beyond the upstream and downstream toe of the aggregate placed around the culvert. In no case should the culvert exceed 40 ft in length.
- Filter cloth should be placed on the streambed and stream banks prior to placement of the pipe culvert(s) and aggregate. The filter cloth should cover the streambed and extend a minimum 6 in. and a maximum 1 ft beyond the end of the culvert and bedding material. Filter cloth reduces settlement and improves crossing stability.
- The invert elevation of the culvert should be installed on the natural streambed grade to minimize interference with fish migration (free passage of fish).
- The culvert(s) should be covered with a minimum of 1 ft of aggregate. If multiple culverts are used they should be separated by at least 12 in. of compacted aggregate fill.
- All areas disturbed during culvert installation should be stabilized within 14 calendar days of the disturbance.

Maintenance

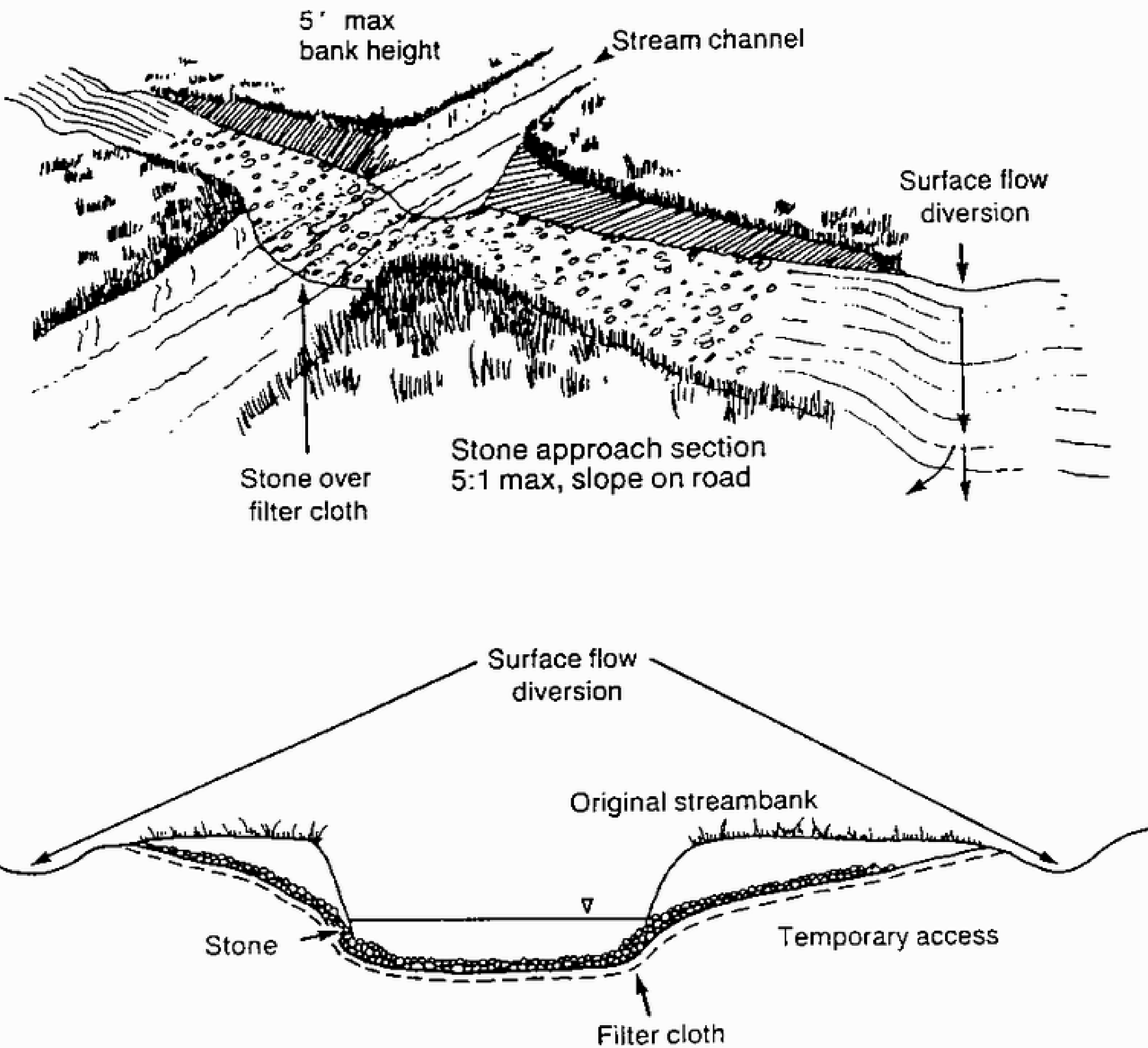
Temporary Bridge

- Periodic inspections should be performed by the user to ensure that the bridge, streambed, and stream banks are maintained and not damaged.
- Maintenance should be performed, as needed, to ensure that the structure complies with the standard and specifications. This should include removal and disposal of any trapped sediment or debris. Sediment should be disposed of outside of the flood plain and stabilized.
- When the temporary bridge is no longer needed, all structures, including abutments and other bridging materials, should be removed within 14 calendar days. In all cases, the bridge materials should be removed within 1 year of installation.
- Final clean-up should consist of removal of the temporary bridge from the waterway, protection of banks from erosion, and removal of all construction materials. All removed materials should be stored outside the waterway flood plain.
- Removal of the bridge and clean up of the area should be accomplished without construction equipment working in the waterway channel.
- All areas disturbed during removal should be stabilized within 14 calendar days of that disturbance.

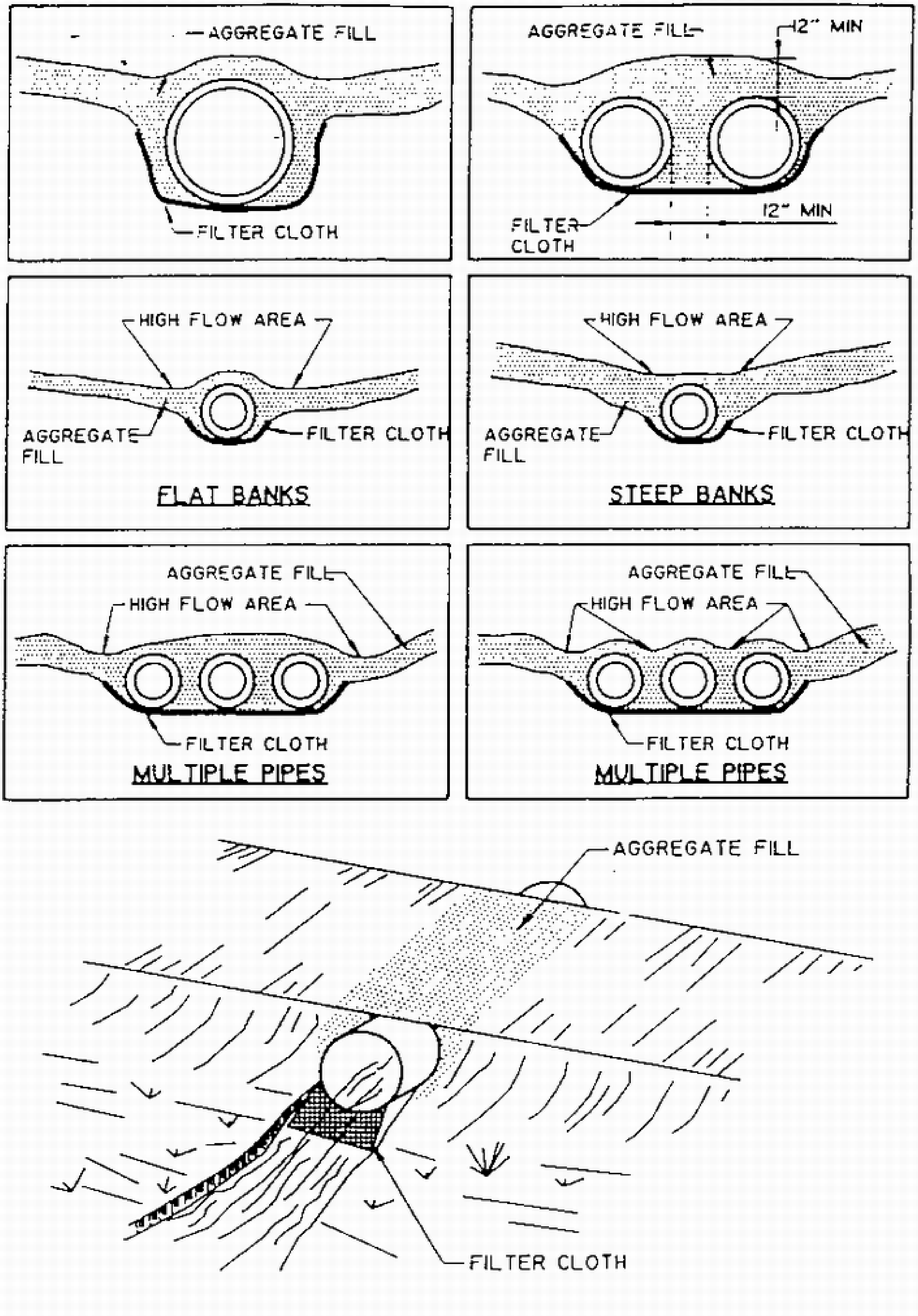
Temporary Culvert

- Periodic inspection should be performed to ensure that the culverts, streambed, and stream banks are not damaged, and that sediment is not entering the stream or blocking fish passage or migration.
- Maintenance should be performed, as needed in a timely manner to ensure that structures are in compliance with this standard and specification. This includes removal and disposal of any trapped sediment or debris.

- Sediment should be disposed of and stabilized outside the waterway flood plain.
- When the crossing has served its purpose, all structures, including culverts, bedding and filter cloth materials, should be removed within 14 calendar days. In all cases, the culvert materials should be removed within 1 year of installation.
- Final clean-up should consist of removal of the temporary structure from the waterway, removal of all construction materials, restoration of original stream channel cross section, and protection of the steam banks from erosion. Removed material should be stored outside of the waterway flood plain.
- Removal of the structure and clean up of the area should be accomplished without construction equipment working in the waterway channel.
- All areas disturbed during culvert removal should be stabilized within 14 calendar days of the disturbance.

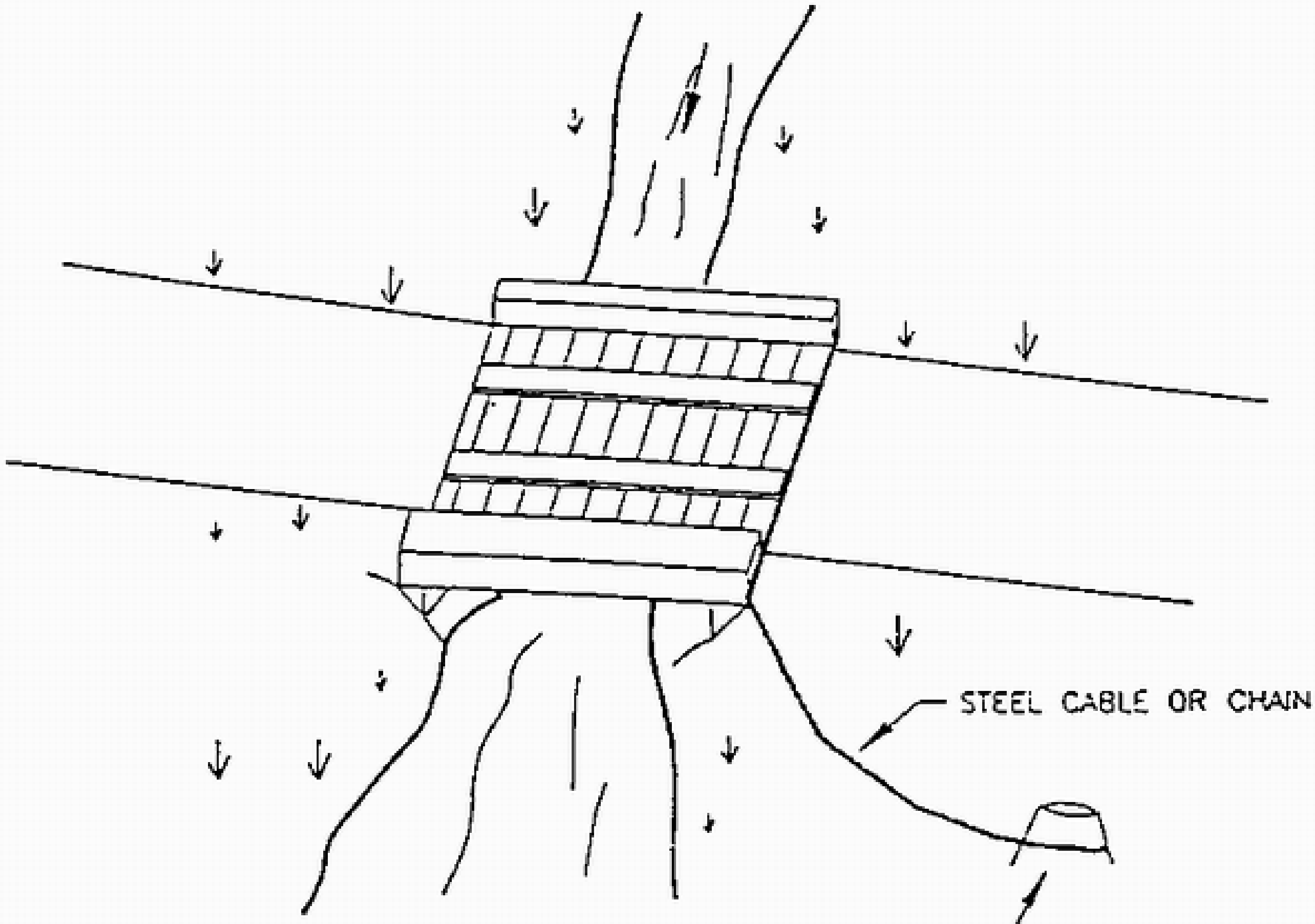


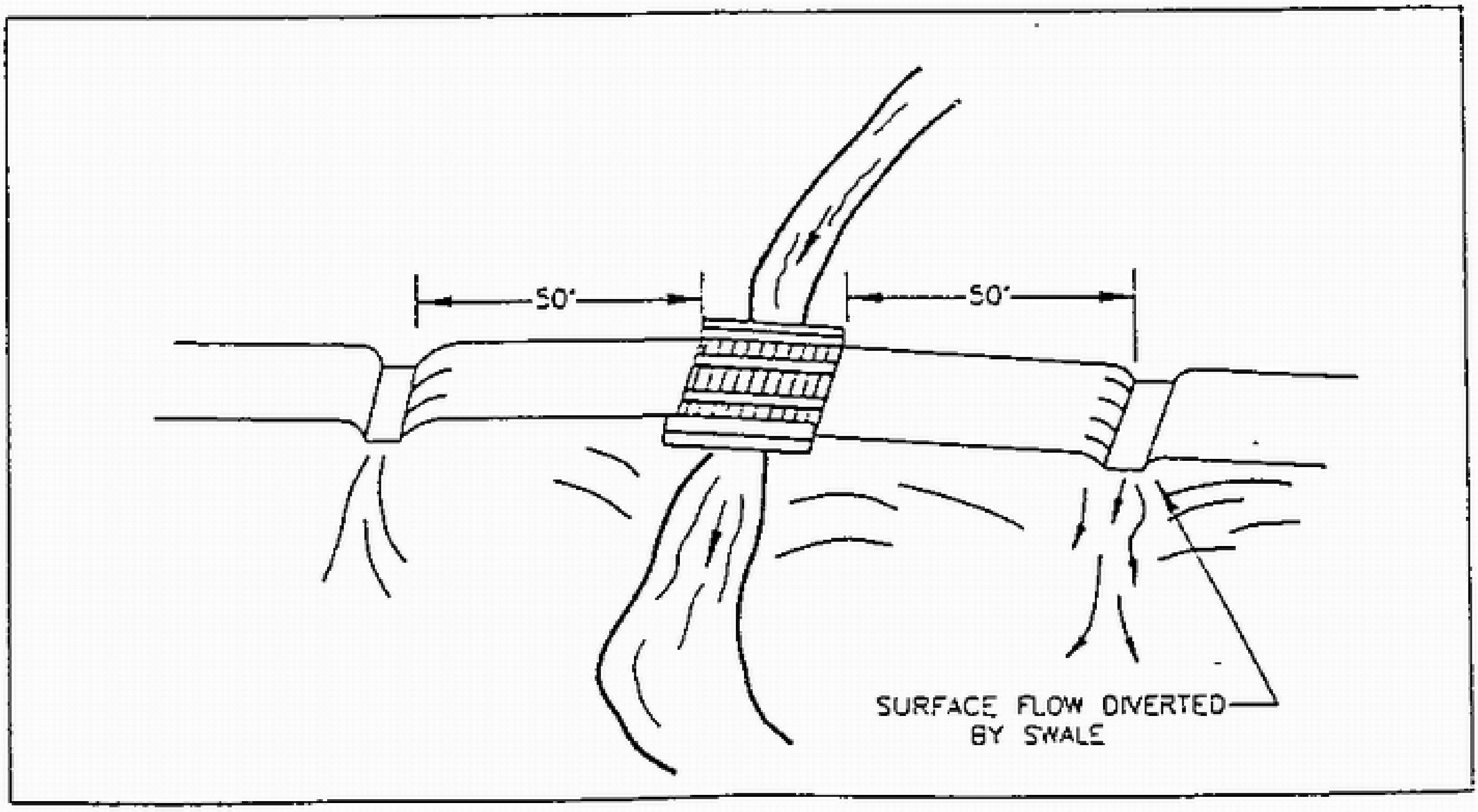
A well constructed ford offers little obstruction to flow while safely handling heavy loadings.



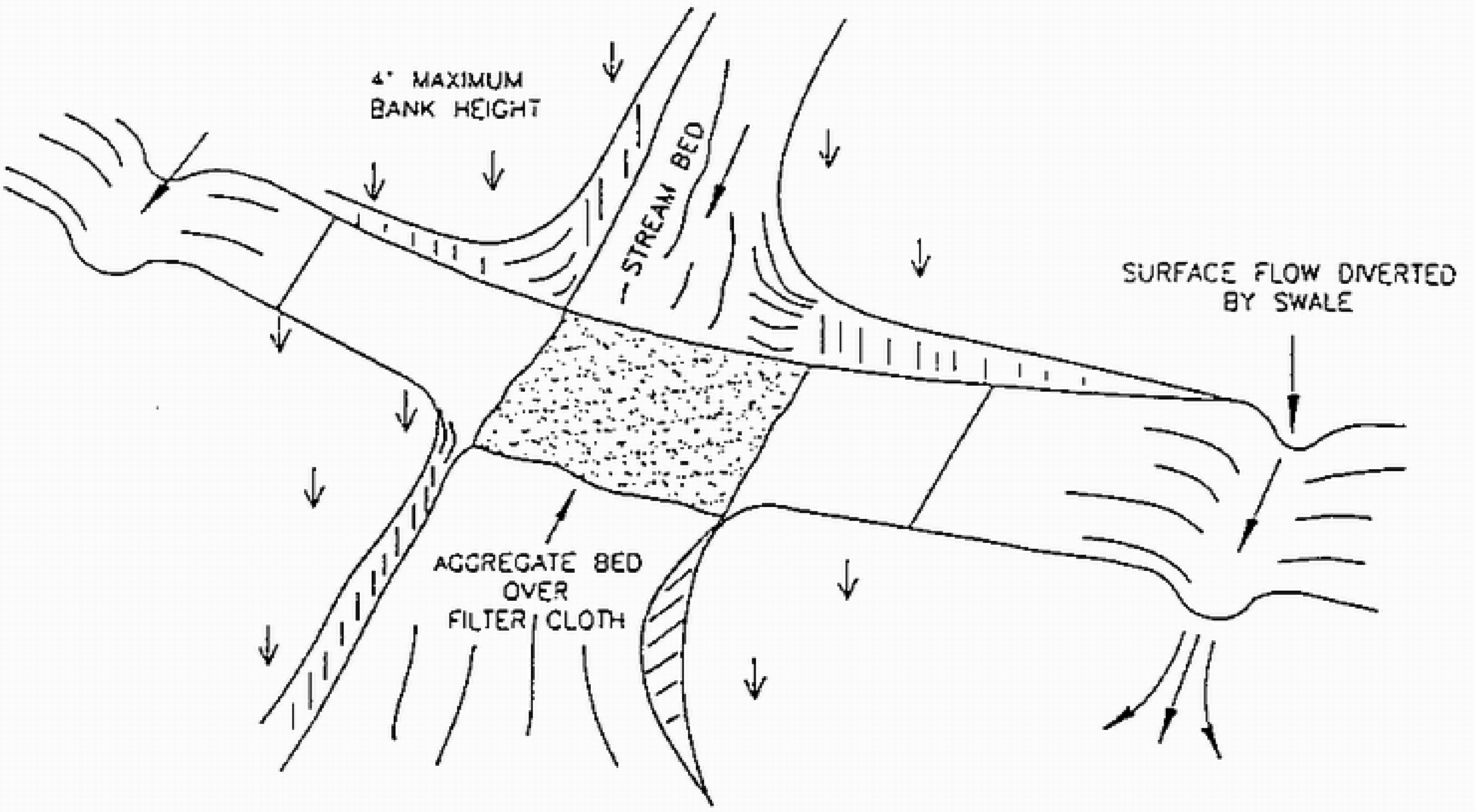
TEMPORARY ACCESS CULVERT

TEMPORARY ACCESS BRIDGE

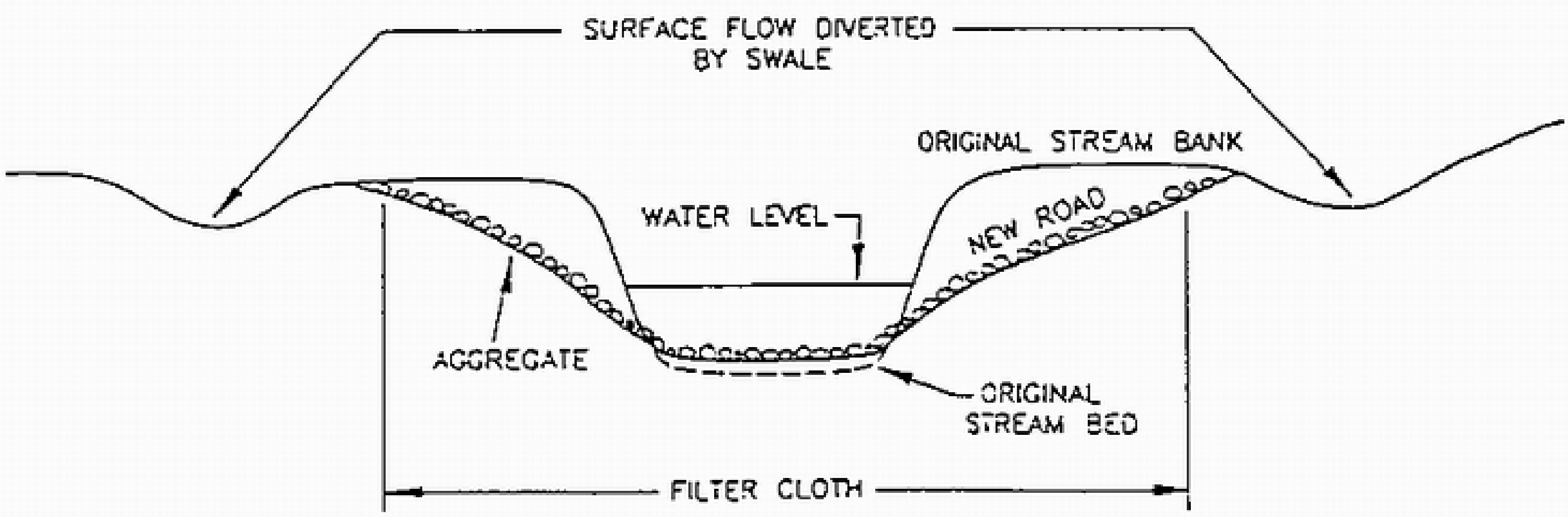




U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	TEMPORARY ACCESS BRIDGE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		TAB-1



AGGREGATE APPROACH
5:1 MAXIMUM. SLOPE ON ROAD



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	TEMPORARY ACCESS CULVERT	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		TAF-1

Biofilter Bags BMP 34

Description

Temporary sediment barriers, consisting of biofilter bags, reduce the transport of sediment from a construction site by providing a temporary physical barrier to sediment and reducing runoff velocities. The barriers can be placed in various combinations to construct the required structure. They may also be used as a barrier to divert or direct small amounts of runoff around active work areas or to a slope drain, sediment trap or other filtration/sedimentation BMP. Biofilter bags (plastic mesh bags filled with wood chips) are temporary measures. They have a limited life span and should be regularly inspected and replaced when damaged.

Applications

The barriers are effective at storm drain inlets, across minor swales and ditches, as diversion dikes and berms, along property lines, and for other applications where the need for a barrier is temporary and structural strength is not required. These are several example applications:

- At the toe of embankment slopes
- At the outlet of slope drains
- As filter cores for log check dams
- In front of silt fences
- To protect inlets along paved streets

Limitations

Drainage area – N/A	Maximum slope – 10%
Minimum bedrock depth - N/A	Minimum water table – N/A
NRCS soil type - ABCD	Freeze/thaw – fair
Drainage/flood control – no	

- These types of barriers are only suitable where flow rates are low (475 gal/min or less). They require regular inspections and repair, and periodic replacement (about 3 months maximum usefulness).
- Even when properly installed, temporary barriers are not usually as effective as silt fences (BMP 36) or gravel berms (BMP 43).

Targeted Pollutants

Sediment

Design Parameters

- Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the barrier.
- The practice may also be used for a single-family lot if the slope is less than 15%. The contributing drainage area in this instance should be less than 1 ac. and the length of slope above the dike should be less than 200 ft.
- Concentrated flows no greater than 475 gal/min per second.
- The useful life is 3 months maximum, depending on site conditions.
- An undisturbed buffer zone of 3 to 6.5 ft is necessary between the barriers and surface waters to allow safe removal of the barrier and of accumulated sediments.
- The barrier should be embedded to a minimum depth of 6 in. and

backfilled for the entire length of the barrier. Each bag should be securely anchored with two stakes 2 in. x 2 in. x 3 ft or steel drift pins driven at least 20 in. into the ground.

Construction Guidelines

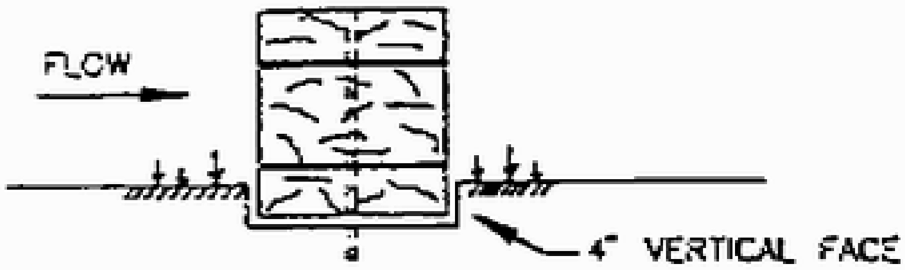
- Barriers used for sediment control at the toe of slopes should be in place prior to disturbing the slope. Install a short distance away from the toe of the slope to increase the effective area but outside of any ditch channel.
- Place the barriers in a single row lengthwise on the contour for sheet flow applications, or perpendicular to the contour in concentrated flow applications. When flows are expected to be high enough to surpass the infiltration capacity of the devices, the center (low point) bales should be wrapped in filter fabric with a 3 ft tail stapled securely and extending from the down gradient side of the barrier to prevent scouring. The ends of the adjacent barriers should tightly abut one another.
- Any gaps between barriers should be filled with tightly wedged straw. For concentrated flow applications, extend the end of the barrier so that the bottoms of the end units are at a higher elevation than the top of the lowest middle unit to assure that sediment-laden water flows through or over the barrier instead of around the ends.

Maintenance

- Perform one inspection during the first runoff-producing event after the installation of the barriers to assure proper functioning. No more than 1 ft depth of sediment should be allowed to accumulate. Damaged barriers, undercutting, or end runs should be repaired immediately.
- If approved, biofilter bags may be used after project completion as mulch.
- Temporary sediment barriers should be removed within 30 days of final stabilization of the site. If rebar is used it should be removed.

Table 34-1. Design Parameters

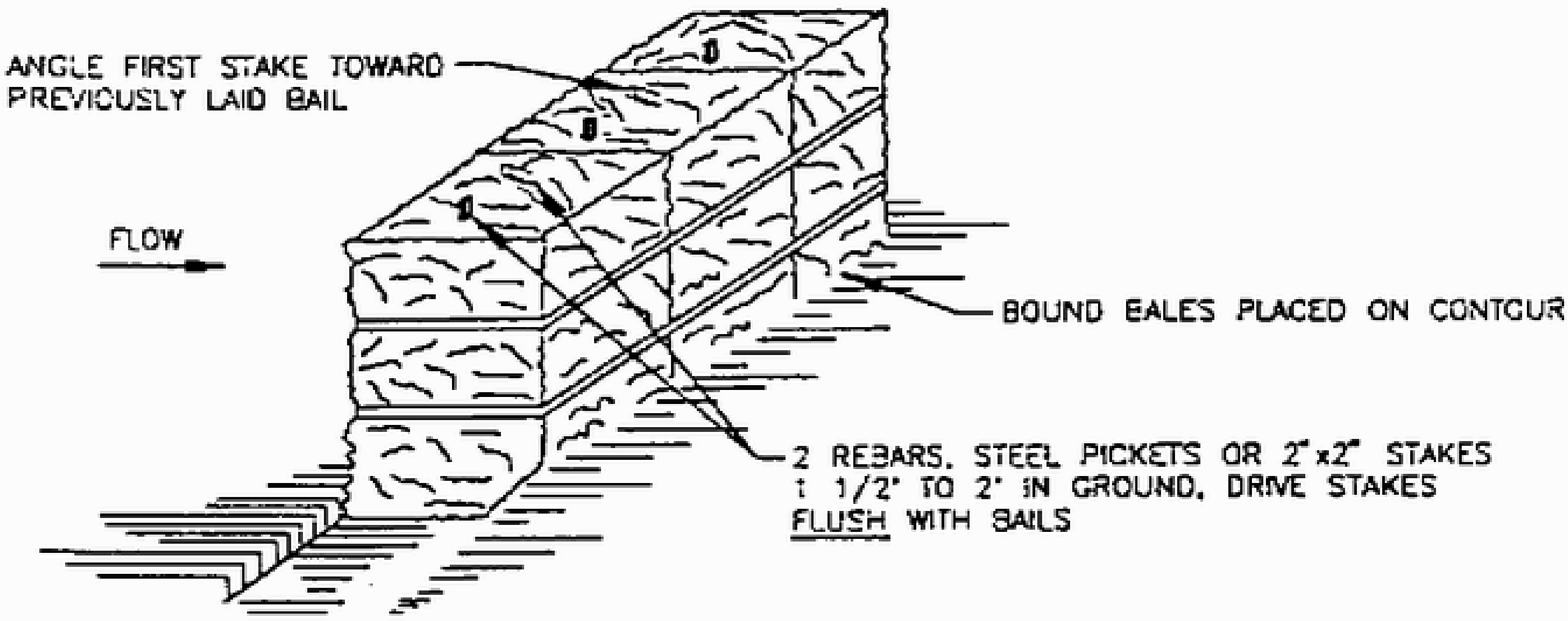
Constructed Slope	Percent Slope	Slope Length Feet
2:1	50	25
2.5:1	40	50
3:1	33	75
3.5:1	30	100
4:1	25	125



BEDDING DETAIL

SBD

STANDARD SYMBOL



ANCHORING DETAIL

CONSTRUCTION SPECIFICATIONS

1 BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.

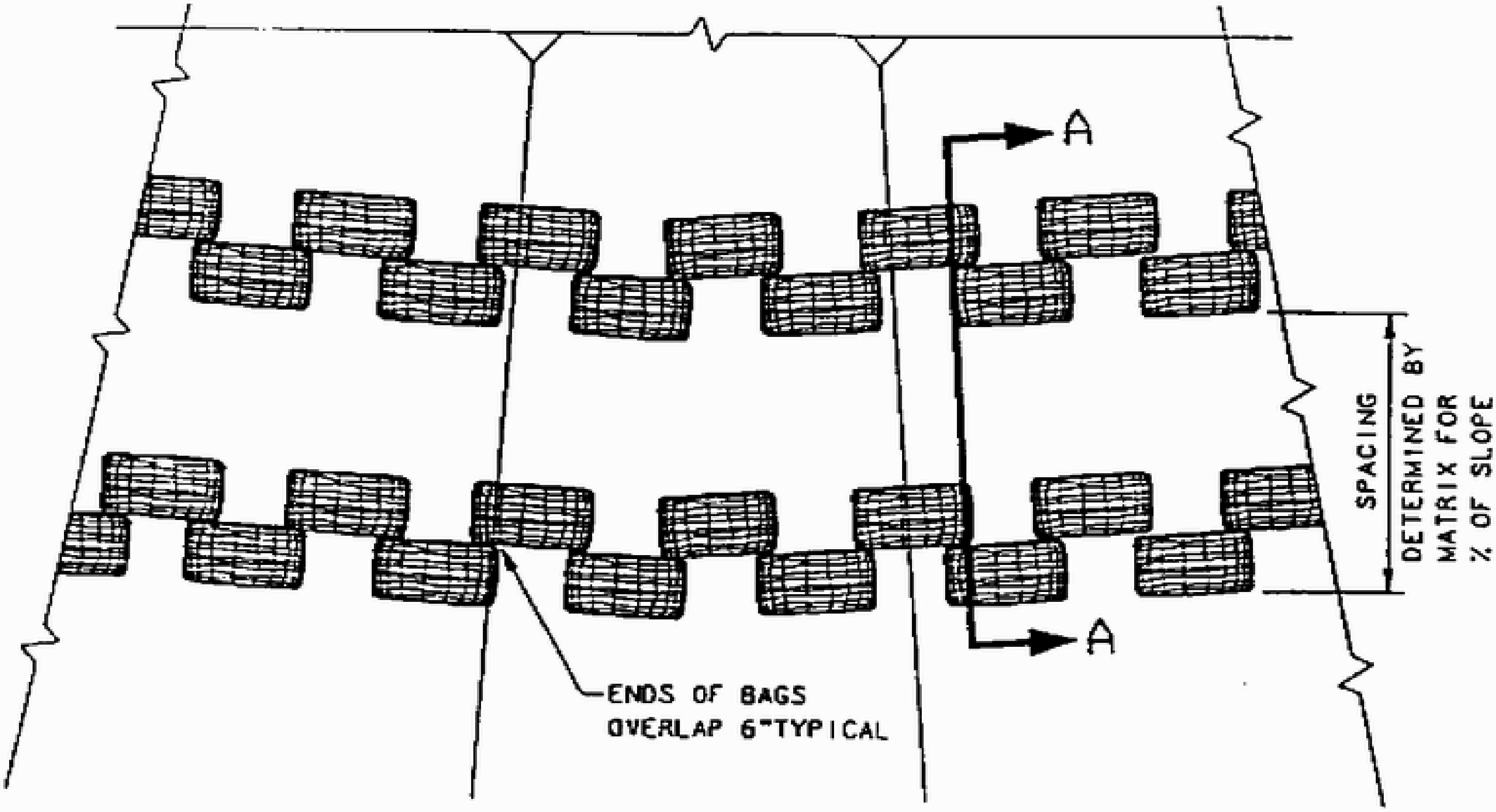
2 EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4 INCHES AND PLACED SO THE BINDINGS ARE HORIZONTAL.

