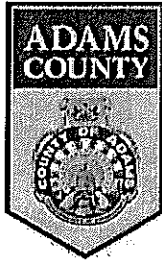


MODULE 1

INSERT THE FOLLOWING DOCUMENTS INTO THE COUNTY AND MUNICIPAL
NOTIFICATION CORRESPONDENCE SECTIONS OF MODULE 1



ADAMS COUNTY OFFICE OF PLANNING AND DEVELOPMENT

670 Old Harrisburg Road, Suite 100 | Gettysburg, PA 17325
Ph: 717-337-9824 | Fx: 717-334-0786

Sherri Clayton-Williams, AICP, Director

DATE: January 9, 2018

TO: Pennsylvania Department of Environmental Protection
Cambria District Office

FROM: Robert Thaeler
Principal Planner

SUBJECT: County Land Use Review
Specialty Granules, LLC
Large Noncoal (Industrial Minerals) Mine Permit
Act67/68-17-069

The Adams County Office of Planning and Development has received the above referenced application for review against the Adams County Comprehensive Plan and in accordance with DEP's Policy for Consideration of Local Comprehensive Plans and Ordinances in DEP Review of Authorizations for Facilities and Infrastructure. The Adams County Comprehensive Plan was adopted in 1991 and updated in 1998, 2001, and 2010. We offer the following comments regarding the above referenced project.


The above referenced project:

- ☒ Is consistent with the Adams County Comprehensive Plan.
☐ Is not consistent with the Adams County Comprehensive Plan.
☐ Consistency cannot be determined. Application packet submitted to this Office is incomplete.

Additional Comments:

See Attached Comments

Submitted By:

Name	Robert Thaeler		
Title	Principal Planner		
Contact Info.	670 Old Harrisburg Road, Suite 100	(717) 337-9824	
Address / Phone	Gettysburg, PA 17325		
Signature			
Date	January 9, 2018		

Additional Comments
Act 67/68 Permit Notification / Specialty Granules, LLC
Large Noncoal (Industrial Minerals) Mine Permit

The Adams County Office of Planning and Development is in receipt of a permit notification from Specialty Granules, LLC. The permit notification involves a mine permit application to expand mining operations into an area bounded by Gum Springs Road to the north and west, Iron Springs Road to the east, and balance of the Specialty Granules mining operation to the south. The Office of Planning and Development has indicated that the proposal is consistent with the Adams County Comprehensive Plan in this land use letter. We also note that the proposal is consistent with the Southwest Adams Joint Comprehensive Plan, the multi-municipal comprehensive plan adopted by Hamiltonban Township.

However, we also note that this project has been subject to Conditional Use zoning review and approval through Hamiltonban Township. Our understanding is that mining operations for this site have been approved by the Hamiltonban Township Board of Supervisors through a Conditional Use approval dated April 1, 2014. Our further understanding is that the written decision for the Conditional Use approval includes a wide range of conditions that the Board of Supervisors have included in their approval.

DEP should closely coordinate with Hamiltonban Township to ensure that any Mine Permit issuance is consistent with the Township's Conditional Use approval. First, DEP should contact the Township to ensure that the Conditional Use approval is still in effect. In many municipalities, such approvals have time limits during which time an applicant must move the project forward or meet the conditions of approval. Second, and assuming that the Conditional Use approval is still in effect, DEP should be closely coordinate with Hamiltonban Township to ensure that any Mine Permit approval appropriately addresses the Township's Conditional Use conditions of approval.

cc. Hamiltonban Township

D'APPOLONIA

701 RODI ROAD, FLOOR 2
PITTSBURGH, PENNSYLVANIA 15235-4559
(412) 856-9440 FAX (412) 856-9535

December 21, 2017

Project No. 152596A

CERTIFIED MAIL

Return Receipt No. 7009 1410 0001 0307 7039

Mr. Bob Gordon, Chairman
Hamiltonban Township Board of Supervisors
23 Carrolls Tract Road
P.O. Box 526
Fairfield, PA 17320

**Act 67, 68 and 127 Municipal Notification
Northern Tract Quarry
Specialty Granules LLC
Blue Ridge Summit
Adams County, Pennsylvania**

Mr. Gordon:

The purpose of this letter is to provide notice of the proposed Northern Tract Quarry project, and request that a Land Use Letter be completed by your office to meet the requirements of the Pennsylvania Department of Environmental Protection (PADEP) discussed herein. A summary of the project is provided in the following sections.

- Permit Application: PADEP – Cambria District Mining Office
Large Noncoal (Industrial Minerals) Mine Permit
- Project Name: Charmian Plant – Northern Tract Quarry
Specialty Granules LLC
- Project Location: The proposed project is located in Hamiltonban Township,
Adams County, PA. See attached Site Location Map.
- Project Description: Specialty Granules LLC (SGI) extracts non-coal materials through existing Pennsylvania Department of Environmental Protection (PA DEP) Surface Mine Permits at the Charmian Quarry complex located north of the town of Blue Ridge Summit in Hamiltonban Township, Adams County, Pennsylvania. The Charmian Site generally consists of an active quarry (Pitts Quarry - SMP 01930302), an inactive quarry (West Ridge Quarry – SMP 6477SM5, which is in the reclamation phase), stockpile storage areas, rock crushers, manufacturing plants, and

related erosion and sediment control/stormwater control features (e.g. sediment ponds and traps, collection ditches, and other best management practices features). SGI extracts metabasalt and related lithologies at the Charmian Site to produce multiple rock products for SGI customers. The main product is manufactured roofing granules that are used to coat asphalt roofing shingles. SGI is currently applying for a new surface mine permit to expand its permitted quarry operations to the north onto the "Northern Tract," an approximately 112-acre parcel contiguous to the Pitts Quarry. The addition of this Northern Tract permit area will be a logical continuation of the existing quarry and processing area currently encompassing some 856± acres owned by SGI, including 620± acres which are authorized under the two above-referenced surface mine permits. The 112-acre Northern Tract permit area will essentially serve as an expansion of the active Pitts Quarry.

The permit limits of the Northern Tract Quarry are presented on the attached Site Location Map. The proposed mineral extraction area at the Northern Tract permit area will be limited by two surrounding buffers, referred to as a maintained buffer and an operational buffer. The maintained buffer is designed to protect the vegetated riparian buffer along Toms Creek and the unnamed tributaries to Toms Creek. No activities other than to add or replace damaged/dead trees will occur within this area. The Maintained Buffer is a minimum distance of 300 feet from Toms Creek. Within the additional 150-foot wide operational buffer, only non-extractive mine support activities will be permitted, such as stormwater/erosion control systems, access roads, and temporary stockpiles. The location of these buffer areas limits the area that will be disturbed for mineral extraction activities.

Acts 67, 68 and 127, which amended the Municipalities Planning Code, direct state agencies to consider comprehensive plans and zoning ordinances when reviewing applications for permitting of facilities and infrastructure, and specify that state agencies may rely upon comprehensive plans and zoning ordinances under certain conditions as described in Sections 619.2 and 1105 of the Municipalities Planning Code. The Pennsylvania Department of Environmental Protection's Policy for Consideration of Local Comprehensive Plans and Zoning Ordinances in DEP Review of Permits for Facilities and Infrastructure (DEP's Land Use Policy) provides direction and guidance to DEP staff, permit applicants, and local and county governments for the implementation of Acts 67, 68 and 127 of 2000. This policy can be found at www.depweb.state.pa.us; Keyword: Land Use.

In accordance with DEP's Land Use Policy, enclosed please find a Land Use Letter that is to be submitted with our permit application to DEP. Please complete the attached form and return within 30 days to:

Robert M. Shusko, P.E.
701 Rodi Road, Floor 2, Pittsburgh, Pennsylvania 15235-4559

Please do not send this form to DEP, as we must include the County Land Use Letter with our permit application. If we do not receive a response from you **within 30 days**, DEP will assume there are no substantive land use conflicts and proceed with the normal application review process.

If you require further information, please contact me at rmshusko@dappolonia.com or 412-856-9440.

Sincerely,

D'Appolonia Engineering Division of Ground Technology, Inc.



Robert M. Shusko, P.E.
Senior Principal Engineer

Enclosure: Site Location Map
 Land Use Letter (to be completed by your office)
 Pre-Addressed, Stamped Envelope

