

Module 12: Erosion and Sedimentation Controls **[§§77.458/77.461/77.466/77.525/77.527/77.531/Chapter 102]**

12.1 Diversion Controls

Provide a plan for the collection and conveyance to a natural drainageway of the runoff from upslope undisturbed areas. Provide a separate general design for a temporary highwall diversion which limits the amount of runoff which can enter the pit (where applicable). Include design criteria, capacity calculations, profile of proposed channel slopes, typical cross-sections, required channel linings and applicable details on 12.1 Data Sheet.

Runoff is to be diverted through the use of diversion swales and diversion berms at the Site. Upslope diversions are proposed along the upslope limits of the Quarry to divert surface water from unaffected areas around the Site and to existing drainage networks.

Runoff from the affected area will be collected by diversion controls, rock lined channels and diversion berms, and directed to sediment basins for settlement of solids prior to discharge through permitted outfalls. Design calculations, cross sections and details for each proposed device are included in the attachments to this Module.

12.2 Erosion and Sediment Control

Provide a plan for the control of erosion and sedimentation for lands within the permit area to be disturbed by mining activities. Include a narrative describing the implementation of the plan, and detailed design and construction plans and specifications for structures or facilities used in the plan. The plan must include each phase or phases of mining. Include design criteria, capacity calculations, profile of proposed channel slopes, typical cross-sections, required channel linings and applicable details on 12.1 Diversion/Collection Ditch Data Sheet for collection and interceptor ditches. Provide documentation of the capacity of the existing drainage system and the effect proposed mining activities will have on the drainage. Show discharge points to natural drainageways and culverts that intercept upslope drainage or carry drainage away from the site. Show facilities to scale on Modules 9 and 16 as appropriate.

12.2.1 Site Location and Permit Area Description

The Rock Hill Quarry is located along the east of North Rockhill Road in East Rockhill Township, Bucks County, PA. The Site is situated within the Tohickon Creek Watershed. Per Title 25, Chapter 93, the Tohickon Creek has a designated use of Trout Stocking, Migratory Fishes (TSF, MF) but is classified as Exceptional Value, Migratory Fish (EV, MF) on PA DEP's Existing Use Table. Topography rises from a low of approximately 525' MSL in the northwest to a high of 815' MSL along the eastern boundary. A quarry pit has been established onsite and encompasses a large portion of the eastern permit area. Support area to include processing area, stockpile area as well as the maintenance shop. Scalehouse and scales are located within the western portion of the permit. Topography drops from east to west; therefore, the erosion and sedimentation controls, including sediment basins, sediment traps, rock-lined channels, diversion berms and perimeter controls, are to be located along the Site's western boundary. A diversion channel runs along the western boundary from south to north and directs drainage from the proposed controls to the Site's existing NPDES discharge point, Outfall 001, along the northwesterly limit of the permit. Discharge flows to the north offsite and enters an Unnamed Tributary to the Tohickon Creek.

12.2.2 Erosion and Sediment Control Facilities

Proposed controls include: sediment basins, diversion channels, diversion berms, culverts, sediment traps, and compost filter socks (as needed).

In addition groundwater seep interceptors, a clarifying pond, and pit dewatering pipe are proposed during initial site operations to collect and divert shallow groundwater flow away from the surface controls and into a separate collection and discharge system.

DESIGN CRITERIA

The following criteria have been used as a basis for the design of the erosion and sedimentation control facilities.

Sediment Ponds:

- The impoundment capacity shall be based on a minimum of 7,000 cf/acre of storage.
- The settling storage portion of the impoundment volume shall be 5,000 cf/acre, and the sediment storage portion shall be 2,000 cf/acre.
- The impoundment shall be designed with a pipe outlet with perforations at the sediment storage elevation to provide controlled release of detained water (settling storage portion).

