SUSQUEHANNA RIVER BASIN COMMISSION
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Groundwater Withdrawal Application Summary

Source Name: Naginey Increase **SRBC Pending No.:** 2023-033

This summary is only a portion of the application materials and is meant to provide general information about the proposed project.

1.1 Project Sponsor

Company Name:	Glenn O. Hawbaker Inc.
Mailing Address Line 1:	711 E. College Ave.
Mailing Address Line 2:	
City:	Bellefonte
State:	PA
ZIP Code:	16823

Contact Person:

First Name:	Benjamin
Last Name:	Welch
Title:	Manager of Environmental Services
Telephone:	(814) 359-5085
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1.3 Existing and Projected Facility Water Use

The usage should be entered in million gallons per day (mgd) and rounded off to the nearest one thousand gallons (three decimal places).

Projected Design Year:
2036

Total Project Water Usage	**Existing Usage (mgd)**	**Projected Usage For Design Year (mgd):**
Maximum 30-day Average Water Demand :	0.3	0.725
Maximum Daily Water Demand :	0.3	0.725
System Capacity :	0.3	0.725

1.4 Requested Withdrawal Amount:

Estimated Daily Hours of Operation per Day (Ex. = 5):	10
Maximum Instantaneous Withdrawal Rate (gpm):	2700
Maximum 24-Hour Day (mgd):	0.725
Maximum 30-Day Average (mgd):	0.725

2.2 Facility Location

Please enter the address of the parcel where the Project Facility is located.

Street Address:	475 Naginey Road
State:	PA
County:	Mifflin
Municipality:	Armagh Township
Zip Code:	17063
Subbasin:	Juniata

Glenn O. Hawbaker, Inc.
Naginey Quarry
SRBC Groundwater Withdrawal Application

2.1 Project Facility Description

Glenn O. Hawbaker, Inc. (GOH) owns and operates the Naginey Quarry (herein referred to as the "facility"), which is located at 475 Naginey Road in Mifflin County, Pennsylvania. The facility is located 1 mile southeast of Milroy, Pennsylvania. From US 322, take the Milroy exit, turn left onto Old US 322, then right onto North Main Street. From North Main Street, continue straight on Naginey Road for 1 mile to the quarry entrance on the north side of the Road. The facility consists of an active open-pit quarry, and stripping, drilling and blasting limestone bedrock, crushing and screening of aggregate materials, and reclamation activities are conducted at the site. The facility has been mined for approximately 98 years in total, with GOH assuming ownership in 2015. GOH intends to continue mining limestone at the facility well into the future.

GOH operates an aggregate processing and asphalt plant at the facility. Aggregate processing includes crushing and screening of limestone materials removed from the active quarry, generating stockpiles of various-sized stone products across the site. Loading of the various stone products also occurs at the facility. In addition to the aggregate plant, an asphalt plant also uses the crushed and sorted limestone materials to produce asphalt in a water-free process.

Approved Facility Groundwater Withdrawal and Consumptive Use Description (SRBC Docket No. 20111204)

Groundwater Withdrawal and Distribution

The facility has a 17.9-acre, approximately 174-million-gallon quarrypit pond that was formed at the facility when historical mining activities intercepted a water-bearing open karst zone. The water is pumped via submersible pump into a 1.6-acre, 15.3-million-gallon processing water pond (approximately 163' x 420' x 30' deep) at the southern end of the pit pond that was formed by constructing a gravel causeway across the quarry pit pond. Under GOH's currently approved SRBC groundwater withdrawal and consumptive use activities, water is then withdrawn from the processing water pond (via two submersible pumps for use in the facility's aggregate processing plant (which has a capacity of approximately 0.300 mgd/208 gpm) and tire wash. The 0.300 mgd capacity of the existing aggregate processing plant is based on the experience of GOH personnel operating the same plant at a nearby limestone quarry processing similar quality material as the Naginey Quarry. The pump used for water supply to the aggregate processing plant is an American-March Pumps Model 13MC, which has a maximum instantaneous withdrawal rate (MIWR) of 1,200 gpm. The pump being utilized for withdrawal of water for the tire wash is a Grindex Major N-H MSHA, with a MIWR of approximately 300 gpm.