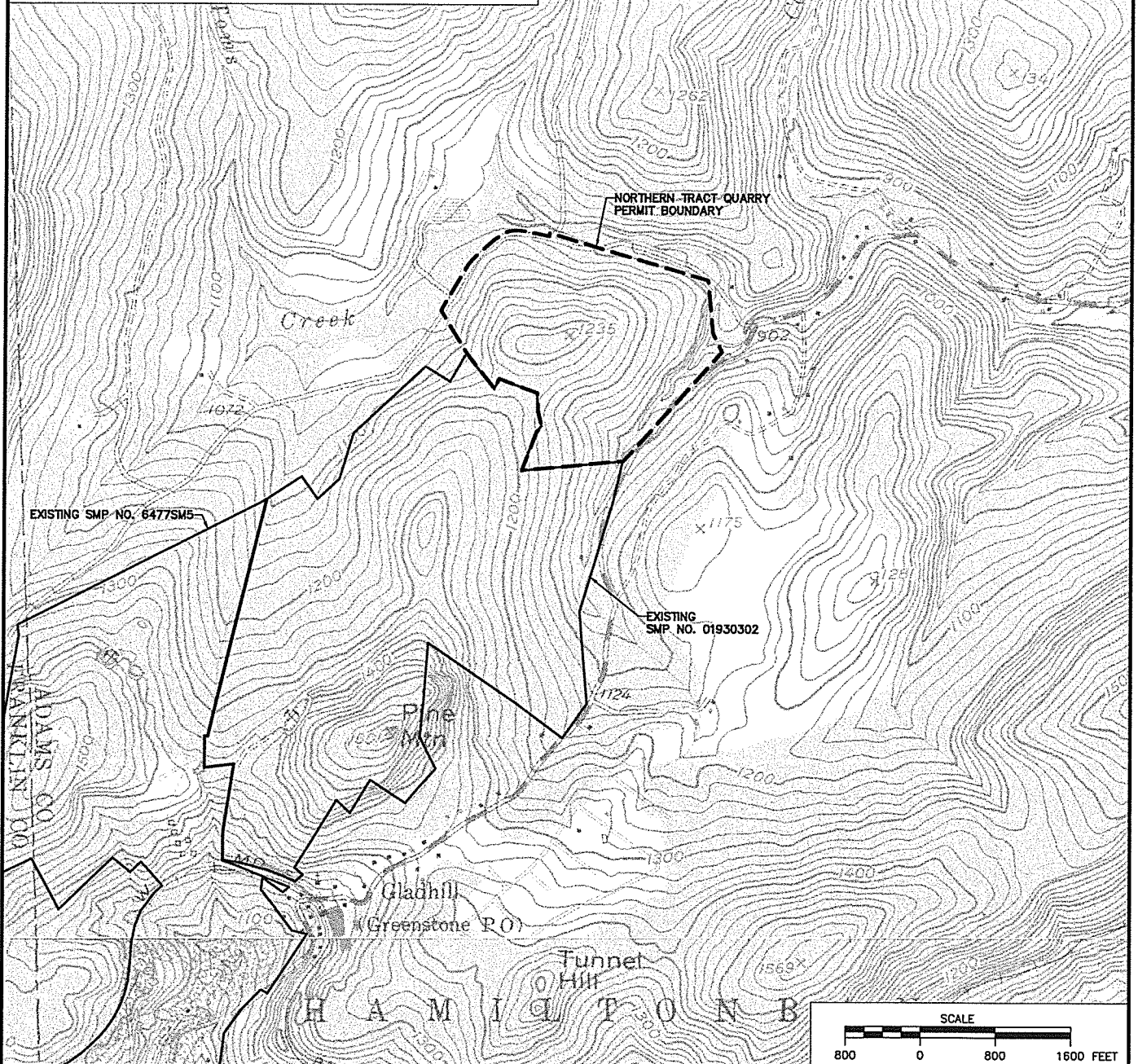
cc: Mr. Anthony Shepeck (SGI)
 Mr. Kevin Moore, P.E. (SGI)
 Mr. Matthew McClure (SGI)

LEGEND

- NORTHERN TRACT QUARRY PERMIT BOUNDARY
- EXISTING PERMIT BOUNDARY 6477SM5
- EXISTING PERMIT BOUNDARY 01930302

REFERENCE:

USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES
BLUE RIDGE SUMMIT PENNSYLVANIA QUADRANGLE, DATED 1953, PHOTOREVISED 1985
IRON SPRINGS PENNSYLVANIA QUADRANGLE, DATED 1953, PHOTOREVISED 1968 AND 1973
SCALE: 1" = 1000'



D'APPOLONIA

701 RODI ROAD, FLOOR 2
PITTSBURGH, PENNSYLVANIA 15235-4559
(412) 856-9440 FAX (412) 856-9535



SPECIALTY GRANULES LLC

CHARMIAN SITE - NORTHERN TRACT QUARRY

FIGURE 1
SITE LOCATION

PROJECT NUMBER: 152596A

DRAWN BY: AJM

DATE: 12/4/2017

FILE NAME: Municipal Notification Site Location Map--R0.dwg

CHECKED BY: MDW

DATE: 12/04/2017

SCALE: AS SHOWN

DRAWING NO. 1

REV 0

12/4/2017 4:54 PM

R: 2015152596 - SGI Disposal Embankment Drawings Northern Tract Quarry Municipal Notification Site Location Map--R0.dwg

LAND USE LETTER

Date: 3/27/18

To: Robert M. Shusko, P.E.

From: Hamilton Township/Borough/City

Re: Specialty Granules LLC – Northern Tract Quarry

The municipality of Hamilton states that it:
☒ has adopted a municipal or multi-municipal comprehensive plan.

If yes, please provide date of adoption: April 20, 2015

☐ has not adopted a municipal or multi-municipal comprehensive plan.

The municipality of Hamilton states that it:
☒ has adopted a county zoning ordinance, or a municipal or joint-municipal zoning ordinance.
☐ has not adopted a county zoning ordinance, or a municipal or joint-municipal zoning ordinance.

If applicable:

The municipality of Hamilton states that its zoning ordinance is generally consistent with its municipal comprehensive plan and the county comprehensive plan.

The above referenced proposed project
☒ meets the provisions of the local zoning ordinance

If zoning approval is required for the project to proceed, the above referenced project:
☒ has received zoning approval.
☐ has not received zoning approval.

If the proposed project has not received zoning approval:

What is the status of the zoning request for the proposed project? (e.g., Special Exception Approval from the Zoning Hearing Board required, Conditional Use approval from the Governing Body required)

Is there a legal challenge by the applicant with regard to zoning for the proposed project?

Not at this time

Name and Contact Information for Municipal Zoning Officer:

Wilbur Slothour zoning Officer for Hamiltonburg twp
P.O. Box 526
23 Carrolls Tract Rd
Fairfield, Pa 17320

Additional Comments (attach additional sheets if necessary):

Submitted By:

Name	Wilbur Slothour
Title	Zoning Officer
Contact Information (Address & Phone)	1837 Heidlersburg Rd Aspers, Pa 717-677-7356
Signature	Wilbur Sloth
Date	3/27/18

MODULE 4

INSERT THE FOLLOWING DOCUMENT AT THE END OF MODULE 4

449 Eisenhower Boulevard, Suite 300
Harrisburg, PA 17111-2302

E-mail: skellyloy@skellyloy.com
Internet: www.skellyloy.com



Phone: 717-232-0593
800-892-6532

Fax: 717-232-1799

March 22, 2018

Mr. Douglas C. McLearen
Bureau for Historic Preservation
Commonwealth Keystone Building, Second Floor
400 North Street
Harrisburg, Pennsylvania 17120-0093


Re: ER No. 2016-0818-001
Northern Tract Quarry Expansion
Project
Hamiltonban Township, Adams
County, Pennsylvania

Dear Mr. McLearen:

Skelly and Loy, Inc. is pleased to provide the Phase I Archaeological Survey Report for the referenced project requested in your February 27, 2018, letter to Mr. Rock Martin of the Pennsylvania Department of Environmental Protection's Cambria District Mining Office. Please contact me at the above number if you have any questions.

Sincerely yours,

SKELLY and LOY, Inc.


Douglas Dinsmore, Ph.D.
Cultural Resource Specialist

Enclosure

cc: Robert M. Shusko, P.E., D'Appolonia
Kevin D. Moore, SGI
Laura Berra, P.E.
R15-0340.000 ✓

File: McLEAREN_DD.doc

**PHASE I ARCHAEOLOGICAL SURVEY REPORT
NORTHERN TRACT MINE EXPANSION PROJECT**

**HAMILTONBAN TOWNSHIP, ADAMS COUNTY,
PENNSYLVANIA**

ER. No. 2016-0818-001

PREPARED FOR



IN ASSOCIATION WITH

D'APPOLONIA

PREPARED BY



MARCH 2018

**PHASE I ARCHAEOLOGICAL SURVEY REPORT
NORTHERN TRACT MINE EXPANSION PROJECT**

**HAMILTONBAN TOWNSHIP, ADAMS COUNTY,
PENNSYLVANIA**

ER No. 2016-0818-001

PREPARED FOR

**SPECIALTY GRANULES, LLC
13424 PENNSYLVANIA AVENUE, SUITE 303
HAGERSTOWN, MARYLAND 21742**

IN ASSOCIATION WITH

**D'APPOLONIA 701 RODI ROAD
PITTSBURGH, PENNSYLVANIA 15235-4559**

PREPARED BY

**SKELLY AND LOY, INC.
449 EISENHOWER BOULEVARD, SUITE 300
HARRISBURG, PENNSYLVANIA 17111**

MARCH 22, 2018

ABSTRACT

Skelly and Loy, Inc. completed a Phase I archaeological survey to identify archaeological remains in the area of potential ground disturbance for the proposed Northern Tract Mine Expansion Project in Hamiltonban Township, Adams County, Pennsylvania. The project would add to the existing mine approximately 112 acres (45.3 hectares). The area of proposed mine extension became the archaeological Area of Potential Effects (APE).

Skelly and Loy conducted the field survey on December 16 and 23, 2015. The APE consists of rock, both outcrops and loose rock, with very little soil. The only soil occurred in a saddle between two higher areas, and four shovel test pits were excavated there. No artifacts were identified. The only observed cultural features were excavations from a nineteenth-century copper mine. The ruins of a smelter and a haul road, which connected the smelter to the excavations, were also identified. These features were determined to be a single archaeological site, 36AdXXXX.

Documentary and physical evidence suggested that the mining of Site 36AdXXXX was part of exploratory excavations that occurred from 1833 through 1836. These excavations ceased in 1836. The deposits in Hamiltonban Township were in small quantity and widely dispersed, and other ores in other states proved more profitable.

A previous archaeological survey, completed by URS Corporation, had focused on a domestic site, the William Smith House, labeled Site 36AdXXXX. In the report for this survey, URS recommended that the site should not be eligible for inclusion in the National Register of Historic Places. Skelly and Loy concurred with their recommendation.

Skelly and Loy recommends no additional archaeological investigations. No significant artifacts were identified. Only the excavations remain; they have little potential to provide additional information.

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APPENDICES

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APPENDIX B -	PHASE I SUMMARY: PINE HILL
APPENDIX C -	PENNSYLVANIA ARCHAEOLOGICAL SITE SURVEY FORMS
APPENDIX D -	AUTHOR'S QUALIFICATIONS



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A. INTRODUCTION

Skelly and Loy, Inc. completed a Phase I archaeological survey for the proposed Northern Tract Mine Expansion Project in Hamiltonban Township, Adams County, Pennsylvania (Figures 1 and 2).

This report was prepared for Specialty Granules, LLC, and D'Appolonia in accordance with federal and state laws which provide for the protection of significant cultural resources, including historical and archaeological sites. A report summary form is included as Appendix A.

The Phase I archaeological investigation consisted of a literature review, site file search, and field work. Compliance with state and federal legislation, including Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992; Advisory Council on Historic Preservation, Protection of Historic and Cultural Properties, revised 1999 (36 CFR 800); Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (Federal Register Vol. 48, No. 190); the Pennsylvania Historical and Museum Commission's (PHMC's), Guidelines for Archaeological Investigations (PHMC 2008); the Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution; the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is assured.

