Module 15: Streams / Wetlands

Note: Engineering designs, engineering calculations, and stream profiles submitted under this Module must be certified by a licensed professional engineer.

Note: Stream/Wetland encroachments may also require authorization from the US Army Corps of Engineers (Corps) under 48 Certification from the Department.

Does this project require a permit from the Corps? ☑ Yes ☐ No

If no, explain why not.

If yes, complete the applicable portions of Module 15.7.

Note: Complete Module 15.8 when proposed activities qualify for coverage under the PA DEP, Bureau of Watershed Management - General Permits.

15.1 Surface Activities within 100 Feet of a Stream

If surface mining activities, including haul road crossings, are proposed within 100 feet of any intermittent or perennial stream provide the following information:

Not applicable. There are no mining activities - this is a restoration project.

a. The name and location of the stream; and location, length, and acreage disturbed by the proposed activities (Identify the location of the proposed activities on the Operation Map, Exhibit 9.1 and the Land Use and Reclamation Maps, Exhibit 18.1.)

b. A narrative giving a description and the purpose and justification of the proposed activities.

c. Provide a narrative that demonstrates that no adverse hydrologic impacts, water quality impacts, or other environmental resources impacts will occur as the result of the variance.

15.2 Surface Activities Involving Stream Encroachments and Water Obstructions

Where a stream relocation, channel change, or any other Chapter 105 activity is proposed for surface mining activities, provide the following information:

Not applicable. There are no mining activities - this is a restoration project.

a. The name and location of stream and location and length of the proposed activity. (Identify the location of the proposed activities on the Operation Map, Exhibit 9.1 and the Land Use and Reclamation Maps, Exhibit 18.1.)

b. A narrative describing the proposed activity, its purpose, and the reason it is necessary.

c. A characterization of the resident aquatic community, a description of the riparian vegetation and an assessment of the probable hydrologic consequences of the proposed activities on the water quality and quantity, and the resident aquatic communities. Provide the name(s), address(es), and telephone number(s) of the individual(s) responsible for the collection and analysis of this data and provide a description of the methodologies used to collect and analyze the data.

d. A hydrologic and hydraulic analysis which includes:
   i. Data on size, shape and characteristics of the watershed;
   ii. The size and frequency of the design storm;
   iii. The hydraulic capacity of the proposed replacement channel;
   iv. The hydraulic capacity of the stream channel upstream and downstream of the proposed relocation or channel change.
e. A stream profile for the existing and proposed channel for a reasonable distance upstream, downstream, and within the proposed change, showing bed slopes, pool-riffle ratios, normal and flood water surfaces, and existing obstructions.

f. A detailed plan and cross sections of the existing and proposed channel upstream, downstream and within the proposed channel change showing the limits and configuration of the proposed activities, dimensions, channel linings and normal and flood water surfaces.

g. A description of the construction methods and sequence including: water handling during construction, erosion and sedimentation controls, and measures to be taken to prevent adverse impacts to water quality and quantity, water users and the aquatic communities, and measures for environmental enhancement if practicable.

h. A characterization of the existing water quality and quantity of the stream, including downstream water uses and 25 PA Code Chapter 93 Protection Water Use Classification.

i. Stormwater Analysis: If a stormwater management plan has been prepared or adopted under the Stormwater Management Act, an analysis of the project's impact on the Stormwater Management Plan and a letter from the county or municipality commenting on the analysis.

j. Floodplain Management Analysis: If the proposed restoration project is located within a floodway delineated on a Federal Emergency Management Agency (FEMA) map, include an analysis of the project's impact on the floodway delineation and water surface profiles and a letter from the municipality commenting on the analysis.

k. Risk Assessment: If the stormwater or the floodplain management analysis conducted in 15.2(i) or 15.2(j) indicates increases in peak rates of runoff or flood elevations, include a description of property or land uses that may be affected and an analysis of the degree of increased risk to life, property and the environment.

l. Provide verification that landowner's consent and permission have been obtained to conduct activities on private property.

m. A Resource Characterization. For each stream or stream segment identified in module 15.2(a) or 15.3(a), provide the following pre-mining water resource information:

   i. Is the water resource stocked by the Pa. Fish and Boat Commission? ☐ Yes ☐ No

   ii. Is the water resource designated as a Natural Wild or Scenic River or as part of the Commonwealth’s Scenic Rivers System? ☐ Yes ☐ No

   iii. Habitat Assessment: Provide a written narrative discussing the following ecological functions; food chain production, general habitat (nesting, spawning, rearing, resting, migration, feeding, escape cover), threatened and endangered species habitat (include PNDI search results), environmental study areas (sanctuaries, refuges).

   iv. Water Quantity and Streamflow. Provide a written narrative discussing the following: natural drainage patterns, flushing characteristics, current patterns, groundwater discharge for baseflow, natural recharge areas for groundwater and surface water, storm and floodwater storage and control.

   v. Water Quality: Provide a written narrative discussing the following: preventing pollution, sedimentation control, and natural water filtration.

   vi. Recreation: Provide a written narrative discussing the following: game species, non-game species, fishing, hiking, observation (plant/wildlife), or other recreational attributes.

   vii. Describe upstream and downstream property uses.

   viii. Other environmental factors determined by site investigation.

n. Provide a discussion of the proposed activity's impacts on: national, state or local parks, forests or recreation areas, natural or wilderness areas, national, state, or local historic sites, national natural
landmarks, national wildlife refuges, cultural or archaeological landmarks, state game lands, federal, state, local or private plant or wildlife sanctuaries, and prime farmland.

o. Environmental Impacts: Provide the following information regarding environmental impacts:

i. A discussion of the proposed activity's impacts to water resource characteristics listed previously in Modules 15.2(m)iii) through 15.2(m)viii).

ii. Identify all environmental impacts on other adjacent land and water resources associated with the planned encroachment activities.

iii. Identify and evaluate the potential cumulative environmental impacts of the proposed activity and other potential or existing similar activities, and the impacts that may result through numerous piecemeal changes to the impacted water resource.

p. Alternatives Analysis: Provide a discussion of any alternatives to implementing the encroachment or restoration plan(s).

q. Where a bridge or culvert is proposed provide the following information:

i. Plans and details showing the location, type, size, and height of the structure.

ii. Calculations showing the hydraulic capacity of the structure.

iii. A profile of the stream bed for a reasonable distance above and below the proposed location showing normal and flood water surface elevations and backwater effects of the structure.

iv. Cross sections upstream, downstream, and at the proposed location of the structure showing normal and flood water surface elevations and other topographic features, elevations, etc., necessary for an appraisal of the hazard potential of the structure.

v. A narrative description of the construction methods and sequence including water handling during construction, and erosion and sedimentation controls.

vi. Indicate if the structure will be temporary or permanent, (include plans for removal of temporary structures.)

15.3 Surface Activities Affecting Wetlands

(Note: Provide the name, address, and phone number of person(s) conducting the wetland delineation.)

a. Complete Form 15.3A "Wetland Inventory Summary" to provide inventory and classification information on all wetlands which occur on or within the permit area of surface mining activity sites or within stream restoration sites. In completing the form, answer "yes" or "no" to the following questions as they pertain to each wetland.

The wetland delineation was conducted under the direction of:

Michael L. Shema, Principal
Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205
(412) 429-2324

Exceptional Value Wetland Characteristics

i. Does the wetlands serve as habitat for flora and fauna listed as "threatened" or "endangered" under the Endangered Species Act of 1973, or Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code?

☐ Yes ☒ No

ii. Is the wetland hydrologically connected to or located within ½ mile of another wetland that serves as habitat of "threatened"
or "endangered" species, and does it serve to maintain the habitat in that wetland?

iii. Is the wetland located in or along the floodplain of a wild trout stream (as designated by the Pennsylvania Fish and Boat Commission), or the floodplain of a tributary to a wild trout stream?

iv. Is the wetland located in or along the floodplain of a stream listed as exceptional value (under Chapter 93) or the floodplain of a tributary to an exceptional value stream?

v. Is the wetland within the corridor of a waterway, which has been designated as a wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or the PA Scenic Rivers Act?

vi. Is the wetland part of, or located along, an existing public or private drinking water supply and does it maintain the quality or quantity of the drinking water supply?

vii. Is the wetland located in an area designated by the Department as "natural" or "wild" area within state forest, game, or park lands?

viii. Is the wetland located in an area designated as a Federal Wilderness Area under the Wilderness Act or the Federal Eastern Wilderness Act of 1975?

ix. Is the wetland located in an area designated as a National Natural Landmark by the Secretary of the Interior under the Historic Sites Act of 1935?

Note: If a "yes" response is indicated for any question in (i) through (ix) above, the wetlands would be "exceptional value" (as defined in 25 PA Code Section 105.17) and a demonstration must be made that the requirements of subsection (a) of 25 PA Code Section 105.18(a) have been met.

Wetland Functions

A qualitative evaluation of the aquatic functions listed in Module 15.3.x through 15.3.xvii was performed for the wetlands within the proposed project area. This evaluation was based on the physical, hydrologic, and biological characteristics of the wetlands and the professional judgment of CEC's ecologists. CEC assigned probability ratings of low, moderate, or high to indicate a wetland's ability to perform the specified aquatic functions. These ratings are qualitative and do not attempt to quantify the physical, chemical, or biological attributes of the individual wetlands.

On Form 15.3A, the answer to the following questions was given as "No" for wetlands in functional classes that were rated as "Low". Conversely, the questions on Form 15.3A were answered as “Yes” for wetlands in functional classes rated as “Moderate” or “High”.

ii. Does the wetland serve natural biological functions, including food chain production; general habitat; and nesting, spawning, rearing, or resting sites for aquatic or land species?

iii. Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?

iv. Does the wetland aid in, or maintain natural drainage characteristics, natural water filtration processes, current (flow) patterns, or other environmental characteristics?

v. Does the wetland serve as a storage area for flood and storm waters, or does it shield other areas from erosion or storm damage?

vi. Does the wetland provide recharge to local streams that maintains minimum baseflow?
xv. Does the wetland serve as a prime natural discharge area where surface water and groundwater are directly connected?  
☐ Yes  ☐ No

xvi. Does the wetland aid in the prevention of pollution?  
☐ Yes  ☐ No

xvii. Is the wetland used for, or does it provide the opportunity to be used for recreation?  
☐ Yes  ☐ No

15.4  **Wetland Impact Analysis/Assessment**

a. Describe the alternatives to the proposed surface mining activities or stream restoration activities that have been considered to avoid or minimize impacts on wetlands. An alternative analysis should include alternatives to the proposed surface mining activities, including alternative locations, routings or designs to avoid adverse impacts on the wetlands (i.e. relocating spoil/topsoil storage areas, rerouting haul roads).