3 BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.

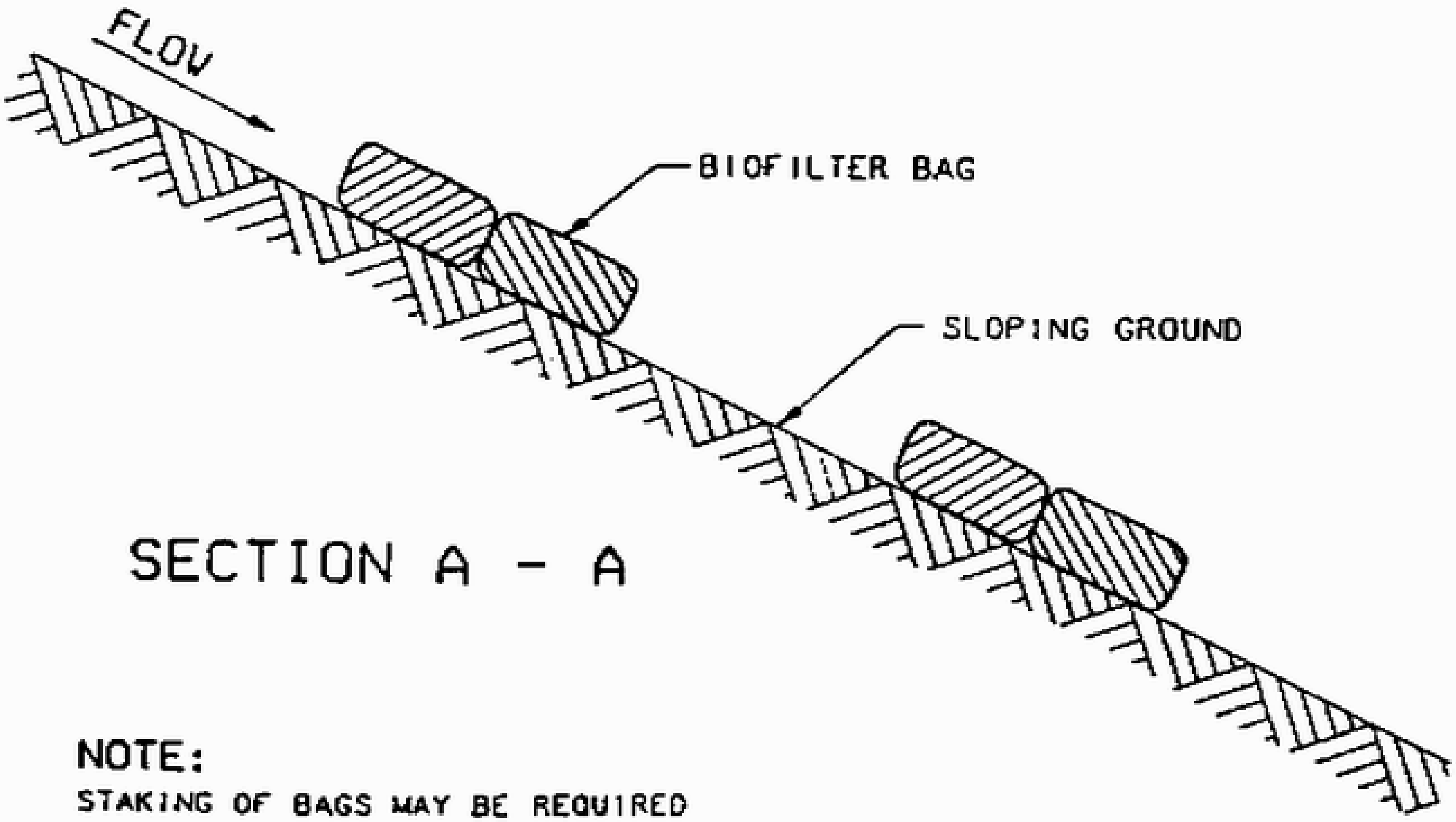
4 INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

5 BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULLNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	STRAW BALE DIKE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		SBD-1



PLAN VIEW



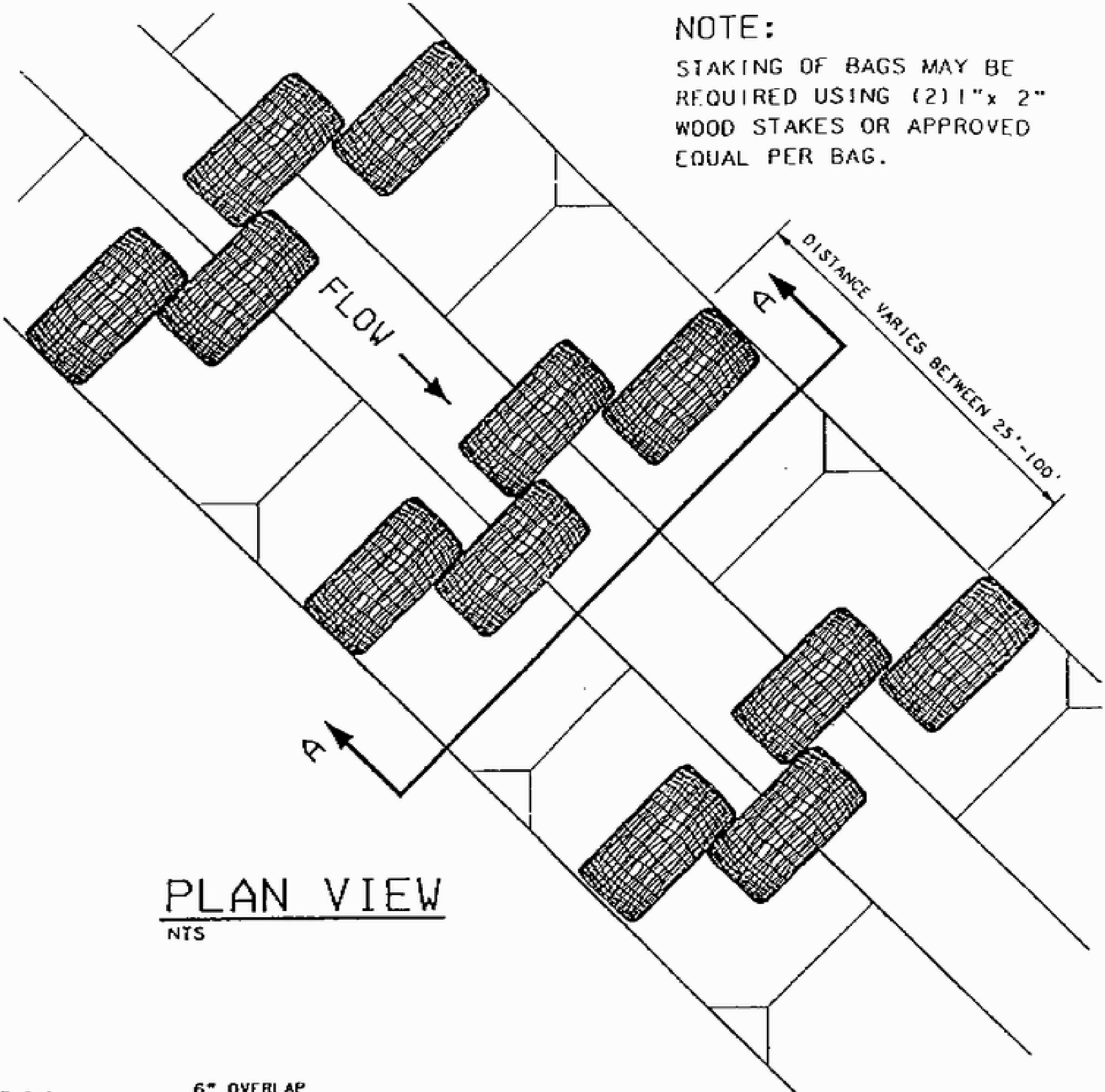
SECTION A - A

NOTE:

STAKING OF BAGS MAY BE REQUIRED WITH EITHER METHOD, USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.

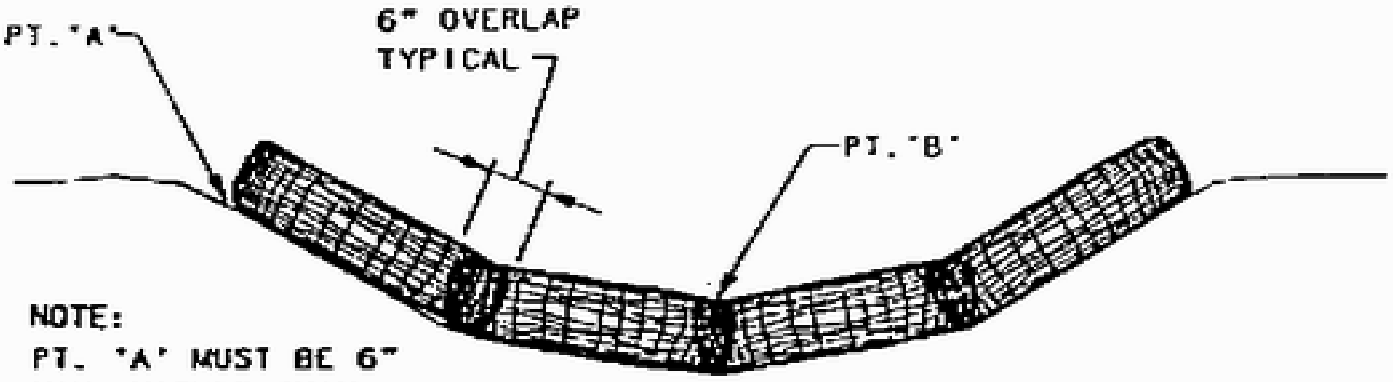
NOTE:

STAKING OF BAGS MAY BE REQUIRED USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.



PLAN VIEW

NTS



NOTE:

PT. "A" MUST BE 6" MIN. HIGHER THAN PT. "B"

SECTION A-A

NTS

Fiber Rolls BMP 35

Description

A fiber roll (wattle/compost-filled socks) consists of straw, flax, or other similar materials bound into a biodegradable tubular plastic or similar encasing material. When fiber rolls are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. By interrupting the length of a slope, fiber rolls can also reduce erosion.

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
- At the end of a downward slope where it transitions to a steeper slope
- Along the perimeter of a project
- As check dams in unlined ditches
- Down-slope of exposed soil areas
- Around temporary stockpiles
- As temporary curbs for conveying water to catch basins and pipe slope drains
- For catch basin protection

Limitations

Drainage area – N/A	Maximum slope – See Design Parameters
Minimum bedrock depth – N/A	Minimum water table - N/A
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – yes	

- Fiber rolls are not effective unless trenched.
- Fiber rolls at the toe of slopes greater than 5:1 (H:V) should be a minimum of 20 in. diameter or installations achieving the same protection (i.e., stacked smaller diameter fiber rolls, etc.).
- Difficult to move once saturated.
- If not properly staked and trenched in, fiber rolls can be transported by high flows.
- Fiber rolls have a very limited sediment capture zone.
- Fiber rolls should not be used on slopes subject to creep, slumping, or landslide.

Targeted Pollutants

Sediment

Design Parameters

Locate fiber rolls on level contours spaced as follows:

- Slope inclination of 4:1 or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.
- Slope inclination between 4:1 and 2:1: Fiber rolls should be placed at a maximum interval of 15 ft (A closer spacing is more effective.).
- Slope inclination 2:1 or greater: Fiber rolls should be placed at a maximum interval of 10 ft (A closer spacing is more effective.).

Construction Guidelines

- Fiber rolls should be either prefabricated rolls or rolled tubes of erosion control blanket. Field rolled fiber roll is assembled by rolling the length of erosion control blanket into a tube of minimum 8 in. diameter and binding the roll at each end and every 4 ft along the length of the roll with jute-type twine.
- Turn the ends of the fiber roll up slope to prevent runoff from going around the roll.
- Stake fiber rolls into a 2 to 4 in.-deep trench with a width equal to the diameter of the fiber roll. Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center. Use wood stakes with a nominal classification of 0.75 x 0.75 in. and minimum length of 24 in.
- If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.

Maintenance

- Inspect prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at 2-week intervals during the non-rainy season.
- Repair or replace split, torn, unraveling, or slumping fiber rolls.
- If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when sediment accumulation reaches one-half the designated sediment storage depth, usually one-half the distance between the top of the fiber roll and the adjacent ground surface.
- Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- If fiber rolls are used for erosion control, such as in a mini-check dam, sediment removal should not be required as long as the system continues to control the grade. Sediment control BMPs will likely be required in conjunction with this type of application.

Silt Fence BMP 36

Description

A silt fence is a temporary sediment barrier consisting of a filter fabric stretched and attached to supporting posts. Wire fence backing is necessary with several types of filter fabric commonly used. Silt fences assist in sediment control by retaining some of the eroded soil particles and slowing the runoff velocity to allow particle settling.

Applications

- Silt fences can be used near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. The fences should remain in place until the disturbed area is permanently stabilized.
- Silt fences can also be used along the toe of fills, on the downhill side of large through-cut areas, along streams, and at natural drainage areas to reduce the quantity of sediment and to dissipate flow velocities to downstream areas.
- Also use at grade breaks on cut/fill slopes and above interceptor dikes.
- The silt fence should be constructed after the cutting and slashing of trees and before excavating haul roads, fill benches, or any soil disturbing construction activity in the drainage areas.

Limitations

Drainage area – 1 ac./100 ft	Maximum slope – 33%
Minimum bedrock depth – 2 ft	Minimum water table – 2 ft
NRCS soil type - ABCD	Freeze/thaw – good
Drainage/flood control – no	

Silt fences should not be used where there is a concentration of water in a channel or drainageway or where soil conditions prevent the minimum fabric toe-in depth or minimum depth for installation of support posts. If concentrated flow occurs after installation, take corrective action by placing rock berms or other corrective measures in the areas of concentrated flow.

Targeted Pollutants

Sediment

Design Parameters

- Maximum allowable slope lengths contributing runoff to a silt fence are listed in Table 36-1 below.
- Maximum drainage area for overland flow to a silt fence should not exceed 0.5 ac. per 100 ft of fence.
- Design computations are not required. All silt fences should be placed as close to the contour as possible, and the area below the fence should be undisturbed or stabilized.
- A detail of the silt fence should be shown on the plan, and contain the following minimum requirements:
  - ✓ The type, size, and spacing of fence posts
  - ✓ The size of woven wire support fences
  - ✓ The type of filter cloth used
  - ✓ The method of anchoring the filter cloth

- ✓ The method of fastening the filter cloth to the fencing support
- Where ends of filter fabric come together, they should be overlapped, folded and stapled to prevent sediment bypass.
- Materials:
  - ✓ Silt Fence Fabric: The fabric should meet the specifications in Table 36-2 below, unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval does not constitute statewide acceptance. Statewide acceptability depends on in-field and/or laboratory observations and evaluations.
  - ✓ Fence Posts (for fabricated units): The length should be a minimum of 36 in. long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square in.. Steel posts will be standard “T” and “U” section weighing not less than 1 pound per linear ft.
  - ✓ Wire Fence (for fabricated units): Wire fencing should be a minimum 14.25 gage with a maximum 6 in. mesh opening, or as approved.
  - ✓ Prefabricated Units: Envirofence or approved equal may be used in lieu of the above method providing the unit is installed per manufacturer’s instructions.

Construction Guidelines

- Posts should be spaced 10 ft apart when a wire mesh support fence is used and no more than 6.5 ft apart when using extra-strength filter fabric (without a wire fence). The posts should extend at least 16 in. into the ground.
- If standard strength filter fabric is to be used, fasten the optional wire mesh support fence to the upslope side of the posts using heavy duty wire staples, tie wires, or hog rings. Extend the wire mesh support to the bottom of the trench. The filter fabric should then be stapled or wired to the fence.
- Extra strength filter fabric does not require a wire mesh support fence. Staple or wire the filter fabric directly to the posts.
- Do not attach filter fabric to trees.
- Where joints in the fabric are required, splice it together only at a support post, with a minimum 6 in. overlap, and securely seal the joint.
- Embedded filter fabric should extend in a flap that is anchored by backfill, to prevent fabric from pulling out of ground.

Maintenance

Silt fences should be inspected periodically for damage (such as tearing by wind, animals, or equipment) and for the amount of sediment that has accumulated. Remove the sediment when it reaches one-half the height of the silt fence. In situations where access is available, machinery can be used.

Otherwise, the silt should be removed manually. The following are key elements to remember:

- The sediment deposits should be removed when heavy rain or high water is anticipated.
- The sediment deposits should be placed in an area where there is little danger of erosion.

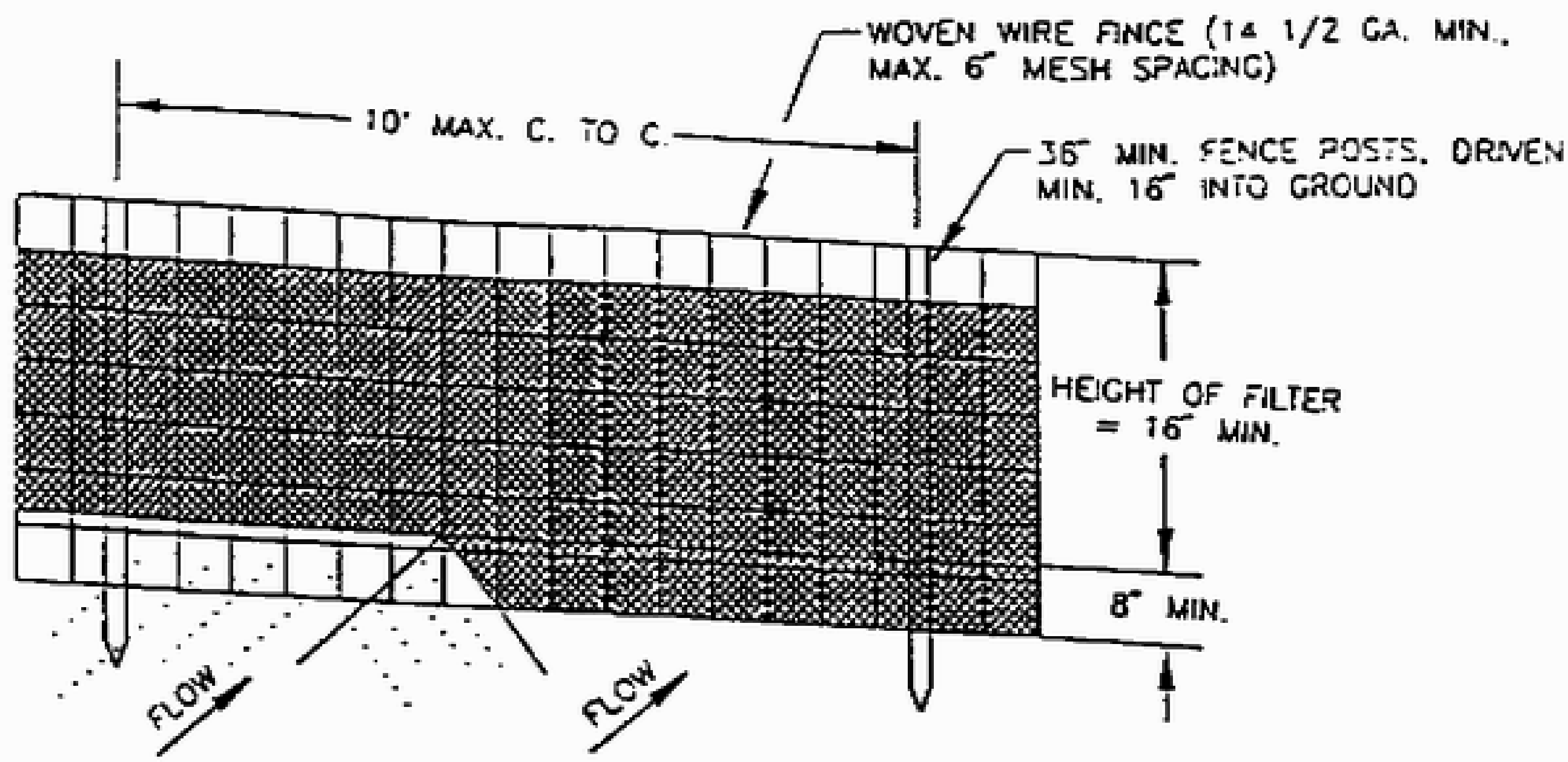
- The silt fence should not be removed until adequate vegetative growth ensures no further erosion of the slopes. Generally, the fabric is cut at ground level, the wire and posts are removed, then the sediment is spread, seeded, and protected (mulched) immediately.

Table 36–1. Maximum Allowable Slope Lengths

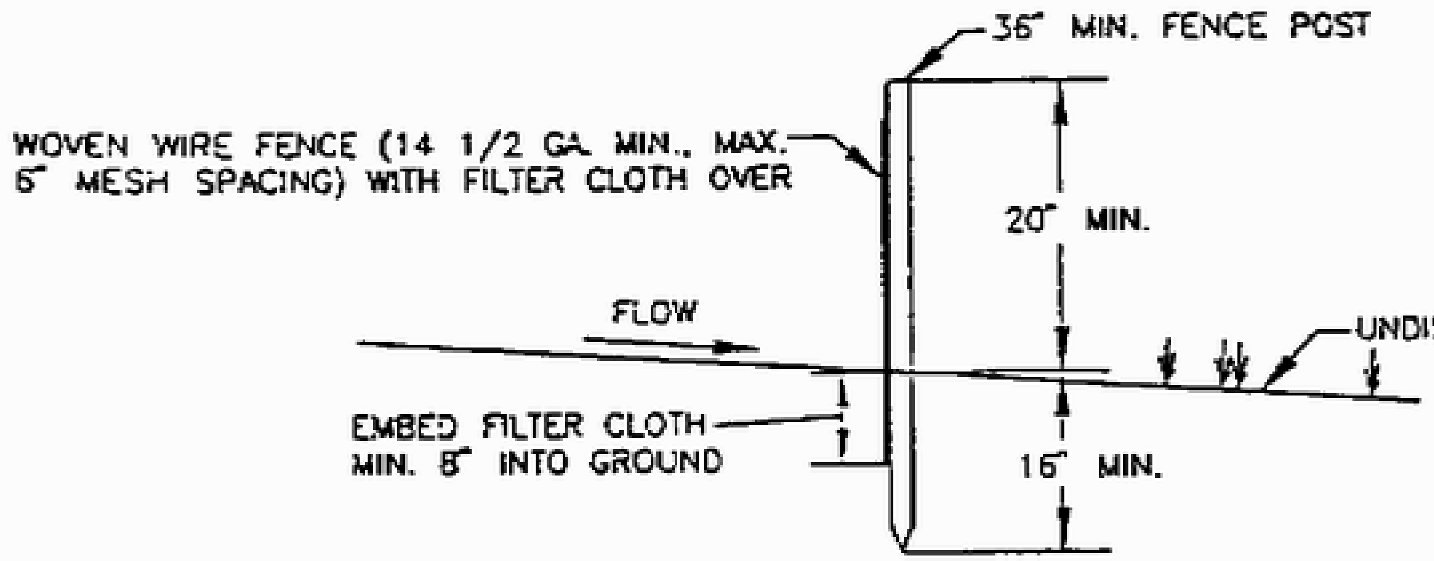
Slope Steepness	Maximum Slope Length (Feet)
2:1	50
3:1	75
4:1	125
5:1	175
Flatter than 5:1	200

Table 36-2. Filter Fabric Specifications

Fabric Properties	Value	Minimum Acceptable Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability %	90	ASTM-G-26



PERSPECTIVE VIEW



SECTION

S —— S

STANDARD SYMBOL

CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

1 WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.

2 FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP AND MID-SECTION.

3 WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6 INCHES AND FOLDED.

4 MAINTENANCE SHALL BE PREFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

POSTS: STEEL, EITHER "T" OR "U" TYPE OR 2" HARDWOOD.

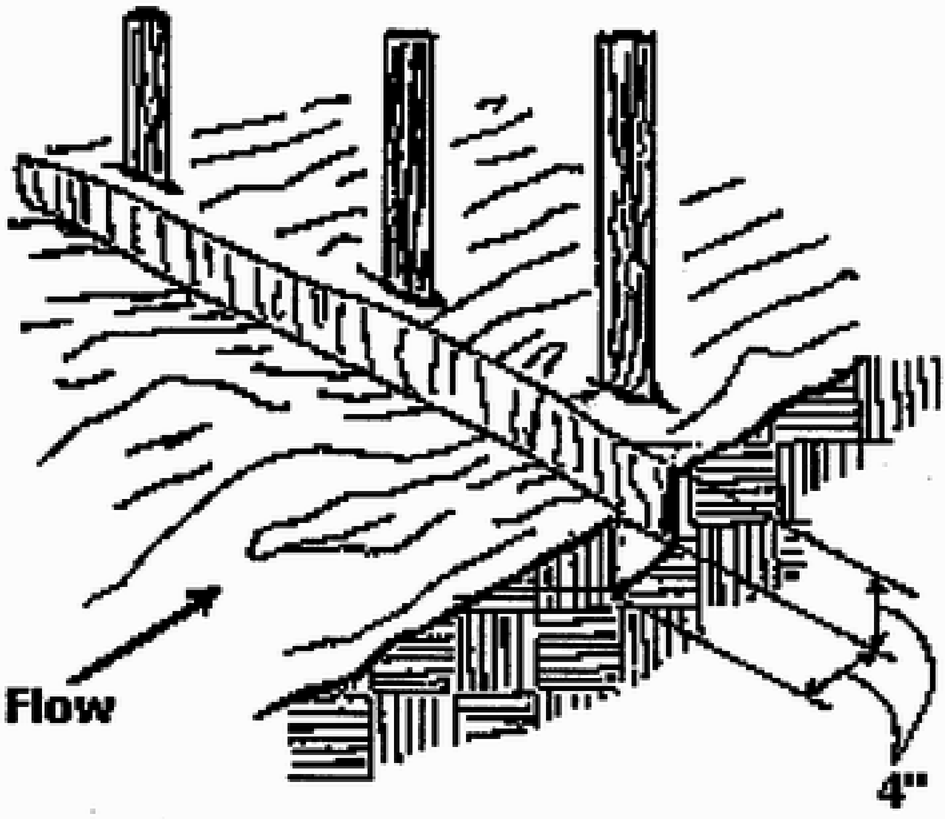
FENCE: WOVEN WIRE, 14 GAGE, 6" MAX. MESH OPENING.

FILTER CLOTH: FILTER X, MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL.

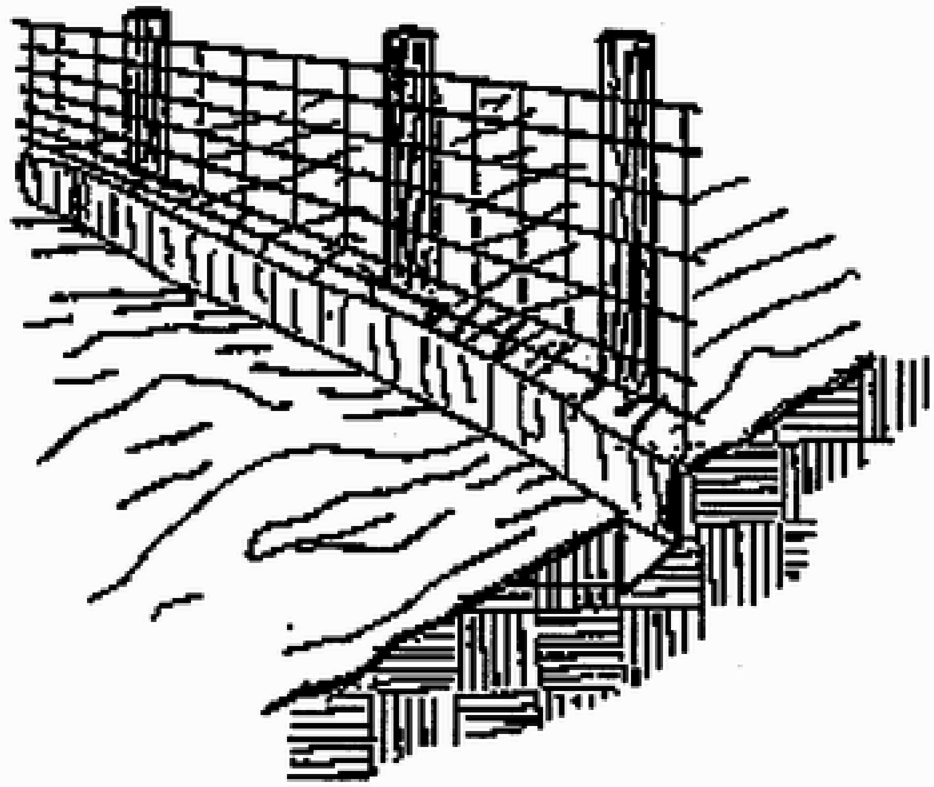
PREFABRICATED UNIT: GEOFAB, ENVIROFENCE OR APPROVED EQUAL.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	SILT FENCE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		SF-1

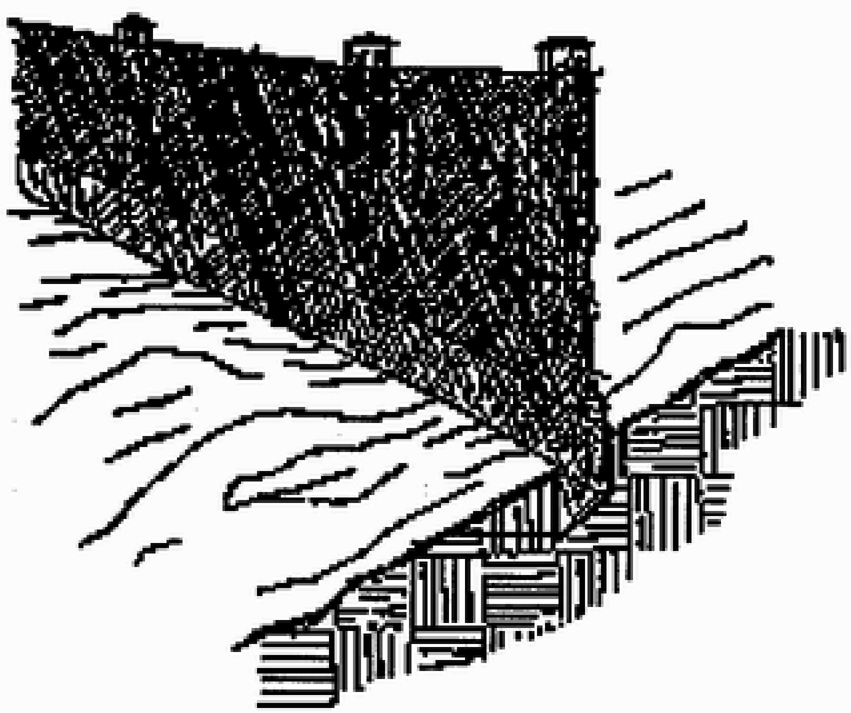
1. Set Posts and Excavate a 4" x 4" Trench upslope along the line of the posts.