No above-ground historic structures are associated with the project.

B. PROJECT DESCRIPTION

Specialty Granules, LLC, proposes to expand an existing mine into a 112-acre (45.3-hectare) area called the Northern Tract. Specialty Granules mines Pre-Cambrian Metabasalt; the basalt is processed into small granules for use in asphalt composition roofing. Specialty Granules uses an open quarry technique to mine the metabasalt. The Northern Tract will have a roughly 66-acre quarry or excavation area, with an approximately 19-acre operational buffer and a roughly 27-acre maintenance buffer comprising the 112-acre area. Earth disturbance will occur in the excavation area. The operation buffer will be used for roads and stockpiles, and erosion and sedimentation controls, and has been included as an area where earth disturbance could occur. The maintenance buffer will be used to maintain existing trees and vegetation. No earth disturbance is proposed for this area. The archaeological Area of Potential Effects (APE) includes both the area of the proposed mine and its operational buffer (Figures 1 and 2).

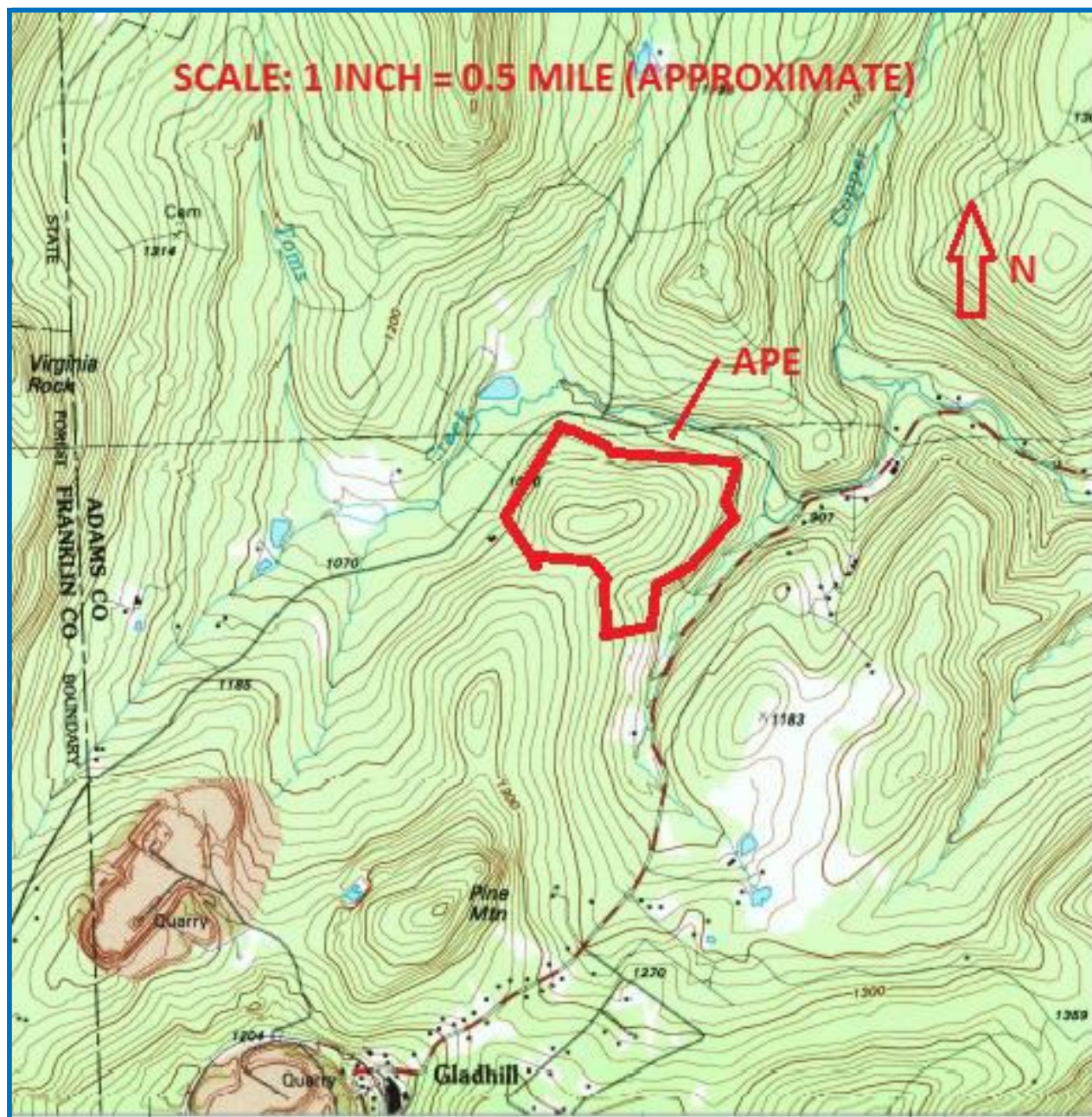


Figure 1: Annotated detail of the USGS 7.5 minute Iron Springs quadrangle, 1990, showing the APE.

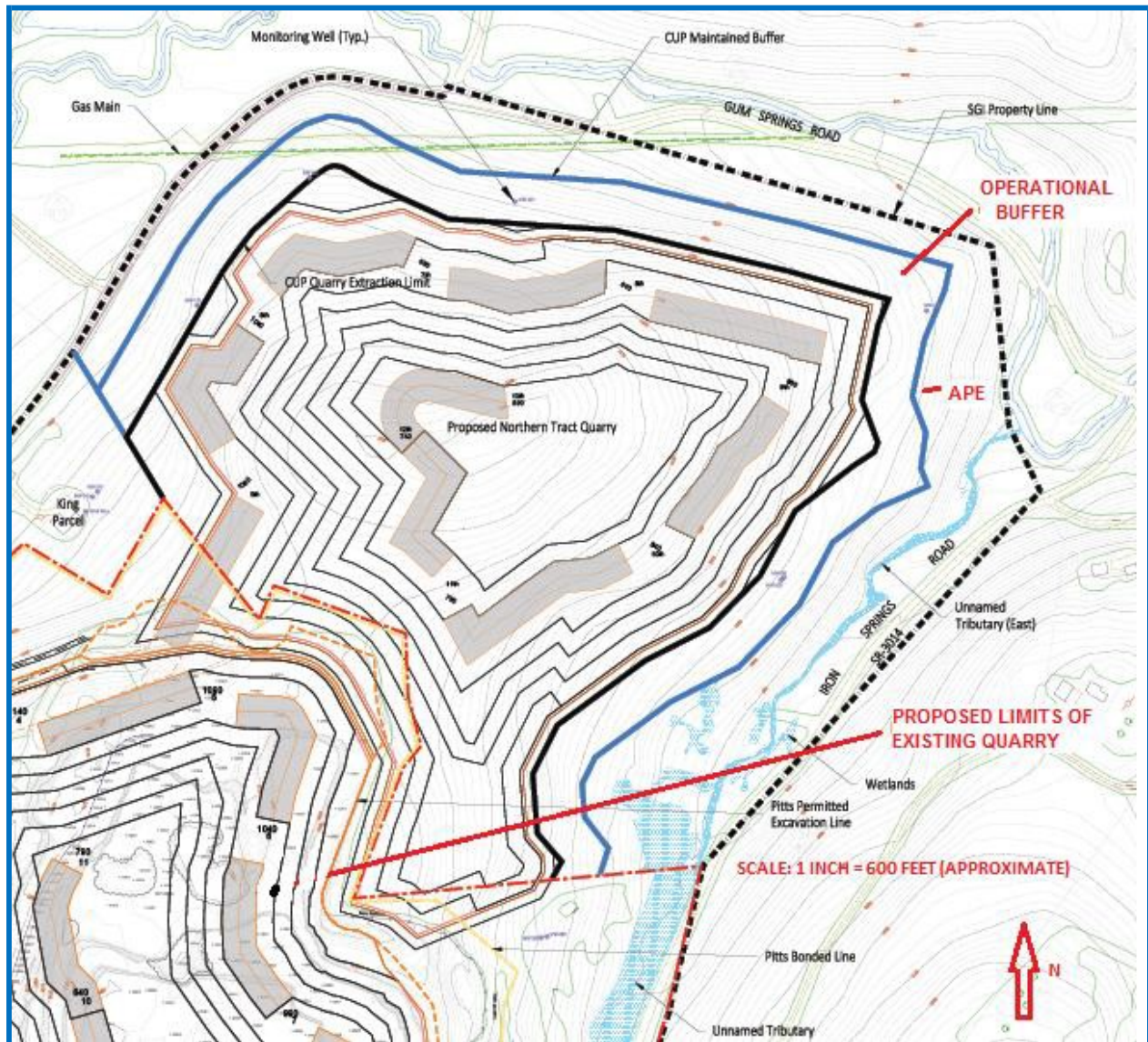


Figure 2: Plan of the Northern Tract Quarry, showing the proposed quarry and operational buffer, together which comprise the APE.

C. ARCHAEOLOGICAL SURVEY

1. ENVIRONMENTAL BACKGROUND

The proposed Northern Tract Mine Expansion Project lies in the South Mountain Section of the Ridge and Valley Province. The bedrock consists of the Catocin Formation of Metabasalt and

Metarhyolite flood basalts that were the result of the breakup of the Mesoproterozoic supercontinent of Rodina, and the opening of the Neoproterozoic and Paleozoic-aged Iapetus Ocean, approximately 750 million years ago. The APE lies completely on the Metabasalt; the Metarhyolite lies to the east and northeast. The Native American rhyolite quarries (36Ad0046) also lie to the east, approximately 0.6 mile (one kilometer), on the Metarhyolite.

The area of the Northern Tract quarry expansion lies within the Toms Creek watershed. Toms Creek in turn drains into the Monocacy River, itself a tributary of the Potomac River.

The Ravenfield-Highfield-Rock outcrop covers approximately 45 percent of the APE. Although portions of the summit are relatively level, much of the APE consists of 15 to 25 percent slope, some over 75 percent. At the lower elevations, Highfield and Catocin channery silt loam, very stony, exist. The APE is extremely stony and well-drained.