Additionally, groundwater used for dust suppression at the facility is currently vacuum pumped directly from the processing water pond into water trucks. The volume of the water trucks used at Naginey Quarry ranges from 4,000 gallons to 9,000 gallons, depending on need and truck availability. The amount of water needed for dust suppression varies greatly according to season and precipitation conditions. The volume of water used is monitored via a daily log of truck volume and count. In the future, GOH may install a pump and meter to supply water for the dust suppression system. In that case, the same model pump and meter as used in the tire wash will

be used to supply and monitor dust suppression withdrawals.

At the aggregate processing plant, water is pumped from the processing water pond primarily to the wash plant and to a flocculent skid. The water is used by the aggregate conditioner, the main wash screen, and the sand washer. Once the limestone materials are washed, the remaining water not absorbed by the material is collected in a slurry collection tank. At the flocculent mixing skid, the fresh water from the processing water pond is mixed with an anionic flocculent. This flocculent mixture is then mixed to the water from the slurry collection tank at a slurry discharge pond. After particulates have separated from the slurry, the water is pumped into a series of settling ponds to provide further time to settle particulates. Once the water is ready to be used again for processing, it is then returned to the Quarry Pit Pond and can be pumped back into the processing water pond for reuse at the plant.

Water Reuse/Return Water Process

Of the 0.300 mgd utilized by the wash plant, most of the water is recycled through the plant as described above. Of that flow, approximately 0.075 mgd of makeup water is required to account for water losses to processing of limestone aggregate, water bound to product rock, use for dust suppression in the plant, and use at the tire wash. This 0.075 mgd of makeup water is used consumptively.

Water is not discharged from the facility. Currently, excess water from the tire wash and stormwater from the asphalt plant flow overland into a collection sump below the tire wash. This water is pumped from the sump into the Slurry Discharge Pond, is allowed to flow through a series of settling ponds for sediment settling and polishing, and is returned to the Quarry Pit Pond via open channel and reused. It should be noted that the need to use the tire wash and dust suppression system will be greatly minimized during rain events that coincide with periods of higher stormwater flows at the facility.

Similarly, excess water from the aggregate plant flows into or is pumped into the slurry collection tank, allowed to pass through the Slurry Discharge Pond and a series of settling ponds, returned to the Quarry Pit Pond, and reused. Stormwater from the area of the aggregate plant also flows overland and collects in the Slurry Discharge Pond; however, stormwater flow from the aggregate plant enters the Slurry Discharge Pond downstream from the metered return flow from the aggregate plant and stormwater will not be included in the metered flows. Additionally, a smaller portion of both the aggregate plant flow and overland stormwater flow infiltrates through the subsurface back into the regional water table.

All stormwater is contained within the quarry pit. There are no stormwater control structures or other point-source discharges at the facility.

Evaporative losses from the processing water pond, collection basin, slurry collection pond, and series of settling basins constitute an additional component of the facility's consumptive use. The processing water pond covers approximately 1.6 acres, the collection pond covers approximately 0.056 acres, and the slurry discharge pond and series of settling/polishing basins cover a combined approximately 0.31 acres, for a total of 1.94 acres of evaporative surfaces. Per correspondence with the Commission dated July 31, 2020, evaporative losses from the larger 16.3-acre quarry pit pond are not to be included in the total consumptive use volume. Table 1 summarizes the evaporative losses by month:

Table 1: Evaporative Loss Summary

Month	Evaporation Amount SRBC Averages (in)	Evaporation per Month (gal/month)	Evaporation per Day (gal/day)
January	0.0	0	0
February	0.0	0	0
March	0.0	0	0
April	3.0	158,027	5,268
May	4.9	258,111	8,326
June	5.4	284,449	9,482
July	5.8	305,519	9,855
August	4.9	258,111	8,326
September	3.6	189,632	6,321
October	2.4	126,422	4,078
November	0.0	0	0
December	0.0	0	0

Notes:

Evaporation amount is based on evaporation rates contained in Commission Form 74

As the table shows, the maximum evaporative loss of 9,855 gpd occurs in July. Rounding to the nearest 0.010 gpd results in a total maximum 30-day average consumptive use of 0.310 mgd for the facility.

Proposed Facility Groundwater Withdrawal and Consumptive Use Increase Description

GOH proposes to install and use an additional sand screw in the aggregate production process. The addition of this equipment will allow GOH to expand its production of sand-sized material for direct sale and/or use at the asphalt production facility at the quarry.