Existing wetland areas have been identified within the stream restoration project boundaries and are located within the Kent Run boundary only. Where possible, these existing wetland areas will be avoided by keeping proposed restoration and construction activities away from the wetland boundaries. In some areas, disturbance of the existing wetlands is unavoidable in order to restore a stable and fully functioning stream and riparian system. Restoration of a stable stream system requires that the new channel be restored in this part of the valley, which will result in temporary disturbance of the existing wetland system through the area. However, the construction practices and liner installation will also restore and enhance areas of adjacent wetlands through higher water table conditions and a more frequent over-bank flooding regime. The 0.11 acre of PEM wetland impact will be replaced onsite.

b. Discuss whether any of the alternatives considered in 15.4(a) are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites that would not affect wetlands?

As discussed in 15.4(a), this is a restoration project and the aquatic resources will be replaced and/or restored.

c. If any wetlands will be directly affected, provide the following:

i. Identify the wetland and the areal extent of the impact.

The following table lists the wetlands adjacent to the project area that will be directly affected and the proposed impacts. These wetlands have been identified on sheets 6, 7 and 15 through 17 of the Kent Run 3L Panel construction drawings. All wetland impacts will be mitigated on site as shown on the Kent Run 3L Panel drawings.

<table>
<thead>
<tr>
<th>Wetland ID</th>
<th>Component Acreage</th>
<th>Total Acreage</th>
<th>Impacted Acreage</th>
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<tr>
<td>Bailey-132A</td>
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<td>0.176</td>
<td>0.030</td>
</tr>
<tr>
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<tr>
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<td>0.006</td>
</tr>
<tr>
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<td><strong>0.231</strong></td>
<td><strong>0.231</strong></td>
<td><strong>0.113</strong></td>
</tr>
</tbody>
</table>
ii. Submit a cross-sectional view showing the wetland and the proposed disturbed area.

Cross sections depicting existing and proposed conditions of the wetlands are included on Drawings 10 and 11 of the Kent Run 3L Panel construction drawings.

iii. Explain how the proposed activities will directly affect the hydrology, functions, and values of the wetlands.

This is a restoration project, no wetlands will be impacted by surface mining activities; however, the restoration project will impact portions of PEM wetlands (Bailey-132A, 133A, 134A, and 135A) that are within the floodplain of the existing Kent Run stream (#32600). All existing wetlands have been avoided to the maximum possible extent.

Wetland impacts will be mitigated onsite and replaced at a 1:1 ratio. The proposed wetland replacement area is located adjacent to existing wetland Bailey-134A. It has been designed to mimic the functions and values provided by the impacted wetlands in terms of acreage, elevation, sources of hydrology, proximity to the stream, microtopography, and vegetative class.

(1) If the proposed surface mining activities will affect less than one (1.0) acre of wetland and the wetland is not an exceptional value wetland (in accordance with 25 PA Code Section 105.17), provide a description and probable degree of impact to the wetland functions and values which will be impacted by the proposed mining activities. NOTE: If a “yes” response is indicated for any question in 15.3(a)i) through 15.3(a)ix), the wetlands would be exceptional value (as defined in Section 105.17).

The wetlands were not identified as exceptional value. No ‘yes’ was indicated in 15.3(a)i) through 15.3(a)ix).

(2) If the proposed surface mining activities will affect one (1.0) or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions and values identified in 15.3(a)x) through 15.3(a)xvii). Provide extent or degree of impact to each function and value.

d. If any wetlands will be indirectly affected by surface mining activities (e.g. altering the wetland hydrology):

Not applicable. No indirect wetland impacts are anticipated.

i. Identify the wetland and provide an estimate of the total wetland acreage affected. Describe the functions or values to be impacted and the degree of impact.

Not applicable.

ii. Provide a description of how the proposed surface mining activities will indirectly affect the wetland’s functions and values.

Not applicable.

e. Indicate whether the cumulative impact of the proposed and anticipated surface mining activities result in a major impairment of the wetland resource in the general area, provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.

All wetland impacts will be mitigated on site. The mitigation will be adjacent to and shall mimic the functions and values of the impacted wetlands. Natural channel design methodology has been utilized to design the proposed channel geometry. This design will maintain or improve the existing hydrologic and hydraulic connectivity of the channel with the wetlands.

15.5 Wetland Mitigation/Replacement.

(Sites where less than 0.5 acres of wetland are affected may qualify for mitigation options provided under the Pennsylvania Wetland Replacement Project. Contact the DEP permitting office for details.)
a. If wetland mitigation measures or wetland replacements are proposed, address the following items:

i. Identify the wetlands where mitigation measures will be employed, wetlands that will be replaced, and sites where replacement wetlands will be constructed along with the respective area of each.

   All impacted wetlands (0.11 acres) located within the project area will be replaced onsite. The existing wetlands and the replacement area are located on the Kent Run 3L Panel site plans.

ii. Provide a plan for mitigation/replacement following the guidelines in the DEP’s Technical Guidance Document, “363-0300-001”, “Design Criteria for Wetlands Replacement.” This guidance can be found on the Department’s eLibrary.

The wetland replacement design has been incorporated into the drawing set. Wetland replacement limits and contouring have been provided on Drawing 7, a vegetation plan has been provided on Drawing 15, and seed mixtures are defined on Drawing 5.

Monitoring will include:

**Post Construction Monitoring**

Monitoring is conducted in order to meet permit conditions and to measure the success of a project’s specific objectives, as well as measure the performance of design over the long term. In summary, monitoring is conducted to measure the success of the compensatory wetland and stream mitigation project. Specifically, these permit conditions state that monitoring shall occur every six months for the first two years after construction and annually three years thereafter for a total of five years minimum.

A separate report will be submitted for each of the monitoring events. Each report shall include a cover sheet indicating the report number (e.g., Monitoring Report 2 of 7). Field reconnaissance shall coincide with the average growing season (frost free days), which is from mid-April through September. The same monitoring protocol, for documenting wetlands as found in the April 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region shall be used for consistency by the same person(s) of the firm that initiated the work, to the degree possible.

These reports will be prepared based on current guidance presented in the U.S. Army Corps of Engineers’ April 10, 2008 Final Rule; Compensatory mitigation for Losses of Aquatic Resources and the April 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The following items and basic information will be included with each wetland monitoring report submission:

- Corps/PADEP Permit Numbers;
- Contact information (permittee and consultant);
- Credentials of individual(s) responsible for collecting and interpreting data;
- Summary paragraph describing:
  - General site conditions (date, time, weather conditions, etc.);
  - Purpose of the approved project;
  - Description of the mitigation area including type of aquatic resources impacted and type of aquatic resources authorized for compensation and mitigation acreage;
- Directions to the site;
- Project location map;
- Dates mitigation commenced and/or was completed;
- Dates of any corrective or maintenance activities;
- Identification and discussion of problem areas and recommended remedial action, if any;
- Correspondence from the USACE and PA DEP, if applicable, and,
- Conclusions on whether performance standards are being met and/or if the mitigation project is progressing towards meeting its performance standards.
The following items include summary data which will ultimately determine the success and/or potential issues associated with the mitigation project. A brief summary of the site conditions for each monitoring event will precede each of these items:

- Current wetland boundary using mapping grade DGPS, if changed;
- Photographic documentation from permanently established photo stations (these photo stations will be depicted on plan view sheets to promote consistency from one monitoring session to the next); and,
- Wetland data forms (Wetland data forms will provide documentation to determine if the project is progressing towards meeting its performance standards). It should be noted that the data forms prescribed in the Regional Supplement will be used.

iii. Show all affected wetlands, mitigation areas, and replacement sites on the Operation Map, Exhibit 9.1; and, in addition, show replacement sites on the Land Use and Reclamation Maps, Exhibit 18.1.

The replacement area is located onsite within the project area, see Drawing 7.

iv. Provide a comparison of the wetlands functions and values of the current vs. replacement wetland acreage. In the case of mitigation, a comparison of the known wetlands functions and values and degree of impact to each must be compared to the functions and values of the proposed mitigation site when completed. This comparison of "currently existing" to "probable replacement" allows for a basis of the 1:1 replacement ratio.

PEM wetlands impacted from the stream restoration project will be restored concurrently at a 1:1 ratio.

Notes: At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres), although the Department may require the ratio to exceed 1:1 based on the functions and values of the wetlands to be affected.

Wetland replacement sites will generally not be approved unless the site is located within the same general area as the existing wetland to be replaced.

15.6 Underground Mining Stream Impact Evaluation / Restoration

Under certain conditions, surface restoration activities may be necessary to avoid impacts to water uses and rectify subsidence-related effects of underground mining beneath streams. These plans typically include Chapter 105 in-stream encroachment activities. Where impact predictions under Module 8.9 and 8.10 indicate the need to perform surface restoration activities, provide the following information. Provide a separate Module 15.6 for each named stream. Unnamed tributaries to named streams may be included in the same Module 15.6 as the named stream.

Note: Where information is required to be shown on Exhibit 6.3, a separate Exhibit 15.6, “Plan Map” of appropriate scale and equivalent information may be substituted.

a. Types of Impacts.

Provide the name and location of each impacted stream and describe predicted or anticipated impacts to the streams due to undermining. Describe potential restoration measures and the general areas in which they may be used, including pooled stream restoration, stream dewatering restoration, and minor stream restoration.

The applicant is providing a stream restoration plan for Polen Run and Kent Run above the 3L, 4L and 5L longwall panels of the Bailey Mine. The existing length of Polen Run over the 3L through 5L panel is 4,470 feet and the proposed post-restoration length if implemented is 4,393 feet. The existing length of Kent Run over the 3L through 5L panel is 4,750 feet and the proposed post-restoration length if implemented is 4,100 feet. The existing length of Polen Run over the 3L panel is 1,920 feet and the proposed post-restoration length if implemented is 1,870 feet. The existing length of Kent Run over the 3L panel is 2,420 feet and the proposed post-restoration length if implemented is 2,100 feet. The restoration plan describes implementation of streamed restoration and monitoring activities should permanent stream flow diminution persist after the stream has
settled and temporary flow augmentation, if needed, has been curtailed. Potential restoration activities include streambed grouting and streambed liner installation as described in section 15.6.c.ii.(1).