Hamiltonban Township has a humid, continental climate with warm summers and cold winters. Most weather systems that affect the APE originate from the west in the Great Plains. Of the annual precipitation, which averages about 111 centimeters (43.6 inches) per year, 56% falls from April through September. The average daily temperature is -1° C (30° F) in January and 22° C (76° F) in July (city-data.com, 2/10/10).

Braun (1950) located the APE within the Oak-Chestnut forest region of the South Mountain section of the Ridge and Valley physiographic province. During the early part of the twentieth century, a fungal parasite decimated the American chestnut tree stands. Although American chestnut trees dominated much of the eastern United States prior to this blight, they are now absent. Kücher (1964) has more recently designated the area as Appalachian Oak Forest. This tall, broadleaf deciduous forest type provides cover for a majority of Pennsylvania and is dominated by white oak and northern red oak. The primary forest cover of Hamiltonban Township has been drastically altered by timbering and land clearance for agriculture, commercial and residential development, and mineral extraction. Current forests consist of second and third growth stands.

In pre-contact time, principal aquatic faunal resources included river and stream fish, sturgeon, perch, bass, catfish, as well as freshwater mussels. All of these species would have been available in the Monocacy River and within some in its tributaries, including Toms Creek. Avian fauna included migratory waterfowl such as Canada goose and several species of duck. Inland avian fauna included wild turkeys, ruffed grouse, and passenger pigeon. Mammals included white-tailed deer and raccoon, predators to the Late Woodland gardens. Other mammals included bison, black bear, porcupine, eastern cottontail, New England cottontail, snowshoe hare, gray and fox squirrels, red

and gray fox, and opossum. Beaver, river otters, and muskrat lived along the river and creeks (Barton, 1976).

2. CULTURAL BACKGROUND

Humans have lived along the tributaries of the Potomac River for over 14,000 years. Following is a brief summary of the commonly designated periods.

Paleoindian (Before 10,000 BP)

The first humans in North America, including what is now Pennsylvania, are designated Paleoindians. Radiocarbon dates from both eastern and western Pennsylvania demonstrate the existence of Paleoindian sites (Adovasio et al. 1990; McNett 1985). In the Paleoindian period, the climate was cooler and wetter, with an ice sheet covering much of North America. The upper end of the Paleoindian period (date of arrival) stands at approximately 19,000 BP.

Highly nomadic foragers, Paleoindians subsisted in small bands, utilizing a wide variety of plant and animal foods. Although past emphasis of Paleoindians was the hunting of Pleistocene megafauna, the evidence in Pennsylvania showed a wide range of seasonally based procurement activities (McNett 1985). Recent inspection of an event around 10,850 BP suggested that an abrupt change occurred, perhaps extra-terrestrial (comet, meteorite) in part (Haynes 2008). The megafauna disappeared, pushing the Paleoindians to a more diversified procurement strategy. Faunal, floral, and aquatic resources were procured from temporary camps. Most camps appeared to have been occupied for short periods (Custer 1994).

Early Archaic (10,000 – 8500 BP)

As the ice sheets retreated, the climate became warmer and drier, with flora and fauna becoming more diverse and more modern. The transition from Paleoindian to Early Archaic was one of degree rather than abrupt change, with sites becoming slightly larger and being occupied for a slightly longer time. The bands became larger, but remained highly mobile. The trend toward a more diversified procurement strategy continued (Custer 1994; Stewart 1980).

The site locations remained similar to the Paleoindian period. Quarry-related sites continued, and base camps began to emerge. Grinding and pitted stones showed the increasing reliance on floral resources. Chert remained the raw material for spear points, knives, and scrapers.

Middle Archaic (8500 – 5000 BP)

The Middle Archaic period remains an enigma in the Middle Atlantic region. Controversial dating and projectile point classification have led to some confusion about the period. Certainly the trends of the Early Archaic continue. Some evidence exists for the beginnings of a seasonal rotation among camps. The population appears to increase, and grinding and pitted stones become more common in the Middle Archaic period. The use of chert and quartz continue. A shift from quarry-related sites to procurement-related sites occurs, suggesting a more base-camp approach to foraging (Custer 1994).

Late Archaic (5000 – 3800 BP)

The Late Archaic period appeared to emerge seamlessly from the Middle Archaic period. However, as the Late Archaic progressed, sites began to appear in a much wider variety of settings than previously. The Late Archaic period was characterized by large base camps and a wide variety of temporary camps, ranging from hunting and fishing camps to quarrying and other tool procurement (reeds for mats and baskets) camps. Camps have been found in almost all settings, including the deep forest. Some researchers have suggested that the transition to the oak-chestnut forest was a result of deliberate Late Archaic people's actions (Delcourt et al. 1998).

Tool types and materials proliferate in the Late Archaic period. Projectile points, knives, and scrapers continue to be fabricated from chert and quartz; rhyolite from South Mountain now joins the lithic materials (Custer 1985). Steatite is made into bowls; grinding and pitted stones continue. Occasional beads and pendants are also found. In Ohio and Western Pennsylvania, burial mounds are found, although few are known along the tributaries of the Potomac River.

Transitional (3800 – 3200 BP)

In the Transitional period, the population clustered along floodplains of large waterways. The climate turned drier, perhaps reducing the amount of food available in the forests. In addition, the

increasing reliance on agriculture meant that less of the systematic foraging of the Late Archaic period was required. Steatite bowl and coarse pottery fragments indicate porridge cooking, a method of rendering grains more palatable. Rhyolite became the predominant lithic material. Extensive trade is apparent from the movement of rhyolite from its only known source in Pennsylvania on South Mountain, about 0.6 mile (one kilometer) east of the APE (Kent et al. 1971; PHMC CRGIS).

House structures, from evidence of post-molds, occurred in the Transitional period. Some areas feature clusters of apparently contemporaneous round houses, often with storage pits (Custer 1994; Custer does not recognize a Transitional period in his summary). Burial practices become more complex. Cultivation of Goosefoot (*Chenopodium berlandien*) and sunflowers (*Holiantus annuus*) likely occurred in the Transitional period along the tributaries of the Potomac River.

Early Woodland (3200 – 1800 BP)

The Early Woodland period continued the trends begun during the Transitional period. Although the Early Woodland period is poorly represented along the tributaries of the Potomac River, some trends have been observed. Clusters of houses grew larger and became hamlet-size. Thick-walled ceramics with coarse grit replaced steatite bowls for domestic use. Tobacco was grown, as evidenced by the appearance of pipes. Tools continue to be fabricated of chert, quartz, and rhyolite, with some argillite and jasper appearing.

In the Midwest extending into Western Pennsylvania, elaborate burial practices mark the Early Woodland period. Mounds with burial chambers within, often with two or more layers, occur. However, such mortuary structures are rare along the tributaries of the Potomac River. The paucity of Early Woodland sites in the basin may be the result of a lack of reliable diagnostic projectile points, as most are known from the Transitional or Middle Woodland (Custer 1994).

Middle Woodland (1800 – 1200 BP)

The Middle Woodland period continued the trends of the Early Woodland period. More cultigens are found, and villages grow larger. Semi-sedentary villages clustered on the floodplains of the Potomac River and its major tributaries. Ceramics became more refined with incised decoration. As in the Early Woodland period, burials became more elaborate. In the Midwest and Western Pennsylvania, burials reached the high elaboration of the Hopewell culture (Custer 1994).

This elaboration can be seen occasionally in apparent trade goods in sites along the Potomac River and its tributaries.

Late Woodland (1200 – 400 BP)

The previous four periods followed one another with expansion of existing trends. The Late Woodland period represents several changes. The agricultural complex became far more sustaining, with the maize, beans, and squash complex arriving. People began to live in larger villages. The bow and arrow came into use, as did fortified villages. Villages became more or less permanent, with stockades surrounding them. By the time of contact, 400 BP, villages often contained populations of 500 to 2,000 people sustained by several square kilometers of gardens in the vicinity.

The nuts and bolts of archaeology, lithics and ceramics, followed the changes in warfare and subsistence. Projectile points became smaller to fit on arrows, rather than spears. The common triangular points were made from chert, quartz, or jasper. Ceramics proliferated with many varieties, ranging from large storage jars to nearly flat griddles. Although a paucity of ceramics have been found in southern Adams County, the few known ceramics display features of a transitional area, with features of the Algonquian-speaking Tidewater groups to the south, and the Iroquoian-speaking groups to the north during the Late Woodland period (Stephenson and Ferguson 1963).

Contact (After 400 BP to Present)

Europeans rapidly displaced the Native Americans after the Contact period. European diseases wiped out large numbers of Native Americans, many before they even met a European, as the diseases spread rapidly through the populations. European technology and organization served to defeat the remaining Native Americans. By 1750, most Native Americans had abandoned their villages and camps along the Potomac River and its tributaries. At Contact, the Susquehannocks controlled the lower Potomac River and its tributaries.

In 1655, Swedish settlers established a trading post at present-day Elkton, Maryland. In 1693, John Hanson Steelman (1655-1749), born at present-day Gray's Ferry in Philadelphia of Swedish parents, built or occupied a trading post at the Elkton location. Steelman served as the interpreter for treaties between the Susquehannocks and Maryland in 1698 and 1700. However, as the Susquehannocks withdrew to the west, Steelman and his family followed, eventually settling in the area that would become Liberty Township, to the south of Hamiltonban Township, about 1720,

becoming the first European settlers in the area (Hulan and Craig 1984). When Steelman and his family arrived about 1720, the area that would become Hamiltonban Township was nominally part of Chester County. In 1729, the area became part of Lancaster County, and in 1749, part of York County. By the time of the establishment of York County, Charles Carroll had procured a tract under title with Lord Baltimore in 1741 (the border between Pennsylvania and Maryland was disputed until the Mason-Dixon Survey of 1763- 1767). Shortly after his 1741 title, a nearby tract was established under the name of Hamilton- Ban. Named after a fortified house in County Armagh in Ireland, a relative (also named Hamilton) settled near present-day Fairfield. (Ban was the word used for a defensive wall or earthwork around a fortified residence.) Hamiltonban Township was established with York County in 1749 (Rupp 1846:541-547).

In 1755, the Township's primary town, Fairfield, was subdivided. It was incorporated in 1801, the year after the Pennsylvania Legislature formed Adams County.

