

## Module 13: Impoundments

Provide the following information for each impoundment that will be used in operations under this permit. Organize the information by site and facility.

### 13.1 General

- a. Identify the impoundment so that it can be keyed to Exhibit 9.1.  
Not applicable to this application. Previously approved.
- b. Describe the function of the impoundment.  
Not applicable to this application. Previously approved.
- c. Attach site-specific cross sections of the impoundment showing: the principal spillway, dewatering pipe, depth of water, crest of emergency spillway, maximum height of embankment, and existing ground. Label the cross-section Exhibit 13.1 – Impoundment Cross-Section.  
Not applicable to this application. Previously approved.
- d. Describe the potential effect of mine subsidence on the impoundment structure.  
Not applicable to this application. Previously approved.
- e. Provide plans and describe procedures to compute accurate discharge flow rates from sediment and treatment pond principal spillways and dewatering pipes. The field system as well as the calculation method must be usable by monitoring personnel and PADEP mine inspectors.  
Not applicable to this application. Previously approved.

### 13.2 Detailed Design Plan

Include a design report, capacity calculations, construction plans, construction specifications, and Form 13.2A. If the embankment is more than 20 feet in height as measured from the upstream toe of the embankment to the crest of the emergency spillway, or has a storage volume of 20 acre feet or more provide a stability analysis. All plans must be certified by a licensed professional engineer. Impoundments must be certified by a licensed professional engineer and approved by the Department before being put into service.

Refer to Attachment 13.2 for treatment pond size justification.

### 13.3 Compliance with 25 Pa Code Chapter 105

Indicate whether or not the impoundment meets the criteria for coverage under Chapter 105 - contributory drainage area exceeding 100 acres, water depth exceeding 15 feet (measured by the upstream toe of the dam at maximum storage elevation), or impounding capacity exceeding 50 acre-feet at maximum storage elevation. Applications for Chapter 105 dams are subject to additional application fees (see Module 1: Section E, Application Fee).

Not applicable to this application. Previously approved.

### 13.4 Groundwater Protection

- a. Describe the quality of water that will be contained in the impoundment.  
Not applicable to this application. Previously approved.
- b. Where impounded water has the potential to cause groundwater contamination or to aggravate an existing groundwater problem:
  - i. Show the liner on the cross section drawings in Module 13.1; and  
Not applicable to this application. Previously approved.

- ii. Complete Module 14.

Not applicable to this application. Previously approved.

### **13.5 Operation and Maintenance Requirements**

Describe the operation and maintenance requirements for the structure, including:

- a. Scope and frequency of inspections;

Not applicable to this application. Previously approved.

- b. Dewatering of runoff collection ponds following storm events;

Not applicable to this application. Previously approved.

- c. Sludge removal operations;

Not applicable to this application. Previously approved.

- d. Maintenance of embankments and liners; and Monitoring.

Not applicable to this application. Previously approved.

Attachment 13.2

Mine Water Discharge and Surface Drainage

Mine Water Discharge

The treatment basins must be capable of retaining the deep mine pumping flow for a minimum of twelve (12) hours of retention.

Mine water pumping rates from the Rustic Ridge #1 mine were utilized, along with the extent of current mining, in order to calculate actual mine water production expressed in gpm/acre mined.

See below for parameters utilized in determining mine water production per acre mined based on July 2021 pumping rates and mined area. Refer to Attachment 13.22: Mining Area for a visual representation of the July 2021 mining area and 35° angle of influence of underground mining utilized in the mine water production rate calculations.

Pumping rate from mine : 94.12 gpm  
35° Angle of influence area: 570.6 Acres

Based on the above parameters, it is calculated that the mine water production per acre mined based on July 2021 pumping rates and mined area is 0.17 gpm/ac mined.

Based on the calculated 0.17 gpm/ac mined, the mine water storage volume required is as follows:

4,280.7 ac. to be mined x 0.17 gpm/ac x 60 min./hr. x 12 hours detention=  
523,958 gallons or 70,048 ft<sup>3</sup> required storage capacity.

Pit / Pad Drainage Areas

The pit area will be excavated to an elevation of 1625' where 1 slope entry will be constructed. The coal storage and stockpile areas as well as the area draining to the final pit opening was used for the purpose of estimating the capacity of the treatment facilities. The final pit drainage configuration will be observed when the treatment facility receives the maximum flow. The following site soil attributes were used to estimate the runoff to the pit and pad area:

Pit Surface Drainage Area = 3.4 ac.

Curve Number = 85

Rainfall 10 yr/24 hr storm = 4.0 in.

Runoff depth from onsite soils\* = .2050'

\*See attached sheet "Rainfall-Runoff Depths for Selected Runoff Curve Numbers"

Pit surface runoff:

3.8 ac. x .2050' x 43,560 = 33,934 ft<sup>3</sup> required storage capacity

Pad Surface Drainage Area = 1.5 ac.

Curve Number = 85

Rainfall 10 yr/24 hr storm = 4.0 in.

Runoff depth from onsite soils\* = .2050'

\*See attached sheet "Rainfall-Runoff Depths for Selected Runoff Curve Numbers"

Pad surface runoff:

1.5 ac. x 0.2050' x 43,560 = 13,395 ft<sup>3</sup> required storage capacity

**Required Storage = 117,377 ft<sup>3</sup>**

**Pumping Rate**

Based on a maximum pumping/flow rate of 2,050 gpm, the required treatment volume can be calculated as follows:

$$\frac{2050 \text{ gal}}{\text{Min}} \times \frac{60 \text{ min}}{\text{hr}} \times 12 \text{ hr} \times \frac{1 \text{ cf}}{7.48 \text{ gal}} = 197,327 \text{ cf}$$

$$\underline{\underline{\text{Required Storage} = 197,327 \text{ ft}^3}}$$

**Total Required Capacity**

The maximum pumping/flow rate to the Treatment facilities yields the larger required storage capacity, 197,327 ft<sup>3</sup>. One third sludge storage factor must be added to determine the total required capacity

$$1.33 \times 197,327 \text{ cf} = 262,445 \text{ cf}$$

$$\underline{\underline{\text{Total Required Storage} = 262,445 \text{ ft}^3}}$$

**Proposed Treatment Pond Capacities:**

Treatment Pond (TP-1) capacity between the sediment storage elevation and the principal spillway is: = 117,241 ft<sup>3</sup> (Total Storage: 157,056 ft<sup>3</sup>)

Treatment Pond (TP-2) capacity between the sediment storage elevation and the principal spillway is: = 109,645 ft<sup>3</sup> (Total Storage: 147,238 ft<sup>3</sup>)

Combining the volumes of these two basins between the sediment storage elevation and the principal spillway elevation equals 226,886 ft<sup>3</sup> or adequate approximately of 13.8 hours of detention for a 2,050 gpm pumping/flow rate.

The total capacity provided for sludge storage is equal to 77,408 ft<sup>3</sup>.

*Note: As per private settlement agreement between LCT Energy, LP and Mountain Watershed Association, the mine water pumping rate will be limited to 1.44 MGD, and the total combined flow rate from the coal pad sump, pit sump and underground working shall not exceed 2.232 MGD.*