Polen Run is a biologically diverse stream above the 3L and 4L panels with a total drainage area of 883 acres and a 1.5% - 3.0% valley slope. The stream channel through the proposed lining and restoration work area is approximately 4,400 feet long. The site consists of a stream valley with wooded riparian areas and slopes. The majority of the site consists of mixed-age hardwood forest.

Kent Run is a biologically diverse stream above the 3L and 4L panels with a total drainage area of 1,702 acres and a 1.5% -3.0% valley slope. The stream channel through the proposed lining and restoration work area is approximately 4,100 feet long. The site consists of a stream valley with wooded riparian areas and slopes. The majority of the site consists of mixed-age hardwood forest. CPCC’s data indicates that under low flow (<300 gpm) conditions, approximately 98% of the water that discharges out of the watershed into North Fork of Dunkard Fork is present at the upstream limit of the 3L panel. Refer to Attachment 15.6(a) for supporting data.


All subsidence modeling was approved with Revision 180. The subsidence modeling approved with Revision 180 and the associated gate cutting are still currently valid as approved for the proposed mining beneath Kent Run in the 3L – 5L panels. The gate cut proposed for Kent Run 3L panel is anticipated to be implemented summer of 2017 and for the Kent Run 4L panel summer of 2018. If proposed channel lining is required for Kent Run in the 3L and 4L panels those activities would not occur until approximately fall of 2018 for the 3L panel and fall of 2019 for the 4L panel.

i. Provide pre-mining stream profiles showing the extents of all riffles, pools, glides and runs. Profiles must be developed from survey information accurate within ±1.0 foot. Submit profiles scaled at a minimum: horizontal 1” = 50’ and vertical 1” = 10’. Key the stream stationing to the Environmental Resource Map, Exhibit 6.3. Identify the profiles as “Exhibit 15.6(b)ii) – Stream Profiles”.

ii. Provide subsidence prediction information, including all documentation and calculations from subsidence prediction models. Show the post-mining stream profiles on Exhibit 15.6(b)ii).

iii. Provide an analysis and description of the extent of post-mining pooled areas based on a comparison of pre-mining and post-mining profiles. Show the post-mining pooled areas on the Environmental Resource Map, Exhibit 6.3, and Exhibit 15.6(b)ii).

iv. Provide a general description of restoration measures if the analysis in Module 15.6(b)iii) indicates pool depths will increase by less than 1.0 foot.

v. Provide a plan for mitigating the effects of mining induced pooling if the analysis in Module 15.6(b)iv) indicates pool depths will increase by 1.0 foot or more. The plan should be designed to address mining induced changes before they rise to the level of adverse effects and, where practical, should include measures to enhance aquatic and terrestrial habitat. The plan must include the following:


2. A description of the proposed restoration activities and the time frame in which the activities will occur. Describe the effect of the restoration activities on public health and safety.

3. The location of proposed restoration areas. Show the extents of restoration areas on the Environmental Resource Map, Exhibit 6.3.

4. Photographs of pre-mining stream conditions along the restoration area. Reference the photograph locations on the Environmental Resource Map, Exhibit 6.3.

5. Post-restoration stream profiles; include on Exhibit 15.6(b)ii).
(6) Stream cross-section(s) at minimum 100-foot intervals along the restoration area. The cross-section(s) must be at a scale of 1” = 10’ or larger. Key the cross-section(s) to the stationing on the Environmental Resource Map, Exhibit 6.3.

(7) An erosion and sedimentation control plan for the restoration activities that includes: a description of the activities, structures, best management practices, water handling plans, construction typicals, and implementation methods that will be utilized throughout all phases of the restoration.

(8) Post restoration stream channel erosion protection and substrate restoration.

(9) A reclamation plan for areas disturbed by restoration activities, including: regrading, revegetation, and environmental enhancement. Include plans for riparian area plantings.

(10) Depict wetland boundaries on the Environmental Resource Map, Exhibit 6.3 within the limits of the restoration project in accordance with Technical Guidance Document “563-2000-655”. Provide a schedule and procedure for the submission of Module Items 15.3, 15.4, and 15.5 before restoration work commences.

(11) A description of the measures that will be used to prevent adverse water quality impacts during restoration activities.

(12) A plan for evaluating the success of the restoration. At a minimum, the plan should provide for biological sampling to document that the macroinvertebrate community has recovered to its pre-mining condition, and substrate evaluations (e.g., Wolman Pebble Counts) to document that the substrate is not being blanketed by fine sediment.

c. Stream Dewatering Restoration.

i. Where mining plans have the potential to cause mining induced flow loss, but do not pose a high probability of causing flow loss, provide a mitigation plan describing all aspects of restoration work needed to restore stream flow to the normal range of conditions. (NOTE: Should mining induced flow loss occur, site-specific plans, including required information in 15.6(c)ii and 15.6(d), must be submitted and approved before restoration work commences.)

ii. Where mining plans are predicted to result in mining induced flow loss in specific areas and Chapter 105 activities are proposed to restore flow, provide the following:

(1) A description of the proposed restoration activities and the time frame in which the activities will occur.

FLOW RESTORATION PLAN

Flow restoration activities, if necessary, will be implemented in a step wise fashion as shown below. The Flow Restoration Plan will be completed within 3 years following the advancement of the longwall panel past the portion of the stream corresponding to each panel. The Plan will be implemented when the longwall panel has advanced a minimum of 3 overburden thicknesses beyond the stream. The Plan will be implemented generally as follows:

- Stream flow measurements shall be recorded at existing Hydrologic Surface Water (HSW) points during mining. HSW points are shown on the Exhibit 15.6.c.ii.1. Flow measurements shall be increased from weekly to daily while the longwall panel is within 1.5 overburdens from the stream(s). Visual monitoring shall increase to two times per day while the longwall face is within 500 feet of the stream. Stream flow monitoring will be reduced to weekly monitoring once the longwall panel is 1.5 overburdens beyond the stream. Weekly monitoring will continue for 6 months or until it is determined that mining induced stream flow diminution is observed. If a mining impact on flow is observed, daily monitoring shall continue until flow fully recovers. If a mining impact on flow is not observed within 6 months, streamflow monitoring will continue on a monthly basis until it is determined that mining has or has not had an affect on streamflow.
• If mining induced stream flow diminution is observed, CPCC will implement stream flow augmentation within 24 hours of the observation in order to maintain normal flow conditions.

• If mining induced stream flow diminution is observed, CPCC will implement shallow or mid-depth grouting as primary restoration. CPCC will select the appropriate grouting technique (shallow and/or mid-depth) based on the magnitude of flow loss, material damage and stream accessibility of the streambed drilling equipment. It is anticipated that implementation of the streambed grouting restoration will be determined within 6 months of mining. It is anticipated streambed grouting will take approximately 2 to 4 months to complete for the portion of Kent and Polen Run above each longwall panel.

• Following primary restoration, CPCC will conduct post-restoration flow monitoring to determine the success of primary restoration. Success criteria are described in the Restoration Effectiveness Evaluation section of the module.

• If primary restoration monitoring indicates the restoration did not achieve the performance criteria, CPCC will implement contingency restoration measures within 60 days of the completion of primary mitigation performance monitoring. Contingency restoration at Polen Run and Kent Run will consist of streambed liner installation. It is anticipated that streambed liner installation will take approximately 4 to 5 months to complete for the portion of stream above each longwall panel.

• Following contingency restoration, CPCC will conduct post-restoration flow monitoring to determine the success of the contingency restoration activity, as described in the Restoration Effectiveness Evaluation section of the module.

• Based on the current timing projections it is anticipated the 3L longwall panel will be underneath Polen Run in mid-December 2016 and beneath Kent Run in the early part of January 2017.

• The streambed liner plans for Kent Run indicate the streambed liner will begin approximately 500' upstream of the 3L panel. The intent of the extension of the liner above the 3L panel is to maximize flow from unmined area upstream of the 3L panel.

• The underdrains are designed with solid 4" PVC piping at the outflow point into the stream. The maximum flow through a 4" PVC pipe, under low pressure conditions (less than 20 psi), is 240 gpm. See attached chart for general pipe size vs flow summary. There will be no impact to the liner system should a pressure of 20 psi be observed beneath the system. CPCC reviewed the pre-mine data collected at Polen Run, Kent Run, and tributaries of these streams above the 3L panel to approximate the change in flow rate that may be attributable to groundwater. According to the review, 240 gpm represents the 85th and 79th percentiles of change in flow at Polen Run and Kent Run respectively across the 3L panel. CPCC feels the underdrains are designed appropriately to accommodate the anticipated groundwater contribution based on this review of the pre-mine data. Supporting stream flow data is included in Attachment 15.6.c.ii(1).

Installation of the streambed liner is not proposed in Polen Run beneath the PennDot bridge near statation 63+00. The presence of the bridge prevents excavation of the stream channel beneath the bridge. Not installing the liner beneath the bridge will not compromise the overall lining system. Streambed grouting can be performed beneath the bridge should mining related flow loss be observed in the portion of the streambed underneath the bridge where the liner cannot be installed.

The Tuflow analyses shows shear stresses between 4 pcf and 6 pcf and velocities up to 12 fps at the bridge approach and under the bridge. These higher shear stresses are the result of the sharp bend in the stream alignment, and the constriction of stream conveyance area caused by the bridge and its associated abutments/wingwalls. The bridge results in a sudden reduction in the 100-year floodplain width from approximately 35 feet to approximately 17 feet. Shear stresses and velocities this high, and even higher, are considered to be normal during severe storm events for similar situations where a bridge or other structure causes abrupt changes in flow direction and restricts flow areas.

The limits of the proposed stream restoration stop at PennDOT’s right-of-way on both sides of the bridge. The post-restoration stream cross section is very similar to the existing stream cross sections beyond the PennDOT right-of-way. The proposed stream restoration will not impact the existing sudden change in flow direction or flow area on either side of the bridge or through the bridge. Therefore, proposed stream restoration is not expected to change shear stresses or velocities in the vicinity of the bridge from existing conditions.
• All known buried utilities within the proposed restoration area are abandoned. The abandoned lines will not affect the mitigation efforts and CPCC is providing written approval to conduct the mitigation activities above the CNX gas line as included in Attachment 10.7. CPCC will cut and cap abandoned utilities that are encountered during installation of the streambed liners. CPCC has performed a preliminary utility locator one call for work within the Kent Run and Polen Run valleys above the 3L panel. CPCC has not received notifications of active utilities within the proposed work areas that would restrict implementation of the proposed restoration plans.