The minerals of Hamiltonban Township had been noticed by early explorers, reputed to be Jesuit missionaries sent by Lord Baltimore (Shoemaker 1941). The first recorded copper mine began in 1795. By the 1830s, more extensive mineral extraction began, with iron mining and the construction of Maria Furnace. Copper mining began about 1833 in the APE; a smelter was constructed nearby. Both efforts ceased in 1836, as neither were profitable (Gettysburg Compiler 1846 and 1868). Some copper mining occurred sporadically to the north and east of the APE, in 1846, in the 1870s and 1880s, and in the early twentieth century. However, the mines were not profitable enough to continue (Bloom 1992:250).

The modern form of mineral extraction began in 1914 near the present Charmian quarry. That year, a grit mill ground "greenstone" and produced granules for roof and siding shingles, and as tennis court surfaces (Bloom 1992:246). A slope (drift) mine was the source of the raw material, and the Funkhouser Company purchased the mine in 1925 (Pennsylvania Geological Survey 1968:8-9). Raymond Joseph Funkhouser (1888-1968), the owner and president of Funkhouser Company, sold the mine to the Rubberoid Company of Washington, Maryland, in 1958. Rubberoid opened the beginnings of the present quarry operations in 1964. Rubberoid merged with the General Aniline and Film Company (GAF) in 1967, and adopted the GAF name. The quarry expanded again in 1981 (Gettysburg Times 1981). In 1991, the mining assets of GAF, including the Charmian plant, became part of ISP Minerals, Inc. In 2011, ISP Minerals Inc. changed its name to Specialty Granules, Inc. (Specialty Granules website). In 2016, Specialty Granules became part of Standard Industries, Inc. (Standard Industries website), which also owns GAF Minerals LLC.

Due to the long occupation of the area that became Hamiltonban Township, artifacts could be expected from throughout the last fourteen or fifteen millennia.

3. METHODOLOGY

Phase I archaeological survey field procedures consisted of visual inspection, surface (pedestrian) survey, and subsurface excavation of shovel test pits (STPs). The APE consists almost entirely of rock outcrops. In a saddle where soil had accumulated, four STPs were excavated. A previous survey, completed by URS Corporation, found a minor domestic site, the William Smith House; their report, which had not been submitted to PHMC, is attached as Appendix B. Skelly and Loy's team recorded the survey with digital photographs.

The project team consisted of Douglas Dinsmore, Ph.D., who served as project manager, field director, laboratory director, and report author, and Nate Beck and Seth Hoover as field technicians. All archaeological studies undertaken followed Skelly and Loy's internal quality assurance/quality control procedures including peer review and technical editing and meet or exceed industry standards and those of PHMC's *Guidelines for Archeological Investigations* (2008).

D. RESULTS

1. BACKGROUND RESEARCH

The APE lies entirely within Hamiltonban Township. According to the Cultural Resources Geographic Information System (CRGIS), one recorded archaeological site lies approximately 0.6 mile (one kilometer) to the east of the APE. This site, 36Ad0046, is the Carbaugh Run Rhyolite Quarries, which is the source of much if not all of the pre-Contact rhyolite material found throughout Central and South-central Pennsylvania. However, the APE consists of a form of metabasalt, and was rarely used for pre-Contact tools. In other areas, open habitation and lithic reduction sites lie along Toms Creek, the latter of which circumscribes the APE to the northwest, north, and northeast. The APE does not include Toms Creek, its tributaries, floodplains, or terraces. No above-ground structures stand within the APE.

2. ARCHAEOLOGICAL INVESTIGATIONS

The Skelly and Loy team conducted the archaeological investigations on December 16 and 23, 2015. The team first investigated the copper mine tunnel, which was shown on the 1858 Hopkins *Map* (Figure 3; the mine was not shown on the 1872 Lake *Atlas*). Local informants also mentioned the tunnel. The tunnel consisted of a horizontal shaft, five feet (1.5 meters) high and five feet wide. A member of Skelly and Loy's team entered the tunnel, and carrying the end of a measuring tape, was able to proceed for about 100 feet (30.5 meters). A large tailings pile lay outside the tunnel; the size of the tailings pile, approximately 50 feet long (15.2 meters), 20 feet wide (6.1 meters), and 20 feet high at the downhill end, suggested a tunnel longer than 100 feet (Photographs 1 and 2 and indicated as P1 and P2 on Figure 4). No other features, such as walls or foundations, could be identified around the tunnel and tailings pile.

The team found additional excavations associated with copper mining exploration. One excavation was a vertical shaft (Vertical Shaft 1), which had been excavated on the south side of the summit, in line with the tunnel (Photograph 3 and indicated as P3 on Figure 4). Judging from the size of the tailings pile, the vertical shaft originally extended about 25 feet (7.6 meters). Likely, the vertical shaft had been excavated to attempt to intersect with the tunnel. The vertical shaft is filled with rubble eroded from the sides, and with trash. Other excavations, including another vertical shaft and smaller drifts (Expl Holes 1 through 4), were also identified (Figure 4).

The team also found a haul road and the ruins of a smelter. The smelter was also located on the Hopkins *Map*. However the smelter ruins lie outside of the APE, as does a portion of the haul road (Figure 4).

The tunnel and its tailings pile are very likely the result of the mining activities that occurred in the period 1833-1836, and noted in the Gettysburg Compiler (1868). The vertical shaft (Vertical Shaft 1 on Figure 4) found on the other side of the summit, at the location where the tunnel would be, is also very likely part of the 1833-1836 activities. Whether the other excavations (Vertical Shaft 2 and the four Exploratory Holes on Figure 4) were part of the early copper mine is not known. The copper mining activities shifted to the northeast after the 1833- 1836 activities, out of the APE. Copper mining continued to the northeast and east until 1904 (Figure 5; Gettysburg Compiler 1846; Kadel 1935:14). Some of the later mines to the northeast and east are shown on Figure 5 (Oles 1967).

The team excavated four STPs (STP1 through STP4 on Figure 4) in a saddle where soil had accumulated. No artifacts were identified in the STPs. All four STPs exhibited the same profile: 10-12 centimeters of dark brown 10YR3/3, then 5-6 centimeters of yellow-brown 10YR5/6, then bedrock.

The team also inspected the William Smith House, which had been investigated in the earlier URS Corporation survey. The report from this earlier survey is included as Appendix B. Previously, local informants had identified the William Smith House as a former schoolhouse. The URS survey found only domestic artifacts, and none that would be associated with a schoolhouse. Skelly and Loy's team concurred with the earlier URS survey, that the William Smith House site was not eligible for inclusion in the National Register of Historic Places.

Pennsylvania Archaeological Site Survey forms were completed for the Copper Mine and the William Smith House, and are included as Appendix C.

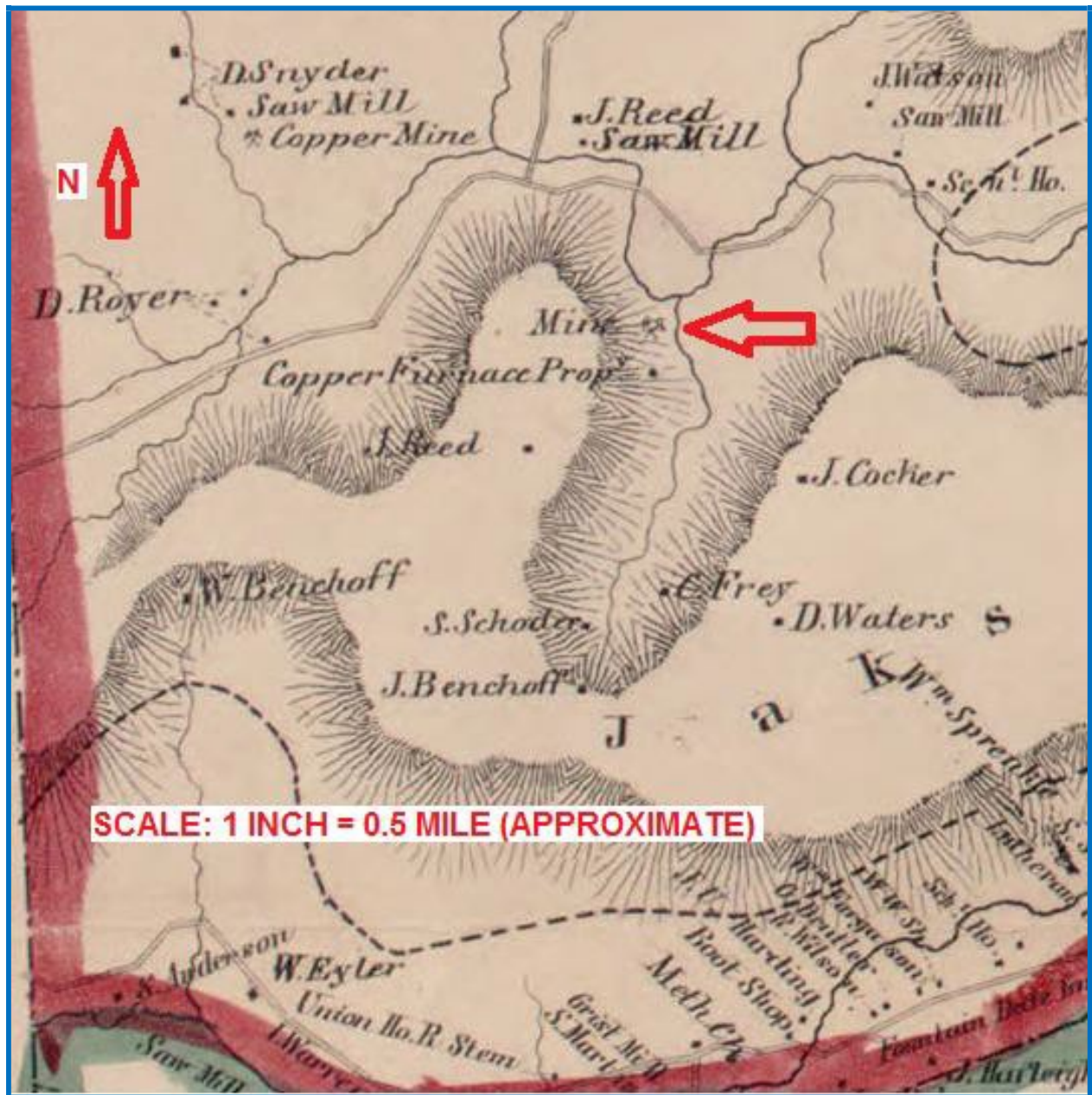


Figure 3: Detail of the 1858 Hopkins Map, showing the mine location (horizontal red arrow).