- The primary spillway shall be capable of dewatering the impoundment's settling storage volume to the sediment storage level within 2 to 7 days.
- The discharge from the impoundment shall be designed with outlet into a proposed rock-lined channel to protect against excessive erosion.
- The impoundment shall be constructed with an emergency spillway set 0.5 feet above the settling storage capacity elevation.
- The emergency spillway shall be designed to safely pass the peak flow from 2 cfs/acre of contributing drainage area. The emergency spillway shall be constructed in original ground wherever possible and protected with an appropriate channel lining.
- The impoundment shall be cleaned when the storage capacity is reduced to 5,000 cf/acre. The cleanout elevation shall be clearly marked via a cleanout marker to be set in each impoundment.
- The impoundment shall be provided with 2 feet of freeboard above the maximum water level elevation at the emergency spillway required to safely pass the peak flow of the design storm event.
- Drainage channel and culvert outfalls entering impoundments shall be protected against excessive erosion by the use of rip-rap lining.
- Impoundments shall be designed with a minimum embankment top width of 10 feet and a minimum combined embankment side slope of 5:1.
- Impoundments shall have a minimum length to width ratio of 4:1 with the use of baffles.
- Impoundment slopes and floor shall be stabilized with vegetation.

Sediment Trap:

- The trap capacity shall be based on a minimum of 2,000 cf/acre of storage.
- The contributing drainage area shall be no larger than 5 acres.
- The dewatering zone portion of the impoundment volume shall be 1,300 cf/acre, and the sediment storage portion shall be 700 cf/acre.
- The trap shall be constructed with a spillway width 3 times the contributing drainage area.
- The spillway shall be constructed in original ground wherever possible and protected with an appropriate channel lining.
- The trap shall be cleaned when the storage capacity is reduced to 1,300 cf/acre. The cleanout elevation shall be clearly marked via a cleanout marker to be set in each impoundment.
- Trap shall be designed with a minimum embankment top width of 5 feet.
- Trap shall have a minimum length to width ratio of 2:1.
- An infiltration trench shall be installed at the constructed spillway.

Channels (Diversion and Collection):

- All channels shall be designed to convey the peak flow from the 10-year/24-hour storm with a minimum 0.5 feet of freeboard.

Diversion Berms:

- Berms shall be constructed of earthen materials and shall be compacted for stability during construction.
- The proposed berms will serve as a diversion or containment structure in the management of runoff.
- The upslope side of the berm shall be lined with the appropriate rock-lining to protect against excessive erosion.
- Perimeter berms shall be constructed from precast concrete blocks.

Culverts:

- Culverts shall be designed to convey the peak flow from the 10-year/24-hour storm from the contributing drainage area.

Compost Filter Sock:

- Compost filter sock will be used as a temporary erosion and sedimentation control measure as needed throughout the Site.
- Installation will be in accordance with standard E&S control requirements and accompanying standard details. Compost Filter Sock, Filtrexx Siltsoxx™ 12" barrier or equal, unless another size is specifically noted on plan.

Clarifying Pond:

- The pond shall be designed to provide a detention volume for groundwater diversions and quarry impoundment/sump discharge providing greater than 6 hours of detention time at the high flow design rate; however, it is anticipated that the long term average flow shall be below this rate, providing greater detention time. The Pond volume shall also include a sludge storage factor of 1.33 times the detention volume.

- The pond shall be outfitted with a v-notch weir overflow outlet designed to provide one-foot of freeboard at the maximum design flow rate. (Contractor may substitute a rectangular weir with Engineer's approval).

Interceptor Pipe:

- Pipes have been designed to provide capacity for high flow conditions from the contributing groundwater seeps to the clarifying pond. The long term average flow rate through the interceptor pipes is anticipated to be below the monthly NPDES rate.

Quarry Pit Impoundment Dewatering Pipe:

- A dewatering pipe shall be installed to allow for dewatering of the Quarry Pit. The pipe shall be outfitted with a manually controlled valve to control and/or prevent flow through the pipe. Initially dewatering shall be achieved by gravity flow and eventually be accomplished through pumping or via syphon. Flow through the dewatering pipe shall be monitored and adjusted so as to maintain site discharge rates consistent with the current approved NPDES discharge rate.

The location of the proposed E&S controls is depicted on Exhibit 9: Operations Map and the Erosion and Sediment Control Plans. Design details are presented on the Erosion and Sediment Control Details drawing. The following sections address their operation and maintenance, the proposed schedule of implementation, and a description of the E&S structures.

12.2.3 Operation and Maintenance of Control Facilities

Operation, maintenance, inspection, and repair of all sedimentation control facilities will be the responsibility of the Site Operator. All erosion and sediment controls shall be inspected after each runoff event and on a weekly basis during dry periods. The permittee shall be responsible for the structural stability of the proposed facilities and their protection against unauthorized acts of third parties.