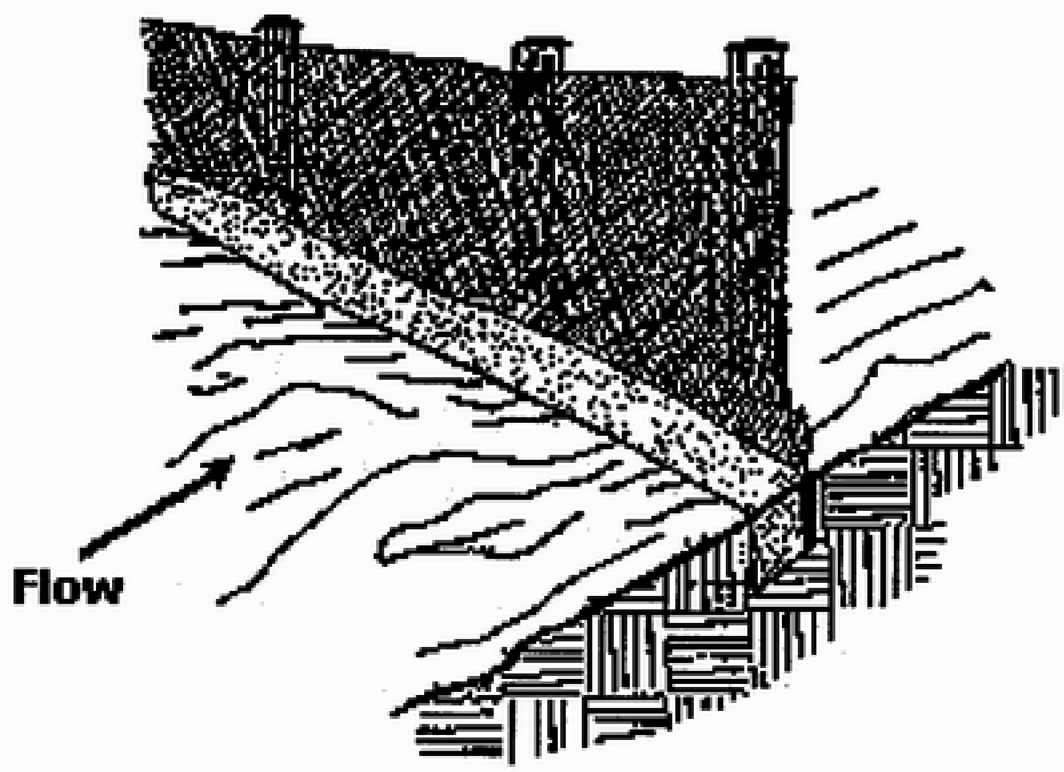
2. Staple Wire Fencing to the Posts.



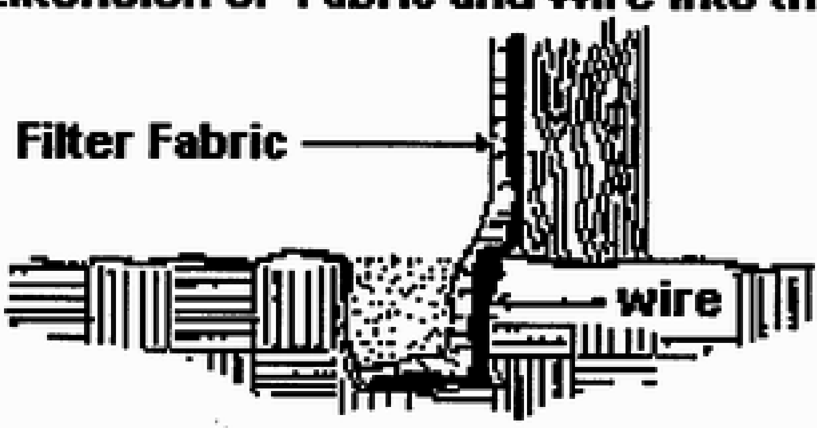
3. Attach the Filter Fabric to the Wire Fence and Extend it into the Trench.



4. Backfill and Compact the Excavated Soil



Extension of Fabric and Wire into the Trench



Vegetative Buffer Strip BMP 37

Description

A vegetative buffer strip is a gently sloping area of vegetative cover that runoff water flows through before entering a stream, storm sewer, or other conveyance. The buffer strip may be an undisturbed strip of natural vegetation or it can be a graded and planted area.

Vegetative buffer strips act as living sediment filters that intercept and detain stormwater runoff. They reduce the flow and velocity of surface runoff, promote infiltration, and reduce pollutant discharge by capturing and holding sediments and other pollutants carried in the runoff water. Vegetative buffer strips function much like vegetated or grassed swales. Buffer strips, however, are fairly level and treat sheet flow across them, whereas grassed swales are indentations that treat concentrated flows running along them (see BMP 40-Temporary Swale).

Applications

- Used for temporary or permanent control, usually in conjunction with other sediment collection and slope protection practices. Consider use with level spreaders or diversion measures such as earth dikes (BMP 41) and slope drains (BMP 24). Also, silt fences (BMP 36) installed upgradient can prevent overloading of the buffer strip.
- May be placed at many locations between the source of sediment (road surface, side slopes) and a natural or constructed waterway. They are inexpensive and easily constructed, and can be put into place at any time if climatic conditions allow for planting.
- May be used at almost any site that can support vegetation, but is best suited for areas where the soils are well drained or moderately well drained and where the bedrock and the water table are well below the surface.
- Provides low to moderate treatment of pollutants in stormwater while providing a natural look to a site.
- Can provide habitat for wildlife.
- Can screen noise and views if trees or high shrubs are planted on the filter strips.

Limitations

Drainage area - unlimited	Maximum slope – 20%
Minimum bedrock depth – 5 ft	Minimum water table – 3 ft
NRCS soil type – ABCD	Freeze/thaw – fair
Drainage/flood control – no	

- Not effective for filtering high velocity flows from large paved areas, steep slopes, or hilly areas. Consider other measures if slopes exceed 15%.
- Requires significant land space.
- May have a short useful life due to clogging by sediments and oil and grease.
- Do not use planted or seeded ground as a buffer strip for sediment trapping until the vegetation is well established.

Targeted Pollutants

Sediment

Design Parameters

- A buffer strip should be at least 20 ft wide to function well. Along live streams or above wetlands, the minimum width should be 100 ft. The length of the strip should be approximately 50 to 82 ft. Where slopes become steeper, increase the length of the strip.
- Tall, dense stands of grass form good sediment traps, as do willows and alder. The willows and alder can be native or planted. A combination of grasses with willows or alder is also effective. Any planted species should be deep rooted and able to adjust to low oxygen levels. Vegetative cover should be at least 75% to assure adequate removal of sediments. Forested strips are always preferred to vegetated strips, and existing vegetation is preferred to planted vegetation. In planning for vegetated strips, consider climatic conditions, since vegetation may not take hold in especially dry and/or cold regions.
- In many cases, a vegetative buffer strip will not effectively control runoff and retain sediments unless employed in conjunction with other control measures. Where heavy runoff or large volumes of sediment are expected, provide diversion measures or other filtering measures above or below the buffer strip.

Construction Guidelines

- Try to direct sediment-laden water onto naturally vegetated or stabilized planted ground.
- Fertilizing seeded or planted ground may enhance growth (and improve its effectiveness as a buffer strip).
- Do not place any equipment, construction debris, or extra soil in the buffer strip (or the strip will be damaged).

Maintenance

- Inspect the buffer strip at regular intervals to ensure proper functioning. Check for damage by equipment and vehicles. In newly planted areas, check the progress of germination and plant growth, and arrange for fertilizing, if needed, to enhance growth and establishment. (Planted ground should not be used for a sediment trap until the vegetation is well established.) Make sure that water flowing through the buffer strip is not causing additional erosion nearby and not forming ponds due to erosion within the buffer strip.
- Buffer strips in natural vegetation do not generally require maintenance; however, on some sites it may be necessary to remove sediments and replant on a regular basis. Promptly repair any damage from equipment, vehicles, or erosion.

Sedimentation Trap (Basin) BMP 38

Description

A sedimentation trap is a temporary or permanent dam or basin used to collect, trap, and store sediment produced by construction activities, or as a flow detention facility for reducing peak runoff rates. Sediment basins can be designed to maintain a permanent pool or to drain completely dry. Either way, the basin detains sediment-laden runoff long enough to allow most of the sediment to settle out.

A sediment basin can be constructed by excavation or by placing an earthen embankment across a low area or drainage swale. The pond has a riser and pipe outlet with a gravel outlet or spillway to slow the release of runoff and provide some sediment filtration.

Applications

Sediment traps are appropriate where physical site conditions or land ownership restrictions preclude the effective use of barrier-type erosion control measures. It may be used below construction operations which expose critical areas to soil erosion.

A temporary sediment basin used in combination with other control measures, such as seeding or mulching, is especially effective for removing sediments. Note that the use of sedimentation basins on construction sites greater than or equal to 1 ac., with an NPDES stormwater permit has special requirements. Refer to Part IV.D.2.a. (2)(a) of the NPDES stormwater general permit for on-site activities.

Limitations

Drainage area – 5 ac.	Maximum slope – 10%
Minimum bedrock depth – 3 ft	Minimum water table – 2 ft
NRCS soil type - BCD	Freeze/thaw – good
Drainage/flood control – no	

- May not be feasible downstream of narrow right-of-way due to lack of space.
- May not be practical in highly erodible soil types (0.01in. and smaller, very fine sand, silt and clay) due to extremely large basin size requirements.
- May not remove enough of the fine silts. Additional control measures such as filter cloth around riser should be used to minimize release of fine silts. If filter cloth is used, regular inspection and replacement is required to deal with clogging.
- Should not be located in any active stream channel.

Targeted Pollutants

Sediment

Design Parameters

- Design of the basin should be based upon the total drainage area lying upstream and (if permanent) on the future use of such lands. A professional engineer should approve the design.

- The volume of the sediment basin should be at least 1800 ft^3 /ac. of total drainage area (about 0.5 in. over the watershed). Disturbed areas greater than 10 acres within the same drainage basin should be provided a basin with a capacity of 3600 ft^3 of total drainage area (1 in. over the watershed) to meet the NPDES regulations.
- The basin should be designed with baffles or other deflectors to spread the flow throughout the basin. It should also include an emergency spillway and riser pipe(s). These structures should be designed on a site-specific basis using standard engineering practices. Calculating the settling zone volume and adding the necessary sediment storage volume should size the basin pond.
- The settling zone volume is determined by the pond surface area calculated using the following equation:

  SA = 1.2Qx / Vsed

  Where:

  ✓ SA = the pond surface area in square meters

  ✓ Qx = the design inflow (in cubic meters per second) based on the runoff from the design storm event for the drainage area.

  ✓ Vsed = the settling velocity for the design soil particle in meters per second. Table 38 lists theoretical settling velocities for different particle sizes (#200 sieve).

- For particle sizes of 0.01in. and smaller, the Vseds are so low that the SA becomes extremely large, often making the overall basin size requirement too large to be practical. In this case, extra protection measures should be taken to negate the need for the basin.
- The settling volume requirement is then calculated by multiplying the surface area by the settling depth. The settling depth should be a minimum of 1 ft and a maximum of 4 ft and is governed by a relationship with the basin length (distance from the inlet to the outlet). The ratio of length to settling depth should be greater than 200. For example, if the length was 394 ft, the settling depth should be less than 2 ft to achieve the ratio of greater than 200.
- Typically, a sediment storage depth of 3 ft is appropriate unless large volumes of soil are expected from highly erodible site conditions. In this case, use the universal soil loss equation or other applicable estimating methods to design the storage depth on a site-specific basis.

Determine the final pond dimensions and volume as follows:

- Determine the pond geometry for the sediment settling volume calculated above by adding a sediment storage depth of 3 ft and 3:1 side slopes from the bottom of the basin. The bottom should be level.
- Extend the side slopes (at 3:1) as necessary to obtain the settling zone volume at the settling zone depth determined above.
- Adjust the geometry of the basin to effectively combine the settling zone volume and sediment storage volume while preserving the depth and side slope criteria listed above.

Sediment basins covered by this standard should be limited to the following category:

- The water surface at the crest elevation of the pipe spillway should not exceed 10 ft measured upward from the original streambed to the crest elevation of the pipe spillway; and the drainage area should not exceed 150 acres.
- Because finer silts may not settle out completely, additional erosion control measures should be used to minimize release of the fine silt. Runoff should enter the basin as far from the outlet as possible to provide maximum retention time.

Construction Guidelines

- The temporary sediment basin should be installed before clearing and grading is undertaken. It should not be built within an active stream channel. Putting a dam in such a site could destroy aquatic habitat, and failure of the dam could result in flooding. A temporary sediment basin should be constructed only if there is sufficient space and appropriate topography. The basin should be made large enough to handle the maximum expected amount of site drainage. Fencing around the basin may be necessary for safety reasons or to discourage vandalism.
- The following general construction criteria are critical to successful installation and operation of sediment basins.
  - ✓ Locate the dam to provide maximum volume capacity for silt behind the structure.
  - ✓ Prepare the dam site by clearing vegetation and removing topsoil before beginning dam construction. Areas under the embankment and any structural works should be cleared and grubbed, and the topsoil stripped to remove all trees, vegetation, roots and other objectionable material. To facilitate cleanout and restoration, the pool area (measured at the top of the pipe spillway) should be cleaned of all brush, trees or other debris.
  - ✓ Level the bed for the pipe spillway to provide uniform support through its entire length under the dam.
  - ✓ Construct an emergency spillway (as per design) on undisturbed soil--not on fill. The design width and entrance/exit channel slopes are critical to the spillway's ability to successfully protect the dam with a minimum of erosion hazard in the spillway channel. The spillway should be lined with 4 in. of concrete, reinforced with 6 x 6 in. 10/10 wire mesh extending to a minimum of 36 in. down each face of the embankment. The spillway should be at least 20 in. deep with 1:1.5 slide slopes.
  - ✓ All pipe joints should be securely fastened and watertight. The riser should be rigidly and securely fastened to the barrel and the bottom of the riser should be sealed (watertight). The barrel should be placed on a firm foundation according to the lines and grades shown on the plans.
  - ✓ Place at least 1 ft of hand-compacted backfill (maximum 6 in. lifts) over the pipe spillway before crossing it with construction equipment. The movement of the hauling and spreading equipment over the fill should be controlled so that the entire surface of each lift will be traversed by not less than one tread tract of the

equipment.

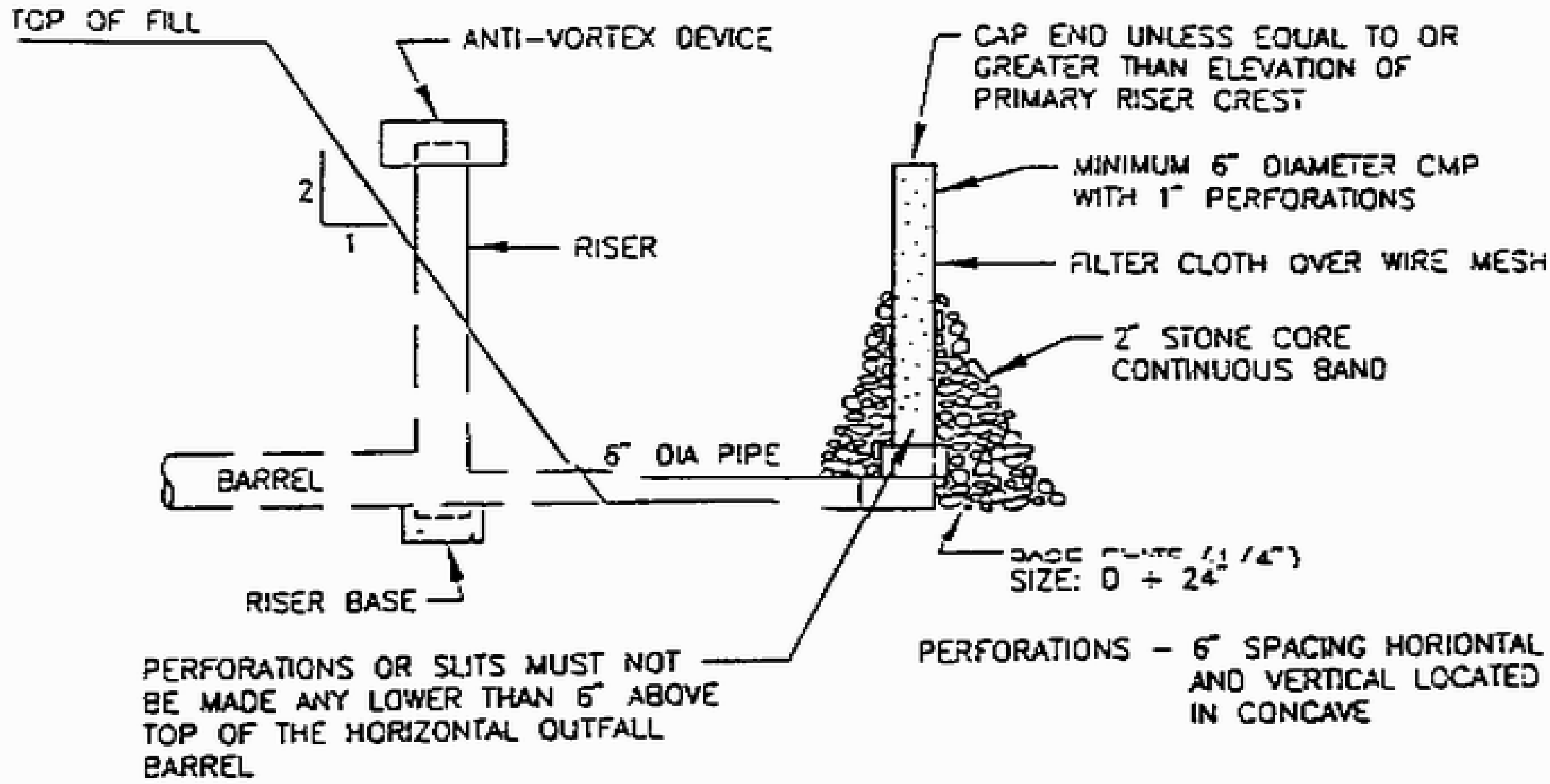
- ✓ The pipe spillway should discharge at ground elevation below the dam, and not more than 12 in. above any streambed.
- ✓ Fill material should be taken from approved designated borrow areas, and should be of the type and quality conforming to that specified for the adjoining fill material. It should be free of roots, woody vegetation, oversize stones, rocks exceeding 6 in. diameter, or other objectionable materials. Do not use frozen material.
- ✓ Areas on which fill is to be placed should be scarified prior to placement of fill. Fill materials should be placed in 6 in. maximum lifts, compacted by construction equipment. The embankment should be raised and compacted to an elevation that provides for anticipated settlement to design elevation (allow at least 10% for settlement). Lifts should be continuous over the entire length of the fill and approximately horizontal.
- ✓ Stabilize the embankment and emergency spillway with revegetation or other stabilization measures.

Maintenance

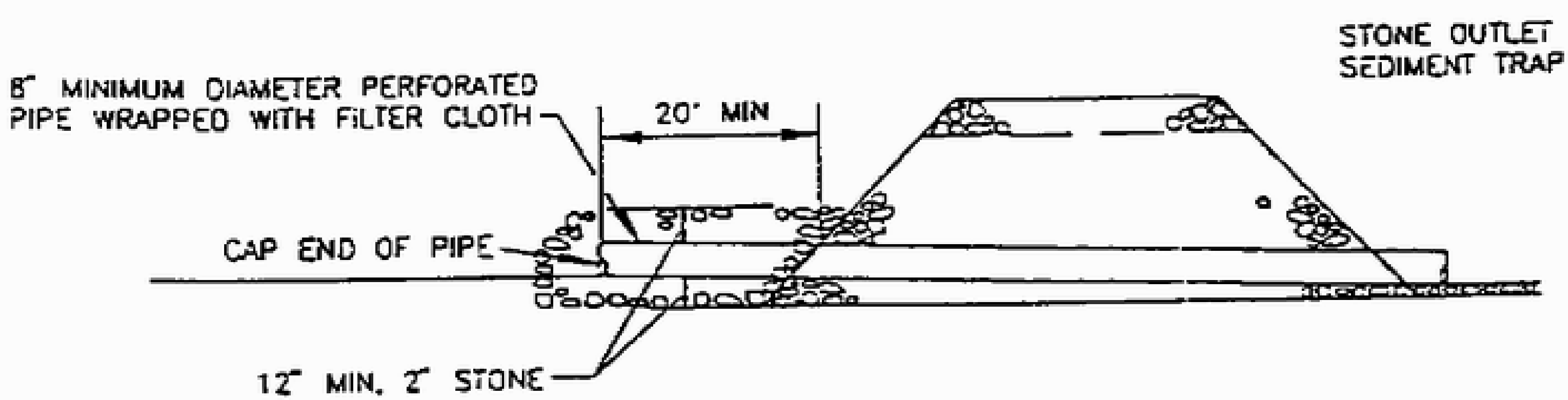
- Sediment basins should be readily accessible for maintenance and sediment removal. The sediment maintenance volume should be determined and marked before the basin is used. They should be inspected after each rainfall and be cleaned out when about half the volume has been filled with sediment. Poorly draining basins require maintenance to clean clogged riser or filter cloth. Removed sediment should be disposed of and stabilized in an approved location such that spoils do not re-enter waters of the state. Sediment may not be dumped into any water of the U.S. without appropriate permitting.
- The sediment basin should remain in operation and be properly maintained until vegetation or other measures permanently stabilize the drainage area. A well-built temporary sediment basin that is large enough to handle the post-construction runoff volume may later be converted to use as a permanent stormwater management structure.
- If the pond is located near a residential area, it is recommended for safety reasons that a sign be posted and that the area be secured by a fence.

Table 38-1. Theoretical settling velocities for different particle sizes (#200 sieve).

Size (in.)	V_{sed} (in./sec)
0.02	0.0023
0.008	0.00079
0.004	0.00028
0.002	0.000079
0.0008	0.000012
0.0004	0.0000028
0.0002	0.00000079

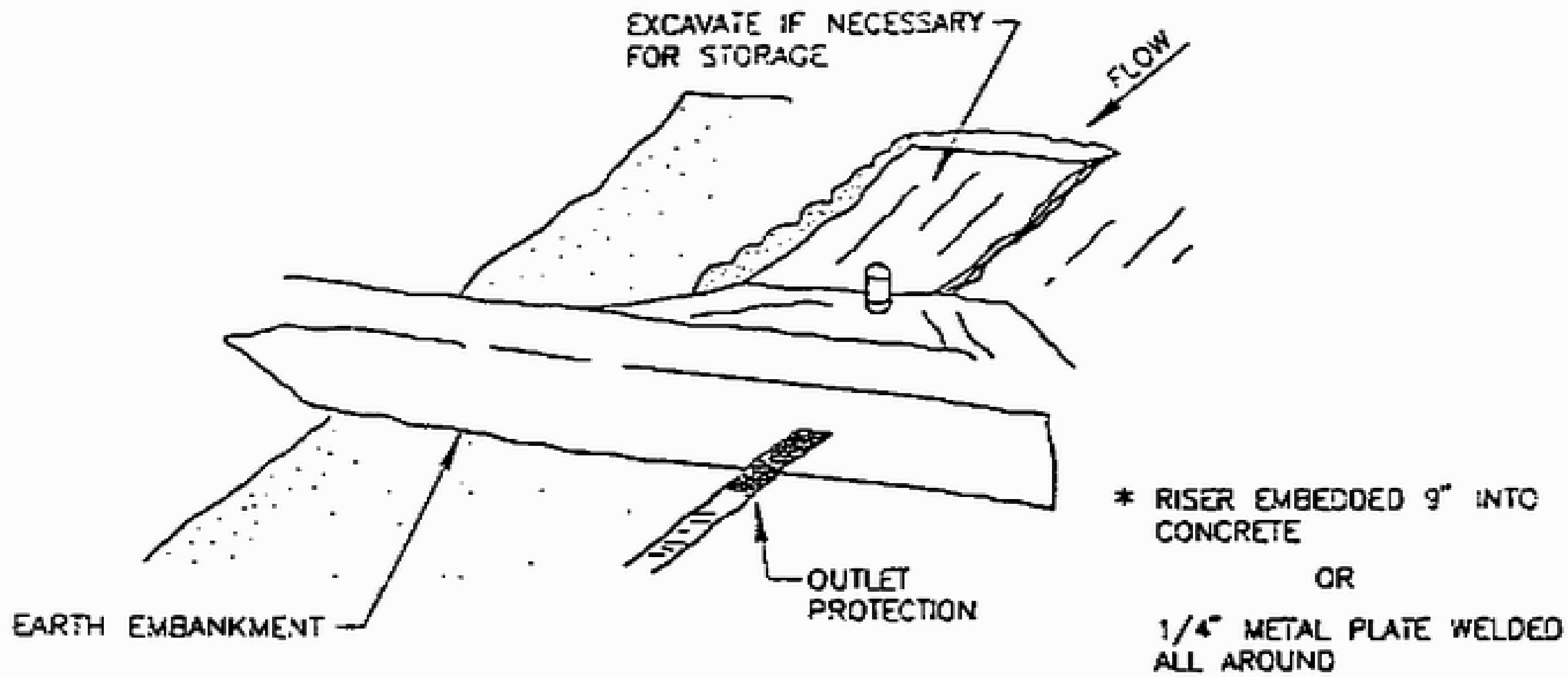


OPTIONAL SEDIMENT TRAP DEWATERING DEVICE–I
WITH 6" PERFORATED RISER

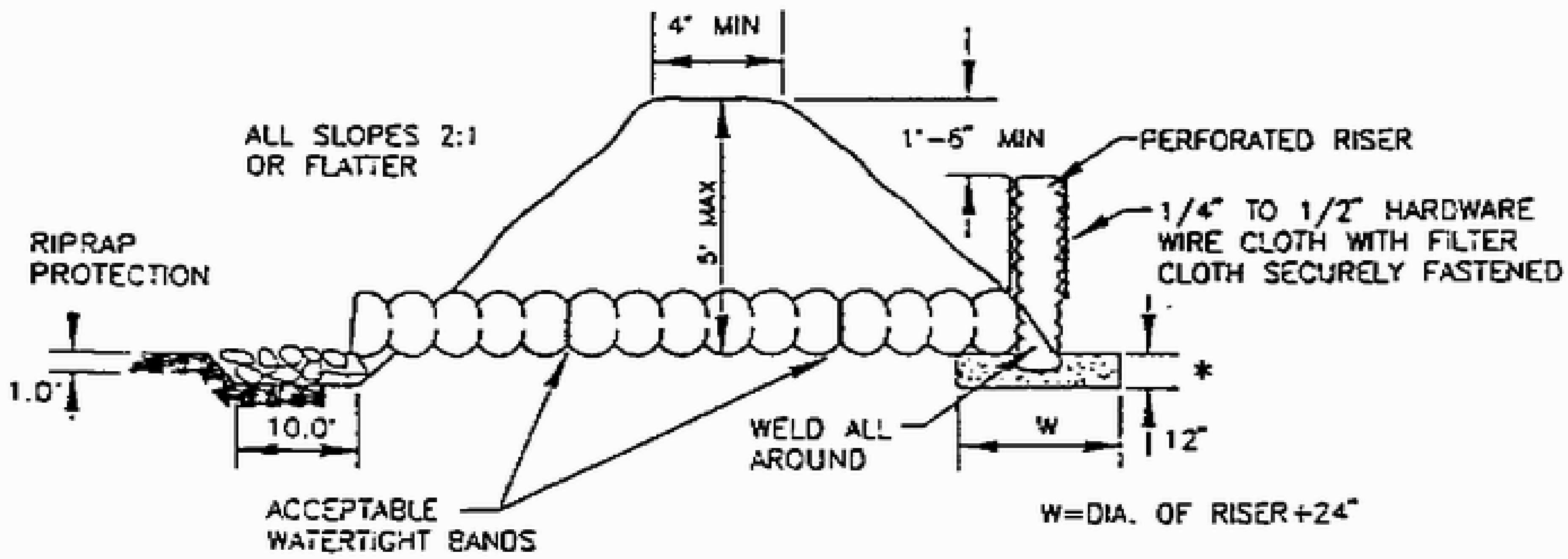


OPTIONAL SEDIMENT TRAP DEWATERING DEVICE–II

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	OPTIONAL SEDIMENT TRAP DEWATERING DEVICES	STANDARD DRAWING
TOOTHMAN–ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		ST



PERSPECTIVE VIEW



EMBANKMENT SECTION THRU RISER

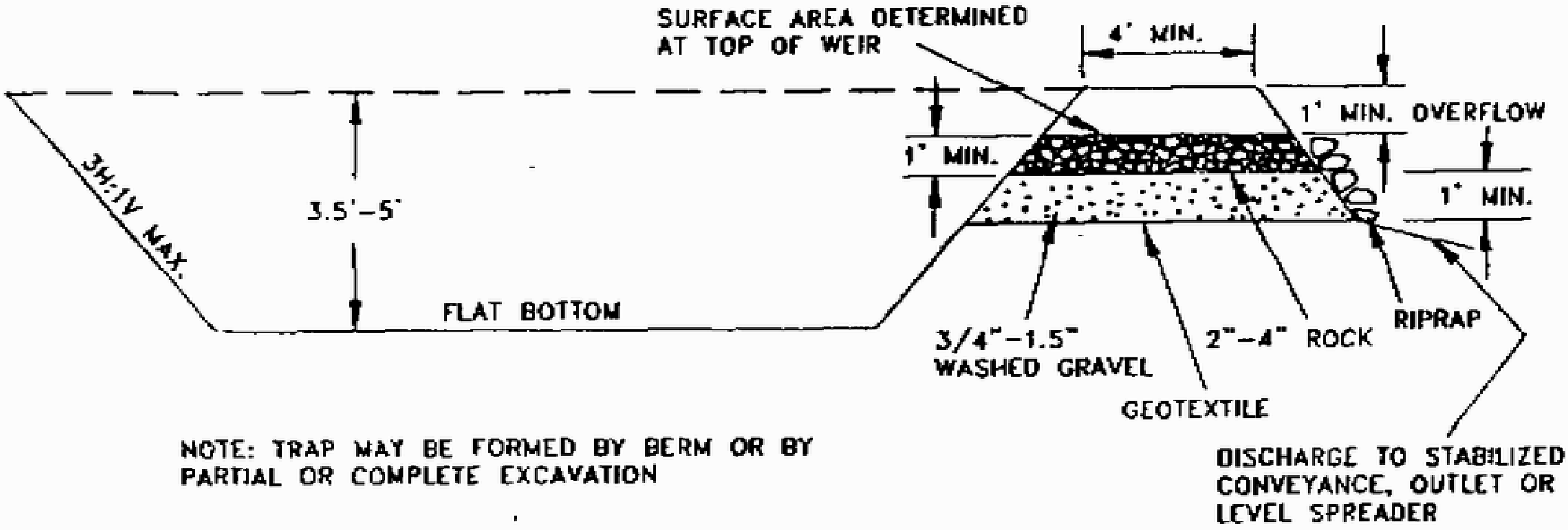
SIZES OF PIPE NEEDED

BARREL DIAMETER ______________
RISER DIAMETER ______________

NOTE:
FOR CONSTRUCTION SPECIFICATION SEE SHEET ________

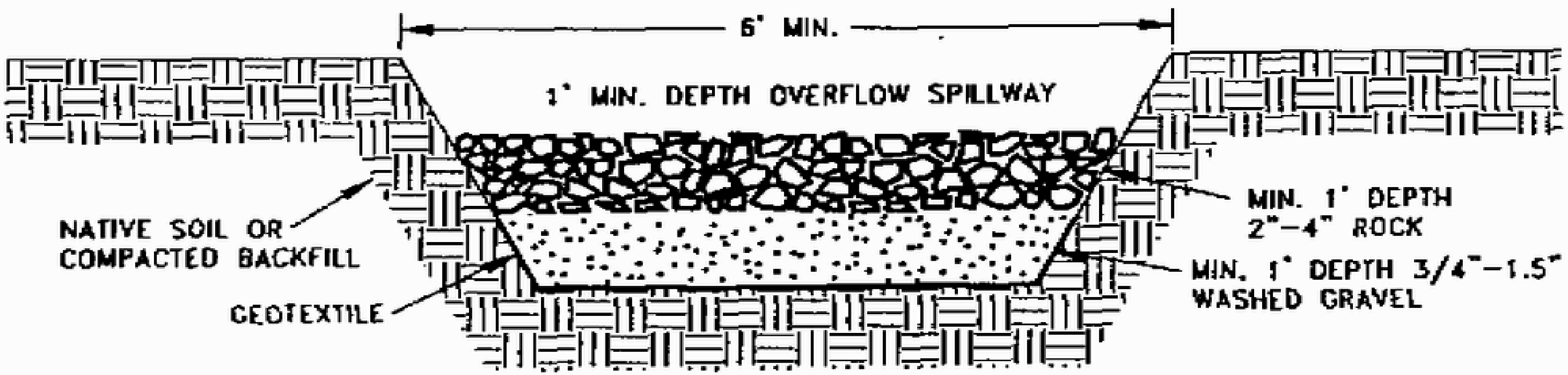
MAXIMUM DRAINAGE AREA: 5 ACRES

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PIPE OUTLET SEDIMENT TRAP	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		ST-1



NOTE: TRAP MAY BE FORMED BY BERM OR BY PARTIAL OR COMPLETE EXCAVATION

CROSS-SECTION



TRAP OUTLET

Portable Sediment Tank BMP 39

Description

A sediment tank is a compartmented tank container through which sediment-laden water is pumped to trap and retain the sediment prior to pumping the water to drainageways, adjoining properties, and rights-of-way below the sediment-tank site.

Applications

A sediment tank should be used on sites where excavations are deep, and space is limited, such as urban construction, where direct discharge of sediment-laden water to stream and storm drainage systems is to be avoided.

Limitations

Drainage area - unlimited
Minimum bedrock depth - N/A
NRCS soil type – N/A
Drainage/flood control – no

Maximum slope – N/A
Minimum water table - N/A
Freeze/thaw – good

Targeted Pollutants

Sediment
Trace metals

Design Parameters

- The sediment tank should be located for ease of clean-out and disposal of the trapped sediment and to minimize the interference with construction activities and pedestrian traffic.
- The following formula should be used in determining the storage volume of the sediment tank: Pump Discharge (G.P.M.) x 16 = Cubic Foot Storage.
- Other container designs can be used if the storage volume is adequate and approval is obtained from the local approving agency.
- The pollution removal efficiency of the sediment tank can be considerably increased by using flocculation chemicals, such as aluminum sulfate, in the tank. Flocculation will allow some very small suspended solids to settle that otherwise would never be removed. The time it takes to settle out larger particulates will also decrease. However, a flocculation tank setup is considerably more complicated as the rate of flocculent addition should be carefully monitored.

Installation Guidelines

Follow manufacturer's specifications.

Temporary Swale BMP 40

Description

A temporary swale is an excavated drainage way designed to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet. Another purpose of a temporary swale is to intercept sediment laden-water and divert it to a sediment-trapping device.