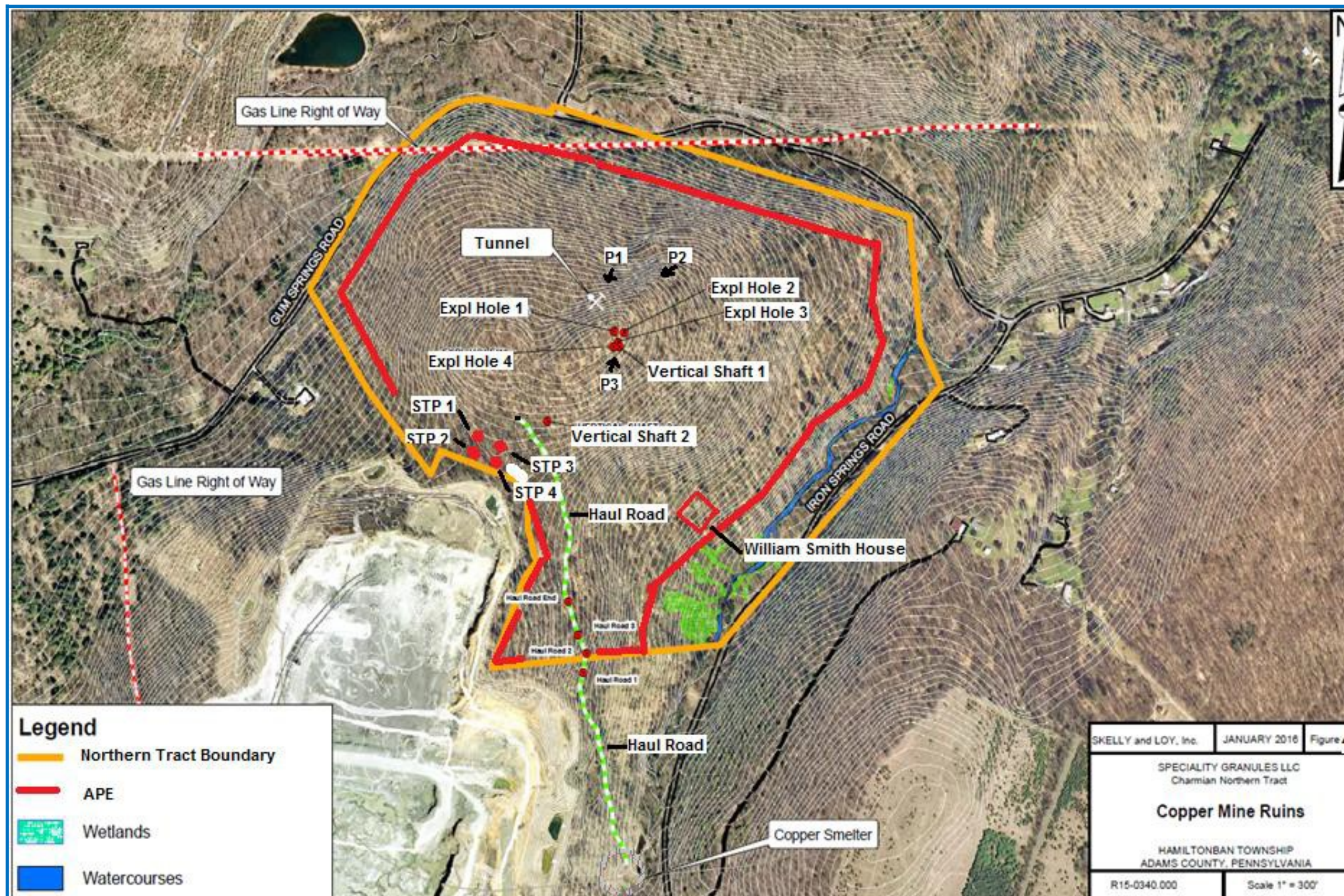
Photograph 1: The tunnel entrance, looking south.



Photograph 2: The tailings pile, looking southwest. Nate Beck provides scale.



Photograph 3: Vertical Shaft 1, looking north. The shaft appeared to be about 25 feet deep, about where it would intersect with the tunnel.



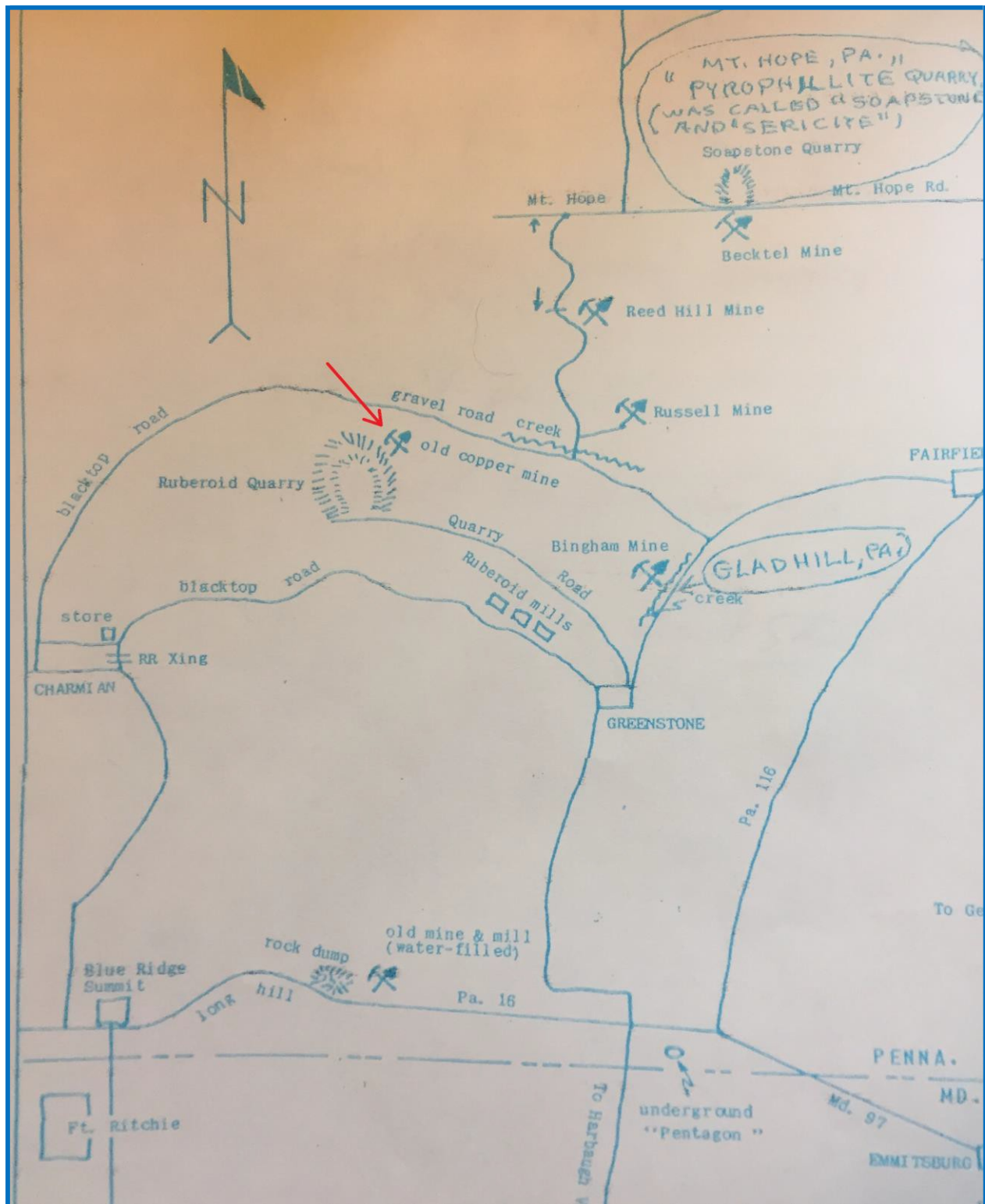


Figure 5: Map drawn by Floyd Oles in 1967, showing the location of copper mining activities, including the "old copper mine" (red arrow).

F. CONCLUSIONS

No previously recorded archaeological sites were located within the APE. As a result of the Phase I archaeological survey, the project team identified two archaeological sites, the Copper Mine (36AdXXXX) and the previously-identified William Smith House (36AdXXXX). The Copper Mine consisted of a tunnel and tailings pile, a vertical shaft, and a haul road and smelter. The smelter and a portion of the haul road lay outside of the APE. The team found no other features associated with the tunnel, tailings pile, and vertical shaft. The documentary evidence indicated that the copper mine excavations had occurred for a short time, 1833-1836, and were then abandoned. Copper mining activity continued throughout the rest of the nineteenth century in Adams County, but at off-site locations to the northeast and east, and no further mining activity appears to have occurred in the APE after the 1833-1836 excavations.

The archaeological investigations of the URS Corporation team at the William Smith House found few artifacts. The team found only domestic artifacts, and none that might be associated with a schoolhouse. They concluded that the William Smith House had been occupied for only a short time. Skelly and Loy's team concurs with the URS team, that the site was a domestic one, not a schoolhouse, and that lacks significant artifacts.

Neither the Copper Mine site nor the William Smith House site should be considered to be eligible for inclusion in the National Register of Historic Places. Both were occupied for a short time. Both sites did not contain significant artifacts, and are unlikely to provide important additional information. Skelly and Loy recommends no additional archaeological survey.

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APPENDICES

**APPENDIX A -
ARCHAEOLOGICAL REPORT SUMMARY FORM**



Archaeological Report Summary Form

ER# 2016-0818-001

DATE 3-19-2018

PROJECT CHECKLIST: Please fill out a copy of this checklist and include it with your initial report submission, (including with management summaries or draft reports). This form may be downloaded and expanded as needed, but please do not eliminate any fields.

1. **Report Title** Phase I Archaeological Survey, Northern Tract Mine Expansion Project

2. **PI** Douglas Dinsmore (☐ MA, ☒ PhD) / **Firm** or Institution Skelly and Loy, Inc.