MAINTENANCE PROGRAM

The following long-term maintenance schedule and procedures are proposed with regard to erosion and sedimentation control features for this project (refer to Exhibit 9). During quarry operations at the Site, E&S control features shall be inspected at least once a week, or more frequently as may be required to comply with this Erosion and Sedimentation Control Plan. Long-term maintenance should not be required after cessation of mining operations and stabilization of the Site.

MAINTENANCE AND REPAIR OF E&SCP FACILITIES

- Where dust or wind erosion is a problem, the unstable surface(s) shall be sprayed with water or other suitable dust suppressor.
- Operator shall employ measures during quarry operations to prevent spills of fuels or lubricants. If a spill occurs, it shall be controlled immediately to prevent its entry into nearby waterways.
- Any temporary erosion control measure applied to exposed soil surfaces shall remain functional until vegetative cover is sufficiently established.
- Permanent soil protection will be completed as early as practical.
- Any debris accumulated at filter sock shall be removed and properly disposed. These temporary barriers shall be checked daily and realigned or reset as required. Sediment shall be removed when it reaches one-half of the fence height.
- Until the Site is stabilized, all erosion and sediment Best Management Practices (BMPs) must be maintained properly. All preventive and remedial maintenance work, including clean-out, repair, replacement, regrading, reseeding, re-mulching, and renetting, must be performed immediately. If erosion and sediment control BMPs fail to perform as expected, replacement BMPs or modifications to what is installed will be required.
- Miscellaneous additions, adjustments or corrections shall be made to any erosion control structure as deemed necessary by the engineer, PA DEP, or County representative in order to correct problems unforeseen or problems caused by storms prior to stabilization.
- All E&SCP measures shall remain in place until the Site has been stabilized. The Site shall be considered stabilized when the entire disturbed area has a minimum, uniform 70% perennial vegetative cover or other non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding and other movements. Only upon reaching stabilization and following PA DEP approval may the E&SCP features be removed.

- Sediment removed from BMPs shall be disposed of in landscaped areas outside of steep slopes, wetlands, floodplains or drainage channels, and shall be immediately stabilized or placed in topsoil stockpiles.

12.2.4 Schedule of Implementation

The following sequence is proposed for installation of the E&S Controls measures at the Site.

Northwestern Support Areas

1. Downslope perimeter controls, including compost filter sock, shall be installed below all areas to be affected prior to initiation of upslope disturbance;
2. The upslope diversion swale, Channel 4, shall be installed to divert drainage from upslope unaffected areas around the proposed limit of disturbance. The channel shall outlet to the existing ephemeral ditch along the northern boundary of the permit and directed along the northern access road. The channel shall be excavated working from downstream to upstream. Excavated material shall be hauled to and stored in the designated overburden storage area and stabilized with vegetation as soon as it is practical;
3. Following installation of downslope and upslope controls, construction/installation of the E&S Control Devices may commence. The initial control device to be installed is Channel 3, located immediately upstream of the NPDES Point. The channel shall be excavated working from the NPDES Point toward Culvert 5. Excavated materials shall be hauled to and stored in the designated overburden storage area and stabilized with vegetation as soon as it is practical;
4. Upon reaching the channel grade and geometry proposed in these plans, the rock channel lining shall be installed for stabilization;
5. Following installation of the channel, Culvert 5 shall be installed. Material shall be excavated from under the existing rail bed and hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical;
6. Following excavation, Culvert 5 shall be installed and backfilled as proposed;
7. The next section of channel, Channel 2, Section 2, shall be installed working from Culvert 5 to Culvert 8. Excavated materials shall be hauled to and stored in the designated overburden storage area and stabilized with vegetation as soon as it is practical;
8. Upon reaching the channel grade and geometry proposed in these plans, the rock channel lining shall be installed for stabilization;
9. Following installation of the channel, Culvert 8 shall be installed. Material shall be excavated and hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical;
10. Following excavation, Culvert 8 shall be installed and backfilled as proposed;
11. Following and/or in conjunction with the installation of Culvert 8, precast concrete block containment berms will be installed immediately upslope of Channel 3 and Channel 2, Section 2.
12. Sediment Trap 2 shall be installed just upslope of Channel 3. Material shall be excavated from the trap and utilized for construction of its downslope embankment. Excess material shall be hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical. The sediment trap shall be outfitted with a filter berm at its base for dewatering into Channel 3. The trap slopes and floor shall be stabilized with vegetation;
13. Following trap installation, the diversion berms, Diversion Berms 4 and 5 shall be installed. Material shall be placed in the footprint of the berms to promote positive drainage to the trap. The base of the diversion berms shall be rock-lined to prevent erosion at the toe of the slope;
14. The next section of channel, Channel 2, Section 2, shall be installed working from Culvert 8 to Culvert 6. Prior to completing this channel work, the existing pond and channel shall be dewatered via pumping to the Quarry Pit Impoundment or Sediment Trap 1 to allow for access and inspection during construction. Once dewatered, channel excavation shall progress. Excavated materials shall be hauled to and stored in the designated overburden storage area and stabilized with vegetation as soon as it is practical;
15. Upon reaching the channel grade and geometry proposed in these plans, the rock channel lining shall be installed for stabilization;
16. Following installation of the channel, Culvert 6 shall be installed. Prior to completing the work, the existing upstream channel shall be dewatered via pumping to the Quarry Pit Impoundment or Sediment Trap 1 to allow for access and inspection during construction. Once dewatered, culvert installation shall progress. Material shall be excavated from under the existing rail bed and hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical;
17. Following excavation, Culvert 6 shall be installed and backfilled as proposed;
18. The next section of channel, Channel 1, shall then be installed. Material shall be excavated from the channel and hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical;
19. Upon reaching the channel grade and geometry proposed in these plans, the rock channel lining shall be installed for stabilization;
20. Following installation of the channel, Culvert 1 shall be replaced/installed. Material shall be excavated across the western access road to allow for installation of a replacement culvert. Excavated materials shall be hauled to and stored in the designated overburden storage area and stabilized with vegetation as soon as it is practical;
21. Following excavation, Culvert 1 shall be installed and backfilled as proposed;