Applications

Temporary swales are constructed for the following reasons:

- To divert flows from a disturbed area
- Intermediately across disturbed areas to shorten overland flow distance.
- To direct sediment laden water along the base of slopes to a trapping device.
- To transport off-site flows across disturbed areas such as rights-of-way.
- Swales collecting runoff from disturbed areas should remain in place until the disturbed areas are permanently stabilized.

Limitations

Drainage area – 10 ac.
Minimum bedrock depth – 5 ft
NRCS soil type - BCD
Drainage/flood control – yes
Maximum slope – 14%
Minimum water table – 3 ft
Freeze/thaw – fair

Targeted Pollutants

Sediment
Trace metals

Design Parameters

The following design criteria should be met, depending on the drainage area served by the swale:

	Swale A	Swale B
Drainage Area	5 ac. or less	5-10 ac.
Bottom Width of Flow Channel	4 ft	6 ft
Depth of Flow Channel	1 ft	1 ft
Side Slopes	2:1 or flatter	2:1 or flatter
Grade	0.5% min 20% max	0.5% min, 20% max

- The temporary swale should be designed with an outlet that functions with a minimum of erosion, and dissipates runoff velocity prior to discharge off the site.
- Runoff should be conveyed to a sediment-trapping device such as a sediment trap or sediment basin until the drainage area above the swale is adequately stabilized.
- The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet condition.
- If a swale is used to divert flows from entering a disturbed area, a sediment-trapping device may not be needed.

Construction Guidelines

- Stabilization of the swale should be completed within 10 days of installation with proper seeding or mulching techniques (see BMP 21-

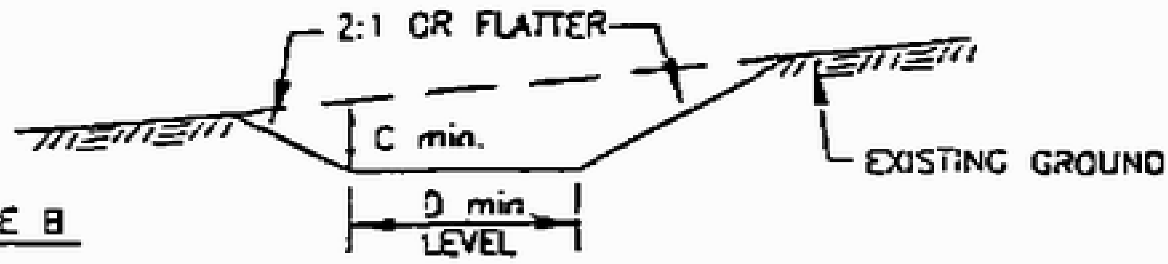
Seeding or BMP 15-Mulching). The flow channel should be stabilized according to the criteria in Table 40-1 below.
- In highly erodible soils, as defined by the Soil Survey (NRCS) of the project's county, refer to the next higher slope grade for type of stabilization.

Maintenance
- Remove sediment and debris regularly.
- Mow vegetation regularly to encourage thicker, healthier growth.
- Do not overfertilize; it may compound water quality problems.

Table 40-1. Flow Channel Stabilization Criteria

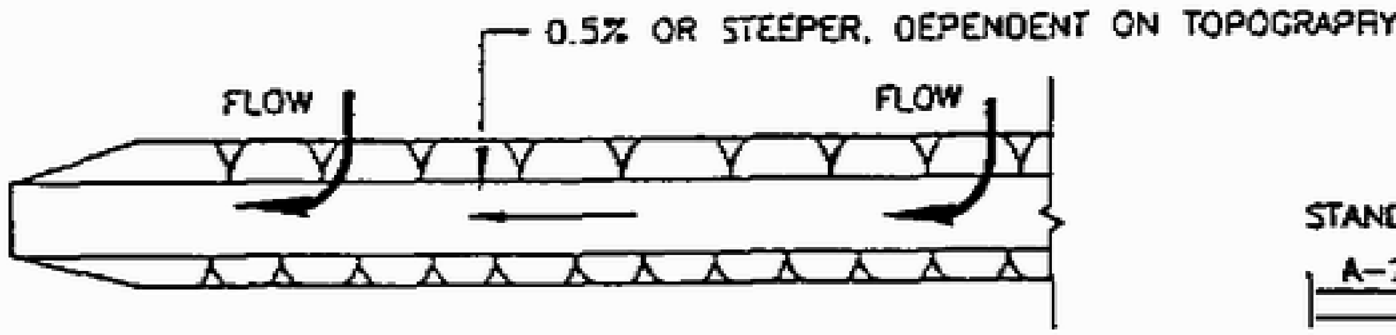
Type of treatment	Channel grade (percent)	Flow Channel A (less than 5 acres)	Flow Channel B (5-10 acres)
1	0.5-3.0	Seed and Straw Mulch	Seed and Straw Mulch
2	3.1-5.0	Seed and Straw Mulch	Seed and cover with Jute or Excelsior; Sod, or line with 2 in. stone
3	5.1-8.0	Seed and cover with Jute or Excelsior; Sod, or line with 2 in. stone	Line with 4-8 in. stone or Recycled Concrete Equivalent[a]
4	9.1-20	Line with 4-8 in. stone or Recycled Concrete Equivalent[a]	Engineering Design

[a] Recycled Concrete Equivalent should be concrete broken into the required size, and should contain no steel reinforcement.



	SWALE A	SWALE B
C	1'	1'
D	4'	6'

CROSS SECTION



STANDARD SYMBOL

OUTLET AS REQUIRED
SEE ITEM NO. 8 BELOW

PLAN VIEW

CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED ON CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. STABILIZATION SHALL BE AS PER THE CHART BELOW.

FLOW CHANNEL STABILIZATION

TYPE OF TREATMENT	CHANNEL GRADE	A (5 AC OR LESS)	B (5 AC-10 AC)
1	0.5-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1-5.0%	SEED AND STRAW MULCH	SEED USING JUTE OR EXCELSIOR
3	5.1-8.0%	SEED WITH JUTE OR EXCELSIOR; SOD	LINED RIP-RAP 4"-8" RECYCLED CONCRETE EQUIVALENT
4	8.1-20%	LINED 4"-8" RIP-RAP	ENGINEERED DESIGNED

9. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	TEMPORARY SWALE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		TS-1

Earth Dike BMP 41

Description

An earth dike is a temporary berm or ridge (or ridge-and-channel combination) of compacted soil located in a manner to channel water to a desired location. Earth dikes are used to protect work areas from upslope runoff and to divert sediment-laden water to appropriate traps or stable outlets. The channel portion (if used) generally has a lining of stone, riprap, or vegetation for stabilization.

Applications

Earth dikes are used in construction areas to control erosion, sedimentation, or flood damage. Earth dikes can be used in the following situations:

- Across unprotected slopes, as slope breaks, to reduce length.
- Below slopes to divert excess runoff to stabilized outlets.
- At or near the perimeter of the construction area to keep sediment-laden runoff from leaving the site.
- To protect cut or fill slopes by diverting upslope flows away from disturbed areas to a stabilized outlet.
- To direct any sediment-laden runoff to a sediment-trapping device.
- To direct clean water away from disturbed areas

Limitations

Drainage area – 10 ac.	Maximum slope – 10%
Minimum bedrock depth – 5 ft	Minimum water table – 5 ft
NRCS soil type - ABC	Freeze/thaw – fair
Drainage/flood control – yes	

- Despite an earth dike's simplicity, improper design can limit its effectiveness.
- Frequent inspection and maintenance are essential to the proper performance of this BMP.
- When the drainage area above the earth dike is greater than 10 ac., consult the NRCS standards and specifications for diversions.

Targeted Pollutants

Sediment
Trace metals

Design Parameters

The earth dike should be constructed of compacted soil or coarse aggregate according to the criteria in Table 41-1 below. The channel formed behind the dike should have a positive grade to a stabilized outlet. The channel should be stabilized with vegetation or other stabilization measures. Grades over 10% may require site-specific design developed or approved by a registered engineer.

Construction Guidelines

- Some general considerations include proper compaction of the earth dike, appropriate location to divert the intercepted runoff, and proper ridge height and thickness. Earth dikes should be constructed along a positive grade. Other than the discharge point, there should be no dips or low points where stormwater will collect.

- Runoff intercepted from disturbed areas should be diverted to a sediment-trapping device. Runoff from undisturbed areas can be channeled to an existing swale or to a level spreader. Stabilization for the dike and flow channel (or drainage swale) should be stabilized as soon as possible. Stabilization materials can include vegetation, stone, or riprap.
- Construct the dike where it will not interfere with major areas of construction traffic so that vehicle damage to the dike will be kept to the minimum.
- Install the dike prior to the majority of soil disturbing activity. The dike may be removed when stabilization of the drainage area and outlet are complete.
- Clear the area of all trees, brush, stumps, or other obstructions.
- Construct the dike to the designed cross-section, line and grade making sure that there are no irregularities or bank projections to impede the flow. Construct the connecting portion to any stream channel last.
- The dike should be compacted using earth-moving equipment (to prevent failure of the dike).
- The dike should be stabilized at least 10 days after installation. The flow channel should be stabilized according to the criteria in Table 41-2 below. In highly erodible soils, as defined by NRCS Soil Survey of the project's county, refer to the next higher slope grade for type of stabilization.
- Earth dikes should have an outlet that function with a minimum of erosion. Runoff should be conveyed to a sediment-trapping device until the drainage area above the dike is adequately stabilized. The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

Maintenance

- Inspect diversion dikes regularly and after every storm. Make any repairs necessary to ensure they are in good working order.
- Inspect the dike, flow channel and outlet for deficiencies or signs of erosion.
- If material should be added to the dike, be sure it is properly compacted.
- Reseed/stabilize the dike as needed to maintain its stability regardless if there has been a storm event or not.

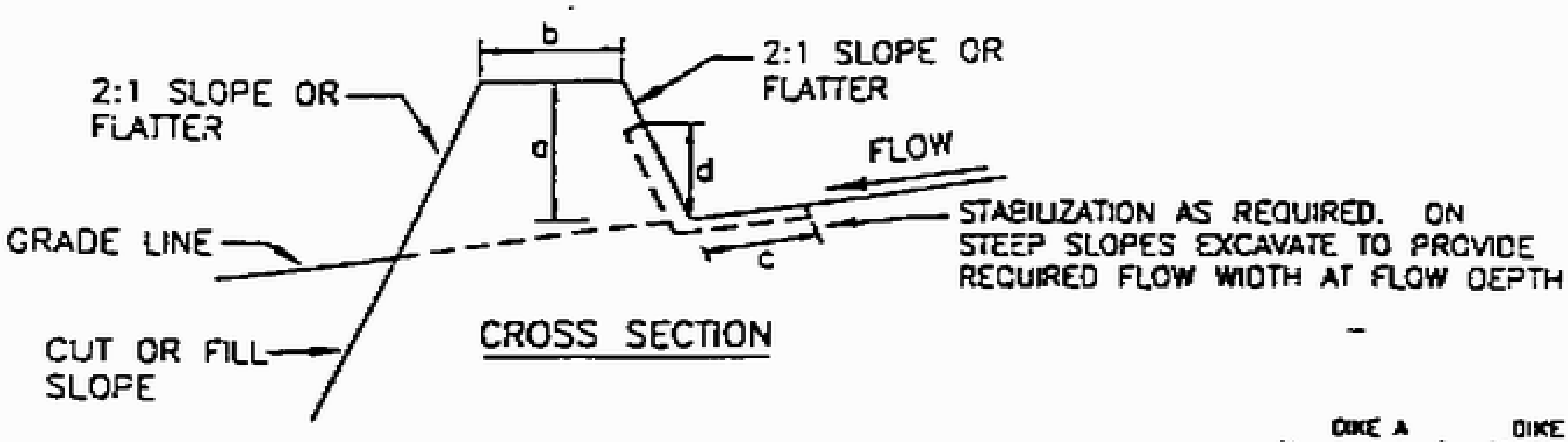
Table 41-1. Suggested Dike Design Criteria

Criteria	Drainage area < 5 acres	Drainage area between 5 to 10 acres
Dike Height	18 in.	3 ft
Dike Width	2 ft	3 ft
Flow Width	4 ft	6 ft
Flow Depth in channel	8 in.	15 in.
Side Slopes	2:1 or flatter	2:1 or flatter
Grade	0.5% - 20%	0.5% - 20%

Table 41-2. Criteria for Earth Dike Construction

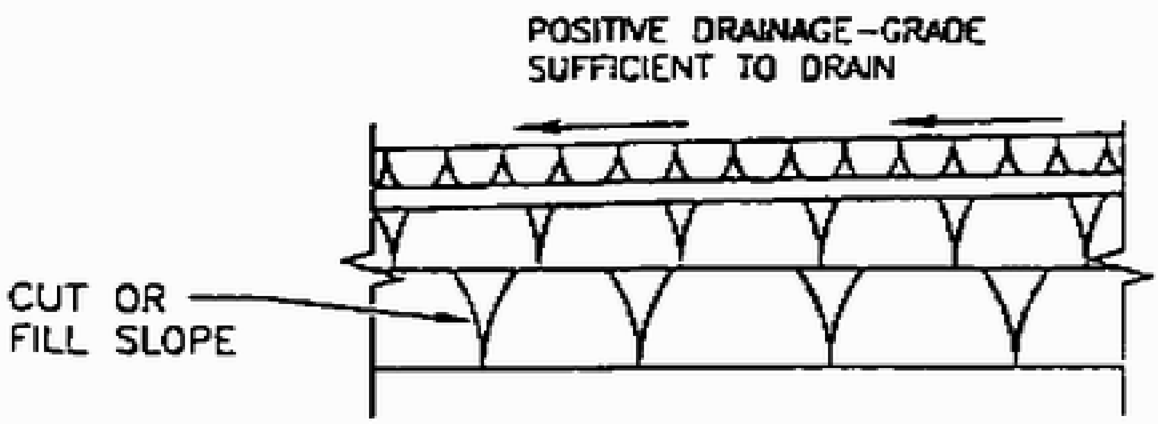
Type of treatment	Channel grade (percent)	Flow channel A (less than 5 acres)	Flow channel B (5-10 acres)
1	0.5-3.0	Seed and Straw Mulch	Seed and Straw Mulch
2	3.1-5.0	Seed and Straw Mulch	Seed and cover with Jute or Excelsior; Sod, or line with 2 in. stone
3	5.1-8.0	Seed and cover with Jute or Excelsior; Sod, or line with 2 in. stone	Line with 4-8 in. stone or Recycled Concrete Equivalent
4	8.1-20	Line with 4-8 in. stone or Recycled Concrete Equivalent	Engineering Design

[a] Recycled Concrete Equivalent should be concrete broken into the required size, and should contain no steel reinforcement.



CROSS SECTION

	DIKE A (5 ac. or less)	DIKE B (5–10 ac.)
a–DIKE HEIGHT	18"	36"
b–DIKE WIDTH	24"	36"
c–FLOW WIDTH	4'	6'
d–FLOW DEPTH	8"	15"



STANDARD SYMBOL

CONSTRUCTION SPECIFICATIONS

1. ALL DIKES SHALL BE COMPACTED BY EARTH-MOVING EQUIPMENT.
2. ALL DIKES SHALL HAVE POSITIVE DRAINAGE TO AN OUTLET.
3. TOP WIDTH MAY BE WIDER AND SIDE SLOPES MAY BE FLATTER IF DESIRED TO FACILITATE CROSSING BY CONSTRUCTION TRAFFIC.
4. FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO UTILIZE A STABILIZED SAFE OUTLET.
5. EARTH DIKES SHALL HAVE AN OUTLET THAT FUNCTIONS WITH A MINIMUM OF EROSION. RUNOFF SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE SUCH AS A SEDIMENT TRAP OR SEDIMENT BASIN WHERE EITHER THE DIKE CHANNEL OR THE DRAINAGE AREA ABOVE THE DIKE ARE NOT ADEQUATELY STABILIZED.
6. STABILIZATION SHALL BE: (A) IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR SEED AND STRAW MULCH OR STRAW MULCH IF NOT IN SEEDING SEASON. (B) FLOW CHANNEL AS PER THE CHART BELOW.

FLOW CHANNEL STABILIZATION

TYPE OF TREATMENT	CHANNEL GRADE	DIKE A	DIKE B
1	0.5–3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1–5.0%	SEED AND STRAW MULCH	SEED USING JUTE OR EXCELSIOR; SOD; 2" STONE
3	5.1–8.0%	SEED WITH JUTE OR SOD; 2" STONE.	LINED RIP-RAP 4"–8"
4	8.1–20%	LINED RIP-RAP 4"–8"	ENGINEERING DESIGN

A. STONE TO BE 2 INCH STONE, OR RECYCLED CONCRETE EQUIVALENT, IN A LAYER AT LEAST 3 INCHES IN THICKNESS AND BE PRESSED INTO THE SOIL WITH CONSTRUCTION EQUIPMENT.
B. RIP-RAP TO BE 4–8 INCHES IN A LAYER AT LEAST 8 INCHES IN THICKNESS AND PRESSED INTO THE SOIL.
C. APPROVED EQUIVALANTS CAN BE SUBSTITUTED FOR ANY OF THE ABOVE MATERIALS.

7. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	EARTH DIKE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		ED-1

Perimeter Dike/Swale **BMP 42**

Description

A perimeter dike/swale is a temporary ridge of soil excavated from an adjoining swale located along the perimeter of the site or disturbed area. The purpose of a perimeter dike/swale is to prevent off-site storm runoff from entering a disturbed area and to prevent sediment laden storm runoff from leaving the construction site or disturbed area.

Applications

- A perimeter dike/swale is constructed to divert flows from entering a disturbed area, along top of slopes to prevent flows from eroding the slope, or along base of slopes to direct sediment laden flows to a trapping device.
- The perimeter dike/swale should remain in place until the disturbed areas are permanently stabilized.

Limitations

Drainage area – 2 ac.	Maximum slope – 10%
Minimum bedrock depth – 5 ft	Minimum water table – 5 ft
NRCS soil type – ABC	Freeze/thaw – fair
Drainage/flood control – yes	

Targeted Pollutants

Sediment
Trace metals

Design Parameters

The perimeter dike/swale should not be constructed outside the property lines without obtaining legal easements from effected adjacent property owners.
A detailed design is not required for the perimeter dike/swale. However, the following criteria should be used:

- Drainage area: Less than 2 acres (for drainage areas larger than 2 acres, but less than 10 acres, see BMP 41-Earth Dike; for drainage areas larger than 10 acres, see BMP 44-Storm Drain Diversion)
- Height: 18 in. minimum from bottom of swale to top of dike evenly divided between dike height and swale depth
- Bottom width of dike: 2 ft minimum
- Width of swale: 2 ft minimum
- Grade: Dependent upon topography, but should have positive drainage (sufficient grade to drain) to an adequate outlet. Maximum allowable grade not to exceed 20%.

Outlet

- The perimeter dike/swale should have an outlet that function with a minimum of erosion.
- Diverted runoff from a protected or stabilized upland area should outlet directly onto an undisturbed stabilized area.
- Diverted runoff from a disturbed or exposed upland area should be conveyed to a sediment-trapping device such as a sediment trap (BMP 38), or to an area protected by any of these practices.
- The on-site location may need to be adjusted to meet field conditions in

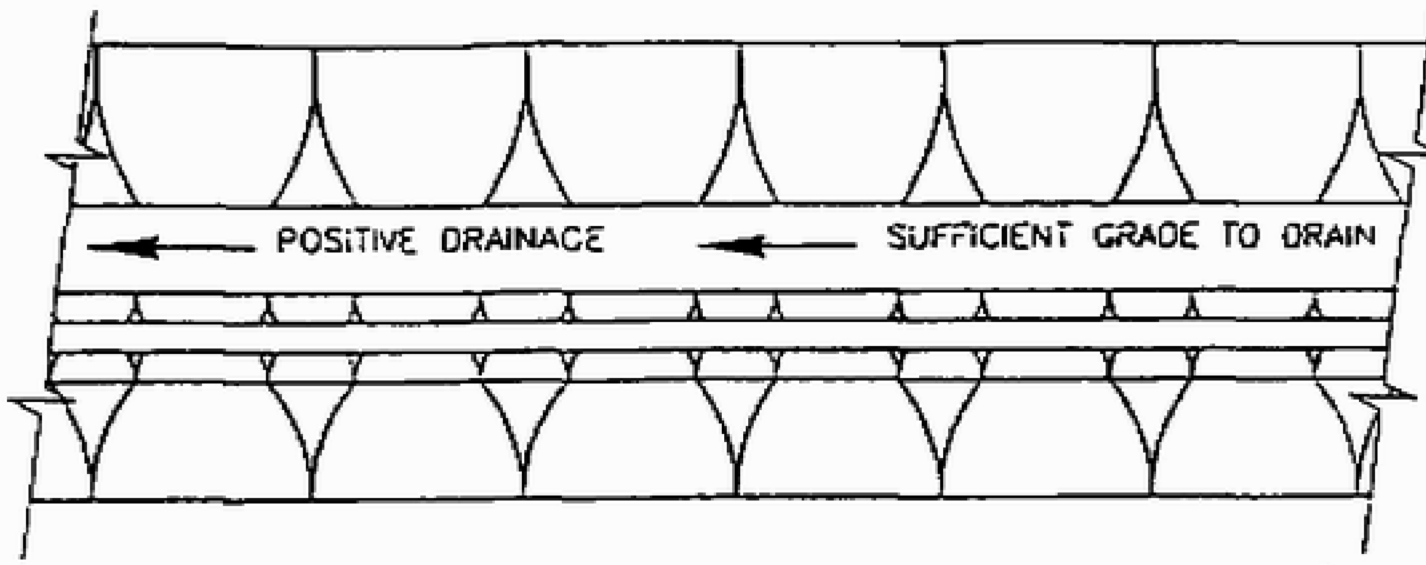
order to utilize the most suitable outlet.

Construction Guidelines

The disturbed area of the dike and swale should be stabilized within 10 days of installation, in accordance with the guidelines seed and straw mulch or straw mulch only if not in the seeding season.

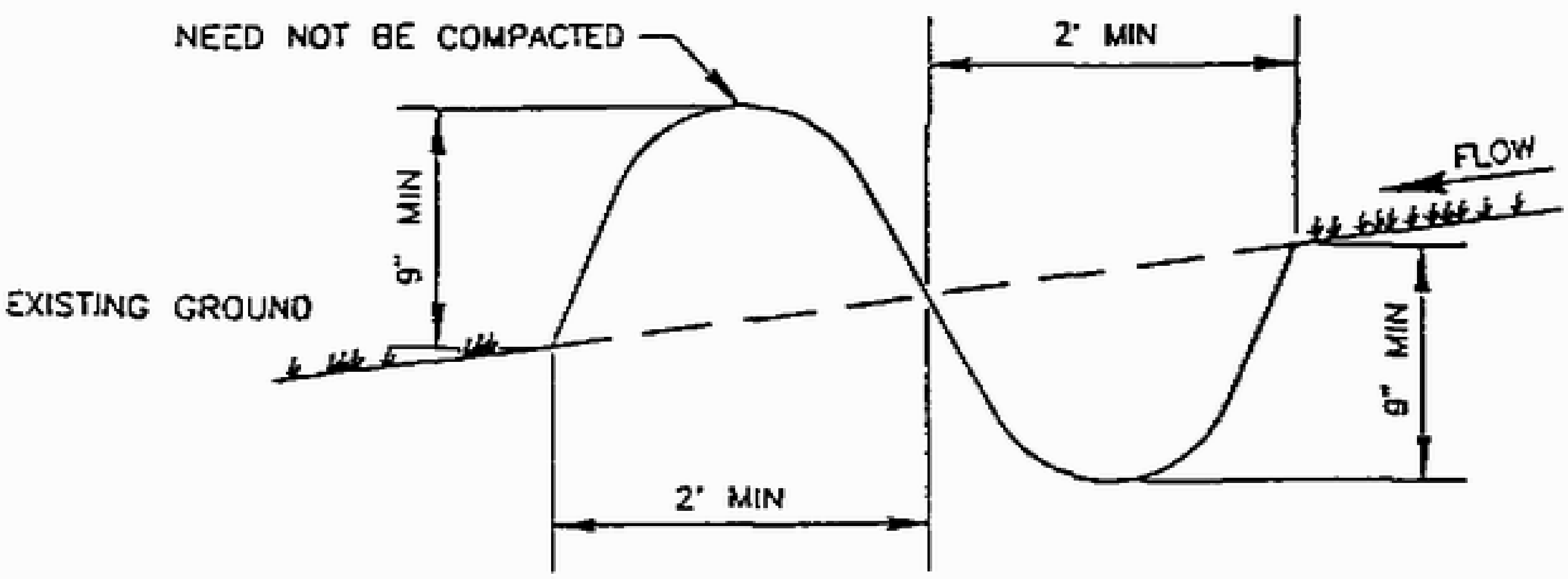
Maintenance

See BMP 41 - Earth Dike



PLAN VIEW

STANDARD SYMBOL



CROSS SECTION

CONSTRUCTION SPECIFICATIONS

1 ALL PERIMETER DIKE/SWALE SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.

2 DIVERTED RUNOFF FROM A DISTRUBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.

3 DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSION VELOCITY.

4 THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED IN THE STANDARD.

5 STABILIZATION OF THE AREA DISTURBED BY THE DIKE AND SWALE SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SEED AND STRAW MULCH, AND SHALL BE DONE WITHIN 10 DAYS.

6 PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT

MAXIMUM DRAINAGE AREA LIMIT: 2 ACRES

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PERIMETER DIKE/SWALE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		PDS-1

Temporary Berms BMP 43

Description

A temporary berm is a ridge of compacted soil, compost, or sandbags which intercepts and diverts runoff from small construction areas. Temporary berms are often constructed along the top edge of fill slopes but may also be constructed across the roadway (as a transverse berm) at a slight angle with the centerline.

Berms are used to prevent runoff onto newly constructed slopes until vegetation is established or until permanent measures are in place. They intercept flow from the construction area and direct it to temporary slope drains or to outlets where it can be safely discharged.

Applications

Temporary berms are used to direct or divert runoff flows, or as barriers to collect and store runoff. They are used at storm drain inlets, across minor swales and ditches, and for other applications where the structure is of a temporary nature.

Limitations

Drainage area – 5 ac.
Minimum bedrock depth - N/A
NRCS soil type – ABCD
Drainage/flood control – yes
Maximum slope – 50%
Minimum water table - N/A
Freeze/thaw – good

Temporary berms do not provide filtration. Therefore, they can only be used for minor flows.

Targeted Pollutants

Sediment

Design Parameters

Soil berm: A berm of soil with an approximate height of 12 to 20 in. with a minimum top width of 2 to 3 ft and side slopes of 2:1 or flatter. Berms should be high enough to prevent flow from overtopping. Berms are normally constructed from embankment materials.

Compost berm: Compost filter berms will perform most effectively when constructed 1 ft high by 2 ft wide and 1.5 ft high by 3 ft wide.

Sandbag berm: The following dimensions are suitable for sandbag berms.
- Height - 20 in. minimum
- Top width - 20 in. minimum
- Bottom width - approximately 4.25 to 5 ft
- Sandbag size - length 2 to 2.6 ft, width 16 to 20 in., depth or thickness 6 to 8 in., and weight 88 to 132 lb

Construction Guidelines

Soil berm:
- All berms should be graded to drain to a slope drain inlet. When practical, embankments should be constructed with a gradual slope to one side of the embankment. This will permit the placement of all temporary berms

and slope drains on one side of the embankment. When fills are constructed on sidehill slopes, the top surface should slope toward the inside so that surface runoff will be away from the fill slope.

- Compact the entire width of the berm. This can be accomplished with the track of a bulldozer or, preferably, with a grader wheel (rubber).

Compost berm: The American Association of State Highway and Transportation Officials (AASHTO) recently adopted test and particle size parameters for compost berms for controlling erosion. See Table 43-1 for recommendations on selecting the best compost for use in filter berms.

Sandbag berm:

- Install so that flow under or between bags is prevented.
- Stack the sandbags in an interlocking fashion to provide additional strength for resisting the force of the flowing water. However, do not stack them more than three high without broadening the foundation using additional sandbags or providing additional stability.
- Sandbag sediment barriers should store the runoff from design storm as specified.

Maintenance

- Temporary berms should be inspected and repaired periodically as well as after each significant rainfall.
- Sandbags should be reshaped or replaced as needed during inspection. Additional inspections should be made daily during wet weather. When silt reaches 6 in., the accumulated silt should be removed and disposed of at an approved site in a manner that will not contribute to additional siltation. The sandbag berm should be left in place until all upstream areas are stabilized and accumulated silt has been removed. Removal of bags should be done by hand.

Table 43-1. Compost filter berm parameters

Parameters	Filter Berm to be Vegetated	Filter Berm to be left Un-vegetated
pH	5.0-8.5	N/A
Soluble Salt Concentration (electrical conductivity in dS/m)	Maximum 5	N/A
Moisture Content (%, wet weight basis)	30-60	30-60
Organic Matter Content (%, dry weight basis)	25-65	25-100
Particle Size (% passing a selected mesh size, dry weight basis)	3 in., 100% passing 1 in., 90% to 100% passing ¾ in., 70% to 100% passing ¼ in., 30% to 75% passing Maximum: Particle size length of 6 in. (no more than 60% passing ¼	3 in., 100% passing 1 in., 90% to 100% passing ¾ in., 70% to 100% passing ¼ in, 30% to 75% passing Maximum: Particle size length of 6 in. (no more than 50% passing ¼

	in. in high rainfall/flow rate situations)	in. in high rainfall/flow rate situations)

Appendix E: Non-Stormwater Discharge Evaluation (EF-029A)

Appendix E
Non-Stormwater Discharge Evaluation Form (EF-029A)

By the end of the first year of permit coverage (2021), all discharge points at Perpetua shall be evaluated for any presence of unauthorized non-stormwater discharges.

Non-Stormwater Discharge Evaluation Form	
Date of Evaluation:	May 18, 2021

Description of Evaluation Criteria Used:

A thorough assessment of each outfall and the upgradient areas contributing stormwater flows to these outfalls was conducted, including:

- Walking the entirety or safely accessible portions of site swale(s) directing stormwater flow to an outfall;
- Inspecting additional BMPs/control measures associated with the outfalls (existing vegetation, sedimentation ponds, culverts, rip-rap, mulch mats, water bars, secondary containments, etc.);
- Inspecting potential stormwater pollutant sources (fuel storage, equipment maintenance areas, etc.) for any indication of problems with BMPs/control measures; and
- Assessing the immediate areas surrounding the outfall locations, including the incoming and outgoing flow paths to/from the discharge points.

Discharge Points Inspected:	Outfalls 001, 002 and 003

Description of Unauthorized Non-Stormwater Discharges Found:

There were no unauthorized non-stormwater discharges occurring, or evidence of having occurred, at the three outfall locations assessed during this inspection.

If Unauthorized Discharges found, describe action(s) taken to immediately correct:

N/A

Utilize the Corrective Action Form (EF-029F) in Appendix H as needed.