Streambed Grouting Program

Streambed grouting will be performed by injecting bentonite amended cement grout into the shallow subsurface via small diameter boreholes that terminate at depths of six (6) to twenty (20) feet below streambed surface. Streambed grouting will be performed in phases, working from upstream to downstream. Each phase of work will treat approximately 100 to 300 feet of stream. After a given reach of streambed is grouted, the effectiveness of the grouting program will be evaluated by measuring stream flow in the treated reach. Stream flow will be measured along the treated reach at stations established at appropriate intervals to determine if additional grouting is required.

Grout injection pressures will be determined in the field by the grouting contractor. Injection pressures will be sufficient to place grout as far as possible into the formation without creating secondary fractures or inducing heaving. Injection boreholes that take an unusually large volume of grout will have secondary boreholes installed surrounding the primary injection borehole. These secondary boreholes will be drilled in a regular geometric pattern on centers that are half the distance of the original borehole spacing.

Refer to Revision 180 Module 15.6(e) and Module 15.2(r) for additional grouting information.

Streambed Liner Installation

Should primary restoration prove unsuccessful then liner installation will take place in approximately 60 days of the completion of primary mitigation performance monitoring. Construction associated with streambed liner installation will first involve clearing necessary portions of the project corridor. The construction corridor width for Kent Run ranges from 80 feet to 160 feet with an average width of 110 feet and for Polen Run the width ranges from 40 feet to 140 feet with an average width of 60 feet. All required erosion and sedimentation control measures will be installed prior to any earth disturbance. Clearing efforts will be minimized to the extent possible to avoid impacts to the riparian corridor adjacent to the project areas. The alignment and liner subgrade depth will be staked in the field prior to construction to provide the necessary information for the contractor to excavate and restore the stream channel. The existing stream bottom material will be stockpiled separately from other cut material for use as stream bed material for during streambed restoration.

The contractor will excavate the proposed channel to the subgrade limits along the proposed channel alignment as directed in these plans. The contractor may fill the existing channel with suitable material if it does not contain flowing water during the grading operations, otherwise a pump-around operation or stream diversion shall be utilized to direct flow around the work area. The fill material used shall be placed within the existing channel and compacted in lifts of no more than 10 inches, shall be free of debris, trash, etc., and shall consist of compactable soil material. Areas of the existing channel which have been filled shall have additional material mounded over the top of the fill to a depth of approximately 6 inches to offset future settling before the proposed channel excavation begins. Excavated material not suitable for channel fill should be stockpiled in areas shown on the plans. In areas where excavation depths exceed 10 inches, topsoil shall be stockpiled and placed back over these areas to a minimum depth of 8 inches to achieve design grades and create a soil base for vegetation. Existing channel areas that are located outside of the relocated channel will be filled with suitable material. Topsoil within disturbed areas shall be stripped, stockpiled, and placed back over areas that have reached final grade to create a soil base for vegetation.

After the subgrade has been prepared and approved by the Owner and Engineer, the contractor shall install the GCL, confinement layer, and alluvium layer. The contractor shall install in-stream structures, seeding, matting, and ready the channel to accept flow. The in-stream structures shall be installed and the banks protected prior to restoring stream flow. Bank protection will include riprap, turf reinforcement mat (TRM) or coconut fiber mat, and vegetation. Filter sock or silt fence shall be placed along the top of bank along both sides of the restored stream. No water shall be turned into any section of channel until the channel has been completely stabilized and all instream structures have been installed.
HABITAT RESTORATION

The design for the proposed bankfull channel took into consideration a comparison of USGS regional curve information, local stream morphology, and on-site reference reach survey data. The appropriate bankfull geometry and structure placement was guided by design parameters using geomorphic relationships/ratios (i.e., pool-to-pool spacing) from stable reference reaches and past experience from successful projects with similar stream-type, valley slope, and drainage area. Natural stream calculations are provided in Attachment 15.6.c.5.

Stockpiled bed material from the original stream channel, along with quarry rock, will be used to create the restored channel bottom, assuming that the available bed material is appropriate for the system and design bed forms. Using this approach, the restored stream will provide appropriate habitats, stability, bed form diversity, and sediment transport characteristics similar to or better than those of natural headwater streams in the area.

In-stream structures will be installed to promote channel stability and bed form diversity, without compromising the integrity of the GCL. Bioengineering methods and structures will be incorporated to provide stability and habitat as described below:

- Appropriate sized riprap will be placed on the stream bottom and partially along the stream banks. The riprap along the stream bottom will be choked with existing stream substrate material that was excavated and stockpiled.
- Permanent turf reinforcement mat (TRM) or coconut fiber mat will be placed along the stream banks to prevent erosion and protect the underlying liner system. The permanent seed mix will be applied prior to installation of the turf reinforcement matting as indicated in comment 2 of the Turf Reinforcement Mat Detail. No temporary seed mixture will be placed in the areas where Turf Reinforcement Matting will be placed.
- Temporary erosion control mat will be installed within the floodplain to minimize erosion and promote native vegetation establishment.
- Native riparian vegetation will be planted to provide bank protection and buffer diversity throughout the riparian corridor. Woody vegetation such as live stakes, bare-root saplings, and container trees/shrubs will be planted along with herbaceous seed mixture appropriate for the site.
- Log roller and boulder structures will be installed along the riffle sections of the stream.

Refer to the design drawings for proposed channel dimensions, structure details, plan, profiles, turf reinforcement matting/vegetation planting and cross sections.

RESTORATION EFFECTIVENESS EVALUATION

Restoration of potential mining impacts to stream flow in Polen Run and Kent Run shall be evaluated following the primary and, when necessary, the contingency restoration activities. The following methodology will be used to evaluate the effectiveness of the restoration activity:

Streambed Grouting Effectiveness Evaluation

Restoration of potential mining impacts using the streambed grouting method will be determined by comparing the post-restoration median flow to the pre-mine flow recorded at the corresponding HSW monitoring point. Refer to Exhibit 15.6.c.ii.1 for locations of the HSW monitoring points. Flow rates will be recorded weekly for a period of one year following completion of the streambed grouting. Flow measurements will be recorded using the USGS Velocity-Area method. The post-restoration median flow must be greater than the 25th percentile of the range of pre-mine flow.

The 25th percentile of the pre-mine flow recorded at Polen Run and Kent Run are summarized below:

<table>
<thead>
<tr>
<th>Stream ID</th>
<th>Panel</th>
<th>Downstream HSW Point</th>
<th>Performance Criterion: 25th percentile of the pre-mine range of flow (gpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polen Run</td>
<td>3L</td>
<td>HSW-03</td>
<td>39</td>
</tr>
<tr>
<td>Kent Run</td>
<td>3L</td>
<td>HSW-02</td>
<td>94</td>
</tr>
</tbody>
</table>

In addition, the median change in flow from the upstream HSW monitoring location to the downstream HSW monitoring location will be compared to the change in flow measured prior to mining from the upstream HSW monitoring location to the downstream HSW monitoring location. The post restoration change in flow must be greater than the 50th percentile of the change in flow measured prior to mining.
The 50th percentile of the pre-mine change in flow across the 3L panel recorded at Polen Run and Kent Run are summarized below:

<table>
<thead>
<tr>
<th>Stream ID</th>
<th>Panel</th>
<th>Downstream HSW Point</th>
<th>Upstream HSW Point</th>
<th>Performance Criterion: 50th percentile of the pre-mine change in flow (gpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polen Run</td>
<td>3L</td>
<td>HSW-03</td>
<td>HSW-04</td>
<td>17</td>
</tr>
<tr>
<td>Kent Run</td>
<td>3L</td>
<td>HSW-02</td>
<td>HSW-03</td>
<td>-6</td>
</tr>
</tbody>
</table>

The 25th and 50th percentile pre-mine flow evaluations provided in the tables above were calculated using flow data recorded at the specified HSW points from February 2009 through October 2016 at Polen Run and March 2009 through October 2016 at Kent Run. Pre-mine flow data recorded at the relative HSW points are provided in Attachment 15.6.c.4.

Streambed Liner Effectiveness Evaluation

Restoration of potential mining impacts using the streambed liner method will be determined by comparing the average flow coming onto the lined portion of the stream to the average flow coming off of the lined portion of stream. Flow rates will be measured on a daily basis over a 6 month period at the upstream and downstream HSW monitoring locations. Flow measurements will be recorded using the USGS Velocity-Area method. The average flow coming off of the lined section (downstream terminus) must be equal to or greater than the flow coming onto the lined section (upstream terminus). Upstream and downstream average flow will be computed for the entire 6 month monitoring period.

In order to normalize the effect of precipitation on the post restoration (primary or secondary restoration) and pre-mine flow data, flow measurements recorded during times of drought and 48 hours following a storm event will be excluded from the analysis. A storm event is defined as a weather event that results in greater than 0.44" of precipitation over a 24-hour period measured at the Waynesburg weather station. 0.44" is the daily mean storm intensity of the 1985-2014 precipitation record at the Waynesburg weather station. 48 hours is the normal baseline recession period for streams in the Bailey Mine area to return to baseline flow conditions following a storm event. If the exclusion of data collected during storm and drought is not sufficient to address normality, CPCC will proceed with logarithmic transformation of the data in order to complete a statistical evaluation of changes to distribution; that is, percentile estimation.

No flow augmentation will occur during the monitoring periods, unless directed by the Department to maintain use of the stream. Detailed records of flow augmentation (flow, date duration) will be maintained.

BIOLOGICAL EVALUATION

Restoration of potential mining impacts to the biological condition in Polen Run and Kent Run shall be evaluated in accordance with the protocol specified in Appendix B of the Streams TGD. Biological sampling will be conducted following primary restoration activity, and when necessary, contingency restoration activity.

A summary of the previously submitted pre-mining Total Biological Scores (TBS) for Biological Surface Water (BSW) Stations located in proximity to the proposed restoration areas are provided below.