3. **Report Date** (Month/Day/Year) March 19, 2018

4. **Number of Pages** 20

5. **Agency Name** PA DEP Federal ☐ State ☒

6. **Project Area County/Municipality** (list all)

County	Municipality
Adams	Hamiltonban Township

7. **Project Area Drainage(s)**, (list all)

Sub-basin	Watershed
Lower Potomac River	D

8. **Project Area Physiographic Zone(s)** (list All) (Use DCNR Map 13 compiled by W.D. Sevon, Fourth Edition, 2000.)

Physiographic Zone
Ridge and Valley – South Mountain

9. **Report Type** (some reports are combinations, check as many as apply to this report)

- | | |
|---|---|
| <input type="checkbox"/> Phase IA/Sensitivity Study | <input type="checkbox"/> Historic Structures |
| <input checked="" type="checkbox"/> Phase I | <input type="checkbox"/> Geomorphology |
| <input type="checkbox"/> Phase II | <input type="checkbox"/> Determination of Effects |
| <input type="checkbox"/> Phase III | <input type="checkbox"/> Other _____ |

10. **Total Project Area** 48.2 hectares

11. **Low Probability/Disturbed Areas** 48 hectares = 99 % of project area

12. **Phase I Methods used for total project** (check as many as apply)

- ☒ shovel tests, ☐ controlled test units/deep tests,

☒ surface survey, ☒ informant interview, ☐ other: _____

13. Total Number of Sites Encountered/Phase I 2

Total Sites Tested/Phase II _____

Total Sites Excavated/Phase III _____

14. Updated PASS Information: Please complete an updated PASS form **for each site** reported by this report. Updated forms need only include the new information and the site number and name. **In Appendix B, following.**

15. PASS Site Specific Information: In addition, the following pages must also be completed **for each site**. Complete only the portions that pertain to the current report. If the report is a stand-alone Phase II, you do not need to fill in the Phase I methods, since they should have been included in the summary form for the previous report.

Please complete the following **for each site** reported by this report.

PASS NUMBER 36AdXXXX

A. Phase I Methods (how the site was located - check as many as apply)

☐ shovel tests, ☐ controlled test units/deep tests,
☒ surface survey, ☒ informant interview, ☐ other: _____

PASS NUMBER 36AdXXXX

A. Phase I Methods (how the site was located - check as many as apply)

☒ shovel tests, ☐ controlled test units/deep tests,
☒ surface survey, ☐ informant interview, ☐ other: _____

B. Phase II Methods

- ☐ controlled surface collection
- ☐ controlled excavation w. screening of plowzone, > 5 units
- ☐ mechanical stripping of plowzone (_____%)
- ☐ deep excavation units
- ☐ remote sensing
- ☐ other _____

square meters of site tested: _____ sq. m

% of site area tested: _____ %

C. Phase III Methods

- ☐ controlled surface collection
- ☐ controlled excavation w. screening of plowzone, > 5 units
- ☐ mechanical stripping of plowzone _____%
- ☐ deep excavation
- ☐ block excavations
- ☐ remote sensing
- ☐ environmental reconstruction (soils, floral, pollen)
- ☐ dietary reconstruction (floral, faunal)
- ☐ intensive lithic analysis (functional)
- ☐ intensive lithic analysis (technological)
- ☐ raw material sourcing
- ☐ ceramic analysis (seriation)
- ☐ ceramic analysis (functional)
- ☐ blood residue
- ☐ other _____

square meters of site tested: _____ sq. m

% of site area tested: _____ %

Recommendations (normally completed only after Phase II):

-- NR Eligibility recommendation

☐ eligible, ☐ ineligible, ☐ undetermined

-- reasons for determination (check as many as apply; expand as needed)

- ☐ eligible: Criterion A. Explain _____
- ☐ eligible: Criterion B. Explain _____
- ☐ eligible: Criterion C. Explain _____
- ☐ eligible: Criterion D:
 - ☐ settlement patterning (intersite patterning)
 - ☐ intrasite artifact patterning
 - ☐ features
 - ☐ radiocarbon dating
 - ☐ organic preservation
 - ☐ evidence of culture change through time
 - ☐ stratified ☐ temporally discrete clusters
 - ☐ burials/human remains
 - ☐ technological
 - ☐ economics
 - ☐ ethnicity

- ☐ dietary
- ☐ other(specify): _____

- ☐ ineligible
 - ☐ disturbed
 - ☐ ephemeral occupation
 - ☐ redundant information
 - ☐ undatable
 - ☐ other (specify): _____

E. Artifacts/Collections

- ☐ will be donated to the State Museum of Pennsylvania
 - ☐ gift agreement from private owner enclosed

- or -

- ☐ transfer of responsibility from State Agency enclosed
- ☐ election of repository from Federal Agency enclosed
- ☐ artifacts washed/marked/cataloged following State Museum guidelines

-- collection will be submitted by _____(date)

- ☐ will be donated to other approved repository (**this option must be negotiated with the BHP and State Museum or stated as stipulation in MOA**)

- ☐ curation agreement enclosed
- ☐ artifacts washed/marked/cataloged following host guidelines

-- collection will be submitted by _____(date)

- ☐ will be retained by land owner (☐ whole or ☐ partial collection)

- ☐ expanded documentation enclosed for items retained
- ☐ proof enclosed that owner was notified of the option to

donate the collection to the State Museum and chose to retain the collection:

- ☐ letter from owner indicating desire to retain collection

- or -

- ☐ agency or representative discussed donation option with owner on _____(date)

- and -

- ☐ copy of letter and certified letter receipt indicating that the owner was offered this option in writing.

No artifacts.

**APPENDIX B -
PHASE I SUMMARY: PINE HILL**

Summary Report

Archaeological Investigations, 112.22-Acre Glatfelter Property

Adams County, Pennsylvania

Prepared for

Specialty Granules Inc.

Prepared by

Patricia Miller, Ph.D., RPA

Andrew Wyatt, M.A.

URS Corporation

437 High Street

Burlington, New Jersey 08016

January 2014

Abstract

URS conducted an archaeological investigation to identify whether the potential remains of the former Pine Hill School were located on Specialty Granules Incorporated's (SGI's) 112.12-acre Glatfelter property in Hamiltonban Township, Adams County, Pennsylvania. The work included background research for the property, along with pedestrian survey and subsurface testing in two study areas that were considered to have a high probability for archaeological resources possibly related to the former Pine Hill School. The fieldwork was limited to these two study areas. Subsurface testing was conducted in and around a stone foundation identified in one of the study areas.

A review of the PHMC's Cultural Resources Geographic Information System (CRGIS) database revealed no recorded archaeological sites or aboveground historic resources on the 112.22-acre Glatfelter property. The 1858 historic map of the area indicated that a mine and a structure of unknown function were present on the 112.22-acre Glatfelter property. The 1872 historic map depicted a building labelled "William Smith" at the approximate location of the stone foundation identified on the 112.22-acre Glatfelter property. Background research indicated that the Pine Hill School operated between 1910 and 1922, and was likely near the J. Bigham property shown on the 1872 map as located outside and to the south of the project area.

Pedestrian survey at the reported potential location of the Pine Hill School did not identify historic foundations or other above-ground evidence of a historic building. Subsurface testing around a stone foundation near the reported potential location of the Pine Hill School produced one prehistoric and 11 historic artifacts. Testing confirmed that the prehistoric artifact was an isolated find. The historic artifacts were found in low density and consisted primarily of architectural items. The foundation is at the approximate location of the structure labelled "William Smith" on the 1872 map and could be a residence of some type. However, the near-absence of domestic items suggests that if the building was a residence, it was only briefly occupied. No depressions suggesting a privy were found. None of the artifacts recovered support the hypothesis that the stone foundation represents a former school.

Based on the low density and diversity of artifacts recovered around this foundation, together with the absence of intact deposits, it is our opinion that this archaeological site is not eligible for listing on the National Register of Historic Places. It is our recommendation that no further investigation of this archaeological site or the two study areas is warranted.

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1

Introduction

URS conducted an archaeological investigation to identify whether the potential remains of the former Pine Hill School were located on Specialty Granules Incorporated's (SGI's) 112.12-acre Glatfelter property in Hamiltonban Township, Adams County, Pennsylvania (Figure 1). The investigation included background research for the property, along with pedestrian survey and subsurface testing in areas considered to have a high probability for archaeological resources possibly related to the reported Pine Hill School. Archaeological testing was limited to two study areas (Figure 2). The Pedestrian Survey Study Area was identified by a local resident as the location of the former Pine Hill School, a one-room school that operated between 1910 and 1922. A pedestrian survey was conducted in this study area. The Stone Foundation Study Area was centered on a stone foundation identified near the Pedestrian Survey Study Area. Subsurface testing was conducted in this study area.

The 112.22-acre Glatfelter property is situated in the South Mountain Section of the Ridge and Valley Province in south-central Pennsylvania. The area surrounding the project is steep, mountainous terrain dissected by small streams that flow through steep-sided ravines. The study area is situated on a steep, southwest-facing slope that is forested. An unnamed first-order stream flows northward along the base of the slope and into Toms Creek. Toms Creek flows northeast before turning south to join the Monocacy River in Maryland. The Monocacy River is part of the Potomac River basin.

Soils in this area are classified as Ravenrock-Highfield-Rock outcrop (15–25 percent slope) and Highfield and Catocin channery silt loams, very stony (25–70 percent) (Web Soil Survey 2012). All of these soils are extremely stony and well-drained, forming on mountainsides.

Patricia Miller served as Principal Investigator for the archaeological survey and is responsible for the content of this report. Andrew Wyatt revised the report to incorporate revisions requested by SGI. James Burton directed the field crew. Paul Elwork edited the text for style and consistency. Nina Shinn prepared the report graphics.