Evaluator Name / Title:	Kyle Fend / Field Operations Manager
Evaluation Signature:	K F

Appendix F: Routine Visual Inspection Form (EF-029B), Control Measure Inspection Form (EF-029C), Visual Assessment Monitoring Form (EF-029D)

Appendix F
Routine Visual Inspection Form (EF-029B)

GENERAL INFORMATION:			
Inspection Date and Time:			
Inspector(s) Name / Title:			
Inspection Type:	☐ Quarterly Routine	☐ Construction (type:)	
DISCHARGE AND WEATHER INFORMATION			
Is a stormwater discharge occurring (i.e. a “measurable storm event”)?	☐ Yes	☐ No	
If so, select storm event type:	☐ Rain event	☐ Snowmelt	
Provide a description of any discharges occurring:			
Provide a description of weather conditions:			

CONTROL MEASURE INSPECTION		
Structural Control Measure	**Operating Effectively?**	**If no, in need of maintenance, repair, or replacement?**
Refer to Control Measure Inspection Form for entire list – any additional control measures not listed there, document here		
	☐ Yes ☐ No	☐ Yes ☐ No
	☐ Yes ☐ No	☐ Yes ☐ No
Notes:		

OUTFALL INSPECTION			
Outfall Name	**Location**	**Inspected?**	**Adequate Condition?**
001	North side of Camp Facility Area	☐ Yes ☐ No	☐ Yes ☐ No
002	West of Office Area, prior to seep	☐ Yes ☐ No	☐ Yes ☐ No
003	Northeast of Hangar, down hillside from road	☐ Yes ☐ No	☐ Yes ☐ No
Notes:			

DRILL SITE INSPECTION (if none active, indicate N/A)			
Site ID	**Location**	**Inspected?**	**Control Measures Sufficient?**

POTENTIAL POLLUTANT SOURCE INSPECTION (if not present, indicate N/A)			
Potential Source	**Map ID**	**Inspected?**	**Control Measures Sufficient?**
Diesel Fuel	1	☐ Yes ☐ No	☐ Yes ☐ No
Gasoline	2	☐ Yes ☐ No	☐ Yes ☐ No
Drinking Water Treatment	3	☐ Yes ☐ No	☐ Yes ☐ No
Wastewater Treatment and Reuse	4	☐ Yes ☐ No	☐ Yes ☐ No
Used Oil Transfer / Storage	5	☐ Yes ☐ No	☐ Yes ☐ No
Sediment	6	☐ Yes ☐ No	☐ Yes ☐ No
Jet A, Diesel Fuel	7	☐ Yes ☐ No	☐ Yes ☐ No
Oils, Greases, Fuel (Maintenance)	8	☐ Yes ☐ No	☐ Yes ☐ No
Sanitary Waste	9	☐ Yes ☐ No	☐ Yes ☐ No
Diesel Fuel (generator)	10	☐ Yes ☐ No	☐ Yes ☐ No
Core Cuttings	11	☐ Yes ☐ No	☐ Yes ☐ No
Diesel Fuel (generator)	12	☐ Yes ☐ No	☐ Yes ☐ No
Sediment and gravel (drill pad)	13	☐ Yes ☐ No	☐ Yes ☐ No
Drilling equipment	14	☐ Yes ☐ No	☐ Yes ☐ No
Construction Staging Areas	15	☐ Yes ☐ No	☒ Yes ☐ No
Access Road Construction	16	☐ Yes ☐ No	☐ Yes ☐ No
Sediment (Borrow Pit)	17	☐ Yes ☐ No	☐ Yes ☐ No

Any Unidentified Potential Pollutant Sources? ☐ **Yes** ☐ **No**			
Location:		**Description:**	
Location:		**Description:**	
Location:		**Description:**	
Location:		**Description:**	

Any Unidentified Discharges of Pollutant Sources? ☐ **Yes** ☐ **No**			
Location:		**Description:**	
Location:		**Description:**	
Location:		**Description:**	
Location:		**Description:**	
Location:		**Description:**	

[1]**Conditions Requiring Corrective Action**
Were any of the following conditions observed: ▪ An unauthorized release or discharge (e.g., spill, leak, or discharge of non-stormwater not authorized by the MSGP or another NPDES permit to a water of the United States) occurred? ▪ Stormwater control measures are not stringent enough for the stormwater discharge to be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards or to meet the non-numeric effluent limits? A required control measure was never installed, was installed incorrectly, or not in accordance with the MSGP, or is not being properly operated or maintained?
Any incidents of non-compliance?
General Comments, Routine Maintenance:
CORRECTIVE ACTION INFORMATION:
If any of the conditions described in Footnote 1 above were observed, corrective action is required to be taken in accordance with Section 6.2-6.4 and documented on the related Corrective Action form in Appendix H of the SWPPP within **24-hours of discovery** of the condition.
SWPPP UPDATES
If construction or a change in design, operation, or maintenance at the facility occurs that significantly changes the nature of pollutants discharged via stormwater, or significantly increases the quantity of pollutants discharged, the facility shall review the SWPPP (e.g., sources of pollution, spill and leak procedures, non-stormwater discharges, selection, design, installation and implementation of your stormwater control measures) to determine if modifications are necessary to meet the effluent limits in the MSGP. Describe any changes to the facility and required SWPPP updates:
INSPECTION 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 contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."
Inspector(s) Signature(s):

Appendix F
Visual Assessment Form (EF-029D)

Outfall:	☐ No Discharge Occurred During Monitoring Period		
Grab Sample Location:			
Sample Collection Date:		**Sample Collection Time:**	
Signature of Person Collecting Sample:			
Was the sample collected within the first 30 minutes of the measurable storm event? If no, provide explanation as to why sample was collected after the first 30 minutes:			
Nature of Discharge (rain, snowmelt):		**Magnitude of Event (in):**	
Start of Discharge (date/time):		**Duration of Event (hrs):**	
Was previous discharging storm event more than 72 hours before this event?	☐ Yes ☐ No		
Visual Assessment Date:		**Visual Assessment Time:**	
Signature of Person Performing Visual Assessment:			

Visually inspect sample for the following characteristics; If the characteristic is present in sample, write "Present (or P)" in the Result column, and provide a description of the characteristic and its probable source. If the characteristic is absent from sample, indicate with "Not Present (or NP)" in the Result column.

Characteristic	Indicator(s) of Contamination	Result	Description / Probable Source(s) of Contamination	Action Required? If yes, describe below
Color	Unusual color, such as reddish, brown, or yellow hue			
Odor	Noticeable odor (smells like gas fumes, rotten eggs, sour, etc.)			
Clarity	Not clear – cloudy or opaque			
Floating Solids	Floating materials at or near top of sample			
Settled Solids	Materials settled at the bottom after approx. 30 minutes			

Suspended Solids	Particles suspended in the water will affect clarity and color			
Foam	After gently shaking the bottle, foam is present			
Oil Sheen	Rainbow color or sheen on surface of the water			
Other obvious indicators of pollution	Unusual color, such as reddish, brown, or yellow hue			

[1]Conditions Requiring Corrective Action

Were any of the following conditions observed:

- 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 United States) occurred?
- Stormwater control measures are not stringent enough for the stormwater discharge to be controlled as necessary such that the receiving water of the United States will meet applicable water quality standards or to meet the non-numeric effluent limits?
- A visual assessment showed evidence of stormwater pollution (e.g., color, odor, floating solids, settled solids, suspended solids, foam)?

If any of the above conditions were observed during the routine inspection, Corrective Action is required to be taken in accordance with Section 6.2-6.4 and documented on the related Corrective Action form in Appendix I of the SWPPP within **24-hours of discovery** of the condition.

Comments / Additional Notes / Routine Maintenance:

INSPECTION 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 contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."

Inspector(s) Signature(s):

Appendix G: Impaired Waters Monitoring Form (EF-029E)

Appendix G
Impaired Waters Monitoring Form (EF-029E)

IMPAIRED WATERS MONITORING INFORMATION		
Date and Time:		
Sampler(s) Name:		
Sample Obtained From:	☐ Rain Event ☐ Snowmelt Event ☐ No discharge occurred during monitoring period	
Time Sample Obtained:		
Within first 30 minutes of event discharge?		☐ Yes ☐ No
If no, provide reason why:		
Did sampled event follow a preceding measurable storm by at least 72 hours?		
If no, provide reason why:		
Discharge Information:	Rain event inches:	
	Rain fall duration:	
Comments:		
Sampler Signature:		

Monitoring Notes:

Impaired Waters Monitoring is required once per year at each SIDP. Outfalls 001, 002 and 003 are all SIDPs so sampling is only required at one outfall. Sample type is a grab or composite sample. Circle which outfall was sampled:

Outfall 001 Outfall 002 Outfall 003

The EFSFSR requires analysis for the following:

☐ Antimony
☐ Arsenic
☐ Combined biota/habitat bioassessment

Refer to Section 5.5 of this SWPPP for details on result exceedances and subsequent monitoring.

Appendix H: Corrective Action Form (EF-029F)

Appendix H
Corrective Action Form (EF-029F)

Complete the following form for each Corrective Action resulting from a routine facility inspection, visual assessment monitoring event, indicator monitoring event, ELG monitoring event, non-compliance or similar event. The Corrective Action documentation process is a **two-step** process. The first half of this form must be completed within ***24-hours*** of discovery of the condition. The second portion of this form must be completed within ***5 days*** of discovery of the condition.

CORRECTIVE ACTION ID: (example: "date-001" "MMYY-001")	
CORRECTIVE ACTION: 24-HOUR INFORMATION	
Date and Time:	
Form Completed By:	
Triggering Event / Reason for Action:	
Description of Condition:	
Immediate Action(s) Taken:	
Signature, If Action(s) Completed:	
CORRECTIVE ACTION: 5-DAY INFORMATION	
Additional Action(s) Taken or to Be Taken:	
Expected Action(s) Timeframe:	
Completed Within 14 days of discovery? ☐ Yes ☐ No If not, why: Provide estimated schedule for completion:	
Signature and Date: When Action(s) Completed	

Appendix I: Endangered Species and Historic Properties Criterion Documentation

United States Department of the Interior

U.S. Fish and Wildlife Service

Idaho Fish and Wildlife Office
1387 S. Vinnell Way, Room 368
Boise, Idaho 83709
Telephone (208) 378-5243
http://www.fws.gov/idaho

OCT 0 5 2012

Keith Lannom
Forest Supervisor
Payette National Forest
800 West Lakeside Avenue
McCall, Idaho 83638

Subject: Golden Meadows Exploration Project—Valley County, Idaho—Concurrence
In Reply Refer To: 01EIFW00-2012-I-0430 Internal Use: CONS-100a

Dear Mr. Lannom:

This letter transmits the U.S. Fish and Wildlife Service's (Service) concurrence on the effects to species listed under the Endangered Species Act (Act) of 1973, as amended, for the proposed Golden Meadows Exploration Project (Project) in Valley County, Idaho. In a letter dated August 13, 2012, and received August 15, 2012, the Payette National Forest (Forest) requested concurrence on their effects determinations. The Service then received updated information, pertinent to the analysis, on September 24, 2012. The Forest made effects determinations, documented in the Wildlife and Aquatics Biological Assessments (Assessment), that the proposed action is not likely to adversely affect the Canada lynx (*Lynx canadensis*), bull trout (*Salvelinus confluentus*), or its designated critical habitat. The Forest also determined that the Project is not likely to adversely affect the wolverine (*Gulo gulo*), a candidate species; the Service acknowledges this determination.

<u>Proposed Action</u>

The Forest is proposing to authorize a Plan of Operations (POO) from Midas Gold Incorporated (MGI) for mineral exploration activities on Forest lands. The Forest authorized POOs from MGI for exploration activities in 2010 and winter 2010-2011; the Service concluded consultation on the authorization of these activities (Reference #s 14420-2010-I-0306 and 01EIFW00-2012-I-0113). The subject consultation is a continuation of previous activities, but as an independent action, it is being addressed as a separate POO, analysis, and consultation.

Components of the POO include: 26 drilling areas, drill access areas, 139 drill pads, 178 drill holes, 120 drill sumps, 0.8 miles of temporary road construction, well use, water storage tanks, re-opening a borrow pit, road maintenance, over-snow travel, fuel transport and management, and myriad best management practices (BMPs). The proposed action was updated on September 24, 2012 to additionally include 16 new groundwater monitoring wells on eight pads (four of the pads (eight wells) have been addressed previously). The project will begin in 2012 and continue through 2014. Drill holes, pads, and sumps will be located on or adjacent to existing road beds, pit benches, or in other previously disturbed (minimally vegetated) areas. Brushing and clearing of small trees immediately adjacent to the roadbed may occur during drill pad constructions, but in general, conducting drilling activities in previously disturbed areas minimizes the need for removing live vegetation. In drill pad areas where a sump is not feasible (e.g., steep slope), a casing diverter and piping would be employed to direct water into a shared sump in a more suitable location. Drill pads and sumps will be reclaimed following use. For winter operations, drilling fluids (water, drill mud, cuttings) will be contained in closed heated containers. For winter drilling, drill pads will be set-up directly on thick snowpack or by removing snow and possibly performing light earthwork to prepare a leveled area if site conditions allow and there is low risk of runoff or erosion. Snow removal and earthwork will be done by hand tools or a heli-portable backhoe.

Water Use

Currently, MGI proposes to obtain water for drilling from groundwater, surface water, and reclaimed water sources. Three existing surface water rights may be used to obtain water from six different streams (Table 1). The temporary water rights expire in 2013. Of the six streams identified for water withdrawal, only the East Fork South Fork Salmon River (EFSFSR), Fiddle Creek, and Sugar Creek are fish-bearing. MGI will use a small pump and a hose equipped with a 3/32-inch screen at the intake. The Forest and MGI have agreed to limit water withdrawal to the diversion rates listed in Table 2. If diversion rates greater than those presented in Table 2 are necessary, MGI will request approval from the Forest and consultation will be reinitiated.

Table 1. Surface water rights that MGI may use to obtain water for drilling activities.

Water Right Number	Maximum Diversion Rate (Cubic Feet per Second [cfs])	Source
77-7293	0.25	Hennessy Creek
Temporary (TP-77-34)	0.78	Hennessy Creek, Yellow Pine Pit (also known as the EFSFSR or the Glory Hole), Fiddle Creek
Temporary (TP-77-38)	0.78	Sugar Creek, West End Creek, Midnight Creek

Table 2. Proposed diversion rates for streams with authorized water withdrawals.

Stream	Diversion Rate (cfs unless otherwise specified)
EFSFSR (at the Glory Hole)	0.33
Fiddle Creek	0.04
Midnight Creek	0.04
Sugar Creek	0.04
Hennessy Creek	10% of the flow
West End Creek	10% of the flow

Stream Flows

Surface water withdrawals have the potential to diminish flows in fish-bearing streams. Using the diversion rates listed in Table 2, flows in the EFSFSR, Fiddle Creek, and Sugar Creek would be reduced by three percent, three percent, and 0.7 percent, respectively. Water withdrawals from Midnight Creek, Hennessey Creek, and West End Creek are not expected to significantly reduce the amount of available water in the EFSFSR or Sugar Creek. Cumulatively, these water withdrawals are not expected to reduce the flows of the EFSFSR (below Sugar Creek) by more than three percent. In addition, water will not typically be withdrawn on a continual basis; therefore, reductions of water in these streams is expected to be of short duration and sporadic during the three years of exploration. As such, these withdrawals are not expected to significantly affect the wetted width of fish-bearing stream channels or the quality of the instream habitat.

MGI will be withdrawing water at a rate that is approximately five percent to 42 percent of their authorized water right. If it becomes necessary to withdraw water at a greater rate, MGI is required to request authorization from the Forest. Prior to authorizing a greater withdrawal rate, the Forest will reinitiate consultation. It is the Service's understanding that MGI will obtain new water rights to support the exploration activities by the time the temporary water rights expire. As long as the quantities of water being withdrawn and streams from which water is withdrawn remain the same as described in the Assessment addendum, no additional consultation will be necessary.

The Project also includes transportation and storage of fuel, and reclamation and conservation measures to reduce effects to Forest resources. A detailed project description, including specific conservation measures, can be found in the Assessments on pages 33-65 (wildlife) and 15-46 (aquatics).

Rationale for Concurrence

Service concurrence that the Project is not likely to adversely affect the Canada lynx is based on the following rationales.

- The area of actual ground disturbance will be about 4.1 acres. Most of the on-the-ground disturbances will occur in potential, but currently unsuitable lynx habitat in an existing Lynx Analysis Unit. Project activities may remove individual or small groups of trees or snags, but will not change the condition of the vegetation or the amount of suitable lynx habitat when viewed at the stand level. More importantly, no removal of denning habitat will occur. Hence, the effects are considered insignificant to the Canada lynx.

- Due to the rarity of lynx on the Forest (no sightings have been documented within or near the Project area) and the small footprint of the proposed action, the potential for disturbance to Canada lynx is discountable.

Service concurrence that the Project is not likely to adversely affect bull trout or its critical habitat is based on the following rationales.

- The anticipated impacts from proposed activities are expected to be insignificant to bull trout and bull trout critical habitat. Overall, project design features and mitigation measures will maintain watershed condition indicators and associated primary constituent elements.

- Drilling activities within 300 feet of bull trout critical habitat are not expected to have significant effects. Based on the analysis provided in the Assessment (page 60), the level of sound transmitted through the air from drilling is not expected to cause effects to fish in the stream while the intensity of sound and vibration transmission through the ground is expected to be attenuated given the minimum 100 foot buffer from the stream. Effects from sound transmitted through the air and ground are expected to be temporary and insignificant.

- Proposed BMPs will be applied to work on both Forest and private lands and will reduce potential sediment delivery to streams to negligible amounts.

- Proposed water withdrawals are not expected to significantly affect the wetted width of fish-bearing stream channels or the quality of the instream habitat.

Conservation Recommendations

- Additional monitoring of BMPs is recommended to assure their effectiveness in reducing sediment.

- MGI should obtain new water rights to support the exploration activities by the time the temporary water rights expire (February and June of 2013). As long as the quantities of water being withdrawn and streams from which water is withdrawn remain the same as described in the Assessment addendum, no additional consultation will be necessary.

If the proposal addressed in this letter is modified, environmental conditions change, or additional information becomes available regarding potential effects on listed species, you should verify with the Service that your conclusions are still valid. Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Allyson Turner (208) 378-5348 if you have questions concerning this letter.

Sincerely,

for Brian T. Kelly
State Supervisor

cc: PNF, Krassel RD, McCall (Hunteman)
PNF SO, McCall (A. Egnew, Nalder)
NPT, Lapwai (Lopez)
NMFS, Boise (Sandow)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NMFS No: WCR-2015-3169

September 23, 2015

Keith Lannom, Forest Supervisor
Payette National Forest
800 W. Lakeside Avenue
McCall, Idaho 83638-3602

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Golden Meadows Exploration Project, HUC #1706020802 – Upper East Fork South Fork Salmon River, Valley County, Idaho (One Project)

Dear Mr. Lannom:

On July 10, 2015, NOAA's National Marine Fisheries Service (NMFS) received your request for reinitiation of consultation for the Golden Meadows Exploration Project (hereinafter referred to as the "proposed action"). More specifically, you requested a written concurrence that the proposed action is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). The Payette National Forest (PNF) is authorizing this proposed action pursuant to the Organic Act of 1897 (16 U.S.C. 478, 551), the Multiple Use Mining Act of 1955 (30 U.S.C. 612), the Mining and Mineral Policy Act of 1970 as reissued in the 1990s, and the National Forest Management Act (16 U.S.C. 1600 *et seq.*). This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination you made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation. In this case, NMFS concluded the proposed action would not adversely affect EFH. Thus, consultation under the MSA is not required for this action.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The concurrence letter will be available through NMFS' Public Consultation Tracking System [https://pcts.nmfs.noaa.gov]. A complete record of this consultation is on file at the Snake Basin Area Office, Boise, Idaho.

Proposed Action and Action Area

The PNF is proposing to approve a 3-year plan of operations submitted by Midas Gold, Inc. (MGI), thereby authorizing exploratory drilling and associated activities on national forest system (NFS) lands within the Stibnite Mining District (hereinafter referred to as the "project area"). The proposed action will be implemented year-round, beginning as early as 2015. The purpose of the proposed action is to better define mineral resource potential in the area. The primary project components include: (1) Drilling exploratory holes; (2) transporting fuel, personnel, and equipment; (3) installing one groundwater monitoring well; (4) reopening and expanding an existing borrow source; and (5) reclaiming disturbed areas on NFS lands. Each of these project components is described in more detail below. In addition, the standard operating procedures (SOPs) and project design features (PDFs) that will be implemented to minimize or eliminate the potential for adverse effects to ESA-listed species and their designated critical habitats are discussed.

Exploratory Drilling

Exploratory drilling will occur in 24 different areas, 21 of which are wholly located on NFS lands (Figure 1). Over the life of the project, approximately 128 drill pads and 110 sumps will be constructed and 166 exploratory holes will be drilled on NFS land (Attachment 1). The exploratory holes will extend anywhere from 200 to 1,500 feet below the ground surface; MGI estimated that up to about 88,000 feet of drilling will be done.

The drill pads, sumps, and drill holes will be located on or adjacent to existing roadbeds, pit benches, or in other previously disturbed (minimally vegetated) areas. Brushing and clearing of small trees may occur during construction of the drill pads or sumps. The drill pads will be a maximum of 25 feet by 25 feet, and the sumps will be a maximum of 8 feet wide, by 16 feet long, by 8 feet deep. Approximately 2 acres of NFS land will be disturbed as a result of drill pad and sump construction. During the winter, drill pads will be set up directly on thick snowpack or by removing snow and possibly performing light earthwork to prepare a level area. All work will be conducted using hand tools, a heli-portable backhoe, or the smallest heavy equipment necessary.

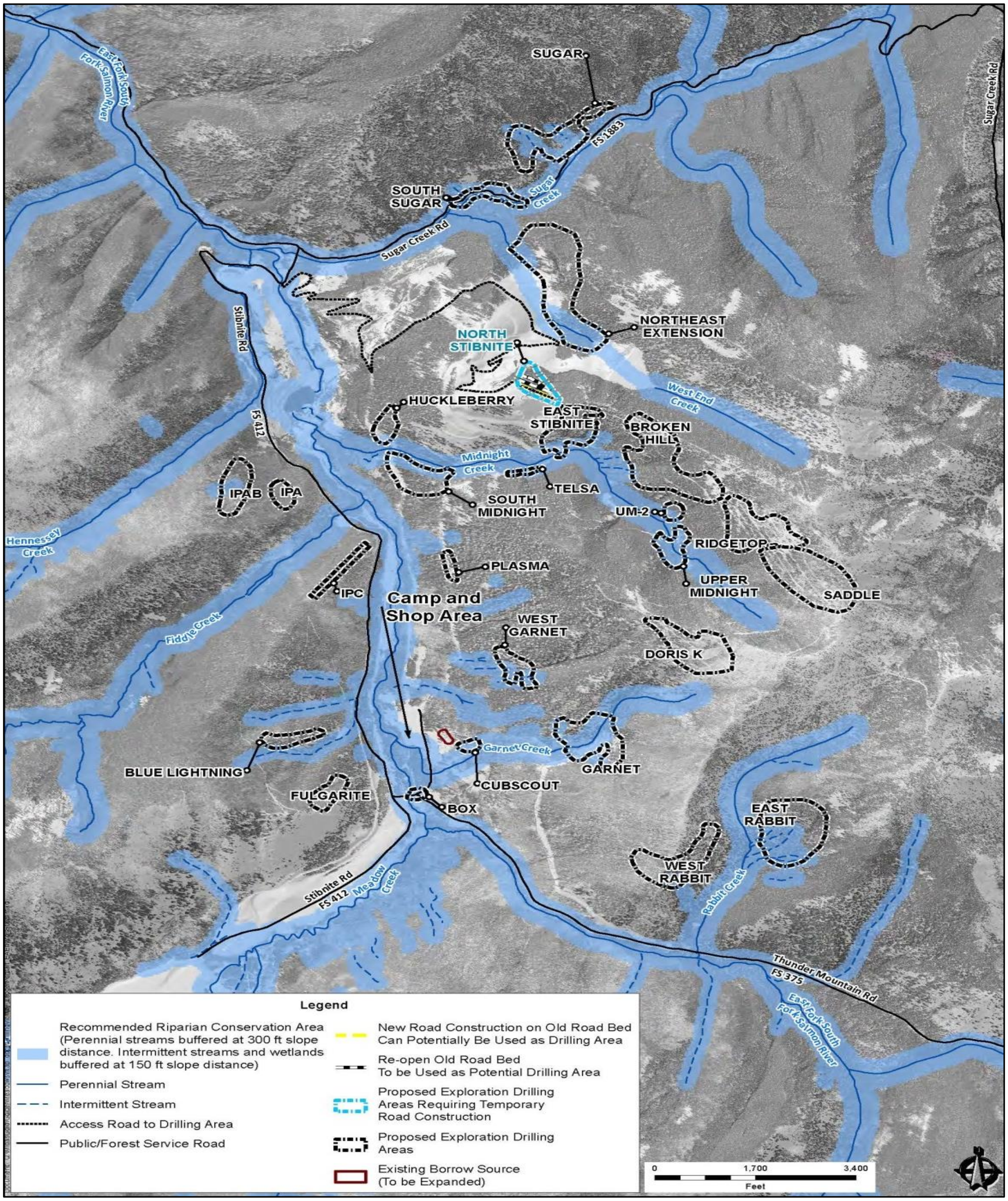


Figure 1. Areas proposed for exploratory drilling and delineated riparian conservation areas (Figure adapted from the 2014 Environmental Assessment for the Golden Meadows Exploration Project. Although shown on the figure, Sugar Creek and South Sugar Creek areas are no longer part of the proposed action).

Exploratory drilling will be conducted using either a heli-portable tracked LF-70 core rig, or a track-mounted reverse circulation rig. Water will be the primary fluid used to remove rock cuttings from the borings and to cool the drill bit. Various drilling additives may be used and will be certified by the National Sanitation Foundation International/American National Standards Institute for use in domestic water supply wells. Drill cuttings will be placed directly into the sump or in a heated shed set up with mud-collection tanks and a clarifier. After completing each drill hole, the cuttings and mud will be buried in the sump. The boreholes will be promptly (i.e., generally within a few hours of borehole completion) abandoned as required by Idaho rules governing exploration.

Midas is proposing to obtain water for mining-related activities (e.g., drilling and dust suppression) from groundwater and surface water sources (Table 1). Drill-return water will be routed to tanks or a drill sump, where the mud will settle out and the clarified water can be reused for drilling. Recycling the drill water will minimize the need for active water withdrawals. Three existing surface water rights may be used to obtain water from six different streams (Table 1). The temporary water rights expire annually and MGI will reapply each year. Of the size streams identified for water withdrawal, only the East Fork South Fork Salmon River (EFSFSR), Fiddle Creek, and Sugar Creek are fish-bearing. Surface water will be withdrawn using a small pump and a hose equipped with a 3/32-inch screen at the intake. The PNF and MGI have agreed to limit water withdrawal to the diversion rates listed in Table 2. If diversion rates greater than those presented in Table 2 are necessary, MGI will request approval from the PNF and consultation will be reinitiated.

Table 1. Surface water rights that MGI may use to obtain water for drilling activities.

Water Right Number	Maximum Diversion Rate (Cubic Feet per Second [cfs])	Source
77-7293	0.25	Hennessy Creek
Temporary (TP-77-34)	0.78	Hennessy Creek, Yellow Pine Pit (also known as the EFSFSR or the Glory Hole), Fiddle Creek
Temporary (TP-77-38)	0.78	Sugar Creek, West End Creek, Midnight Creek

Table 2. Diversion rates for streams with authorized water withdrawals.

Stream	Diversion Rate (cfs unless otherwise specified)
EFSFSR (at the Glory Hole)	0.33
Fiddle Creek	0.04
Midnight Creek	0.04
Sugar Creek	0.04
Hennessy Creek	10% of the flow
West End Creek	10% of the flow

Fourteen drill areas will be within riparian conservation areas (RCAs), as indicated in Attachment 1 and Figure 1. Of these drill areas, only the Box drilling area is within designated critical habitat for Chinook salmon. Vegetation clearing in RCAs will be kept to a minimum, leaving the overall riparian plant community unaltered. Although not anticipated, if large trees are felled, they will be left in the RCAs.

Six of the drilling areas have some risk of drilling fluid discharging at the ground surface (hereinafter referred to as "daylighting" of drilling fluid). Those drilling areas are North Stibnite, East Stibnite, IPA, Garnet, Box, and Northeast Extension. These areas were identified based on one or more of the following considerations: (1) Relation of the drill pad to historic mining activities; (2) depth and composition of overburden; (3) angle and orientation of projected drill hole; (4) proximity to natural, heavily fractured bedrock zones; and (5) proximity of drill pad and projected drill hole to surface waterbodies. In 2012, multiple daylighting events, and a small amount of drilling fluid reached surface water in six of these events. In response, MGI developed a series of SOPs designed to minimize the risk of daylighting and subsequent discharge to surface water. These SOPs were implemented in 2013 and are summarized in the "Standards Operating Procedures and Project Design Features" section of this letter. Although 12 daylighting events occurred, no drilling fluid discharged to surface water due to implementation of the SOPs.

Fuel, Personnel, and Equipment Transportation

In order to conduct exploration activities, MGI will need to transport fuel, personnel, and supplies to/from the project area as well as to/from the individual drilling areas. Roads used for transportation will include: (1) Open NFS roads; (2) existing, unauthorized routes that will be authorized for temporary use; and (3) newly constructed routes that will be authorized for temporary use.

Access to the project area can occur via three separate routes: (1) Johnson Creek; (2) South Fork Salmon River (SFSR); or (3) Lick Creek. The NFS road segments making up each of these routes are summarized in Table 3 and illustrated in Figure 2. These roads are open for public use and are currently maintained by Valley County. At a minimum, most native surface/gravel roads are graded two times per year, although NFS Road 413 (Johnson Creek Road) is graded at least three times per year. In addition, cleaning of ditches and culvert inlets is performed as necessary. Although infrequent, the county also applies dust abatement chemicals to road surfaces as needed. Transportation within the project area will occur on both NFS roads and routes authorized for temporary use. Access to and within the project area is described in more detail below.

Transportation of Personnel and Supplies to the Project Area

Johnson Creek will be the primary route used to transport personnel and exploration supplies to the project area during the snow free season. This road is closed during the winter season, which generally extends from mid-December through mid-June. During this time, the SFSR and EFSFSR

Roads are plowed by Valley County and provide the only winter access route to Yellow Pine. Since 2012, Valley County has also plowed the Stibnite Road in order to provide MGI access to the project area. The PNF imposes weight restrictions on the SFSR Road during spring break-up conditions (which generally extend from mid-May through mid-June), and MGI will abide by those restrictions. The MGI will also discourage its employees and contractors from using the Lick Creek route to access the project area; however, the PNF has assumed that a limited amount of use of this route will occur.

Table 3. Transportation Route Road Characteristics, Stream Sediment Functional Rating, Road Sediment Delivery, and Daily Traffic Counts.

Forest Road Number/Name	Warm Lake Highway (NFS Road 579: Cascade to Johnson Creek Road)	Johnson Cr. Road (NFS Road 413: Warm Lake Highway to Yellow Pine)	SFSR Road (NFS Road 474/674: Warm Lake Highway to EFSFSR - SFSR confluence)	Lick Cr Road (NFS Road 412: Lick Cr. summit to the EFSFSR - SFSR confluence)	EFSFR Road (NFS Road FR 412 EFSFSR - SFSR confluence to Yellow Pine)	Stibnite Road (NFS Road 412: Yellow Pine to Project Area)
Johnson Creek Route	x	x				x
SFSR Route	x	x	x			x
Lick Creek Route				x	x	x
Road Length (mi)	31.7	25.2	31.7	16.8	14.7	13.8
RCA Road Length (mi)	24.9	15.1	24.9	9.3	13.8	11.2
Route Surfacing Paved/Gravel/Native (%)	100/0/0	0/31/69	100/0/0	0/9[1]/91	0/100/0	0/65/35

[1]Graveling five miles of native surface road along the lower Secesh River will occur in 2015 increasing the amount of gravel surface to 39%.

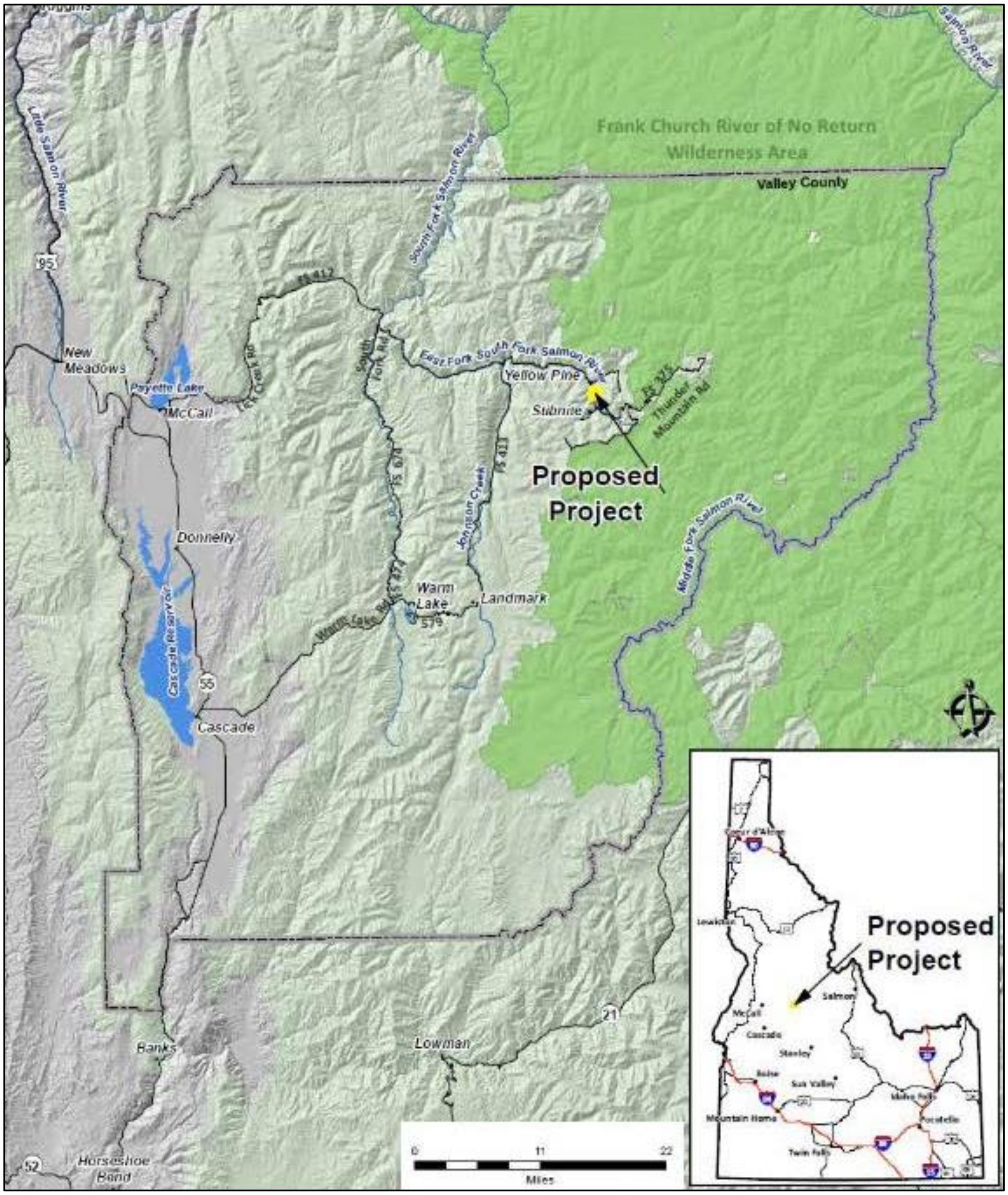


Figure 2. Proposed access routes to the project area (Figure adapted from the 2015 BA Amendment).

Because much of the infrastructure is already in place on private land within the project area, a smaller amount of exploration-related traffic is expected to occur on these routes in comparison to previous years. This is especially true for the segment of road between Yellow Pine and the project area. Up to 61 staff and drillers will be housed at the temporary camp within the project area, eliminating the daily commute of workers between Yellow Pine and the project area. The MGI estimated project-related traffic volumes to be about 60 light passenger vehicle and pickup truck/trailer round trips per month between Cascade and the project area. Although the MGI will discourage use of the Lick Creek route, the PNF assumes that project-related traffic on this route will be about 15 light personal vehicle round trips per month.