### Previously Submitted Pre-mining Appendix B Data for Polen Run (32603) and Kent Run (32600)

<table>
<thead>
<tr>
<th>Stream Name</th>
<th>Appendix B Monitoring Station</th>
<th>Appendix B Sample Date</th>
<th>Appendix B TBS</th>
<th>Mean TBS</th>
<th>Relative Percent Difference (RPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polen Run</td>
<td>BSW14</td>
<td>1/11/2007</td>
<td>76.4</td>
<td>80.6</td>
<td>10.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/22/2010</td>
<td>84.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSW18</td>
<td>1/11/2007</td>
<td>78.2</td>
<td>77.2</td>
<td>2.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/21/2010</td>
<td>76.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kent Run</td>
<td>BSW-08</td>
<td>1/9/2007</td>
<td>68.0</td>
<td>69.5</td>
<td>4.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5/27/2010</td>
<td>71.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSW13</td>
<td>1/10/2007</td>
<td>65.5</td>
<td>70.5</td>
<td>14.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4/20/2010</td>
<td>75.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Previously Submitted Pre-mining Appendix B Data for Polen Run (32603) and Kent Run (32600)

<table>
<thead>
<tr>
<th>Stream Name</th>
<th>Appendix B Monitoring Station</th>
<th>Appendix B Sample Date</th>
<th>Appendix B TBS</th>
<th>Mean TBS</th>
<th>Relative Percent Difference (RPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSW17</td>
<td></td>
<td>1/10/2007</td>
<td>61.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11/18/2010</td>
<td>55.5</td>
<td>58.6</td>
<td>10.6%</td>
</tr>
</tbody>
</table>

Minor field modifications to the lining and/or grouting plans such as those necessary to achieve the restoration targets or avoid liner installation during incliment weather will be performed with approval by the PADEP inspector. Significant revisions to the plans will be approved by the Department.

Minor field changes to the lining and/or grouting plans will be brought to the attention of DEP inspectors as soon as possible. Approval of the minor field changes will be made in an expeditious manner in order to not cause an unreasonable delay.

(2) A description of the effect of restoration activities on public health and safety.

The restoration activities should not adversely affect public health and safety since there will be no land use changes. Public access to the work area will be restricted during construction activities and until completion of all activities that could affect public safety.

(3) A description of the location of specific areas predicted for stream dewatering. Show the extents of predicted dewatering areas on the Environmental Resource Map, Exhibit 6.3.

There are no specific areas predicted for stream dewatering. The information included in this permit application pertains to restoration efforts that may be required if flow diminution is observed.

(4) All necessary supporting data (calculations, manufacturer’s specifications, typical drawings, etc.) for the proposed restoration measures.

Refer to the Design Drawings and Attachments 15.6.c.1, 15.6.c.2, 15.6.c.4 & 15.6.c.5.

(5) Pre and post-mining, and post-restoration stream profiles (if not submitted in Section 15.6(b)(ii)). Profiles must be developed from survey information accurate within ±1.0 foot. Submit profiles scaled at a minimum: horizontal 1” = 50’ and vertical 1” = 10’. Key stream stationing to the Environmental Resource Map, Exhibit 6.3. Identify the profiles as “Exhibit 15.6(c)(ii)(6) – Stream Profiles.”

Stream profiles are included as part of the Design Drawings.

(6) Photographs of pre-mining stream conditions along the restoration area. Reference the locations of the photographs on the Environmental Resource Map, Exhibit 6.3.

Refer to Attachment 15.6.c.3.

(7) Stream cross-sections at minimum 100-foot intervals along the restoration area. Indicate the limits of stream channel disturbance. Cross-section scale must be at a scale of 1” = 10’ or larger. Key the cross-sections to stream stationing on the Environmental Resource Map, Exhibit 6.3.

Cross sections are included as part of the Design Drawings.

(8) An erosion and sedimentation control plan for the restoration site that includes: a description of the activities, structures, best management practices, water handling plans, construction typicals and implementation methods that will be utilized throughout all phases of the restoration.

An Erosion and Sediment Control Plan was developed using the guidelines contained within the Erosion and Sediment Pollution Control Program Manual (E&S Manual), Pennsylvania Department of Environmental Protection Office of Water Management,
March 2012. Erosion and sediment devices constructed, maintained and operated as part of this plan, will remain in place to provide control during construction and will remain functional until the contributing area has been stabilized.

The proposed site plan was prepared to minimize the area disturbed by grading and construction activities. Developing the site in accordance with that plan and implementing the E&S Plan will minimize and/or prevent excessive erosion and sedimentation control problems. In addition to staged construction, the primary means of temporary sediment control on this project will consist of rock construction entrances, filter sock/silt fence, rock filters, work area bypassing, temporary crossings, pumped water filter bags, temporary seeding, and erosion control mat. Installation of these facilities will be completed prior to earth moving activity and they will be maintained during construction. Erosion and sediment control facilities may be removed after a minimum uniform 70 percent perennial vegetative cover has been established onsite as directed. Road variance approval from PennDot for work to be performed within the road right-of-way for State Route 4005 and State Route 3022 is included as Attachment 15.6.c.ii(8).

Installation of specific erosion control devices is required to control runoff and prevent pollution of the waters of the Commonwealth of Pennsylvania. The contractor shall be responsible for implementing the erosion control devices in accordance with the following construction sequence prior. The contractor shall not be permitted to alter the construction sequence without authorization from the Department of Environmental Protection.

1. Prior to beginning any land disturbing activities, permit approval must be granted from the Pennsylvania Department of Environmental Protection and the US Army Corp of Engineers.

2. Contact Pennsylvania “One Call System” (1.800.242.1776) at least 72 hours before any excavation commences.

3. Notify the Owner 48 hours prior to construction.

4. Flag tree protection and sensitive resource areas prior to construction activities and before clearing and grubbing begins.

5. Delineate project boundary limits, clearly marking all pertinent features in the field. Pertinent features shall include marking all underground utilities, identification of clearing limits required for construction of erosion control devices, and staking of proposed erosion control devices.

6. Construct temporary rock construction entrances at the locations shown on the plans. Access to the work areas will be from these entrances. The contractor shall not remove any vegetation or perform any earthmoving operations beyond that required to gain site access with heavy equipment. The contractor shall be responsible for keeping roadways clear of sediment and debris for the duration of the project.

7. Install any signage and safety devices necessary to maintain and protect traffic through areas of construction.

8. Construction traffic shall be restricted to the area denoted “limits of disturbance” as shown on the plans.

9. Improve access road and install silt fence/compost filter sock adjacent to staging area and establish parking/staging area at locations show on plans.
10. For each segregated channel disturbance “Work Area Limit” with stream diversion, use the following sequence:

10.1 Install the temporary crossings, rock filters, filter sock/silt fence, compost filter sock and wetland protection fence at locations shown on the plan. Note: The placement of silt fence may not be limited to those areas shown on the plans. Silt fence may be used to control areas disturbed by unforeseen construction activities, installation of haul roads, around equipment staging areas, etc.

10.2 Install stream bypass and pump water filter bags. These will be utilized during all instream construction activities.

10.3 Clear and grub an area adequate to construct the new stream channel, channel liner, and floodplain grading operations. Materials not suitable for construction shall be stockpiled within the designated areas and hauled offsite to a specified location approved by the owner.

10.4 Begin construction by excavating the proposed channel to the subgrade limits along the proposed channel alignment as directed in these plans. The contractor may fill the existing channel with suitable material if it does not contain flowing water during the grading operations, otherwise a pump-around operation shall be utilized. The fill material used shall be placed within the existing channel and compacted in lifts of no more than 10 inches, shall be free of debris, trash, etc., and shall consist of compactable soil material. Areas of the existing channel which have been filled shall have additional material mounded over the top of the fill to a depth of approximately 6 inches to offset future settling before the proposed channel excavation begins. Excavated material not suitable for channel fill should be stockpiled in areas shown on the plans. Topsoil within disturbed areas shall be stripped, stockpiled, and placed back over areas that have reached final grade to create a soil base for vegetation.

10.5 After the subgrade has been prepared and approved by the Owner and Engineer, the contractor shall install the various stream liner layers. The contractor shall install in-stream structures, seeding, matting, and ready the channel to accept flow. The in-stream structures shall be installed and the banks protected prior to receiving “live” stream flow. Silt fence or filter sock shall be placed between stockpiles and the existing channel. Filter sock or silt fence shall be placed along the top of bank along both sides of the completed restored stream. No water shall be turned into any section of channel prior to the channel being completely stabilized with all structures installed.

11. Install woody vegetation and live stakes according to plan details and specifications. The contractor shall complete the vegetation planting phase of the project at the appropriate time of the year. Seed and mulch all disturbed areas and install erosion control mulch blanket on slopes indicated on the plans once final grade is established.

12. Maintain erosion and sediment controls until all tributary areas are stabilized (70-percent vegetative cover overall ground surface areas). Remove sediment control facilities after all tributary areas are stabilized (70-percent vegetative cover overall ground surface areas).

13. The contractor shall ensure that the site is free of trash and leftover materials prior to demobilization of equipment from the site. Upon completion of all construction activities, the area is to be restored to a condition equal to or better than found prior to undertaking work.

(9) Post restoration steam channel erosion protection and substrate restoration.
Refer to the Design Drawings

(10) A reclamation plan for areas disturbed by restoration activities, including: regrading, revegetation, and environmental enhancement. Include plans for riparian area plantings.

Refer to the Design Drawings.


Refer to the Design Drawings and 6.3/22.4 Exhibits.

(12) A description of the measures that will be used to prevent adverse water quality impacts during restoration activities.

Erosion and sedimentation measures will be in place to address any adverse water quality impacts during the restoration activities.

d. Chapter 105 Requirements for Pooled Stream Flow Restoration and Stream Dewatering Restoration should include the following information:

i. Verification that the public notification required in Module 2 was completed.

The required notifications are located in Module 2.

ii. A characterization of the resident aquatic community, a description of the riparian vegetation and an assessment of the probable hydrologic consequences of the proposed activities on the water quality and quantity, and the resident aquatic communities.

Refer to the Biological Monitoring Report prepared by CEC that was included in the Bailey East Permit Application (revisions #158 & 180) for a characterization of the resident aquatic community and the methods used to collect the biological data.

The riparian corridor of the streams within the restoration area consists mainly of mixed-age hardwood forest.

The purpose of this project is for a stream channel restoration plan and a design to minimize potential flow diminution; therefore, the proposed activities should improve the water quality and quantity and the resident aquatic communities.

iii. The name(s), address(es), and telephone number(s) of the individual(s) responsible for the collection and analysis of this data and provide a description of the methodologies used to collect and analyze the data.

The following individuals were responsible for the collection of the biological data used for this assessment:
James E. Mudge, Ph.D. Vice President of Ecological Services and CEC Staff
Civil & Environmental Consultants
333 Baldwin Road
Pittsburgh, Pennsylvania 15205-9702
Telephone (412) 429-2324

iv. A hydrologic and hydraulic analysis which includes:

(1) Data on size, shape and characteristics of the watershed;

The watershed of Polen Run is approximately 883 acres at the downstream limits, is primarily forested with type C and D hydrologic group soils. The watershed of Kent Run is approximately 1,702 acres at the downstream limits, is primarily forested with type C and D hydrologic group soils.