22. Following installation of the culvert, the western conveyance system shall be completed allowing for installation of upslope detention and treatment controls;
23. Following and/or in conjunction with the installation of Sediment Basin 2 and 1, construction/installation of the Clarifying Pond shall commence. Prior to completing the construction work, the existing clarifying pond shall be dewatered via pumping to the Quarry Pit Impoundment, Sediment Trap 1 or the sediment basins to allow for access and inspection during construction. Once dewatered, construction of the Clarifying Pond shall progress. Material excavated from the pond shall be hauled to and stored in the designated overburden storage area and stabilized with vegetation as soon as it is practical. The primary spillway, consisting of a v-notch overflow weir, shall be installed in the northwestern edge of the Pond and connected to a channel leading to Culvert 1. The Pond slopes and floor shall be stabilized with vegetation;
24. Following the installation of the Clarifying Pond, Interceptor Pipe 1, 2 and Pit Impoundment Dewatering Pipe System shall be installed. Material shall be excavated along the pipe locations and hauled and stored in designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical;
25. Following the excavation, the interceptor pipes and dewatering pipe system shall be installed and backfilled as proposed.
26. Sediment Basin 2 shall be installed along with the associated primary and emergency spillways. Material excavated from the basin shall be hauled to and stored in the designated overburden storage area and stabilized with vegetation as soon as it is practical. The primary spillway, consisting of a 24" perforated riser pipe and 18" outlet barrel shall be installed in the northwest corner of the basin and connected directly into Channel 2, Section 1. The emergency spillway shall be installed along the basin's western embankment, lined with rip-rap and connected to Channel 2, Section 1. The basin slopes and floor shall be stabilized with vegetation;
27. Following the installation of Sediment Basin 2, Culvert 4 and Diversion Swale, Channel 5 shall be installed along the northern side of the existing access road. Concurrently, the existing 18" concrete culvert running under the access road (Culvert 3) will be extended and connected with two (2) inlets to provide stormwater conveyance from the area and Diversion Swale, Channel 6 will direct flow from Culvert 3 into Sediment Basin 2. Material shall be excavated along the culvert and channel location and hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical. Channel 5 shall be rock-lined to prevent erosion;
28. Following and/or in conjunction with the installation of Sediment Basin 2, construction/installation of Sediment Basin 1 shall commence. Similar to above, material excavated from the basin shall be hauled to and stored in the designated overburden storage area and stabilized with vegetation as soon as it is practical. The primary spillway, consisting of a 24" perforated riser and 18" outlet barrel shall be installed in the northwest corner of the basin and connected directly to Channel 1. The emergency spillway shall be installed on the basin's western embankment, lined with rip-rap and connected to Channel 1. The basin slopes and floor shall be stabilized with vegetation;
29. Following installation of Basin 1, and/or in conjunction with the installation of the Clarifying Pond and associated interceptor pipes and dewatering pipe, Culvert 2 shall be installed under the site access road. Material shall be excavated along the culvert location and hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical;
30. Following excavation, Culvert 2 shall be installed and backfilled as proposed. The upslope end of Culvert 2 shall be located in an excavated depression along the south of the access road. The upslope diversions shall direct runoff into the depressed inlet to allow for entry into the culvert;
31. The upslope diversion berm, Diversion Berm 1, Sections 1 and 2 shall be installed. Material shall be placed along the western boundary of the Processing Plant and Stockpile Area to promote positive drainage from south to north toward Culvert 2. The base of the diversion berm shall be rock-lined to prevent erosion at the toe of slope;
32. Installation of the above provides for downslope control and treatment of the Site's access, maintenance, processing, and support areas in the northwest of the Permit.