Hauling of Fuel to the Project Area

The proposed action requires large quantities of fuel (on-road and off-road diesel, gasoline, Jet-A fuels) to operate drill rigs and vehicles, fly helicopters, and conduct day-to-day operations. Based on past fuel use coupled with the anticipated drilling to be performed (i.e., drilling about 88,000 feet using two drill rigs), the annual fuel needs are estimated to be about 141,000 gallons annually, or about 423,000 gallons over the three year period.

Fuel will be regularly delivered to the project area using tanker trucks capable of hauling 4,000 gallons. No fuel trailer pups will be used. The fuel haul route consists of roads managed and maintained by Valley County, the Boise National Forest, and the PNF. During the snow-free months (generally June through mid-December), fuel will be hauled to the project area along the Johnson Creek route. No fuel will be hauled during the winter months, when the Johnson Creek Road is closed. In addition, no hauling of fuel is anticipated to occur when weight restrictions are in place (generally from mid-May through mid-June).

Fuel convoys will generally consist of one to four 4,000-gallon tanker trucks, depending on fuel requirements at the site and the availability of transport trucks. The trucks will be accompanied by a pilot vehicle and emergency response response truck. While the exact number of trips could vary slightly, the estimated fuel usage would require a single 4,000-gallon tanker to make about 35 trips[1] per year over the life of the project. Since the project would use convoys of one to four tankers, the actual number of convoys would vary as well, but overall, the project would necessitate between about 25 and 105 total convoys over the life of the project.

A fuel management plan will be followed for all activities associated with fuel delivery. This plan is a collection of standard operating procedures (SOPs) and best management practices (BMPs) that will be implemented to: (1) Minimize the risk of a spill; and (2) if a spill occurs, to prevent or minimize the amount of fuel reaching live water. The SOPs and BMPs associated with fuel haul are summarized later in this document and are described in detail in the Amendment to the Golden Meadows Exploration Project Biological Assessment (hereinafter referred to as the "BA Amendment").

[1] The BA Amendment indicates 30 trips per year; however, that estimate appears to be based on total fuel haul of around 117,000 gallons (the amount of fuel estimated to be needed for drilling only).

<u>Transportation of Fuel, Personnel, and Equipment within the Project Area.</u>

Roughly 61 staff will be housed at the camp on private land within the project area. Transportation of equipment and personnel to the drilling areas will be done by helicopter, tracked vehicles, rubber-tired vehicles, snowcat (winter only), or by foot. A helicopter will be used to access 22 drill areas during the snow-free season. During winter, these areas may be accessed by helicopter, snowcat, or other tracked vehicle. The remaining two areas (North Stibnite and Box) will be accessed by existing or new temporary roads.

Approximately 3.4 miles of existing unauthorized road on public land will be authorized for temporary use. In addition, approximately 0.32 miles of new temporary road will be constructed to access the IPC and North Stibnite drilling areas. The temporary roads will be approximately 12 feet in width; thus, including the cut and fill slopes, construction of new temporary roads is anticipated to result in the disturbance 1.5 acres of public land. Ground transport to drill areas in the winter may entail traveling overland, off designated routes. This will only occur where there is sufficient snowpack to limit ground-surface disturbance. Selection of routes to the drill pads will consider minimizing the impact on vegetation. Fish-bearing streams will be crossed via existing bridges and culverts. When crossing non-fish-bearing streams, snow or ice bridges will be constructed where necessary to prevent damage to streambanks.

Fuel will be transported to drill areas using a helicopter, tracked vehicles, or rubber-tired vehicles. When transported by helicopter, fuel will be contained in double-walled, reinforced fly tanks. When transported by vehicle, fuel will be contained in truck-mounted fuel tanks or in sealed 55-gallon drums in an all-terrain vehicle trailer. During the winter, fuel will be transported in double-walled tanks.

Groundwater Well Installation

The MGI is proposing to install a groundwater monitoring well in the Fiddle Creek drainage to obtain information about the geology, groundwater elevation and groundwater quality. The well will be located at least 100 feet away from stream channel, and will be installed in a manner than conforms to state well construction rules. The PNF will authorize use of an existing unauthorized route across NFS land to reach the well location.

Borrow Source Expansion

An existing borrow source on NFS land east of the current camp will be reopened and expanded to provide an estimated 7,000 cubic yards of crushed gravel to support the exploration program, including road maintenance. The borrow rock will be crushed and applied in areas such as on roadbeds at stream crossings to help reduce sediment delivery to streams. The expansion will disturb an additional 1-acre on NFS lands, which is outside of the RCA. Borrow material will be kept at a staging area on private land near the airplane landing strip.

Reclamation

A reclamation plan has been developed and provides direction for restoring disturbed lands. All disturbed areas on NFS lands will be reclaimed following their use. All drilling related structures, trash, debris, equipment, and other related materials will be removed from each drill site once drilling is complete. Upon completion, each drill hole will be backfilled with a mixture of drill slimes, bentonite hold plug, and native material, then capped with concrete. The drill sumps will be backfilled and recontoured, and the drill pads will be re-leveled and graded back to their original contours using either hand tools or the heli-portable backhoe.

Reclamation of the borrow source will include segregating topsoil, implementing stormwater and sediment control BMPs, backfilling and placing of topsoil, and revegetating the disturbed areas. Temporary roads will be decommissioned following completion of drilling activities and prior to winter unless a request for reauthorization for temporary road use is made. Decommissioning will include backfilling, recontouring, and removing compaction using standard reclamation practices and sediment and stormwater control BMPs. Disturbed areas will be mulched with certified weed-free hay mulch and, where possible and practical, replanted with certified weed-free see mixes and suitable native plant species.

Standard Operating Procedures and Project Design Features

A variety of SOPs and PDFs have been incorporated into the proposed action to minimize and avoid the risk of adverse impacts to ESA-listed fish and designated critical habitat. These SOPs and PDFs are fully described in the BA Amendment and its supporting documentation. The most notable SOPs and PDFs for protection of ESA-listed species and designated critical habitat are listed below.

1. All petroleum products will be transported in accordance with state and Federal Department of Transportation regulations, and handled and stored as per applicable state and Federal petroleum product storage and handling laws and regulations.

2. Fuel hauling will only occur during daylight hours and when weather conditions are acceptable. Acceptable weather conditions will be determined jointly by the MGI, the PNF, and the Valley County Road Department on a case-by-case basis.

3. Setup and confirmation of at least two caches for spill response equipment will occur on the fuel delivery route.

4. The pilot and emergency response vehicles will carry appropriate containment and spill response equipment. All drivers will be required to have spill response, safety, and resource awareness training.

5. A spill prevention control and countermeasure (SPCC) plan will be implemented.

6. Staff handling fuel or petroleum products will be trained to successfully implement the SPCC plan. Inspections of fuel storage and handling areas will be conducted as specified in the SPCC plan.

7. A spill prevention and cleanup kit consisting of absorbent pads, absorbent booms, shovels, and a fire extinguisher will be placed at the fuel storage site (private property), at the core shack (private property), and at drill sites or any other areas where fuel and/or petroleum products are present.

8. Water intake pumps will be placed in containment capable of holding 120% of the pump engine's fuel, engine oil, and hydraulic fluid. The smallest practical pump and intake hose will be used.

9. Any fuel, oil, or chemical discharges; or spills greater than 25 gallons on land, or any spill directly in a stream will be reported to NMFS immediately (or as soon as possible after onsite containment efforts are implemented as per the SPCC plan) and emergency consultation will be initiated. Spill response will be in accordance with the SPCC plan, which includes a trained onsite emergency response team.

10. For drill areas with a higher risk of drilling fluids emerging at the ground surface, the following SOPs will be implemented:

    a. Drillers will exercise a high degree of vigilance for signs of lost circulation at shallow depths.

    b. The casing will be advanced simultaneously with the drill string through the alluvial section of all drill holes.

    c. Regular monitoring of the adjacent slopes below the drill rig for daylighting of drilling fluids will be performed by environmental technicians. Stream channels in these areas will also be regularly monitored. At least one person will be stationed on the slope below the drill rig at all times until surface casing is set.

    d. For drill holes proposed to be sited within an RCA in areas identified as having risk for daylighting of drilling fluid, an interdisciplinary team including the PNF resource specialists and MGI geologists, drillers, and environmental technicians will conduct an onsite review of all geologic target considerations and environmental risk and mitigation factors in order to identify the optimal hole locations that would present the least environmental risk.

    e. Silt fence, straw wattles, portable sumps, pumps, and hoses will be pre-staged for emergency use to contain drilling fluid should it daylight. A PNF representative will verify that such measures are in place on the ground at locations warranting such precautionary measures.

11. Sediment and erosion control BMPs will be implemented to minimize the potential for sediment to reach steams. For example, to minimize sediment runoff from temporary roads and roadbeds, water bars, silt fencing, certified weed-free waddles, and/or weed-free straw bales will be installed in strategic downslope areas and in RCAs. Proper BMPs will be used to prevent sediment from escaping drill pad and sump locations.

12. Road rutting from traffic will be minimized by requiring construction and maintenance of surface drainage structures (e.g., water bars), application of surfacing material, and by restricting road use when conditions are unacceptable due to moisture that is leading to the onset of rutting and concentrations of turbid flow.

13. Road maintenance will be conducted along the Stibnite Road under a cooperative agreement with Valley County (this segment of road is operated under a Forest Roads and Trail Act easement between Valley County and the PNF). Road maintenance and improvement actions that will be performed include, but are not limited to, cleaning roadside ditches and improving drainage, reducing potential rock fall, improving and regrading roadway surfaces, replacing soft roadway materials, and adding surface coat aggregate with appropriate gradation and durability characteristics followed by application of dust abatement and binding products in select areas. Maintenance activities will be performed in accordance with the PNF Road Maintenance Programmatic (NMFS Tracking #2008/04131), unless otherwise noted in this letter (i.e., application of dust abatement chemicals).

14. Additional road maintenance on the Stibnite Road will focus on those areas where modeled sediment delivery is greater than 0.1 tons of sediment per year (using GRAIP). These areas will be inspected and prioritized for surface aggregate. Placement of surface aggregate will occur during the first summer of project implementation.

15. A gate will be installed within 300 feet of the bridge just east of the Profile Gap Road (Forest Service [FS] Road 340) and Stibnite Road (FS Road 412) intersection. The gate will be closed during the snow plowing and spring-break up seasons in order to regulate full-sized vehicle access to the project area. This will help avoid damage caused by motorized vehicles that could lead to excessive erosion and deterioration of the overall road condition. Administrative access beyond the gate by landowners, law enforcement, or government personnel may be permitted by Valley County.

16. No chemical deicers or sand/gravel less than 3/8-inch will be used on roads.

17. Dust abatement chemicals will be applied in a manner that avoids runoff into the streams. Where the road surface is within 25 feet (slope distance) of surface water, dust abatement chemicals will only be applied to a 10-foot swath down the centerline of the road. The rate and quantity of application will be regulated to ensure all of the chemical is absorbed and does not leave the road surface.

18. Unless a request is made to reauthorize road use, all temporary roads will be decommissioned immediately after use to a condition equivalent to, or better than, their condition prior to use.

19. Drill sites and other reclaimed drill areas will be monitored during spring runoff to ensure that sediment and erosion control BMPs are in place and working so that soil erosion is minimized.

20. Travel and drilling off designated routes on NFS lands will only occur when there is adequate snow depth or frozen soil to prevent rutting and puddling. Snow used to build snow bridges across non-fish bearing streams will not contain soil or other debris.

21. When a drill pad is needed in an RCA, MGI will submit a written request to the PNF for approval of the location. The request must include an explanation as to why there is no reasonable alternative to siting the pad in an RCA. MGI must receive approval from the PNF prior to pad construction. Drill pads in RCAs will be sited to avoid removing any large trees to the extent possible. Any trees that are felled within the RCA will be left in the RCA.

22. Drill pads will not be located within 100 feet of streams.

23. Employees and staff will receive training and direction to avoid harassment of spawning adult Chinook salmon and steelhead.

24. Water diversion rates will not exceed those specified in Table 2 of this letter of concurrence. If higher diversion rates are necessary, consultation will be reinitiated. Water withdrawal pumps will be turned off when not in use and water conservation practices will be implemented.
25. If monitoring of the proposed action identifies unanticipated effects to fish or fish habitat, activities will cease until corrections can be made. The Level 1 Team will be informed or consultation will be reinitiated.

Monitoring

The MGI will monitor turbidity, fuel haul, and mining-related traffic (i.e., traffic associated with MGI staff, drillers, and other contractors) to the project area. Visual turbidity monitoring will occur immediately upstream and downstream of active drilling operations for drills working within 300 feet of surface water. If operations are shown to be generating visible turbidity in a stream channel downstream of drilling that is greater than upstream levels, operations will cease until the source of sediment can be identified and mitigated. While actions are taken to stop the turbidity pulse, a turbidimeter will be used to measure turbidity in the stream at 15-minute intervals until turbidity subsides. If turbidity is due to drilling, the Level 1 Team will be promptly provided with a report that includes an account of the event, measures taken to stop the plume, and the turbidity data. The MGI will keep track of fuel hauled to the project area by recording the number of trucks, the volume of fuel contained in each truck, and the dates the fuel convoys occurred. In addition, the MGI will record the number of light personal vehicles and truck/trailer trips to/from the project area each month. This information will be shared with the Level 1 team annually.

Action Area

The action area includes all areas to be affected directly or indirectly by the action, including any interdependent/interrelated activities. The MGI owns private land within the action area and will be conducting actions on those private lands that are interrelated and interdependent to the proposed actions on public lands. Actions on private land include: (1) Operating the onsite camp that will house up to 61 staff; (2) constructing and operating a wastewater treatment plant; (3) operating a potable drinking water treatment system; and (4) conducting exploratory drilling that is accessed via temporary authorized roads across NFS lands.

The wastewater treatment facility is designed to meet Class A municipal recycled water quality and sludge will be hauled away and disposed at a licensed septage receiving facility or wastewater treatment plant. The MGI obtained a Reuse Permit (Permit # M-228-01) from the Idaho Department of Environmental Quality, which allows the following uses of the treated wastewater: (1) Hydroseeding and irrigation of reclamation sites on lands owned or controlled by MGI; (2) dust suppression on roads and construction areas within the facility's boundaries; (3) toilet flushing; and (4) subsurface discharge in the existing drainfield. The permit also allows the use of treated wastewater for hydroseeding, irrigation, and dust suppression on NFS land, once written authorization has been received from the U.S. Forest Service (USFS).

When conducting work on private land, the MGI has committed to implementing the same BMPs as those implemented on public lands. For example, in a letter to the PNF dated July 2, 2012, MGI states that MGI's SOPs "do not make a distinction between NFS lands and private lands regarding the implementation and maintenance of erosion control BMPs."

For this action, those areas that could be affected by sediment inputs or chemical contamination represent the fullest extent of the action area. The action area encompasses all of the drilling locations, staging areas, the borrow pit, and all transportation and haul routes. All drilling activities will occur in the vicinity of the Stibnite Mine, which is located approximately 14 miles upstream of Yellow Pine, Idaho. Haul routes that may be used to transport fuel, personnel, and/or equipment to the project area include the Johnson Creek route, the SFSR route, and the Lick Creek route. The action area includes the drainages of: (1) West End Creek; (2) Sugar Creek, from approximately the West End Creek confluence downstream to the confluence of the EFSFSR; (3) the EFSFSR, from its headwaters downstream to the town of Yellow Pine; (4) Meadow Creek, from the tailings impoundment downstream to the confluence with the EFSFSR; and (5) those portions of Johnson Creek, Lick Creek, Secesh River, EFSFSR, and SFSR that are along the transportation routes.

Action Agency's Effects Determination

The PNF determined that the proposed action is NLAA Snake River Basin steelhead *(Oncorhynchus mykiss),* Snake River spring/summer Chinook salmon (*O. tshawytscha),* and their designated critical habitats. Table 4 provides the status and Federal Register citations for these species and their designated critical habitat.

Table 4. Federal Register notices for final rules that list threatened and endangered species, designated critical habitat, or apply protective regulations to listed species considered in this consultation (Listing status: 'T' means listed as threatened under the ESA; 'E' means listed as endangered).

Species	Listing Status	Critical Habitat	Protective Regulations
Chinook salmon (*Oncorhynchus tshawytscha*)			
Snake River spring/summer run	T 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543 10/25/99; 64 FR 57399	6/28/05; 70 FR 37160
Steelhead (*O. mykiss*)			
Snake River Basin	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

Consultation History

On August 16, 2012, NMFS received a request for consultation for the proposed action. NMFS provided a letter of concurrence on October 18, 2012 (NMFS Tracking # 2012/04160). The PNF issued a Decision Notice for the project on December 2, 2013. On April 22, 2014, the Idaho Conservation League and Nez Perce Tribe filed a complaint in the U.S. District Court for the State of Idaho challenging the PNF decision and the letters of concurrence issued by NMFS and the U.S. Fish and Wildlife Service (FWS). On June 23, 2014, the PNF withdrew the decision to implement the project to allow for further analysis of the issues identified by the plaintiffs.

On October 8, 2014, the PNF provided NMFS and the FWS with a draft sediment analysis. NMFS provided comments on the analysis on October 28, 2014. The PNF provided a draft BA Amendment, including the additional sediment and fuel haul analyses, on November 25, 2014. NMFS and the FWS provided comments on the draft BA Amendment on December 15, 2014. The comments were discussed during a Level 1 meeting on December 17, 2014. A revised draft BA was provided on June 5, 2015 and discussed during a June 23, 2015, Level 1 meeting. The final BA Amendment was received by NMFS on July 10, 2015, and consultation was initiated.

Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is NLAA listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

The proposed action and its interrelated/interdependent activities have the potential to cause minor temporary negative impacts to critical habitat by reducing streamflows, increasing turbidity and sediment deposition, and/or causing chemical contamination. Such effects to critical habitat have the potential to then affect fish. Fish may also be directly affected by construction activities (e.g., noise generation). These potential effects are discussed in more detail below.

Critical Habitat Determination

Within the action area, the following major streams are designated as critical habitat for Snake River spring/summer Chinook salmon and Snake River Basin steelhead: Johnson Creek; the SFSR; the EFSFSR; Lick Creek, Secesh River, and Sugar Creek. On the EFSFSR, designated critical habitat for steelhead terminates just downstream of the Glory Hole. For Chinook salmon, critical habitat includes the EFSFSR, from its mouth upstream to and above the Glory Hole, as well as Meadow Creek and any other tributaries that were historically accessible. Designated critical habitat for Chinook salmon includes the adjacent riparian zone, which is defined as those areas within 300 feet of the ordinary high water mark. Table 5 summarizes the suite of essential physical and biological features (Chinook salmon) or primary constituent elements (PCEs) (steelhead) of designated critical habitat (hereinafter collectively referred to as PCEs).

The proposed action has the potential to affect the following PCEs: (1) Water quantity; (2) water quality (i.e., turbidity and chemical contamination); (3) spawning gravel/substrate; and (4) riparian vegetation. Any modification of these PCEs may affect freshwater spawning, rearing, or migration in the action area. Proper function of these PCEs is necessary to support successful adult and juvenile migration, adult holding and spawning, and the growth and development of juvenile fish. All remaining PCEs will not be affected by the proposed action. As previously described, the proposed action incorporates a variety of SOPs and PDFs that will minimize the potential for adverse effects to these PCEs.

Table 5. Types of sites and essential physical and biological features designated as PCEs, and the species life stage each PCE supports.

Site	Essential Physical and Biological Features/PCEs	ESA-listed Species Life Stage
Snake River Basin Steelhead[a]		
Freshwater Spawning	Water quality, water quantity, and substrate.	Spawning, incubation, and larval development
Freshwater Rearing	Water quantity & floodplain connectivity to form and maintain physical habitat conditions	Juvenile growth and mobility
	Water quality and forage[b]	Juvenile development
	Natural cover[c]	Juvenile mobility and survival
Freshwater Migration	Free of artificial obstructions, water quality and quantity, and natural cover[c]	Juvenile and adult mobility and survival
Snake River Fall and Spring/summer Chinook Salmon		
Spawning and Juvenile Rearing	Spawning gravel, water quality and quantity, cover/shelter, food, riparian vegetation, and space	Juvenile and adult
Migration	Substrate, water quality and quantity, water temperature, water velocity, cover/shelter, food[d], riparian vegetation, space, safe passage	Juvenile and adult

[a]Additional PCEs pertaining to estuarine, nearshore, and offshore marine areas have also been described for Snake River Basin steelhead. These PCEs will not be affected by the proposed action and have therefore not been described in this letter of concurrence.
[b]Forage includes aquatic invertebrate and fish species that support growth and maturation.
[c]Natural cover includes shade, large wood, log jams, beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
[d]Food applies to juvenile migration only.

Water Quantity

Surface water withdrawals will intermittently and temporarily diminish flows in designated critical habitat. Water is not expected to be withdrawn on a continual basis; therefore, reductions of water in these streams is expected to be of short duration and sporadic during the 3 years of operation. Furthermore, although some water will be lost due to evapotranspiration, the majority of the water is not expected to be consumptively used and is assumed to eventually reenter nearby streams through groundwater flow. Using the diversion rates listed in Table 2, flows in the EFSFSR, Fiddle Creek, and Sugar Creek will be reduced, on an intermittent basis, by three percent, three percent, and 0.7%, respectively. Water withdrawals from Hennessey and West End Creeks (non-fish bearing at points of withdrawal) will not exceed 10% of the existing instream flow. If withdrawals from these streams occurred simultaneously, they are expected to cumulatively reduce flows in the EFSFSR (below Sugar Creek) by less than three percent.

According to information in the 2012 BA addendum, MGI will be withdrawing water at a rate that is approximately five percent to 42% of their authorized water right. If it becomes necessary to withdraw water at a greater rate, MGI is required to request authorization from the PNF. Prior to authorizing a greater withdrawal rate, the PNF will assess whether consultation should be reinitiated. As long as the quantities of water being withdrawn do not exceed those described in the 2012 BA addendum, implementation of the greater withdrawal rates will not require additional consultation.

The estimated intermittent reductions in streamflows as a result of project-related water withdrawals are not expected to decrease habitat availability, decrease forage, or increase stream temperatures to a degree that will adversely affect the ability of the critical habitat to support ESA-listed fish. This is because water will be removed on an intermittent basis over a period of 3 years, the majority of water will not be consumptively used, and only a very small proportion of the streamflow will be removed. The largest potential proportional reduction is 10%, and such reductions will only occur in non-fish bearing stream reaches. Flow reductions in fish bearing stream reaches are expected to be far less. Maintenance of 90% of average annual streamflow conditions contributes substantially to the maintenance of stream widths and depths[2]. Considering this information, the proposed water withdrawals are expected to have insignificant effects on habitat availability and quality within fish-bearing stream. .

Exploratory drilling has the potential to affect groundwater flows by altering hydrologic connectivity, which in turn could affect stream flows within the action area. The MGI will employ various SOPs that will minimize these potential effects. For example, upon completion, each exploratory hole will be backfilled with a mixture of bentonite and drilling mud. Backfilling the exploratory holes effectively prevents any water transmission (gains or losses) within the disturbed ground. Furthermore, if water is encountered, or lost during drilling activities, MGI will immediately seal off the inflows and/or outflows by pumping bentonite mud down the drill hole. If this does not control the groundwater flows such that drilling can continue, then MGI will close the hole by backfilling as described above. Because MGI will be implementing these SOPs, NMFS expects the exploratory drilling will have an insignificant effect on stream flows within the action area.

Sediment Deposition/Turbidity

The proposed action and the interrelated/interdependent actions on private lands are likely to generate and mobilize sediments as a result of road construction, maintenance, and reclamation; infrastructure development; drilling-related activities; and increased road use. Twenty-two of the drilling areas on NFS lands will be accessed by helicopter or reached via over-snow travel. Two of the drilling areas will be accessed by temporary roads. Sediment generated and delivered to nearby streams as a result of infrastructure development, temporary road construction, and drilling pad and sump construction and operation is expected to be insignificant for the following reasons: (1) The majority of drilling areas will be accessed without using roads; (2) roads used to access two drilling areas are located outside of the RCA, will be maintained during their use, and will be reclaimed

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[2] Orth, D. J. and R. J. White. 1993. Stream habitat management. Pages 217-218 i*n:* C.C. Kohler and W.A. Hubert, editors. Inland fisheries management in North America. American Fisheries Society. Bethesda, Maryland.

following their use; (3) sediment-erosion control BMPs will be implemented, monitored, and adaptively managed to ensure sediment mobilization and delivery to surface water is minimized.

When drilling exploratory holes, there is potential for drilling fluids to daylight and enter surface waters. If delivery to surface water occurred, it would result in turbidity pulses and subsequent deposition of fine materials (e.g., sediments and bentonite clay material) within stream channels. Implementation of various SOPs (e.g., regularly monitoring the downslope area, having materials useful for containment of drilling fluids, etc.) will minimize the risk of drilling fluids being discharged to nearby streams. These SOPs were implemented in 2013 and proved effective on private land. Furthermore, visual turbidity monitoring will be conducted when drilling occurs in RCAs. If visible turbidity is present downstream of drilling activities, operations will cease until the source of turbidity can be identified and mitigated. This will minimize the duration and frequency of elevated turbidity pulses and subsequent deposition of fine material, rendering those effects insignificant.

As previously stated, six of the drill areas have elevated risk of daylighting. Three of these areas are located far from surface water and/or have relatively flat terrain; therefore, containment of drilling fluids would be readily accomplished and the risk of discharge to surface water is discountable. Drill pads in the remaining three areas (Garnet, East Stibnite, and Northeast Extension) will be located as close as 100 feet to streams (Garnet Creek, Midnight Creek, and West End Creek, respectively); therefore, there is greater potential for discharge of drilling fluids to surface water.

Both Garnet and Midnight Creeks have a very steep gradient (average gradient > 22%), are narrow, and shallow). These creeks are unlikely to support fish; however, they do provide a source of forage to downstream, occupied habitats. The lower-most segment of West End Creek is likely occupied critical habitat; however the majority of this creek is unoccupied, as it is located beneath a waste rock dump. Although the chances of drilling fluid reaching these creeks is low, if it were to occur, the resulting turbidity pulse and subsequent fine material deposition is expected to be insignificant. This is because implementation of SOPs will ensure that only a small amount of drilling fluid would have the potential to reach surface water and would be rapidly diluted in the receiving streams. The magnitude, duration, and frequency of turbidity pulses and subsequent deposition associated with such a release are not expected to be sufficient to alter the benthic community in unoccupied habitats. In the unlikely event that drilling fluids are transported to downstream to occupied habitats, the bentonite material and sediment are not expected to be in sufficient concentrations nor are they expected to persist for a sufficient amount of time. Therefore, any effects to the water quality and stream substrate PCEs are expected to be insignificant.

The PNF also analyzed the potential for sediment-related effects associated with increased road use due to transportation of fuel, personnel, and mining-related supplies to the project area along the Johnson Creek, SFSR, and Lick Creek routes. The analysis considered sediment conditions in streams paralleling the transportation routes; road surface composition (i.e., paved, native, or gravel), maintenance activities, and road use; existing sediment yield from roads; project-related road use and maintenance activities; and available information about road use, maintenance, and sediment yields.

Roads are often chronic sources of sediment delivery to nearby streams through surface erosion (from cutslopes, fillslopes, ditchlines, and running surfaces) and mass wasting. Sediment yield to streams from roads is influenced by a number of factors including, but not limited to, distance between the road and stream; road surface composition; road gradient; road condition (e.g., drainage characteristics, level of maintenance, saturation, etc.); and quantity, type (e.g., total vehicle load, axles and wheel configuration, etc.), and behavior (e.g., acceleration/deceleration, speed, etc.) of trafficking vehicles. The proposed action would result in some additional road maintenance activities and increased traffic, both of which can contribute to sediment delivery.

Road maintenance can temporarily increase sediment delivery but can decrease it in the longer term. Erosion from roads can be reduced by hardening the road surface with pavement or gravel aggregate and installing appropriate drainage features such as crossdrains, rolling dips, or waterbars. General road maintenance such as surface grading and ditch cleaning have been shown to temporarily increase erosion by as much as four-fold; however, sediment delivery decreases substantially within 1 to 2 years following maintenance activities (assuming the maintenance activities are not ongoing). Road maintenance is necessary to maintain drivability and its beneficial effects (e.g., preventing rutting or other road damage that can lead to chronic erosion and sediment delivery) may persist for many seasons. The proposed action includes some additional road maintenance activities on the Stibnite Road, and additional surface grading may occur on the Johnson Creek Road if conditions are deemed unsafe for fuel haul.

Traffic increases have been shown to result in increased sediment yield to nearby streams. When comparing traffic to no-traffic use of forest roads, Foltz (1996)[3] found sediment yields from road segments being used by logging trucks to be between two and 25 times greater than sediment yields from the same roads when no logging truck use occurred (only occasional light pickup traffic occurred). The magnitude of the increase in sediment yield was dependent upon the quality of gravel on the surface of the road, with it becoming more important as use increased. Reid and Dunne (1984)[4] compared sediment yield from road segments receiving various levels of use defined as: heavy (more than 4 logging truck trips per day; moderate (between one and four logging truck trips per day); light (no logging trucks, but some light vehicles), and abandoned. They found that when compared to a paved road, the average sediment yield on a gravel road with light vehicle traffic increased two fold, moderate log truck traffic increased 20 fold, and heavy log truck traffic (traffic loads ranged between 16 and 32 trucks per day) increased 250 fold. Sediment yield on a gravel road with moderate log truck traffic was 11 times greater than that with light

[3] Foltz, R. B. 1996. Traffic and no-traffic on an aggregate surfaced road: sediment production differences. Presented at the FAO Seminar on Environmentally Sound Forest Roads, June 1996. Sinaia, Romania. 13 pp.
[4] Reid, L. M. and T. Dunne. 1984. Sediment productions from forest road surfaces. Water Resources Research. 20(11):1753-1761.

traffic. Sheridan et al. (2006)[5] found that total sediment yield from graveled roads in their study increased by two and four times when comparing high traffic use (nine or more logging truck passes) to low traffic use (fewer than nine logging truck passes) during "dry" and "wet" road conditions, respectively.

Although studies have shown sediment yield to increase with increasing traffic use of roads, these studies have primarily evaluated the effects of logging truck traffic. Therefore, these results are not directly comparable to the potential increases in traffic presented by MGI, which are primarily comprised of lighter vehicles (four counts per day), with limited heavy vehicle use (0.4 counts per day). Furthermore, as previously stated, there are many factors that influence sediment yield from roads. Based on existing research, NMFS expects MGI-related traffic to cause some increase in sediment yield; however, we expect the increase in sediment to be immeasurable for a number of reasons, which are described below:

1. Project related? Traffic is minimal and primarily comprised of lighter vehicles (four counts per day) with limited heavy vehicle use (0.4 counts per day).

2. The Warm Lake Highway and SFSR Roads are paved, which effectively minimizes, if not eliminates, sediment delivery due to traffic.

3. The EFSFSR road was surfaced with a 6-inch lift of gravel aggregate in 2012, and a 4-inch lift of aggregate was placed on a 5-mile segment of the Lick Creek road (along the Secesh River) in 2015. Placement of gravel aggregate has been found to reduce sediment yield from roads because it helps prevent rutting (even in wet spring conditions) and is generally more resistant to crushing and abrasion from tires than the native surfaces of roads in this area.

4. Because of routine road maintenance, the transportation routes are in relatively stable condition.

5. Sediment delivery points on the Stibnite Road that were modeled to contribute more than 0.1 tons of sediment per year will be field verified and prioritized for surface aggregate application. Treatments will be completed during the first summer of project implementation.

6. During the winter, the ground surface of the EFSFSR and Stibnite Roads is expected to be frozen and the roads will be covered with snow; therefore, surface material will be less susceptible to crushing and abrasion from tires.

[5] Sheridan, G. J., P. K. Noske, R. K. Whipp, and N. Wijesinghe. 2006. The effect of truck traffic and road water content on sediment delivery from unpaved forest roads. Hydrologic Process. 20:1683-1699.

7. Because driving on saturated roads can cause substantial erosion, the PNF has incorporated an SOP that restricts road use when conditions are unacceptable due to moisture and when use could lead to rutting and concentrated turbid flow.

8. Both the PNF and Valley County impose vehicle weight restrictions when roads are slushy and soft due to melting snow and rain events. Although the timing of these restrictions depends on environmental conditions, weight restrictions have generally been imposed from mid-May through mid-June. During this time, no fuel haul will occur and MGI-related traffic will be limited to the lighter weight vehicles, if it is not otherwise restricted as described in #7 above.

9. Because the proposed action involves snowplowing of the Stibnite Road, there is increased potential for public use of the road during winter and spring. To limit the amount of traffic use, a gate will be installed on the road just upstream of the confluence of Profile Creek and the EFSFSR. This gate will be locked closed during the winter and spring periods to prevent public use during seasons when the road is susceptible to damage from vehicles. Both MGI and PNF personnel will be able to administratively use this road beyond the gate, as long as conditions are suitable for driving.

During prior mining exploration in 2012, traffic count data collected on the Stibnite Road at Profile Creek were almost 100 times greater than what is expected to occur under this proposed action. This is due to the significant difference in day-to-day operations (i.e., running eight drills at a time and housing employees at Yellow Pine rather than onsite during 2012 versus running two drills at a time and housing employees onsite under the proposed action). Sediment data (i.e., % free matrix and % surface fines) collected in streams adjacent to these transportation routes do not suggest a significant worsening of these metrics. Although these data should be interpreted with caution, the 2012 and 2013 percent free matrix data for the EFSFSR below Sugar Creek and just upstream of Yellow Pine suggest an improvement in the free matrix conditions.

Given the discussion above, sediment generation and mobilization resulting from increased traffic use will be low and will not result in any measurable increase in turbidity or sediment deposition in area streams. Similarly, construction, use, and reclamation of temporary roads will not result in a measurable increase in turbidity or sediment deposition because of their location and implementation of SOPs and PDFs. Because of their location and implementation of SOPs and mitigation measures, drill platform construction, use, and reclamation is also expected to not result in any significant turbidity plumes or measurable sediment deposition in streams within the action area. Given the SOPs and mitigation measures associated with this proposed action, the effects of potential turbidity pulses and subsequent sediment deposition on critical habitat will be insignificant.