(2) The size and frequency of the design storm;
A natural channel design methodology has been utilized to size the channel geometry. This methodology uses the channel forming design storm even which equivalent to a 2 year storm event.

The proposed material overlying the GCL has been designed to withstand the anticipated shear stresses and velocities during a 100-year storm event. A hydrologic analysis is provided in Attachment 15. 6.c.1.

An analysis of design shear stresses and velocities is provided in Attachment 15. 6.c.1. Figures showing the anticipated shear stresses and velocities during a 100-storm are provided as Exhibits 15.6.d, respectively. Riprap shall be placed on the stream bottom and portions of the banks. Allowable shear stresses and velocities for riprap were obtained from the PADEP E&S Manual. Turf reinforcement mat (TRM) or coconut fiber mat is proposed for erosion protection on the banks. The proposed TRM has been tested in accordance with ASTM standards to withstand shear stresses up to 8.0 pounds per square feet (psf) and velocities up to 15 feet per second (fps) when fully vegetated. The proposed coconut fiber mat has been tested in accordance with ASTM standards to withstand shear stresses up to 2.25 pounds per square feet (psf) and velocities up to 8 feet per second (fps) when fully vegetated. Information on the proposed TRM and coconut fiber mat material is provide in Attachment 15. 6.c.2.

(3) The proposed stream restoration should have no adverse impact on velocities or shear stresses along the Polen Run Road embankment. Velocities and shear stresses can be expected to be lower than exiting conditions along the embankment since the stream channel is being moved further away from the embankment and a small floodplain is being created as part of the stream restoration grading plan. The combination of erosion control blanket, vegetation, and tree plantings proposed along the embankment will provide sufficient protection against erosion of the road embankment. The hydraulic capacity of the proposed replacement channel;

Refer to Attachment 15. 6.c.1.

(4) The hydraulic capacity of the stream channel upstream and downstream of the proposed relocation or channel change.

Natural channel design methodology was utilized to size the proposed channel and floodplain hydraulic capacities. This methodology mimics the existing channel/floodplain section, channel roughness, and slopes of the existing stream to provide stable channel geometry. The proposed channel capacities will match the existing channel at the upstream and downstream limits. See calculations provided in Attachment 15. 6.c.1.

v. Storm water Analysis: If a storm water management plan has been prepared or adopted under the Storm water Management Act, an analysis of the project’s impact on the Storm water Management Plan and a letter from the county or municipality commenting on the analysis.

Not applicable.

vi. Floodplain Management Analysis: If the proposed restoration project is located within a floodway delineated on a FEMA map, include an analysis of the project’s impact on the floodway delineation and water surface profiles and a letter from the municipality commenting on the analysis.

Not applicable.

vii. Risk Assessment: If the storm water or the floodplain management analysis conducted in 15.6(d) or 15.6(d)4 indicates increases in peak rates of runoff or flood elevations, include a description of property or land uses that may be affected and an analysis of the degree of increased risk to life, property and the environment.

The applicant is providing a stream restoration plan for Polen Run and Kent Run above the 3L, 4L and 5L longwall panels of the Bailey Mine. The existing length of Polen Run over the 3L through 5L panel is 4,470 feet and the proposed post-restoration length if implemented is
The existing length of Kent Run over the 3L through 5L panel is 4,750 feet and the proposed post-restoration length if implemented is 4,100 feet. The existing length of Polen Run over the 3L panel is 1,920 feet and the proposed post-restoration length if implemented is 1,870 feet. The existing length of Polen Run over the 4L panel is 1,790 feet and the proposed post-restoration length if implemented is 1,760 feet. The existing length of Polen Run over the 5L panel is 760 feet and the proposed post-restoration length if implemented is 763 feet. The existing length of Kent Run over the 3L panel is 2,420 feet and the proposed post-restoration length if implemented is 2,100 feet.

The project will have no adverse impact on flooding potential through the project areas or downstream of the projects. The land use and cover in the Polen Run and Kent Run watersheds will not change; therefore, the runoff curve number will not change. Primary or contingency restoration within Polen Run will not measurably impact the overall stream length.

Primary or contingency restoration within Polen Run will not measurably impact the overall stream length. If the contingency restoration in Polen Run over the 3L Panel had to be completed to the maximum possible length, the stream length would be reduced by approximately 50 feet. If the contingency restoration in Kent Run over the 3L Panel had to be completed to the maximum possible length, the stream length would be reduced by approximately 320 feet. These decreases are due to the elimination of meanders in the existing stream.

These reductions in stream lengths represent a minimal decrease in travel time length in the overall watersheds (Polen Run ~ 0.3% ; Kent Run ~ 2.3%). The roughness coefficient of the post-restoration channel will be higher than the roughness coefficient of the existing stream channel due to placement of riprap on top of the liner system. The existing roughness coefficient is 0.035, and the post-restoration roughness coefficient is 0.045 for Polen Run and 0.040 for Kent Run. The increased roughness reduces the flow velocity and increases the time of concentration. The end result of the slightly reduced stream length and higher roughness results in a slightly longer time of concentration for post-restoration conditions for both the Polen Run and Kent Run 3L Panel reaches. This demonstrates that there will be no adverse impact on flooding potential. Refer to Attachment 15.6.d.1 for time of concentration calculations.

viii. Provide verification that landowner’s consent and permission have been obtained to conduct activities on private property.

**Landowner consent has been obtained, see documentation provided in Attachment 15. 6.d.2.**

<table>
<thead>
<tr>
<th>Property ID</th>
<th>Surface Owner</th>
<th>Stream</th>
<th>Panel Number</th>
<th>Type of Document Allowing Access</th>
<th>Date Agreement Obtained</th>
</tr>
</thead>
<tbody>
<tr>
<td>2212-102</td>
<td>Hayhurst Company</td>
<td>Polen Run</td>
<td>3L</td>
<td>Deed</td>
<td>CPCC owned property 9/17/2010</td>
</tr>
<tr>
<td>2207-146</td>
<td>Phillip A. Hernberger</td>
<td>Polen Run</td>
<td>3L</td>
<td>Stream Access Agreement</td>
<td>Stream Access Agreement 7/16/2014</td>
</tr>
<tr>
<td>2212-104</td>
<td>Peter D. Friday</td>
<td>Polen Run</td>
<td>4L</td>
<td>Stream Access Agreement</td>
<td>Stream Access Agreement 4/9/2012</td>
</tr>
</tbody>
</table>
ix. Resource Characterization: For each stream or stream segment identified in module 15.6(a), provide the following pre-mining water resource information:

1. Is the water resource stocked by the Pa. Fish and Boat Commission? □ Yes □ No
2. Is the water resource designated as a Natural Wild or Scenic River or as part of the Commonwealth’s Scenic Rivers System? □ Yes □ No
3. Habitat Assessment: Provide a written narrative discussing the following ecological functions; food chain production, general habitat (nesting, spawning, rearing, resting, migration, feeding, escape cover), threatened and endangered species habitat (include PNDI search results), environmental study areas (sanctuaries, refuges).

   The watercourses run through wooded areas, which provide shade and some detritus material aiding in baseline food chain production. Tributaries provide habitat for nesting, rearing, resting, feeding and escape cover for small avian, mammalian and amphibian species. The stream restoration work will not decrease habitat functions.

   There are no known threatened or endangered species and/or critical habitat which have been identified within or adjacent to the proposed surface activity site. The PNDI searches indicated potential impacts under the jurisdiction of the Pennsylvania Game Commission (PAGC), PA Department of Conservation and Natural Resources (PADCNR), PA Fish and Boat Commission (PAFBC) and US Fish and Wildlife Service (USFWS). Approval letters from the PAGC, PAFBC, USFWS and PADCNR are provided in Module 4.

   A portion of the proposed project area is within Ryerson State Park. There are no known environmental study areas such as sanctuaries and/or refuges within the project area.

4. Water Quantity and Streamflow: Provide a written narrative discussing the following: natural drainage patterns, flushing characteristics, current patterns, groundwater discharge for baseflow, natural recharge areas for groundwater and surface water, storm and floodwater storage and control.

   The existing and planned restoration drainage patterns within the project area are consistent with forested stream corridors.

   **Natural Drainage Patterns, Flushing Characteristics, and Current Patterns**

   The affected reaches within the project area would be rated from low to high for these three hydrologic functions, depending on the degree of channel incision/floodplain connection, sinuosity, and bank stability present within each stream reach. Incised and unstable channels would be rated low, whereas those exhibiting more stable and natural channel characteristics would be rated moderate to high.

   **Groundwater Discharge and Recharge**
For the purpose of evaluating these functions it was assumed that the stream flow of higher order streams are maintained by groundwater baseflow discharge, contributary flow from tributary streams and springs, and periodic rainfall events and associated stormwater runoff. As such, all assessment reaches would be rated as high for groundwater discharge/baseflow and low for recharge. However, it should be noted that groundwater discharge and recharge functions could not be definitively confirmed with existing data. Hydrologic studies on other streams in the area (e.g., Enlow Fork) have demonstrated the presence of alternating loosing and gaining stream reaches within the same stream, indicating both functions may occur in the same regional setting. It is more likely that the streams receive groundwater discharges as baseflow and from hillside springs and seeps.

**Storm and Flood Water Storage and Control**

Stream assessment reaches would be rated low if the channel was incised well below the adjacent floodplain and lacked bankfull benches, gravel bars, or contiguous wetlands to provide floodwater attenuation and storage within, or adjacent to, the channel. Reaches with moderate incision, low banks and broad floodplains with depressional storage, and/or bankfull benches or wetland within the channel would be rated as moderate for the storm and floodwater control function.

(5) Water Quality: Provide a written narrative discussing the following: preventing pollution, sedimentation control, and natural water filtration.

Polen Run and Kent Run are both listed as TSF. Water quality and quantity is depicted in Module 8.3B and corresponding 8.4A Forms located within revision 180.

(6) Recreation: Provide a written narrative discussing the following: game species, non-game species, fishing, hiking, observation (plant/wildlife), or other recreational attributes.

Kent Run above the 3L panel is located on Commonwealth property within Ryerson State Park. The property is used as an outdoor recreation area for hunting, fishing, hiking, picnics and wildlife viewing opportunities. Polen Run above the 3L panel is located on private property.