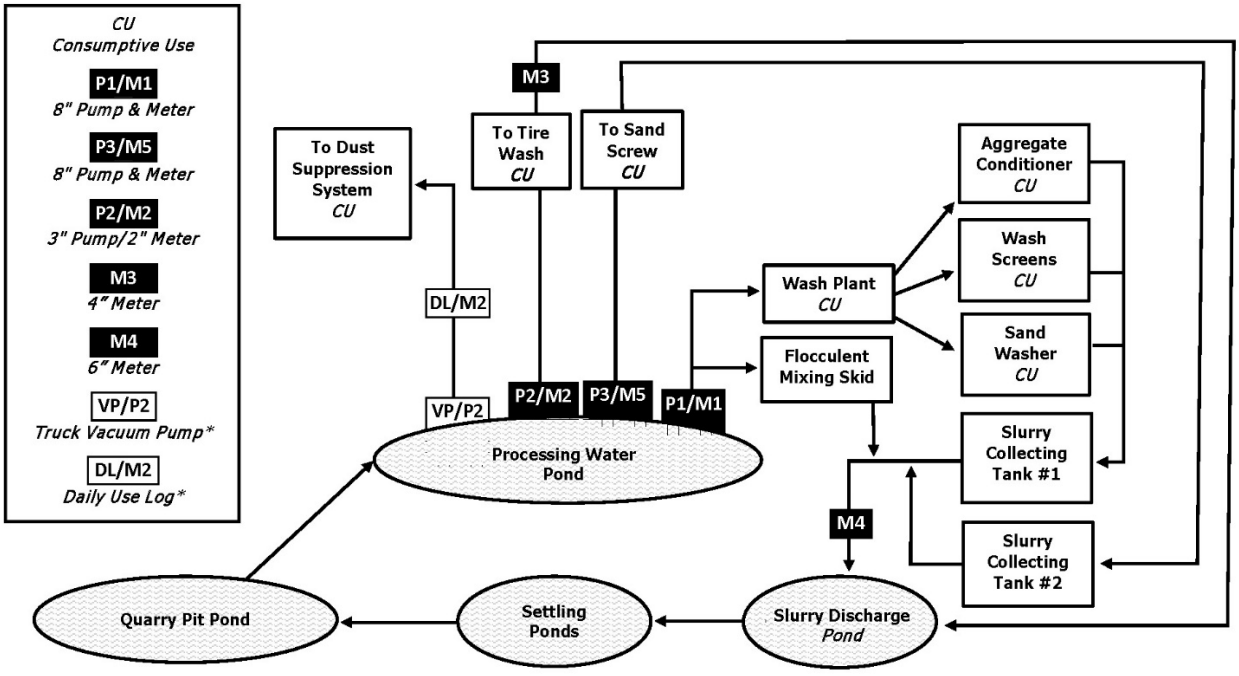
Use of the sand screw will require an increase in the facility's approved groundwater withdrawal rates. **Based on production at other facilities utilizing a similar sand screw, GOH proposes to increase its groundwater withdrawal to 0.725 million gallons per day (mgd) or 1208.3 gallons per minute (gpm)**; this total daily usage represents the full capacity of the wash plant incorporating the new sand screw at maximum processing rates, assuming no water is lost.

GOH proposes to use an identical pump as is currently used to supply the aggregate processing plant, an American-March Pumps Model 13MC, to supply the new sand screw. As the operating conditions are also essentially identical between the aggregate processing plant and new sand screw, the new sand screw pump will also have a maximum instantaneous withdrawal rate (MIWR) of 1,200 gpm. **Therefore, the MIWR for the entire facility based on the total pump capacity will be 2,700 gpm or 1.62 mgd (over a 10 hour day or operation).**

However, of the 0.725 mgd utilized by the wash plant, most of the water is recycled through the plant as described above. With the addition of the new sand screw, GOH estimates that approximately 0.125 mgd of makeup water will be required to account for water losses to processing of limestone aggregate (including the new sand screw), water bound to product rock, use for dust suppression in the plant and on roadways, and use at the tire wash. **This 0.125 mgd of makeup water will comprise the consumptive use of the facility with the use of the new sand screw. Because the approved consumptive use at the facility is 0.310 mgd based on the existing total system capacity, GOH does not intend to modify the approved consumptive use application.**

The return water from the new sand screw will be pumped to a new, dedicated slurry collecting tank adjacent to the existing slurry collecting tank used for the wash plant. Discharge for the new slurry collecting tank will be pumped through the same line as the existing slurry collecting tank into the Slurry Discharge Pond, and combined return flows will be measured at the existing meter (identified as M4 in the diagram below).

The flow diagram below illustrates the overall flow of water through the facility following incorporation of the new sand screw.