Chemical Contamination

The following components of the proposed action have the potential to cause chemical contamination of designated critical habitat: exploratory drilling, application of dust abatement chemicals, and transportation of fuel. As described in the proposed action section, various SOPs and PDFs will be implemented to minimize the risk of contamination of designated critical habitat.

As discussed above regarding sediment delivery, the risk of drilling fluids being discharged to streams is very low; however, it cannot be discounted. The primary drilling fluid will be water; however, additives may be used to increase viscosity or reduce fluid loss. All of the additives that may be used are non-toxic; therefore, even if they were released into streams, the risk of adverse effects to critical habitats is discountable.

The proposed action may include application of dust abatement chemicals (e.g., magnesium chloride, calcium chloride, or lignin sulphonates) on the EFSFSR road between Yellow Pine and the project area (application of dust abatement chemicals to other segments of the transportation system are performed by the county, regardless of whether the proposed action is implemented). The risk of dust abatement chemical runoff to nearby streams is low assuming proper implementation of the SOPs and PDFs. Even if some runoff did occur, any adverse effects from dust abatement chemicals are expected to be insignificant because: (1) Only a small quantity of chemical will be applied; (2) chemical application will be infrequent; (3) implementation of SOPs and PDFs will minimize potential for delivery to nearby streams; (4) and adjacent streams offer a substantial amount of dilution.

Because large quantities of fuel will be transported (about 141,000 gallons annually for a period of three years), stored, and used as part of this project, there is potential for an accidental spill of toxic chemicals into the riparian zone or directly into action area streams. However, fuel-related SOPs/mitigation measures keep fuels as far as possible from live water and include measures to reduce the likelihood of uncontained spills. For example, refueling of equipment will occur in appropriate spill containment structures. Equipment will be well maintained to prevent fuel or lubricant leaks. A SPCC plan will be implemented, and spill prevention and cleanup kits will be placed at various locations where fuel and/or petroleum products are present. Various SOPs and mitigation measures will be implemented when fuel is being transported to and within the project area. These SOPs and mitigation measures will include the use of double-walled tanks, pilot vehicles, emergency response vehicles, prepositioning of spill kits along the route, and transporting fuel only under favorable weather conditions. Furthermore, no fuel haul will occur during winter or when weight or road use restrictions are in place.

Fuel spills have occurred in the SFSR drainage in the past. Between 1987 and 1993, there were seven accidents involving trucks that were hauling fuel or chemicals to Stibnite area mines. Four of these accidents involved fuel haul. Diesel fuel entered a perennial stream in one of these accidents. This accident occurred on September 6, 1989, and an estimated 400 gallons of the 1,700 gallons of spilled fuel reached Johnson Creek. After this event, transportation procedures for commercial haulers on NFS roads were strengthened in numerous ways (e.g., driver safety inspection of transport vehicles, prohibition of hauling petroleum products in trailers, reduced speed limits, use of pilot vehicles, etc.). In addition, tanker manhole covers were required to be upgraded in 1993. Rather than withstanding pressures of 9 pounds per square inch (psi), the manhole covers were required to withstand pressures of 36 psi. The higher psi requirement coupled with some of the new transportation requirements for commercial haulers were thought to reduce the risk of spills from occurring and entering streams. Since 1990, no spill has occurred; however, one incident occurred in 1991 when a truck carrying hazardous material slid into a ditch while trying to navigate the Johnson Creek road during difficult driving conditions. Although no spill occurred, there was potential to adversely affect ESA-listed fish because material could have readily reached Johnson Creek.

Using data from Valley County, there have been additional accidents associated with commercial haul within the action area. In 2010, a truck hauling bentonite on the Johnson Creek Road was involved in an accident. The causal agent in this case was cited as unstable terrain and overloading of the truck. In 2008, a logging truck was center or left of center on the SFSR Road and was involved in a collision. In 2010, a truck was traveling too fast for its weight load and was pushed over an embankment on the SFSR road.

Large quantities of fuel were hauled to the Stibnite Mining area in 2012 and 2013. A total of 64 fuel haul convoys (using trucks with the capacity to carry either 500 gallons or up to 4,000 gallons of fuel) occurred during this 2-year time period and no incidents occurred. The PNF used incident data from the Valley County Sheriff and road count data from PNF traffic counters to evaluate the potential for accidents. The incident data included both personal vehicles and commercial traffic. On the Johnson Creek Road, the calculated accident rate was one incident per 4,455 vehicle counts for the time period between 2000 and 2001. This incident rate was higher than any other point during the period of 2000 to 2010. Using data from a longer time period (i.e., historical road counts from 1984 through 2001 and accident data for 2000 through 2010), the calculated accident rate is one incident per 10,495 counts. The Stibnite Road has a calculated accident rate of 1 per 40,606 vehicle counts.

Considering this information, there is clearly a risk of accident and spill; however, the majority of the requirements (e.g., manhole covers capable of withstanding pressures of nine pounds per square inch, use of a pilot vehicle, prohibition of hauling using pup trailers, etc.) implemented in the early 1990s will continue to be implemented as part of this proposed action. Additional requirements have been added to further minimize the risk for a spill, such as no transportation of fuel during winter or when road use restrictions due to weight restrictions or saturation are in place. Therefore, NMFS believes that a spill associated with fuel haul is unlikely to occur. If a spill were to occur in, or outside of, the RCA, there are contingencies in place to prevent or minimize the quantity of fuel reaching live water.

Based on the historic and recent accident information and because MGI will implement various SOPs aimed at reducing the risk of fuel spills, NMFS has determined the risk of chemical contamination of area streams is discountable.

Riparian vegetation

The proposed action has the potential to affect riparian vegetation because some removal of vegetation may occur in RCAs to facilitate exploratory drilling and because dust abatement chemicals will be applied to roads within RCAs. Although drilling will be conducted in previously disturbed areas, some vegetation removal may be necessary to construct drill pads and sumps. Although very few trees, if any, are expected to be removed, any trees that have to be felled within the RCA will be left in place. After work is completed, the drill holes, pad, and sumps will be reclaimed. Because there will be limited vegetation removed, any felled trees will be left in the RCA, and all disturbed areas will be rehabilitated, there will be insignificant effects to the RCA and their large woody debris recruitment potential.

Dust abatement chemicals can cause necrosis of plant tissues, and some vegetation, including pine, is particularly sensitive to salt-based chemicals. If vegetation in the riparian zone is killed, there could be localized reductions in stream shade and large woody debris recruitment, especially when treatment occurs on roads immediately adjacent to streams. Application of dust abatement chemicals will be done in a manner that is expected to minimize runoff into adjacent vegetated areas. In areas that are within 25 feet of streams, only a 10-foot swath of road will be treated along the centerline, which will provide for additional buffer width between treated areas and adjacent vegetation. Considering this information, NMFS believes any effects to riparian vegetation due to implementation of the proposed action will be insignificant.

Species Determination

Snake River spring/summer Chinook salmon and Snake River Basin steelhead have been documented to utilize Johnson Creek, Sugar Creek, the SFSR, the EFSFSR, Secesh River, and Lick Creek for migration, spawning, and rearing. Within the project area, a steep cascade immediately upstream of the Glory Hole (within the EFSFSR) is thought to preclude upstream migration for Chinook salmon. However, the Idaho Department of Fish and Game transplants adult Chinook salmon into the EFSFSR upstream of this barrier. Because of this, the EFSFSR and its tributaries (e.g., Meadow Creek) upstream of the Glory Hole have recently been used by Chinook salmon for spawning, rearing, and outmigration. This cascade is thought to prevent steelhead migration at low flows; however, steelhead may be able to pass above it during high flows. The PNF has documented steelhead/redband trout in the EFSFSR and its tributaries above the Glory Hole. Therefore, steelhead migration, spawning, and rearing may occur in the EFSFSR and its tributaries upstream of the Glory Hole.

Because activities may be performed year-round, the proposed action has the potential to affect all life stages of Chinook salmon and steelhead. With the exception of direct harassment of fish due to construction noise, potential effects to ESA-listed fish are expected to be a result of effects to critical habitat (i.e., effects to the water quantity, water quality, spawning gravel/substrate, and riparian vegetation PCEs).

Direct Effects to Fish through Disturbance

Conventional drilling could take place as little as 100 feet from the EFSFSR. The direct mechanisms of effect from operation of the drill rigs could be from transmission of noise and vibrations through the ground to the stream and from airborne sound caused by the drilling operation. If present at sufficient levels, noise exposure can cause lethality in fish as well as sublethal effects such as changes in hearing capabilities, damage to sensory structures of the inner ear, and avoidance of noisy areas. In a study by Wysocki *et al.* (2007)[6], rainbow trout did not experience adverse impacts from prolonged exposure to three sound treatments common in aquaculture environments (115, 130, and 150 decibels). Ground vibrations can also be lethal to incubating eggs; however, no information was available about adverse effect thresholds from vibrations on nearby eggs. Based on manufacturer reported values, sound pressure levels produced by the drill are not expected to exceed 100 decibels root mean square (at a reference pressure of 20 micropascals). This airborne sound will lose a considerable amount of energy as it travels to the streams and as it crosses the air-water interface. As such, NMFS expects the sound to be far below the threshold for causing injury to fish. Because drilling will not occur within 100 feet of streams, NMFS expects the associated vibrations to attenuate to levels that will not have more than insignificant effects on fish.

Presence of helicopters, vehicles, and people near the streams may harass fish within action area streams. The MGI employees will receive training and direction to avoid harassment of spawning adult Chinook salmon and steelhead. Fish are routinely disturbed by passing birds, walking mammals, and other fish. NMFS does not anticipate implementation of the proposed action will result in effects substantially different than those routinely experienced by fish because of the buffers between drilling locations and occupied streams and because existing routes will be used. Because the expected noise levels and level of disturbance will be minimal, and MGI employees will be trained to avoid harassment of ESA-listed fish, the effects from conducting drilling activities near streams will be insignificant.

Indirect Effects to Fish As a Result of Effects to Designated Critical Habitat

As described in the critical habitat effects section, the proposed action has the potential to affect the water quantity, riparian vegetation, water quality, and spawning gravels/substrate PCEs. The potential effects of water quantity on ESA-listed salmonids are expected to be insignificant because water will be diverted from select streams on a non-continual basis (as needed for drilling activities) and the majority of water will be non-consumptively used. Similarly, impacts to

[6] Wysocki, L.E., J. W. Davidson III, M. E. Smith, S. S. Frankel, W. T. Ellison, P. M. Mazik, A. N. Popper, and J. Bebak. 2007. Effects of aquaculture production noise on hearing, growth, and disease resistance of rainbow trout *Oncorhynchus mykiss*. Aquaculture 272:687-697.

salmonids associated with removal of riparian vegetation are expected to be insignificant because there will be limited vegetation removed, any felled trees will be left in the RCA, and all disturbed areas will be rehabilitated.

ESA-listed salmonids could also be affected by water quality impacts. The potential effects to water quality (turbidity and chemical contamination) and spawning gravel/substrate (sediment deposition) were described previously. The effects to the water quality and spawning gravel/substrate PCEs resulting from sediment or bentonite material introduced to surface water will be insignificant because of implementation of proposed SOPs and PDFs. These protective measures should ensure that only a minor amount of fine material and sediment generated by the proposed action will reach surface water occupied by ESA-listed fish. Therefore, any effects to ESA-listed fish as a result of elevated turbidity or increased sediment deposition will be insignificant. The effects to salmonids due to chemical contamination from spills of petroleum products is expected to be discountable because implementation of various SOPs will make it extremely unlikely that any contaminants will reach surface waters in the action area. Effects to ESA-listed fish as a result of drilling fluids or dust abatement chemicals reaching surface waters are expected to be insignificant because only a small of amount of chemicals have the potential to be discharged, and such discharge would only last a short amount of time and would be infrequent. Therefore, the magnitude, duration, or frequency of discharge is not expected to reach levels that would elicit adverse effects in individual fish.

Conclusion

Based on this analysis, NMFS concurs with the PNF that if the proposed action (including implementation of the SOPs and PDFs) is implemented as described in the BA Amendment and this letter, then the effects of the proposed action are NLAA Snake River spring/summer Chinook salmon, Snake River Basin steelhead, and their designated critical habitats.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by the PNF, or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law, and: (1) New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or, (3) if a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

Please direct questions regarding this letter to Mrs. Johnna Sandow (208) 378-5737 or Mr. Bill Lind (208) 378-5697.

Sincerely,

David Mabe
for

William W. Stelle, Jr.
Regional Administrator

cc: R. Holder – USFWS
C. Nalder – PNF
C. Colter – SBT
M. Lopez – NPT

bcc: SBAO – Read file
SSBO – J. Sandow (electronic only), B. Lind (electronic only)

Sandow:Lind:GoldenMeadowsExplorationPOO:am:20150923:WCR-2015-3169

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Attachment 1

Summary of Proposed Action Drill Site Activities

Drill Area	Land Owner	Approx. No. of Holes	Approx. No. of Pads	Approx. No. of Sumps	Temporary Road Construction[1]	Approx. Disturbed Area (ft^2)[2]	Approx. Disturbed Area in RCA (ft^2)	Nearest Receiving Waterbody	Distance to stream (ft)
North Stibnite	USFS/P	7	4	4	Yes (1,711 linear ft or 1.49 acres)	67,920	0	Midnight Creek West End Creek	994-1,008 949-1,387
Huckleberry	USFS	5	5	5	No	2,860	2,860	EFSFSR Midnight Creek	1146-1,208 113-422
East Stibnite	USFS	10	5	5	No	2,860	2,860	Midnight Creek	100-839
Broken Hill	USFS	15	15	15	No	8,580	0	Midnight Creek West End Creek	401-1,268 603-704
IPAB	USFS/P	1	1	1	No	628	628	EFSFSR	1,239-2,123
IPA	USFS	10	5	5	No	2,860	0	EFSFSR	834-1,196
South Midnight	USFS	5	5	5	No	2,860	2,860	EFSFSR Midnight Creek	642-1,213 100-395
Telsa	USFS	2	1	1	No	572	572	Midnight Creek	100-240
Upper Midnight-2	USFS	2	1	1	No	572	572	Midnight Creek	290-380
Ridgetop	USFS	10	5	5	No	2,860	0	Midnight Creek	655-1,508
IPC	USFS	10	5	5	No	2,860	0	EFSFSR Fiddle Creek	489-1,347 660
Plasma	USFS	2	1	1	No	572	0	EFSFSR	766
Upper Midnight	USFS	5	5	5	No	2,860	2,860	Midnight Creek	100-359
West Garnet	USFS	3	3	3	No	1,716	1,716	EFSFSR	1,772-1,775
Blue Lightning	USFS/P	3	1	1	No	628	0	EFSFSR	1,753
Fulgarite	USFS	5	3	2	No	1,644	0	EFSFSR Meadow Creek	859-1,595 1,546-1,588
Cub Scout	USFS	2	1	1	No	572	572	Garnet Creek	138-224
Garnet	USFS	10	10	5	No	5,360	5,360	Garnet Creek	100-585
West Rabbit	USFS	10	10	10	No	5,720	5,720	Unnamed tributary of EFSFSR	504-1,263

Drill Area	Land Owner	Approx. No. of Holes	Approx. No. of Pads	Approx. No. of Sumps	Temporary Road Construction[1]	Approx. Disturbed Area (ft^2)[2]	Approx. Disturbed Area in RCA (ft^2)	Nearest Receiving Waterbody	Distance to stream (ft)
East Rabbit	USFS	5	5	5	No	2,860	2,860	Unnamed tributary of EFSFSR	213-1,397
Saddle	USFS	25	21	14	No	11,508	0	Midnight Creek Unnamed tributary of Cinnabar Creek	759-1,241 3,678
Box	USFS	2	1	1	No	753	572	EFSFSR	100-262
Doris K	USFS	10	10	5	No	5,360	0	EFSFSR Garnet Creek Midnight Creek	4,349-4,579 454-1,131 686-1,280
Northeast Extension	USFS	7	5	5	No	2,860	2,860	Sugar Creek West End Creek	554-1,472 100-684
					NFS Land Disturbance	144,137 (3.3 acres)	39,164 (0.9 acres)		

Notes:

[1]Temporary roads are assumed to be 10 feet wide times the length, plus cut and fill based on slopes.

[2]Typical drill pad is approximately 20 feet wide by 25 feet long (500 square feet [ft^2]). Steep slope pads are smaller at approximately 16 feet wide by 18 feet long (288 ft^2). Actual disturbance is smaller as typically only the upslope side requires digging to level timbers. Tracked rig pads are typically 25 feet wide by 25 feet long (625 ft^2). Drill pad sumps are typically 6 feet wide, by 12 feet long, by 3 feet deep (216 cubic feet); with an area of 72 ft^2. Track drill rig sumps are 8 feet wide, by 16 feet long, by 8 feet deep (1,024 cubic feet); and an area of 128 ft^2.

Key:
P = Private
USFS = U.S. Forest Service
ft = feet
ft^2 = square feet

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NOV 05 2015

Keith Lannom
Forest Supervisor
Payette National Forest
800 West Lakeside Avenue
McCall, Idaho 83638

Subject: Golden Meadows Exploration Project—Valley County, Idaho—Concurrence
In Reply Refer To: 01EIFW00-2012-I-0430-R001

Dear Mr. Lannom:

This letter provides the U.S. Fish and Wildlife Service's (Service) concurrence on the effects to species listed under the Endangered Species Act (Act) of 1973, as amended, for the Golden Meadows Exploration Project (Project) in Valley County, Idaho. On October 5, 2012, the Service concurred with the Forest's (Forest) determination for the subject exploration project (Reference #01EIFW00-2012-I-0430). Prior to implementation of the Project, the Forest, the Service, and NOAA Fisheries were all party to a complaint questioning the validity of the Forest's effects determination. The Forest withdrew the Project, and has recently released a new Environmental Assessment (EA), along with an amended Biological Assessment. We are therefore, withdrawing the 2012 letter of concurrence and replacing it with this correspondence. We have updated the proposed action and added more detail to bolster our concurrence with the Forest's effects determinations.

The effects determinations made by the Forest were documented in the Wildlife and Aquatics Biological Assessments (Assessment). With this letter we are concurring with your determinations that the project is not likely to adversely affect the Canada lynx (*Lynx canadensis*), bull trout (*Salvelinus confluentus*), and bull trout designated critical habitat.

The Forest is proposing to approve a three-year plan of operations submitted by Midas Gold, Inc. (MGI), thereby authorizing exploratory drilling and associated activities on National Forest System lands within the Stibnite Mining District. The proposed action will be implemented year-round, beginning as early as 2015. The purpose of the proposed action is to better define mineral resource potential in the area. The primary project components include: (1) drilling exploratory holes; (2) transporting fuel, personnel, and equipment; (3) installing one groundwater monitoring well; (4) reopening and expanding an existing borrow source; and (5) reclaiming disturbed areas on Forest System lands. Each of these project components is described in more detail in the Assessment and below. In addition, the standard operating procedures (SOPs) that will be implemented to minimize or eliminate the potential for adverse effects to species listed under the Act and their designated critical habitats are discussed.

History of the Proposed Action

In addition to the subject action, the Forest authorized Plans of Operations (POOs) from MGI for exploration activities in 2010 and winter 2010 to 2011; the Service conducted consultation on the authorization of these activities (Reference #s 14420-2010-I-0306 and 01EIFW00-2012-I-0113). These independent activities have been completed.

The subject action is a continuation of previous similar activities, but it is a separate POO, analysis and consultation. On August 16, 2012, the Service received a request for consultation for the proposed action, and a letter of concurrence was issued on October 5, 2012 (as mentioned above). The Forest issued a Decision Notice for the project on December 2, 2013. On April 22, 2014, the Idaho Conservation League and Nez Perce Tribe filed a complaint in the U.S. District Court for the State of Idaho challenging the Forest decision and the letters of concurrence issued by NOAA Fisheries and the Service. On June 23, 2014, the Forest withdrew the decision to implement the project to allow for further analysis of the issues identified by the plaintiffs. The project was modified and the Forest bolstered their analysis with additional information; a final Biological Assessment Amendment was received by the Service on July 10, 2015.

Proposed Action

Exploratory drilling will occur in 24 different areas, 21 of which are wholly located on National Forest System (NFS) Lands. Over the life of the project, approximately 128 drill pads and 110 sumps will be constructed and 166 exploratory holes will be drilled on NFS land. The exploratory holes will extend anywhere from 200 to 1,500 feet below the ground surface; MGI estimated that up to about 88,000 feet of drilling will be done.

The drill pads, sumps, and drill holes will be located on or adjacent to existing roadbeds, pit benches, or in other previously disturbed (minimally vegetated) areas. Brushing and clearing of small trees may occur during construction of the drill pads or sumps. The drill pads will be a maximum of 25 feet by 25 feet, and the sumps will be a maximum of eight feet wide, by 16 feet long, by eight feet deep. Approximately two acres of NFS land will be disturbed as a result of drill pad and sump construction. During the winter, drill pads will be set up directly on thick snowpack or by removing snow and possibly performing light earthwork to prepare a level area. All work will be conducted using hand tools, a heli-portable backhoe, or the smallest heavy equipment necessary.

Exploratory drilling will be conducted using either a heli-portable tracked LF-70 core rig, or a track-mounted reverse circulation rig. Water will be the primary fluid used to remove rock cuttings from the borings and to cool the drill bit. Various drilling additives may be used and will be certified by the National Sanitation Foundation International/American National Standards Institute for use in domestic water supply wells. Drill cuttings will be placed directly into the sump or in a heated shed set up with mud-collection tanks and a clarifier. After completing each drill hole, the cuttings and mud will be buried in the sump. The boreholes will be promptly (i.e., generally within a few hours of borehole completion) abandoned as required by Idaho rules governing exploration.

Midas is proposing to obtain water for mining-related activities (e.g., drilling and dust suppression) from groundwater and surface water sources (Table 1). Drill-return water will be routed to tanks or a drill sump, where the mud will settle out and the clarified water can be reused for drilling. Recycling the drill water will minimize the need for active water withdrawals. Three existing surface water rights may be used to obtain water from six different streams. The temporary water rights expire annually and MGI will reapply each year. Of the size streams identified for water withdrawal, only the East Fork South Fork Salmon River (EFSFSR), Fiddle Creek, West End Creek, and Sugar Creek are fish-bearing. Surface water will be withdrawn using a small pump and a hose equipped with a 3/32-inch screen at the intake. The Forest and MGI have agreed to limit water withdrawal to the diversion rates listed in Table 1. If diversion rates greater than those presented in Table 1 are necessary, MGI will request approval from the Forest and consultation will be reinitiated.

Table 1. Proposed diversion rates for streams with authorized water withdrawals

Stream	Diversion Rate (cfs unless otherwise specified)
EFSFSR (at the Glory Hole)	0.33
Fiddle Creek	0.04
Midnight Creek	0.04
Sugar Creek	0.04
Hennessy Creek	10% of the flow
West End Creek	10% of the flow

Fourteen drill areas will be within riparian conservation areas (RCAs). Vegetation clearing in RCAs will be kept to a minimum, leaving the overall riparian plant community unaltered. Although not anticipated, if large trees are felled, they will be left in the RCAs.

Six of the drilling areas have some risk of drilling fluid discharging at the ground surface (hereinafter referred to as "daylighting" of drilling fluid). Those drilling areas are North Stibnite, East Stibnite, IPA, Garnet, Box, and Northeast Extension. These areas were identified based on one or more of the following considerations: (1) Relation of the drill pad to historic mining activities; (2) depth and composition of overburden; (3) angle and orientation of projected drill hole; (4) proximity to natural, heavily fractured bedrock zones; and (5) proximity of drill pad and projected drill hole to surface waterbodies. In 2012, multiple daylighting events, and a small amount of drilling fluid reached surface water in six of these events. In response, MGI developed a series of SOPs designed to minimize the risk of daylighting and subsequent discharge to surface water. These SOPs were implemented in 2013 and are detailed in the "Standards Operating Procedures and Project Design Features" section of the Assessment. Although 12 daylighting events occurred, no drilling fluid discharged to surface water due to implementation of the SOPs.

Fuel, Personnel, and Equipment Transportation

In order to conduct exploration activities, MGI will need to transport fuel, personnel, and supplies to and from the project area as well as to and from the individual drilling areas. Roads used for transportation will include: (1) Open NFS roads; (2) existing, unauthorized routes that will be authorized for temporary use; and (3) newly constructed routes that will be authorized for temporary use.

Access to the project area can occur via three separate routes: (1) Johnson Creek; (2) South Fork Salmon River (SFSR); or (3) Lick Creek. These roads are open for public use and are currently maintained by Valley County. At a minimum, most native surface/gravel roads are graded two times per year, although NFS Road 413 (Johnson Creek Road) is graded at least three times per year. In addition, cleaning of ditches and culvert inlets is performed as necessary. Although infrequent, the county also applies dust abatement chemicals to road surfaces as needed. Transportation within the project area will occur on both NFS roads and routes authorized for temporary use. Access to and within the project area is described in more detail below.

Transportation of Personnel and Supplies to the Project Area

Johnson Creek will be the primary route used to transport personnel and exploration supplies to the project area during the snow free season; this road is closed during the winter season, which generally extends from mid-December through mid-June. During this time, the SFSR and EFSFSR Roads are plowed by Valley County and provide the only winter access route to Yellow Pine. Since 2012, Valley County has also plowed the Stibnite Road in order to provide MGI access to the project area. The Forest imposes weight restrictions on the SFSR Road during spring break-up conditions (which generally extend from mid-May through mid-June), and MGI will abide by those restrictions. Midas Gold Incorporated will also discourage its employees and contractors from using the Lick Creek route to access the project area; however, the Forest has assumed that a limited amount of use on this route will occur.

Because much of the infrastructure is already in place on private land within the project area, a smaller amount of exploration-related traffic is expected to occur on these routes in comparison to previous years. This is especially true for the segment of road between Yellow Pine and the project area. Up to 61 staff and drillers will be housed at the temporary camp within the project area, eliminating the daily commute of workers between Yellow Pine and the project area. Midas Gold, Inc. estimated project-related traffic volumes to be about 60 light passenger vehicle and pickup truck/trailer round trips per month between Cascade and the project area. Although the MGI will discourage use of the Lick Creek route, the Forest assumes that project-related traffic on this route will be about 15 light personal vehicle round trips per month.

Hauling of Fuel to the Project Area

The proposed action requires large quantities of fuel (on-road and off-road diesel, gasoline, Jet-A fuels) to operate drill rigs and vehicles, fly helicopters, and conduct day-to-day operations. Based on past fuel use, coupled with the anticipated drilling to be performed (i.e., drilling about

88,000 feet using two drill rigs), the annual fuel needs are estimated to be about 141,000 gallons annually, or about 423,000 gallons over the three year period.

Fuel will be regularly delivered to the project area using tanker trucks capable of hauling 4,000 gallons. No fuel trailer pups will be used. The fuel haul route consists of roads managed and maintained by Valley County, the Boise National Forest, and the Payette National Forest. During the snow-free months (generally June through mid-December), fuel will be hauled to the project area along the Johnson Creek route. No fuel will be hauled during the winter months, when the Johnson Creek Road is closed. In addition, no hauling of fuel will occur when weight restrictions are in place (generally from mid-May through mid-June).

Fuel convoys will generally consist of one to four 4,000-gallon tanker trucks, depending on fuel requirements at the site and the availability of transport trucks. The trucks will be accompanied by a pilot vehicle and an emergency response truck. While the exact number of trips could vary slightly, the estimated fuel usage would require a single 4,000-gallon tanker to make about 35 trips per year over the life of the project. Since the project would use convoys of one to four tankers, the actual number of convoys would vary as well, but overall, the project would necessitate between about 25 and 105 total convoys over the life of the project.

A fuel management plan will be followed for all activities associated with fuel delivery. This plan is a collection of SOPs and best management practices (BMPs) that will be implemented to: (1) Minimize the risk of a spill; and (2) if a spill occurs, to prevent or minimize the amount of fuel reaching live water. The SOPs and BMPs associated with fuel haul are detailed in the Forest's Assessment.

Transportation of Fuel, Personnel, and Equipment within the Project Area

Roughly 61 staff will be housed at the camp on private land within the project area. Transportation of equipment and personnel to the drilling areas will be done by helicopter, tracked vehicles, rubber-tired vehicles, snowcat (winter only), or by foot. A helicopter will be used to access 22 drill areas during the snow-free season. During winter, these areas may be accessed by helicopter, snowcat, or other tracked vehicle. The remaining two areas (North Stibnite and Box) will be accessed by existing or new temporary roads.

Approximately 3.4 miles of existing unauthorized road on public land will be authorized for temporary use. In addition, approximately 0.32 miles of new temporary road will be constructed to access the IPC and North Stibnite drilling areas. The temporary roads will be approximately 12 feet in width; thus, including the cut and fill slopes, construction of new temporary roads is anticipated to result in the disturbance 1.5 acres of public land. Ground transport to drill areas in the winter may entail traveling overland, off designated routes. This will only occur where there is sufficient snowpack to limit ground-surface disturbance. Selection of routes to the drill pads will consider minimizing the impact on vegetation. Fish-bearing streams will be crossed via existing bridges and culverts. When crossing non-fish-bearing streams, snow or ice bridges will be constructed where necessary to prevent damage to streambanks.

Fuel will be transported to drill areas using a helicopter, tracked vehicles, or rubber-tired vehicles. When transported by helicopter, fuel will be contained in double-walled, reinforced fly tanks. When transported by vehicle, fuel will be contained in truck-mounted fuel tanks or in sealed 55-gallon drums in an all-terrain vehicle trailer. During the winter, fuel will be transported in double-walled tanks.

Groundwater Well Installation

Midas Gold, Inc. is proposing to install a groundwater monitoring well in the Fiddle Creek drainage to obtain information about the geology, groundwater elevation and groundwater quality. The well will be located at least 100 feet away from the stream channel, and will be installed in a manner that conforms to state well construction rules. The Forest will authorize use of an existing unauthorized route across NFS land to reach the well location.

Borrow Source Expansion

An existing borrow source on NFS land east of the current camp will be reopened and expanded to provide an estimated 7,000 cubic yards of crushed gravel to support the exploration program, including road maintenance. The borrow rock will be crushed and applied in areas such as on roadbeds at stream crossings to help reduce sediment delivery to streams. The expansion will disturb an additional one-acre on NFS lands, which is outside of the RCA. Borrow material will be kept at a staging area on private land near the airplane landing strip.

Reclamation

A reclamation plan has been developed and provides direction for restoring disturbed lands. All disturbed areas on NFS lands will be reclaimed following their use. All drilling related structures, trash, debris, equipment, and other related materials will be removed from each drill site once drilling is complete. Upon completion, each drill hole will be backfilled with a mixture of drill slimes, a bentonite hold plug, and native material, then capped with concrete. The drill sumps will be backfilled and recontoured, and the drill pads will be re-leveled and graded back to their original contours using either hand tools or the heli-portable backhoe.

Reclamation of the borrow source will include segregating topsoil, implementing stormwater and sediment control BMPs, backfilling and placing of topsoil, and revegetating the disturbed areas. Temporary roads will be decommissioned following completion of drilling activities and prior to winter unless a request for reauthorization for temporary road use is made. Decommissioning will include backfilling, recontouring, and removing compaction using standard reclamation practices and sediment and stormwater control BMPs. Disturbed areas will be mulched with certified weed-free hay mulch and, where possible and practical, replanted with certified weed-free seed mixes and suitable native plant species.

Monitoring

The MGI will monitor turbidity, fuel haul, and mining-related traffic (i.e., traffic associated with MGI staff, drillers, and other contractors) to the project area. Visual turbidity monitoring will occur immediately upstream and downstream of active drilling operations for drills working within 300 feet of surface water. If operations are shown to be generating visible turbidity in a stream channel downstream of drilling that is greater than upstream levels, operations will cease until the source of sediment can be identified and mitigated. While actions are taken to stop the turbidity pulse, a turbidimeter will be used to measure turbidity in the stream at 15-minute intervals until turbidity subsides. If turbidity is due to drilling, the Service will be promptly provided with a report that includes an account of the event, measures taken to stop the plume, and the turbidity data. The MGI will keep track of fuel hauled to the project area by recording the number of trucks, the volume of fuel contained in each truck, and the dates the fuel convoys occurred. In addition, the MGI will record the number of light personal vehicles and truck and trailer trips to and from the project area each month. This information will be shared with the Service annually.

In addition to the details above, the proposed action also includes SOPs or conservation measures included to reduce the impact of the project on fish and wildlife resources. These are detailed on pages 24 to 48 of the Assessment.

Changes to the Proposed Action

In summary and to clarify the changes between this proposed action and the action withdrawn in 2012, changes are described below. The original consultation and POO proposed to conduct exploratory drilling in 24 different areas, 21 of which are wholly located on Forest lands. Approximately 128 drill pads and 110 sumps will be constructed and 166 exploratory holes will be drilled. Other unchanged components include, water storage tanks, re-opening a borrow pit, road maintenance, over-snow travel, fuel transport and management, groundwater monitoring wells and SOPs. The items that have changed with the issuance of a new Environmental Assessment are, 1) quantities associated with fuel needs and trips on access roads, 2) proposed season and routes for fuel haul (i.e., fuel haul will not occur during the winter months and will only use the Johnson Creek route, although drilling will occur year-round), 3) the mileage of proposed road authorization has dropped from 4.26 to 3.72 miles (including 0.32 miles of temporary road construction), 4) no drilling will occur at the Sugar and South Sugar drilling areas, and 5) the addition of a groundwater monitoring well at Fiddle Creek. As mentioned above, additional standard operating procedures have been added (e.g., the Stibnite Road will be gated during spring break-up to reduce effects to resources).