The game species, non-game species, and fishing functions would be rated as high for the affected reaches within Ryerson State Park along North Fork Dunkard Fork because of the presence of both game and forage fish. The game species, non-game species, and fishing functions would be rated as moderate for the affected reaches within Ryerson State Park along Kent Run because of the presence of only forage fish. A low rating was assigned to privately owned reaches for these functions because of the limited public access. Hiking and nature observation would be rated as moderate to high within Ryerson State Park and low within privately owned reaches because of the limited public access to the streams and riparian zones.

(7) Describe upstream and downstream property uses.

The property upstream of Polen Run 3L panel is a mixture of forested and agricultural areas. The downstream property is a state road and North Fork Dunkard Fork. The property upstream of Kent Run 3L is uninhabited forest areas within Ryerson State Park. The downstream property is a state road and North Fork Dunkard Fork, located within Ryerson State Park.

(8) Other environmental factors determined by site investigation.

Not applicable.

x. Provide a discussion of the proposed activity’s impacts on: national, state or local parks, forests or recreation areas, natural or wilderness areas, national, state, or local historic sites, national natural landmarks, national wildlife refuges, cultural or archaeological landmarks, state game lands, federal, state, local or private plant or wildlife sanctuaries, and prime farmland.
The project will not have any impacts on national parks, national, state or local historic sites, national natural landmarks, national wildlife refuges, cultural or archaeological landmarks, state game lands, federal, state, local or private plant or wildlife sanctuaries and prime farmland since none are present within the project area.

The project will not have any long-term impacts on Ryerson State Park since the stream channels will be restored and forested vegetation closely matching existing conditions will be planted. Impacts associated with the proposed restoration activities on state park lands may consist of temporary access and construction disturbances including temporary impacts to Pine Box Trail near Kent Run. These impacts will be limited in scope and area. Pine Box Trail will have restricted access during construction but will be restored to original condition upon completion of construction. There is no potential impact anticipated as forested areas are re-established since the impacted forested areas are all near stream banks and outside recreational areas. The duration of temporary impacts during construction and revegetation will be approximately 120 days.

xi. Environmental Impacts: Provide the following information regarding environmental impacts:

(1) Include a discussion of the proposed activity's impacts to water resource characteristics listed in paragraph ix, above.

Primary and contingency restoration at Polen Run and at Kent run will not change the water resource characteristics of the streams. The water resource characteristics identified to include shade, detritus material and habitat, the ability to fish (trout stocked streams), hike and view wildlife and water quality and quantity will not be affected by mitigation activities (grouting or lining) because the proposed activities will not cause a reduction in the characteristics of the above. Proposed restoration activities will not cause impacts to the water resource characteristics listed in paragraph ix above including water resources stocked by PAFBC, waters designated as a natural wild or scenic river, Habitat Assessment, water quantity and streamflow, water quality, recreation, property uses or any other environmental factors determined by site investigation. Refer to the responses in paragraph ix above for the complete resource characterization and the following responses for construction impacts to the items listed in 15.6(d)(ix) above.

Habitat Assessment:

Primary restoration construction activitites will have no impacts to ecological functions, food chain production, general habitat, threatened and endangered specie habitat, sanctuaries or refuges. During channel excavation and lining, the stream habitat, vegetation, substrates, and associated small, immobile or sedentary organisms within the stream impact area will be temporarily lost. Larger and more mobile vertebrates should be able to migrate to adjacent areas of suitable habitat that are capable of providing acceptable food resources, cover and nesting habitats. Based on previous studies of benthic macroinvertebrate recovery following channel lining in stream reaches immediately downstream of Polen Run, the benthic community was restored to better than pre-restoration densities and quality in less than one year. No impacts are anticipated to general habitat or threatened and endangered spiecies habitat as shown by the PNDI clearances for either restoration activity.

Water Quantity and Streamflow:

Primary and contingency restoration construction activitites will temporarily affect the natural drainage patterns, flushing characteristics, and current patterns of the affected reaches. Restoration activities should restore most, if not all, of these hydrologic functions to pre-restoration conditions.

Short-term flow loss would limit the study streams’ ability to provide natural drainage patterns, flushing characteristics, and current patterns. However, flow augmentation should maintain the hydrologic functions associated with natural stream flow during low-flow periods. During decreased flow conditions, flushing characteristics and current pattern functions are naturally reduced. CPCC’s stream restoration plan will maintain these functions at a natural low-flow level.
The groundwater discharge functions of the affected reaches should not be altered by the proposed restoration activities.

The proposed channel excavation and restoration activities should restore flood control functions to the pre-restoration condition. Short-term flow loss due to restoration activities would not have any effect on storm and flood water storage and control functions.

**Water Quality:**

The proposed channel excavation and restoration activities should restore pollutant and sediment removal functions and natural water filtration to the pre-restoration condition if any impacts are encountered.

**Recreation:**

The proposed stream restoration activities should return the affected reaches to their pre-restoration condition, thus restoring existing recreational functions.

**Upstream and Downstream Property Uses:**

No adverse impacts are anticipated to upstream or downstream property uses in relation to stream restoration activities.

**Other Environmental Factors**

No other significant environmental features were identified during this study and no adverse impacts to significant environmental factors are anticipated from the completion of this project.

If contingency restoration is required at Kent Run above the 3L panel between station 0+00 and 21+00, the overall stream length will be reduced by 13% through the project area due to the removal of meanders and sections of the existing stream which are unstable. However, surface area of the restored stream at Kent Run above the 3L panel will increase by approximately 12% above the 3L panel. The surface areas of the pre-mining and post-restoration stream channels, which are calculated from the top of the stream bank, are determined from detailed topographic surveys and digital measurements. If contingency restoration is required at Polen Run above the 3L panel between station 56+47 and 75+00, the overall stream length will be reduced by a nominal 50 feet (3%) through the project area which does due to the removal of meanders and sections of the existing stream which are unstable. The surface area of the restored stream at Polen Run above the 3L panel will be reduced by 14%. The surface area of the pre-mining and post-restoration stream channels, which are calculated from the top of the stream bank, are determined from topographic surveys and digital measurements from the top of the streambank. The reduction in area is primarily attributable to site constraints upstream of the open grate bridge on Polen Run Rd. The streambed area downstream of the open grate bridge remains essentially unchanged. The restored channels, along with the liner installation, will provide continuity of hydrology, channel morphology, instream habitat, and riparian zones providing geomorphological and ecological benefits with increased stream areas in the system.

<table>
<thead>
<tr>
<th>Stream ID</th>
<th>Panel ID</th>
<th>Existing Streambed Area</th>
<th>Proposed Streambed Area</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kent Run</td>
<td>3L</td>
<td>50,780</td>
<td>57,035</td>
<td>12%</td>
</tr>
<tr>
<td>Polen Run</td>
<td>3L</td>
<td>36,613</td>
<td>31,359</td>
<td>-14%</td>
</tr>
</tbody>
</table>

Where contingency restoration is required, CPCC will compare pre-mine bio-density scores to post-restoration bio-density scores to show that the post-restoration biological community will remain equal to or greater than the pre-mine biological community. Bio-density scores will be calculated from biological data collected at Appendix A monitoring station 32600(1B) at Kent Run above the 3L panel and at Appendix A monitoring station 32603 (1B) at Polen Run above the 3L panel. Appendix A monitoring station are as approved and shown in Revision 180 as well as in Exhibit 15.6(c)(ii)(1) of this permit application.

Data used to determine the pre-mine and post-restoration densities will be collected in accordance with the PA DEP's Technical Guidance Document 563-200-655, Appendix A Stream Survey sampling protocol. As such, organisms are collected within a 1 square meter of streambed sampling location, identified to the family level and categorized by relative abundances of rare (1-
3), present (4-10), common (11-24), abundant (25-100), or very abundant (>100). The following numeric value will be assigned to each abundance category to determine the total number of organisms collected during each sampling event: rare (2), present (7), common (18), abundant (62), very abundant (200). The total number of organisms estimated to be present within the stream channel will be based on the number of organisms counted during each Appendix A survey and the corresponding area of stream. Please see Attachment 15.6.d.xi.(1) for a table of the pre-mine bio-density calculation and baseline data forms for data collected at 32600(1B) and 32603(1B).

The post-restoration bio-density calculation will be conducted between the months of October through May for a period of 3 years following completion of the restoration or until the performance standard is met. The performance standard will be considered to be met once the total number of organisms estimated to be present in the post-restored stream areas of Kent and Polen Run above the 3L panels are equal to or greater than the number of organisms estimated to be present in the pre-mining stream areas that corresponds to the portion of the stream where contingency restoration is performed. Yearly reports on the monitoring shall be submitted to the Department.

Failure to meet the performance standard within 3 years will result in additional restoration requirements to offset the reduction in stream lengths.

(2) Identify all environmental impacts on other adjacent land and water resources associated with the planned encroachment activities.

No environmental impacts on other adjacent land and water resources are expected from the planned encroachment activities associated with this application.

(3) Identify and evaluate the potential cumulative environmental impacts of the proposed activity and other potential or existing similar activities, and the impacts that may result through numerous piecemeal changes to the impacted water resource.

No cumulative environmental impacts are expected. The channel flows will be restored and stable channels will be constructed.

xii. Alternatives Analysis: Provide a discussion of any alternatives to implementing the encroachment or restoration plan(s).

There are no alternatives to implementation of the restoration plan.

e. Minor stream restoration activities should include the following information:

(Note: Minor stream restoration activities could include: streambed deformation restoration, streambed sealing, streambed grouting, stream channel enhancement structures, etc.)

i. A post-mining evaluation procedure for the proposed restoration activities.

Refer to section 15.6.c.ii.(1) for a description of the post-mining evaluation plan for the proposed restoration activities and to the approved grouting plans in Revision 180 Module 15.2(r).

ii. A description of the location of the streambed restoration area(s) (if known). Show the restoration areas on the Environmental Resource Map, Exhibit 6.3.

The stream restoration plan included in this application is for Polen Run and Kent Run above the 3L through 5L longwall panels. Refer to the Exhibit 6.3/22.4 maps for locations of the proposed restoration activities.

iii. Restoration plans that should include the following information:

(1) A general description of the proposed restoration activities and the time frame in which the activities will occur. Describe the effect of the restoration activities on public health and safety.

Potential restoration activities include streambed grouting and/or streambed liner installation. Refer to section 15.6.c.ii.(1) for a more descriptive answer. The proposed
restoration activities are not expected to have any effect on public health and safety since there will be no landuse changes.