Processing Area and Stockpile Area – South End

The following E&S Plan has been included for control and treatment of the five-acre area located at the southern end of the Plant/Stockpile Area:

1. Downslope perimeter controls, including compost filter sock, shall be installed along the base of the area prior to affecting upslope areas;
2. Following installation of the perimeter controls, Sediment Trap 1 and 3 shall be installed in the southwest area. Material shall be excavated from the trap and utilized for construction of its downslope embankment. Excess material shall be hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical. The sediment trap shall be outfitted with a filter berm and infiltration trench at its base for dewatering. The trap slopes and floor shall be stabilized with vegetation;
3. Following trap installation, the diversion berms, Diversion Berms 2 and 3 shall be installed. Material shall be placed in the footprint of the berms to promote positive drainage to the Trap. The base of the diversion berms shall be rock-lined to prevent erosion at the toe of slope;

Quarry Pit

The following E&S Plan has been included for control and treatment of runoff within the Quarry Pit and upslope drainage areas:

1. The Quarry Pit is self-contained with a large portion of the Site draining directly to the existing open water feature. The water impoundment maintains a water level at approximately elevation 590' MSL and the downslope highwall of the Pit is maintained at an elevation just above this point.
2. Downslope diversions will be installed at the base of the Overburden Storage Areas and haul roads to direct surface water into the western edge of the pit at the downslope highwall. Cross slope diversions shall be installed along the haul road to divert water into the Pit at multiple locations and limit the amount of water draining to the base of the road;
3. Water levels will be monitored to review conditions at the downslope highwall to determine if modification of the crest elevation is needed. Modifications will be proposed if increased containment is needed.
4. Installation of the above diversions will allow for surface waters from the Mining and Overburden Storage Areas to be segregated from other Site waters to allow for increased settling within the Pit and eventually the Pit Sump;
5. In conjunction with the installation of the interceptor pipes outlined above, a Quarry Pit dewatering pipe shall be installed to allow for dewatering of the pit. The pipe will begin at the low point of the downslope highwall and travel to the west where it will be tied in with a fitting to connect with Interceptor Pipe 1. The dewatering pipe will be outfitted with a valve to provide for manual control of dewatering. Flow through the dewatering pipe shall initially be provided by gravity flow. Eventually a pump and/or syphon discharge will be utilized for dewatering. Dewatering flows shall be monitored and maintained at a level at or below the current permitted NPDES discharge rate for the site.