An estimated number of round trips of 30 to 40 trips per day included in the original description was revised to 65 round trips per month between Cascade and Stibnite using the Federal, State, and local road system. An estimated fuel need of 500,000 to 600,000 gallons per year included in the original project description has also been revised to 170,000 gallons on an annual basis. In addition to these large reductions in vehicular traffic and fuel needs associated with the Project, the Forest also included a robust analysis of sediment effects and fuel spill risk associated with the Project in their revised Assessment.

The original number of trips and fuel needs for the operations were based on a presumed need to develop over 200,000 feet of core holes. The original estimates took a conservative approach, while the latest estimates are based on actual fuel usage at the site in 2012 and known trip needs to accomplish the program of work at the site. The drill areas and number of pads needed to complete the project have only been reduced by one (i.e., the south Sugar Creek pad has been removed from the proposal), however MGI estimates the needed geologic information can be obtained with roughly 88,000 feet of development using two drills. The exploratory holes will extend anywhere from 200 to 1,500 feet below the ground surface. The combination of the need to only support two drills, develop only 88,000 feet, and the ability to base estimates on past relevant work at the site has resulted in a reduced estimate for trips on access routes and overall fuel needs to complete the project.

Rationale for Concurrence

Canada Lynx

Service concurrence that the Project is not likely to adversely affect the Canada lynx is based on the following rationales.

- The area of actual ground disturbance will be about 4.1 acres. Most of the on-the-ground disturbances will occur in potential, but currently unsuitable lynx habitat in an existing Lynx Analysis Unit. Project activities may remove individual or small groups of trees or snags, but will not change the condition of the vegetation or the amount of suitable lynx habitat when viewed at the stand level. More importantly, no removal of denning habitat will occur. Hence, the effects are considered insignificant to the Canada lynx.

- Due to the rarity of lynx on the Forest (no sightings have been documented within or near the Project area) and the small footprint of the proposed action, the potential for disturbance to Canada lynx is discountable.

Bull Trout and its Designated Critical Habitat

Service concurrence that the Project is not likely to adversely affect bull trout or its critical habitat is based on the following rationales.

Access of Project-related Personnel and Equipment

- The fuel haul portion of the travel route associated with the Project has changed from occurring year-round and on two different access routes to only occurring during the summer months (roughly June to September), and it will only utilize the Johnson Creek route. Personnel may use a route from McCall over the Lick Creek summit. All travel routes are adjacent to bull trout Feeding, Migratory, and Over-wintering habitat; winter travel is considered to occur to a lesser extent than summer travel; and all travel was predicted to be out of the streams (i.e., no fording is anticipated). Bull trout generally make only seasonal use of the Secesh, Johnson Creek and the EFSFSR due to unfavorable conditions at certain times of the year. The majority of these larger/mainstem stream segments are used as foraging/migration/overwintering habitat;

bull trout would not be expected to make appreciable use of these areas during the summer and early fall periods (i.e., June to September). It is possible that fuel will be hauled between September and mid-December, as mentioned above, on the Johnson Creek Road, but the SOPs proposed to be implemented will keep effects to any bull trout using Johnson Creek during this time to a negligible level.

- It is expected that increases in sediment input from road use associated with the subject action will be negligible for the following reasons: 1) project-related traffic is primarily composed of lighter vehicles; 2) larger, fuel-haul trucks will be present, but a portion of the travel route (Warm Lake Highway and the South Fork Road) is paved, minimizing most sediment production, and portions of the EFSFSR Road were re-surfaced with gravel to reduce fine sediment production in 2012 and 2015; 3) sediment delivery points on the Stibnite Road that were modeled to contribute more than 0.1 tons of sediment per year will be field verified and prioritized for surface aggregate application, with treatments completed during the first summer of project implementation; and 4) during the winter, the ground surface of the EFSFSR and Stibnite Roads is expected to be frozen and the roads will be covered with snow, therefore, surface material will be less susceptible to crushing and abrasion from tires.

- Bull trout are not known to be present in the portions of the travel route in the North Fork Payette sub basin (e.g., Big Creek and Lick Creek).

- Although there is some bull trout spawning habitat within the proposed project area (e.g., Sugar Creek), buffers of a minimum of 100 feet are included to keep effects at an insignificant level via the filtering of any sediment through vegetation and attenuating sound/vibration from drilling activities.

- Effects of incidental fuel releases (e.g., those associated with leaks) associated with the Project are considered discountable because of conservation measures built into the project (e.g., inspections, monitoring, etc.). Additionally, the likelihood of a large accident and spill is remote given the conservation measures applied to MGI's transportation management component (e.g., use of a pilot vehicle and prohibition of hauling using pup trailers). The Forest has also added additional requirements to further minimize the risk for a spill, such as no transportation of fuel during winter or when road use restrictions due to weight restrictions or saturation are in place.

- Proposed SOPs such as gating the Stibnite Road during spring mud conditions (to keep the public off of the road and to restrict the road to lighter MGI use) and methods to reduce slope failure will reduce potential sediment delivery to streams to negligible amounts. The Assessment describes all of the SOPs and also describes their effectiveness. See Table 5 in the assessment.

Drilling Activities

- The proposed action is likely to generate and mobilize sediments as a result of road construction, maintenance, and reclamation; infrastructure development; drilling-related activities; and increased road use. Drilling areas on Forest lands will be accessed by helicopter, temporary roads, or reached via over-snow travel. Sediment generated and delivered to nearby streams as a result of infrastructure development, temporary road construction, and drilling pad and sump construction and operation is expected to be insignificant for the following reasons: (1) the majority of drilling areas will be accessed without using roads; (2) roads used to access two drilling areas are located outside of the RCA, will be maintained during their use, and will be reclaimed following their use; (3) and where drilling will occur within the standard RCA buffers, sediment-erosion control SOPs will be implemented, monitored, and adaptively managed to ensure sediment mobilization and delivery to surface water is minimized.

- Drilling activities within 300 feet of bull trout critical habitat are not expected to have significant effects. Even though work will occur within the standard 300 foot stream buffer and sediment will be generated, the drilling activities are not expected to affect riparian processes and functionality because of SOPs included to reduce sediment delivery (e.g., after completing each drill hole, the cuttings and mud will be buried in the sump, promptly abandoning bore holes, etc.).

- Based on the analysis provided in the Assessment (page 60), the level of sound transmitted through the air from drilling is not expected to cause effects to fish in the stream while the intensity of sound and vibration transmission through the ground is expected to be attenuated given the minimum 100 foot buffer from the stream. Effects from sound transmitted through the air and ground are expected to be temporary and insignificant.

Water Quantity

- Proposed water withdrawals are not expected to significantly affect the wetted width of fish-bearing stream channels or the quality of the instream habitat because they will use water intermittently and temporarily during the three-year operating period (i.e., reductions of water in these streams is expected to be of short duration and sporadic). Much of the water is not consumptive and will be returned to the system through groundwater flow after use. Flows in the EFSFSR, Fiddle Creek, and Sugar Creek will be reduced, on an intermittent basis, by three percent, three percent, and 0.7 percent, respectively. Water withdrawals from Hennessey and West End Creeks (non-fish bearing at points of withdrawal) will not exceed 10 percent of the existing instream flow. If withdrawals from these streams occurred simultaneously, they are expected to cumulatively reduce flows in the EFSFSR (below Sugar Creek) by less than three percent. This reduction is not expected to measurably decrease the availability of usable habitat in areas occupied by bull trout at the time they are expected to be present.

In summary, the anticipated impacts from proposed activities are expected to be insignificant to Canada lynx, bull trout and bull trout critical habitat. Overall, SOPs and mitigation measures will maintain watershed condition indicators and associated primary constituent elements.

Conservation Recommendations

- The Service recommends providing updates on the status of the project more than the once annually committed by the Forest. Three times per year is recommended, so that the Service can get updates on the critical phases of the Project in a timely manner (i.e., following winter travel, after spring break-up, etc.).

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by the Forest, or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law, and when (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or, (3) if a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16).

Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Ms. Allyson Turner (208) 378-5348 if you have questions concerning this letter.

Sincerely,

Michael Carrier

Michael Carrier
State Supervisor

cc: PNF, Krassel RD, McCall (Botello, Zurstdat)
PNF SO, McCall (J. Egnew, Nalder)
NPT, Lapwai (Rogers)
NMFS, Boise (Sandow)
Midas Gold, Boise (Fend)

Appendix J: Time Critical Removal Actions (TCRAs)

- Appendix J.1 DMEA Dump Removal Construction Information (CLOSED[1])
- Appendix J.2 Hennessy Creek Diversion Project Construction Information (CLOSED[1])
- Appendix J.3 Smelter Flats Diversion Project Construction Information (CLOSED[1])
- Appendix J.4 Fiddle Borrow Source Project Construction Information
- Appendix J.5 Lower Meadow Creek Tailings Removal (CLOSED[1])
- Appendix J.6 Bradley Man Camp Dumps Waste Rock and Tailings Removal (CLOSED[1])
- Appendix J.7 NW Bradley Man Camp Dumps Removal (CLOSED[1])
- Appendix J.8 Onsite Repository Project

[1]CLOSED TCRA documentation can be found in the Environmental files.

Appendix J.4: Fiddle Borrow Source Construction Informationion

Appendix J.4: Fiddle Borrow Source Project Details

The following table provides an overview of the proposed stormwater control measures that may be deployed during Fiddle Borrow Source Project. Refer to the additional documents provided in this appendix or in the project's Final Design Reports.

Project Summary	
Construction Start:	Spring/Summer 2022
Construction End Date (Anticipated):	Late Fall 2022
Project Schedule Summary:	
Anticipated General Construction Sequence: - Mobilization, install temporary erosion and sediment control measures in accordance with the SWPPP and EPP; - Clearing and grubbing; - Excavation to lines and grades; - Removal of aggregate material - Crushing and sorting of aggregate material - Final grading/replanting; and - Address final inspection punch list items, site cleanup and demobilization.	

Erosion and Sediment Control		
Control Parameters:		
Maintenance: Initiate efforts to fix immediately; Complete maintenance work by end of next workday Replacement: When replacement needed, complete work within 7 days.		
Control	**Location**	**Description**
Sediment/Silt Fence	Various – See diagrams	Silt fencing may be installed as a temporary measure to control sediment runoff from project area(s), including around the excavated areas.
Straw Wattles	Various – See diagrams	Straw wattles may be installed as a temporary measure to control sediment runoff from project area(s)
Matting (Sedge Mats, Jute Matting, etc.)	Various – See diagrams	Matting may be placed on bare soil to reduce erosion of areas

Perimeter Controls		
Control Parameters:		
Remove sediment before accumulation reaches ½ ground height of control		
Control	**Location**	**Description**
Sediment/Silt Fence	Various – See diagrams	Silt fencing may be installed as a temporary measure to control sediment runoff from project area(s), including around the excavated areas
Earthen Berm	Various – See diagrams	Earthen berms may be constructed around project perimeter areas, access road(s) and/or staging area to control/divert stormwater runoff.

Soil or Sediment Stockpiles

Control Parameters:		
Any piles must be located outside of natural buffers.		
Control	**Location**	**Description**
Silt Fence	Perimeter of Excavated Materials Stockpiles	Silt fence may be installed around the perimeter of the material stockpile location at the Northwest Bradley Dumps area.
Natural Buffer	NA	The excavated material stockpile location will be positioned at least 50 feet outside of any WOUS

Minimize Dust		
Control Parameters:		
Control	**Location**	**Description**
Water Source	Project-wide	Contractor shall either truck water to the site or work with Perpetua personnel to obtain water to use for dust abatement

Use of Treatment Chemicals		
Control Parameters:		
Control	**Location**	**Description**
Application Buffer	Project-wide	Dust abatement additives and stabilization chemicals will not be applied within 25 feet of water of a stream channel, avoided during or just prior to wet weather.

<table>
<tr><th colspan="3">Site Stabilization Requirements</th></tr>
<tr><td colspan="3">Control Parameters:</td></tr>
<tr><td colspan="3">Temporary Stabilization: Initiate immediately in portions of the site where earth-disturbing activities have temporarily ceased, but in no case more than 14 days after such activities have temporarily ceased.

Final Stabilization: Initiated immediately where earth-disturbing activities have permanently ceased, but in no case more than 14 days after such activities have permanently ceased.
- If using vegetation, no later than 14 days after initiating stabilization
    o Seed/plant area and provide temporary cover
    o Once established, vegetation must be uniform, perennial and cover at least 70% of stabilized area
- If using non-vegetation, by no later than 14 days after initiating stabilization
    o Install or apply all non-vegetative controls;

Discharging to Impaired Waters: More rapid stabilization of exposed areas: Complete initial stabilization activities within 7 days of stopping earth-disturbing work.</td></tr>
<tr><td>Control</td><td>Location</td><td>Description</td></tr>
<tr><td>Project Phasing</td><td>Project-Wide</td><td>As noted in the beginning of this appendix, project phasing has been organized for timely installation of storm water control measures prior to any work starting in a certain area and are appropriate for each phase of work. Additionally, removal of any temporary</td></tr>
</table>

		control measures will be completed as work/phasing progresses (ex: if possible, will not wait until Phase 2 to remove Phase 1 temporary controls).
Hydroseed / Revegetation	Project-Wide	Where appropriate, hydroseeding and/or planting will be utilized to re-establish any existing vegetation that has been removed.

Natural Buffers		
Control Parameters:		
Provide a 50-foot undisturbed natural buffer between construction activities and WOUS; or Provide an undisturbed natural buffer that is less than 50-feet supplemented by additional erosion or sediment controls, which in combination, achieve a sediment load reduction that is equivalent to a 50-foot undisturbed natural buffer; or If it is unfeasible to provide a buffer of any size, implement erosion and sediment controls that are equivalent. *There are exceptions to buffer requirements listed in Part 8.G.4.2.3 of the MSGP.*		
Control	**Location**	**Description**
Natural Buffer	Northwest Bradley Dumps Area	The Northwest Bradley Dumps Area is located greater than 50 feet to the west of WOUS. Additional sediment and erosion controls will be deployed, as needed.
Natural Buffer	Wetland Area SW of Project Area; Meadow Creek	There is a wetland area identified to the SW of the Project area as well as Meadow Creek. Project activities, traffic and storage of materials will not occur within 50’ of this area (note that the wetland area is upgradient of Project).

Native Topsoil Preservation		
Control Parameters:		
Preserve topsoil, unless unfeasible. Store in a manner that will maximize its use in reclamation or final vegetative stabilization		
Control	**Location**	**Description**
NA – Immediate Reuse	Throughout	The topsoil depth located within the areas of excavation for the project is limited. It will be redistributed to support vegetation growth within the site boundary, if possible. Any non-viable top material will be removed and permanently placed in the Northwest Bradley Dumps Area.

Steep Slopes		
Control Parameters:		
Control	**Location**	**Description**
Project Phasing	Project Area	The Project has been proposed in multiple phases, including clearing/grading first and will reduce the amount of excavated/exposed slopes. Additionally, the topography in the Project Area is not significant.

		Additionally, silt fencing, straw wattles and/or sedimentation basins are proposed to control any runoff and slow down erosion of slopes.

Dewatering Practices

Control Parameters:

Prohibited from discharging groundwater or accumulated stormwater that is removed from excavations, trenches, foundations, vaults or other similar points of accumulation, unless such waters are first effectively managed by appropriate controls. You must also meet the following requirements for dewatering:

- No discharging visible floating solids or foam;
- Remove oil, grease and other pollutants;
- Utilize vegetated uplands to infiltrate dewatering water before discharge;
- Implement velocity dissipation devices;
- Haul backwash water away for disposal or return it to the beginning of the treatment process;
- Clean or replace filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

Control	Location	Description
Visual Assessment	Dewatering Areas	Any dewatering water will be pumped to a proposed sedimentation basin. Any flow out of the sedimentation basin will follow natural, minimally sloped topography. Dewatering within the project area is not anticipated. However, if necessary, this section will be updated and personnel will routinely visually inspect the sedimentation basin and 'downstream' flow path(s) to ensure that dewatering water is not flowing to WOUS.

Pollution Prevention Requirements

Control Parameters:

Prohibited discharges: wastewater from washout of concrete; wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials; fuels, oils, or other pollutants from operation / maintenance of vehicles or equipment; soaps, solvents, or detergents used in vehicle or equipment washing; toxic or hazardous substances from a spill or other release.

Control	Location	Description
Fuel Storage Restrictions	Project-wide	No temporary contractor fuel storage will be allowed with tanks greater than 5 gallons.
Spill Cleanup Materials	Project-wide	Contractors and Perpetua personnel shall have quick access to spill cleanup materials (absorbent pads, shovels, etc.)

Appendix J.4: Fiddle Borrow Source Project Visual Inspection Form

GENERAL INFORMATION:
Construction Project: Fiddle Borrow Source Project
Inspection Date and Time:
Inspector(s) Name / Title:
Inspection Type: ☐ 7 Day Cycle ☐ 14 Day Cycle (and following 0.25” event)
DISCHARGE AND WEATHER INFORMATION
If inspection is on a 14 Day Cycle and triggered by a 0.25” or greater storm event, provide method for obtaining storm event information (rain gauge, weather station): Provide total rainfall measured for the inspection day: Note: Within 24 hours of the occurrence of a storm event” means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm
AREAS TO BE INSPECTED

Area	**Are Controls Installed, Operational, and Working Effectively?**	**If no, in need of maintenance, repair, or replacement?**
Disturbed Areas, which may include: *Diversion Excavation Extent* *Northwest Bradley Dumps Area* *Access Road(s)* *Stream Bypass / Dewatering Areas*	☐ Yes ☐ No	☐ Yes ☐ No
Erosion and Sediment Controls: *Sediment Basin* *Silt Fences* *Straw Wattles* *Hydroseed / Planting Areas*	☐ Yes ☐ No	☐ Yes ☐ No
Locations with Stabilization Controls *Diversion Excavation Areas* *Northwest Bradley Dumps Area*	☐ Yes ☐ No	☐ Yes ☐ No
Material, waste, borrow or equipment storage and maintenance areas *Equipment Parking/Staging Area* *Equipment Wash Area* *Borrow Area*	☐ Yes ☐ No	☐ Yes ☐ No
Areas where stormwater flows within project boundary	☐ Yes ☐ No	☐ Yes ☐ No

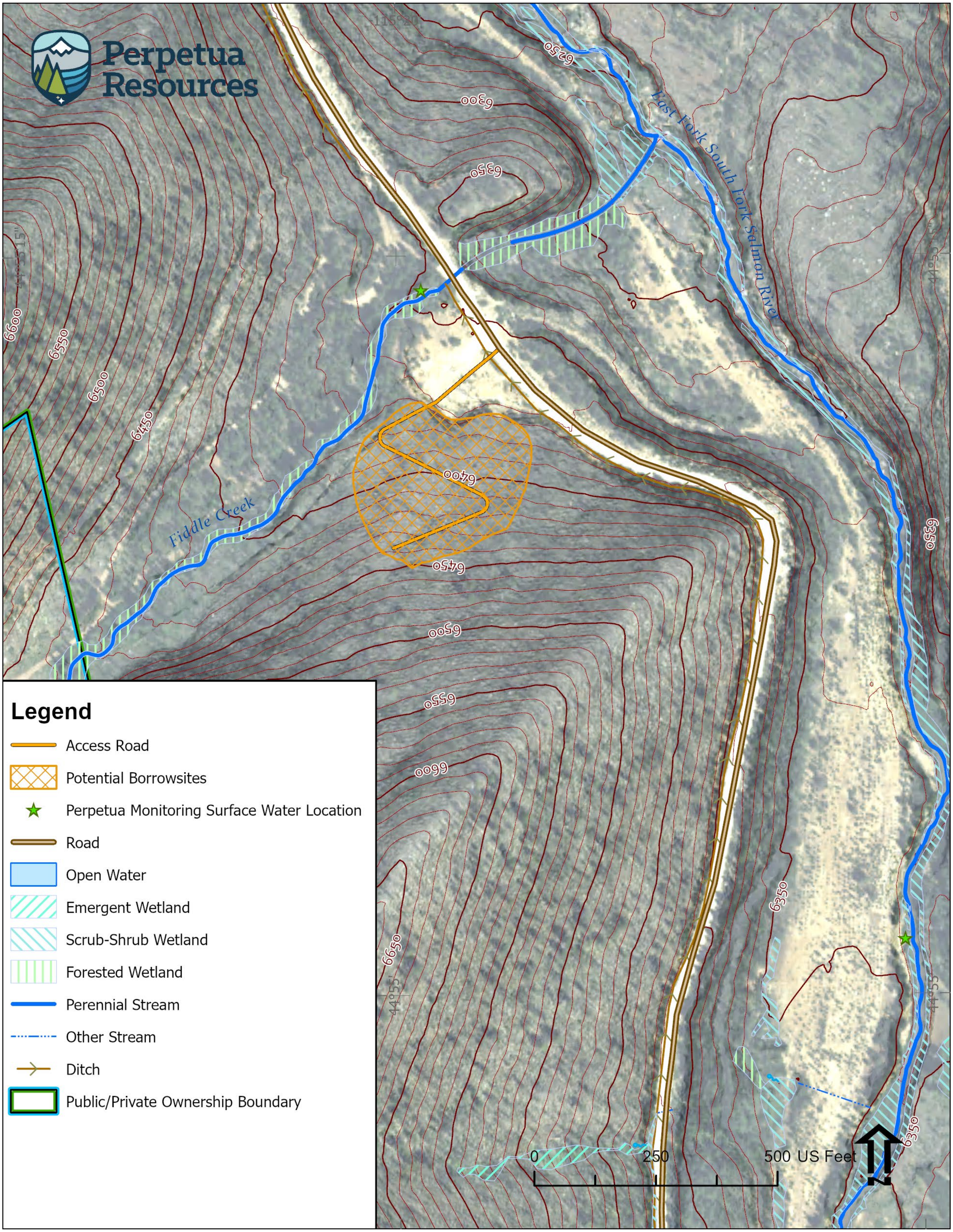
Areas with conditions that could lead to a spill or leak, which may include: *Equipment Staging* *Sanitation Facilities*	☐ Yes ☐ No	☐ Yes ☐ No
Natural Buffers *Between project area(s) and WOUS (including wetlands and Meadow Creek)*	☐ Yes ☐ No	☐ Yes ☐ No
Other:	☐ Yes ☐ No	☐ Yes ☐ No
Other:	☐ Yes ☐ No	☐ Yes ☐ No
Notes:		

OUTFALL INSPECTION			
Outfall Name	**Location**	**Inspected?**	**Adequate Condition?**
NA		☐ Yes ☐ No	☐ Yes ☐ No
Note any visual signs of erosion/sedimentation at points of discharge: *NA – No Outfall from Project Area. Visual inspection will include an assessment of extent of any flow from the project area in relation to WOUS.*			
If discharge is occurring, note the quality and characteristics of the discharge: *NA – No Outfall from Project Area. Visual inspection will include an assessment of extent of any flow from the project area in relation to WOUS.*			

SUMMARY OF INSPECTION FINDINGS

PROHIBITED INSPECTIONS
If it was unsafe to inspect a portion of the site, provide the reasoning and the location(s):

INSPECTION SIGNATURE
Inspector Signature:
Inspector Signature:



Fiddle Borrow Source

Appendix J.8: Onsite Repository Project

Appendix J.8: Onsite Repository Project Details

The following table provides an overview of the proposed stormwater control measures that may be deployed during the Onsite Repository Project. Refer to the additional documents provided in this appendix or in the project's Final Design Reports.

Project Summary	
Construction Start:	Summer 2023
Construction End Date (Anticipated):	Late Fall 2023
Project Schedule Summary:	

Anticipated General Construction Sequence:

- Mobilization, install temporary erosion and sediment control measures in accordance with the construction drawings, SWPPP and EPP
- Perform clearing and necessary improvements for temporary construction access, haul routes and staging areas;
- Construct Repository Access Ramp;
- Remove topsoil from Onsite Repository footprint;
- Install permanent stormwater control measures;
- Clean up site;
- Ensure all pre-final punch list items have been sufficiently addressed;
- Schedule final inspection;
- Reclaim temporary access routes; and
- Demobilize after obtaining approval on punch list items.

Erosion and Sediment Control

Control Parameters:

Wattles shall be installed on contour. Turn the terminating end of each row upslope to prevent runoff from flowing around the wattle. Any damaged wattle shall be replaced. Straw wattle diameter shall be 9" unless approved. Installation of wattles shall be prior to planting and seeding activities. Straw wattles installed in Diversion Ditch shall meet requirements on Drawing A320.

Silt fence fabric joints shall be spliced at posts. Use staples, wire rings, or equivalent to attach fabric to posts with a minimum 4" overlap. Stitched loops on filter fabric (if present) shall be installed on downhill side of slope.

Control	Location	Description
Straw or Fiber Wattles	Various – See diagrams	Straw wattles shall be installed on all final grade surfaces within grading limits.
Construction Entrance/Exit Pads	Various – See diagrams	Temporary construction entrances constructed of gravel on top of a geotextile may be utilized to reduce mud and soil tracking on/offsite of the project area.
Silt Fencing	Various – See diagrams	Silt fencing may be installed along perimeters of project area, temporary stockpile locations, and/or temporary construction access roads.

Runoff Control Control		
Control Parameters:		
Water bars shall have a 3% Outslope and berming shall be tied into the embankment.		
Control	**Location**	**Description**
Diversion Channel	See Diagrams	A stormwater runoff Diversional Channel may be utilized to divert upgradient runoff around the project area. Within the Channel, wattles, silt fencing, flow dissipation and sediment settling basins may be installed.
Water Bars	Repository Access Ramp	Water bars may be installed on the Repository Access Ramp during construction to divert runoff and reduce stormwater accumulation on/around the Access Ramp.

Appendix J.8: Onsite Repository Project Visual Inspection Form

GENERAL INFORMATION:
Construction Project: Onsite Repository Project
Inspection Date and Time:
Inspector(s) Name / Title:
Inspection Type: ☐ 7 Day Cycle ☐ 14 Day Cycle (and following 0.25” event)
DISCHARGE AND WEATHER INFORMATION
If inspection is on a 14 Day Cycle and triggered by a 0.25” or greater storm event, provide method for obtaining storm event information (rain gauge, weather station): Provide total rainfall measured for the inspection day: Note: Within 24 hours of the occurrence of a storm event” means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm

AREAS TO BE INSPECTED

Area	**Are Controls installed, operating, and working effectively?**	**If no, in need of maintenance, repair, or replacement?**
Disturbance Areas, which may include: *Repository Footprint* *Temporary Construction Access and Haul Roads* *Other*	☐ Yes ☐ No ☐ NA	☐ Yes ☐ No
Erosion and Sediment Controls: *Straw Wattles* *Silt Fence* *Temporary Construction Entrance/Exits* *Existing Vegetation* *Other*	☐ Yes ☐ No ☐ NA	☐ Yes ☐ No
Area Entrance/Exit Controls: *Temporary Construction Entrance/Exits*	☐ Yes ☐ No ☐ NA	☐ Yes ☐ No
Staging, Storage and Stockpile Areas: *Equipment Parking/Staging Areas* *Other*	☐ Yes ☐ No ☐ NA	☐ Yes ☐ No
Runoff Management Controls: *Diversion Ditch* *Water Bars* *Other*	☐ Yes ☐ No ☐ NA	☐ Yes ☐ No
Areas with conditions that could lead to a spill or leak, which may include: *Equipment staging*	☐ Yes ☐ No ☐ NA	☐ Yes ☐ No

Other:	☐ Yes ☐ No ☐ NA	☐ Yes ☐ No
Other:	☐ Yes ☐ No ☐ NA	☐ Yes ☐ No
Notes:		

OUTFALL INSPECTION

Outfall Name	Location	Inspected?	Adequate Condition?
NA		☐ Yes ☐ No	☐ Yes ☐ No

Note any visual signs of erosion/sedimentation at points of discharge:

NA – No Outfall from Project Area. Visual inspection will include an assessment of extent of any flow from the project area in relation to WOUS.

If discharge is occurring, note the quality and characteristics of the discharge:

NA – No Outfall from Project Area. Visual inspection will include an assessment of extent of any flow from the project area in relation to WOUS.

SUMMARY OF INSPECTION FINDINGS

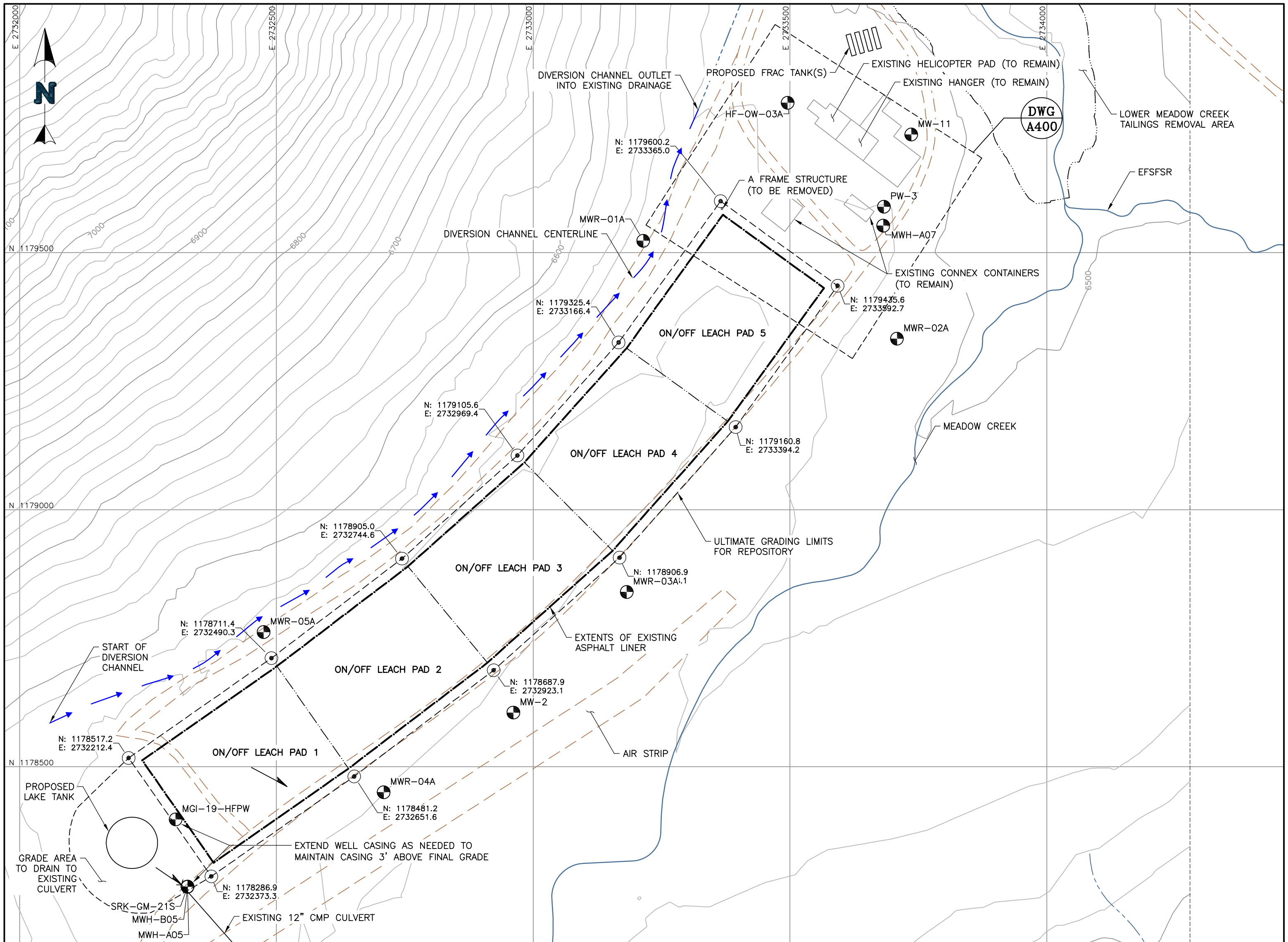
PROHIBITED INSPECTIONS

If it was unsafe to inspect a portion of the site, provide the reasoning and the location(s):

INSPECTION SIGNATURE(S)

Inspector Signature:

Inspector Signature:



LEGEND:

- EXISTING GROUND CONTOURS
- EXISTING ROADS/TRAILS
- EXISTING FACILITIES BOUNDARY
- EXISTING BUILDINGS
- PERENNIAL STREAM
- OTHER DRAINAGE
- EXTENTS OF EXISTING ASPHALT LINER
- EXISTING CELL DIVIDER BERM
- ULTIMATE GRADING LIMITS FOR REPOSITORY
- DIVERSION CHANNEL CENTERLINE
- N: E: ESTIMATED LINER EDGES
- EXISTING MONITORING WELL (SEE NOTE 1)

NOTES:

1. EXISTING MONITORING WELLS TO BE CAREFULLY PROTECTED DURING ALL CONSTRUCTION ACTIVITIES

0 100 200 FEET

REFERENCE:

EXISTING GROUND TOPOGRAPHY CREATED IN THE IDAHO WEST STATE PLANE NAD83 COORDINATE SYSTEM FROM FILE SGP_EOY_Elevation.gdb RECEIVED ON NOVEMBER 11, 2022 FROM PERPETUA RESOURCES.

REV	DATE	DESCRIPTION	TECH	ENG
0	05/15/23	ISSUED FOR FINAL DESIGN	KCS	KDL
B	03/06/23	ISSUED FOR 95% DESIGN	KCS	KDL
A	12/21/22	ISSUED FOR 90% DESIGN	KCS	KDL

APPROVED BY: KDL
CHECKED BY: KDL
DESIGNED BY: KDL
DRAWN BY: KCS

DISCLAIMER

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CLIENT: PERPETUA RESOURCES

PROJECT: ON-SITE REPOSITORY

TITLE: GENERAL FACILITIES ARRANGEMENT

FILENAME: 000498.002.002P

DRAWING NO.: A060

REVISION: 0

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