***Note:** Groundwater is currently vacuum pumped directly from the processing water pond into water trucks for dust suppression use at the facility. The volume of water used is monitored via a daily log of truck volume and count. GOH reserves the right to install a pump and meter in the future to supply water and monitor groundwater withdrawal for the dust suppression system. In the case that GOH replaces the vacuum pump and daily truck log with a pump and meter, it is anticipated that the same pump and meter will be used to supply and monitor water use in the dust suppression system as is currently used in the tire wash.

Refer to Table 1 and Attachment 2 for meter specifications, and Attachment 3 for withdrawal pump specifications.

Glenn O. Hawbaker, Inc.
Naginey Increase
SRBC Alternative Hydrogeologic Evaluation Application

4.3.3 Impacts to the Environment

Background

The Glenn O. Hawbaker, Inc. (GOH) Naginey Quarry (herein referred to as the "facility"), uses a 17.9-acre, 174-million-gallon quarry pit pond as a water resource for processing activities. The pond was formed at the facility when historical mining activities intercepted a water-bearing open karst zone. A 1.6-acre, 15.3-million-gallon processing water pond (approximately 163' x 420' x 30' deep) at the southern end of the pit pond was formed by constructing a gravel causeway across the quarry pit pond. The causeway separates the approximately 1.6-acre portion of the facility pit pond from the main water body specifically for use at the facility. GOH currently pumps water from the remaining 16.3-acre, 159-million-gallon portion of the quarry pit pond into the 1.6-acre processing water pond for use at the facility.

As discussed in the Groundwater Availability Analysis in Section 3.1, the calculated available 1-in-10-year drought recharge, determined by using 60 percent of the average annual recharge rate, is estimated to be 0.39 mgd/sq. mi. (0.64 mgd/sq. x 0.60). The Available 1-in-10-Year Drought Recharge for the pit pond at the facility is therefore 2.800 mgd; calculated by multiplying the total drainage area by the 1-in-10-year drought recharge rate (7.255 sq mi x 0.39 mgd/sq mi). Although the total capacity of the aggregate processing system at the facility of 0.725 mgd represents approximately 25.9 percent of the 1-in-10 year drought, the anticipated effective daily withdrawal rate of the facility for makeup water with the addition of a new sand screw of 0.125 mgd is approximately 4.4 percent of the total 1-in-10-year drought for the groundwater basin as calculated.

Also as discussed in the Groundwater Availability Analysis in Section 3.1, reported flows from Mammoth Springs, located approximately 4,100 feet south-southwest of the facility, suggest that the groundwater availability is considerably higher than calculated using basin delineation and precipitation statistics. The facility is situated above a karst conduit-controlled unconfined aquifer, with the regional groundwater table represented within the facility pit pond. Movement of groundwater through the regional groundwater table is highly influenced by the presence of caverns and other large-scale solution features, which have in turn developed along major joint orientations of the bedrock. The relationship between joint sets and cavern development is apparent at the nearby Alexander Caverns, as the cavern alignment generally parallels joint sets and bedding plane partings. The cavern system funnels regional groundwater flow beneath the facility in a southerly direction, with the major discharge point being Mammoth Springs immediately below Alexander Caverns. The spring averages a flow of approximately 21,024,000 gallons of water per day (Saad and Hippe, 1990, Kochanov, 2010, p. 15).

Based on the total estimated volume of the quarry pond of 179 million gallons and the volume of groundwater flowing through the karst conduit groundwater flow system feeding the quarry pond, it is unlikely that pumping at the existing and proposed withdrawal rates will pull water from the surrounding bedrock enough to produce a noticeable drawdown adjacent to the quarry

pond. As such, the 90-day area of influence for the pumping activities at the requested rate is conservatively estimated to be 100' feet along the periphery of the quarry.

Impacts to the Environment

Given the limited estimated area of influence for the withdrawal and the general lack of environmental receptors within the area of influence, impacts to the environment are expected to be minimal. Although several threatened or endangered species were identified in the Pennsylvania Natural Diversity Inventory, neither of these species are present within the area of influence and the Pennsylvania Fish and Boat Commission and Game Commission indicated that the withdrawal will have no affect on the identified species as documented in Section 4.2. Further, given the lack of environmental receptors within the area of influence and the relatively low volume of the withdrawal compared to groundwater availability, impacts to streams, wetlands, critical wildlife habitat, or sensitive ecological communities are not anticipated.