Quarry Pit Development

1. The Northeast portion of the proposed mining area naturally drains directly into the existing quarry pit and/or existing diversion structures. Refer to the figure Northeast Mining Area: E&S Plan for areas associated with this expansion area.
2. The Southeast portion of the proposed mining area has been broken into three stripping phases, each including perimeter diversion berms draining to a typical 5-acre sediment trap.
3. Typical development of each phase in the southeast mining area will occur as follows:
4. Downslope perimeter controls, including compost filter sock shall be installed.
5. Following installation of the perimeter controls a typical 5-acre sediment trap shall be installed at the base of the phase. Material shall be excavated from the trap and utilized for construction of its downslope embankment. Excess material shall be hauled to and stored in the designated overburden storage area. Material shall be stabilized with vegetation as soon as it is practical. The sediment trap shall be outfitted with a filter berm and infiltration trench at its base for dewatering.
6. Following trap installation, diversion berms shall be installed along the downslope perimeter of the phase to divert surface drainage into the trap.
7. Following installation of the berms, upslope areas may be cleared of vegetation, grubbed, and stripped of topsoil to prepare the area for mining.

12.2.5 Plan for Reclamation

Upon completion of Site mining operations, reclamation grades will be achieved as depicted in Exhibit 18: Land Use and Reclamation Map. Topsoil (including subsoil) will be spread as needed across the reclaimed area to establish vegetation according to the approved Revegetation Plan.

12.2.6 Construction Specifications and Typical Facility Illustrations

Specifications and illustrations of the proposed facilities are presented in this Module and attachments, and on the Erosion and Sediment Control Plan and Details drawings, Sheets ES-001 through ES-004.

CONSTRUCTION SPECIFICATIONS

- All erosion and sedimentation control measures shall meet the requirements set forth in DEP's Technical Guidance Document titled "DEP Engineering Manual for Mining Operations," Document No. 563-0300-101 and Chapter 77.
- For the duration of Site activities, the Site Operator is responsible for maintaining all erosion and sediment control measures until all disturbed areas have been permanently stabilized in accordance with the approved Reclamation Plan on file with the Department.
- All structures, including sediment ponds, channels, diversion berms, and stockpiles, shall be stabilized immediately upon completion.
- All areas where activities have or will cease for more than twenty (20) days shall be stabilized with temporary vegetative cover in accordance with the approved Revegetation Plan in Module 23.

12.2.7 Supporting Design Computations and Data

Design calculations and construction details for the sediment basins, sediment trap, diversion channels, diversion berms, and culverts described in this Erosion and Sedimentation Control Plan are presented as attachments to this Module.

12.3 Haul Roads

Provide the following information for each haul road to be constructed, reconstructed or used in the operation:

Note: Activities proposed to be conducted under General permit for Temporary Road Crossings (BMR-GP-101) and General Permit for Access Road Crossings (BMR-GP-102) must include a completed Notification Form, with attachments, for the respective General Permit (i.e., Form 5600-FM-MR0054 for BMR-GP-101 and Form 5600-FM-MR0059 for BMR-GP-102). BMR-GP-102 may not be used for haul roads.

- a) Location; show on Exhibit 9 (and Exhibit 18 if road will remain as part of postmining land use);

See Exhibit 9 for the location of haul roads.

- b) Description and typical cross-sections showing the construction of the haul road including existing ground, grades, slopes, culvert locations, outlet protection and other drainage control;

Haul roads are to be installed and/or maintained as outlined in the cross section included on the E&S Details drawing.

- c) Measures to control and prevent erosion and sedimentation; include proposed spacing of sediment traps, turnouts, culverts, check dams, etc.;

All haul roads are to drain to proposed E&S Controls as depicted on the Site Plans.

- d) Plan for reclamation after mining is completed;

Haul roads are to be removed during the reclamation process. Roads will be regraded as needed and revegetated per the approved Revegetation Plan.

- e) If the haul road involves the crossing of any intermittent or perennial stream or wetland include Module 14 Streams/Wetlands;

N/A

- f) Will a PennDOT highway occupancy permit be needed? ☐ Yes ☒ No

If yes, PennDOT Occupancy Permit number must be submitted prior to permit activation.

12.1 Diversion/Collection Ditch Data Sheet

Title:	Site:	Company:	Permit Number:
Prepared by:	Telephone Number:	Date:	Sheet _____ of _____

Design Calculations:

Station		Drainage Area acres	Design Storm (yrs.)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q cfs	Channel Bed Slope (%)	Freeboafd (ft.)	Channel Lining	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes	Flow Area (sq.ft.)	Flow Depth (ft.)	Top Flow Width (ft.)	Flow Velocity (ft/sec)	Q Available cfs	With Freeboard		
Start	Eleva- tion																	Channel Depth (ft.)	Top Channel Width (ft.)	Q Available cfs
End	tion																			