(2) A general cross-section of the restoration area.

**Cross sections are included as part of the Design Drawings.**

(3) An erosion and sedimentation control plan for the restoration activities that includes a description of the activities, structures, best management practices, water handling plans, construction typicals and implementation methods that will be utilized throughout all phases of the restoration.

**Refer to section 15.6.c.ii.(8) for the erosion and sedimentation plan for the proposed restoration activities.**

(4) Post restoration stream channel erosion protection and substrate restoration.

**Refer to the Design Drawings.**

(5) A reclamation plan for areas disturbed by restoration activities, including: regrading, revegetation, and environmental enhancement. Include plans for riparian area plantings.

**Refer to the Design Drawings.**

(6) A description of the measures that will be used to prevent adverse water quality impacts during restoration activities.

**Erosion and sedimentation measures will be in place to address any adverse water quality impacts during the restoration activities.**

(7) A post-mitigation Stream Delineation and Bioassessment Summary (Form 8.8B), a Quantitative Multi-Habitat Bioassessment of Diverse Community (Form 8.8C), and a Biometric and Total Biological Score Summary (Form 8.8D), must be submitted to evaluate all areas requiring minor stream restoration.

**The approved Bailey East Revision 180 application contains the approved plan for the above assessments for streams within the entire permit area. Refer to section 15.6.c.ii.(1) of this application to address the restoration effectiveness and biological evaluations for areas that may require stream restoration.**

### 15.7 United States Army Corp of Engineers Permits

a. The United States Army Corps of Engineers (Corps) authorizes a Pennsylvania State Programmatic General Permit – 4 (PASPGP-4) when there will be a discharge of dredged or fill materials, or the placement of both temporary and/or permanent structures, which individually or cumulatively result in impacts to 1.0 acre or less of waters including wetlands. The information submitted under this section will be forwarded to the Corps as a PASPGP-4 / Category III activity for review. The Commonwealth has issued 401 Water Quality Certification for projects eligible under PASPGP – 4.

**CPCC is coordinating directly with the US Army Corps of Engineers (USACE). A NWP 27 permit application has been submitted to the USACOE Pittsburgh Office. Approval from the Corps will be provided to the Department.**

Have you completed and attached the “PASPGP-4 Cumulative Impacts Project Screening Form (3150-PM-BWEW0050)” and supporting documents listed below to this module? □ Yes □ No

Note: The applicant must attach an additional copy of the following information, which will be forwarded to the appropriate Corps District:

i. PASPGP-4 Cumulative Impact Project Screening Form (3150-PM-BWEW0050)

ii. Exhibits:
(1) Exhibit 6.1 Location Map,
(2) Exhibit 6.2 Environmental Resource Map,
(3) Exhibit 9 Operations Map,
(4) Exhibit 18 Land Use / Reclamation Map, and
(5) A CD or DVD containing any exhibits that are larger than 8 ½ by 11 inches. (saved in a .pdf form).

iii. Module 1: Application for Bituminous Underground Mine, Coal Preparation Plant and/or Coal Refuse Disposal Area.


v. Endangered Species Act /Pennsylvania Natural Diversity Inventory correspondence.

vi. Pennsylvania Historical and Museum Commission correspondence (Section 106 coordination).

Note: If the site has been identified as a high probability or known archeological site, the Corps will require a Phase I survey.

b. If there will be a discharge of dredged or fill materials, or the placement of both temporary and/or permanent structures, which individually or cumulatively result in impacts to more than 1.0 acre of waters including wetlands, or such activities are otherwise ineligible for a PASPGP-4, the Corps may require an individual permit in accordance with Section 404 of the Clean Water Act.

Have you submitted an "Individual Permit" to the Corps?  □ Yes  □ No

If yes, you must also complete Form 15A to request a 401 certification from the Department.

15.8 General Permits – Water Obstruction and Encroachments

Please check the appropriate box for each General Permit submitted with this application.

Not applicable.

□ New Permit
□ Transfer or Existing Permit

Type of General Permit:

□ GP- 1: Fish Habitat Enhancement Structures
□ GP- 2: Small Docks & Boat Launching Ramps
  □ Private recreational dock
  □ Public access facility
  □ Public service facility
  □ Other private or commercial facility
□ GP- 3: Bank Rehabilitation, Bank Protection, and Gravel Bar Removal
□ GP- 4: Intake and Outfall Structures
□ GP- 5: Utility Line Stream Crossing
□ GP- 6: Agricultural Crossings & Ramps
□ GP- 7: Minor Road Crossings
□ GP- 8: Temporary Road Crossings
□ GP- 9: Agricultural Activities
□ GP-10: Abandoned Mine Reclamation
□ GP-11: Maintenance, Testing, Repair, Rehabilitation, or Replacement of Water Obstructions and Encroachments
□ GP-15: Private Residential Construction in Wetlands
Note: The “Application for Transfer of Permit1/ and Submerged Lands License Agreement” (3150-PM-BWEW0016) may be required when submitting a general permit.

The General Permit application(s) must include, but are not be limited to the following contents for each proposed surface mining activity.

1. A description of the category of each dam, water obstruction, or encroachment covered by the general permit, including all exceptions to that category.

2. Identify all watersheds, streams, or geographic areas within the general permit area.

3. A set of standardized specifications or plans for the particular category of dam, water obstruction or encroachment or a reference to specific criteria and requirements adopted by another Federal or State agency which adequately regulates the particular category of dam, water obstruction or encroachment.

4. A set of conditions governing the construction, operation, maintenance, inspection and monitoring of the projects covered by the general permit as are necessary to assure compliance with the act, Chapter 105 and other laws administered by the Department, the Fish and Boat Commission and a river basin commission created by interstate compact.

5. The correct fee(s) for each General Permit submitted.

6. General Permit registration requirements established by the Department.
General requirements: A mining or coal refuse disposal activity that involves encroachment into a stream or wetland requires a DEP mining activity permit and a US Army Corps of Engineers (Corps) permit issued pursuant Section 404 of the Federal Clean Water Act (FWPCA). An applicant proposing this type of activity must file a state mining activity permit application with the DEP district mining office and a separate federal permit application with the Corps district office.

Need for a Section 401 certification: As a matter of coordination, the Corps district office will not issue the federal Section 404 permit until DEP issues an Individual Water Quality Certification pursuant to Section 401 of the FWPCA, certifying that the activity will comply with the provisions of sections 301-303, 306 and 307 of the FWPCA and will not violate applicable federal and state water quality standards. The DEP district mining office issues this certification based on the information presented in the state permit application, public comments received with respect to the state permit application, and consultation with the Corps district office in regard to the federal permit application.

To ensure timely processing of both state and federal permit applications, the applicant is encouraged to:

- Contact the Corps district office to determine if a Section 404 permit is required for the proposed activity, and what type of permit is needed (an individual permit or nationwide permit).
- Complete and submit this form with the state mining activity permit application to the DEP district mining office.

Applicant: Consol Pennsylvania Coal Company LLC  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317  
Telephone: 724-485-3445  
Municipality: Richhill  
County: Greene  
Operation Name: Polen & Kent Run Restoration  
Application No: 30841316  
Application Date: October 2015

Section 1: Corps Determination:

This project requires 401 certification for:

☐ An individual 404 permit  
☐ Modification to an existing 404 permit  
☒ Authorization to operate under Nationwide Permit No. 27

Section 2: Activity Description:

Please describe the activities that are the subject of this request:

Conduct stream restoration activities and wetland impact and replacement on Polen and Kent Run within the 3L to 5L Panels.

If the scope of activities (including any mitigation to be performed as compensation for the unavoidable impacts of fill placement) proposed under the federal permit application is the same as the scope of activities proposed under the state permit application, check here ☒ and provide the application number assigned by the Corps TBD and the date on which the application was filed October 2015.
If the scope of activities described under the federal permit application differs from the scope of activities described under the state permit application, attach a copy of the federal permit application.

Note that any substantial revisions required as part of the federal application review process must be provided to the DEP district mining office.

Section 3: Signature(s)

I (am the applicant) (am an officer of the applicant) (have the authority to file a Section 404 application for this project) and certify that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief, I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Note: Cross out inapplicable portions in parenthesis).
## FORM 15.3A - WETLAND INVENTORY SUMMARY

Operator: CONSOL PA Coal Company LLC

Operation Name: Bailey Mine

### Site Information
- **Bailey 3L Panel**
  - 132A: 0.176 acre
  - Wetland I.D.: 132A
  - Acridaceae: N
  - Nipaella: N
  - Nymphaeaceae: N
  - Noxious Plants: N
  - Nymphoides: N
  - No Nuisance: N
  - No Nuisance: Y
  - Nymphaeaceae: N
  - No Nuisance: N

- **Bailey 3L Panel**
  - 133A: 0.012 acre
  - Wetland I.D.: 133A
  - Acridaceae: N
  - Nipaella: N
  - Nymphaeaceae: N
  - Noxious Plants: N
  - Nymphoides: N
  - No Nuisance: N
  - Nymphaeaceae: N
  - No Nuisance: N

- **Bailey 3L Panel**
  - 134A: 0.021 acre
  - Wetland I.D.: 134A
  - Acridaceae: N
  - Nipaella: N
  - Nymphaeaceae: N
  - Noxious Plants: N
  - Nymphoides: N
  - No Nuisance: N
  - Nymphaeaceae: N
  - No Nuisance: N

- **Bailey 3L Panel**
  - 135A: 0.022 acre
  - Wetland I.D.: 135A
  - Acridaceae: N
  - Nipaella: N
  - Nymphaeaceae: N
  - Noxious Plants: N
  - Nymphoides: N
  - No Nuisance: N
  - Nymphaeaceae: N
  - No Nuisance: N

- **Bailey 3L Panel**
  - 136A: 0.040 acre
  - Wetland I.D.: 136A
  - Acridaceae: N
  - Nipaella: N
  - Nymphaeaceae: N
  - Noxious Plants: N
  - Nymphoides: N
  - No Nuisance: N
  - Nymphaeaceae: N
  - No Nuisance: N

- **Bailey 3L Panel**
  - 137A: 0.049 acre
  - Wetland I.D.: 137A
  - Acridaceae: N
  - Nipaella: N
  - Nymphaeaceae: N
  - Noxious Plants: N
  - Nymphoides: N
  - No Nuisance: N
  - Nymphaeaceae: N
  - No Nuisance: N