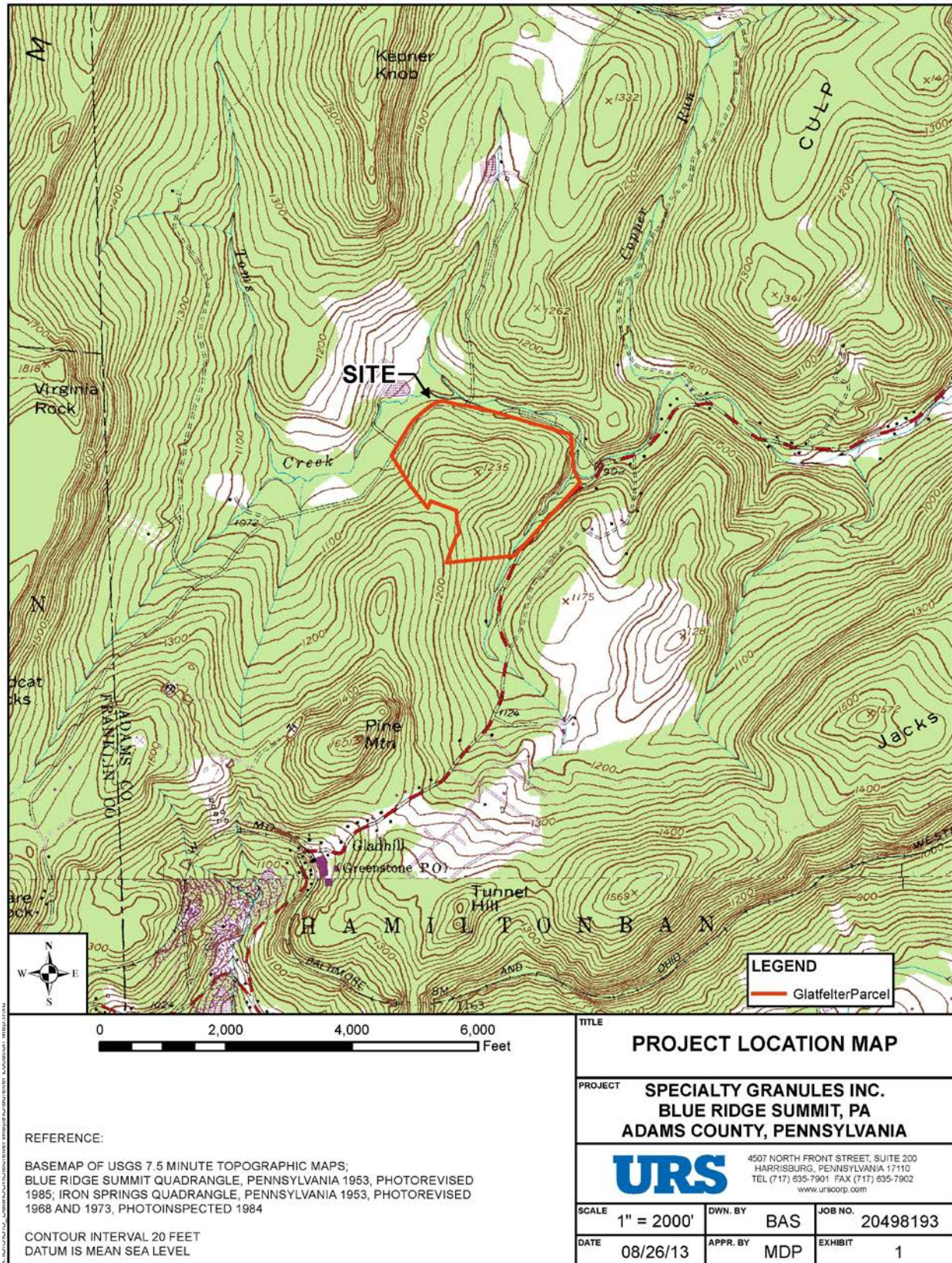


Figure 1: Project location map

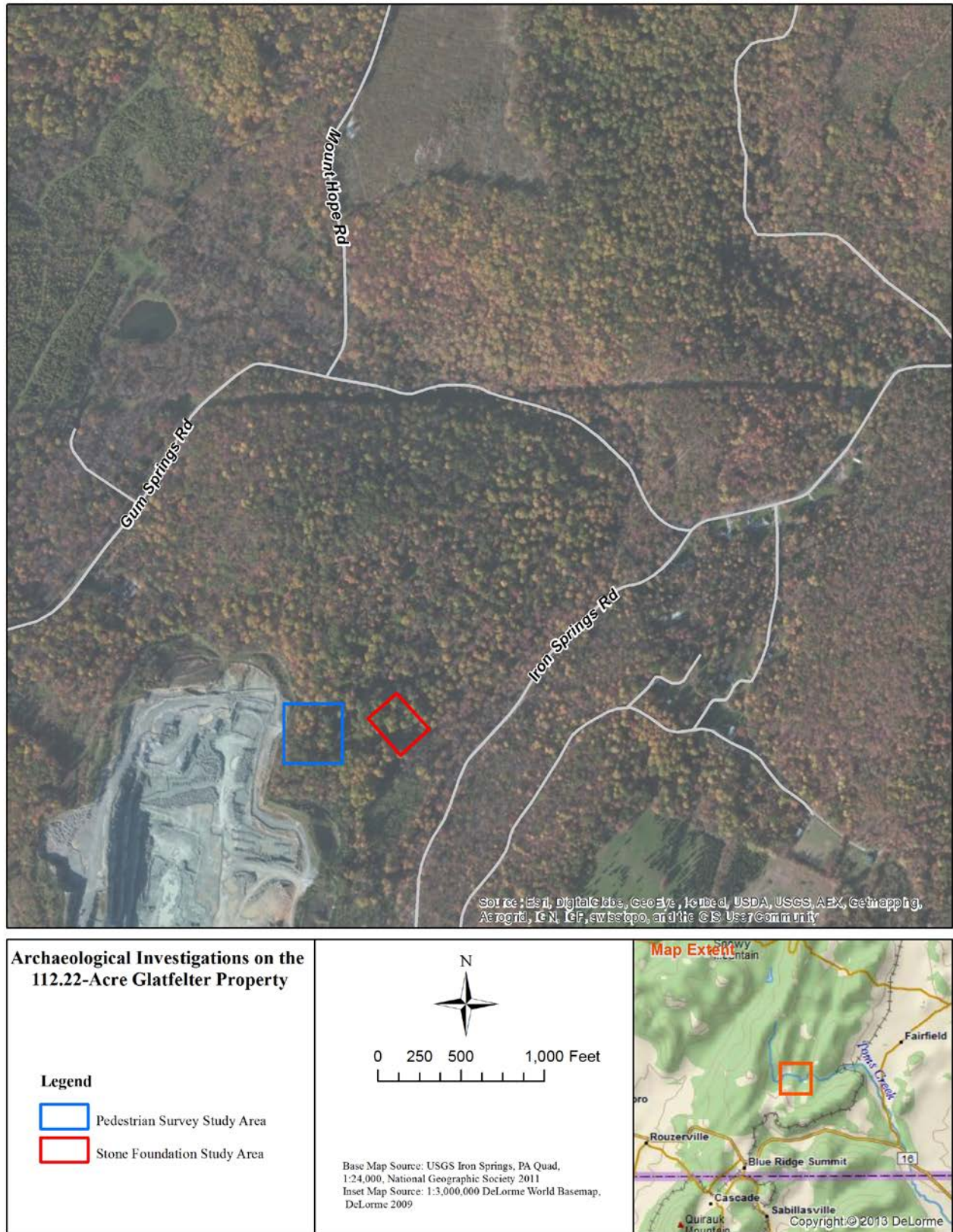


Figure 2: General vicinity of the 112.22-acre Glatfelter property showing study areas.

2 Methods

BACKGROUND RESEARCH METHODS

A background and property history of the project area was assembled from maps, deeds, genealogical data, and local histories. Deeds were searched at the Adams County Recorder of Deeds office in Gettysburg. Maps and local histories came from the Adams County Historical Society in Gettysburg and the Gettysburg branch of the Adams County Library System. In addition, online sources provided additional cartography, early issues of the *Gettysburg Times* newspaper, and family history information.

FIELD AND LABORATORY ANALYSIS METHODS

Because soils within the study area formed in the residuum of bedrock, field techniques involved the excavation of shovel test pits (STPs). The STPs measured 50 x 50 centimeters (20 x 20 inches) and were excavated by natural strata. STPs were excavated at least 10 centimeters (4 inches) into B-horizon subsoil or to impassable rock. STPs were excavated at 7.5- and 15-meter (25- and 49-foot) intervals on level terrain surrounding the stone foundation. Soil from each STP was screened through 1/4-inch hardware mesh and the residue examined for the presence of artifacts.

Soil profiles were recorded using the Munsell color system and standard texture classifications. Following completion of each STP, the pit was completely backfilled and compacted.

Prehistoric artifacts were cataloged in terms of material type, form, function, and, if possible, cultural affiliation. No prehistoric ceramics were identified. One piece of debitage was found. The artifact was classified using morphological traits, such as the presence of a platform and bulb of percussion, the type of platform, dorsal flake scars, and presence of cortex. Evidence of thermal alteration on debitage was tabulated.

Historic artifacts include ceramics, glass, metal, and miscellaneous other artifacts. Historic artifacts were analyzed in terms of type of material, form, function, and temporal attributes. Historic ceramics were characterized by paste, glaze, and decoration. Major categories include pearlware, whiteware, white granite, stoneware, porcelain, and red-bodied earthenware. Vessel function was inferred whenever possible, based on vessel shape and size. Maker's marks were recorded and identified, when present. If the quality of the evidence permitted, the date and place of manufacture were specified for each vessel in the assemblage.

Glass containers were characterized by type, color, and element (body, rim, base). Whenever the quality and completeness of the vessel were sufficient, the date of manufacture and the function of the bottle were specified. Window glass was characterized by color. Nails were classified by manufacturing process (wrought, die-cut, wire) and the function (common nail, roofing nail, brad, etc.) specified for all complete pieces. Bricks were classified by manufacturing process, if possible.

Artifacts were prepared for curation according to the current State Museum of Pennsylvania guidelines. All artifacts from this investigation will be returned to SGI at their request.

Background Research Results

PREVIOUSLY RECORDED RESOURCES

Review of the PHMC's Cultural Resources Geographic Information System (CRGIS) revealed that there are no listed archaeological sites or aboveground historic resources within the 112.22-acre Glatfelter property boundary.

HISTORICAL BACKGROUND

The territory of Adams County was part of the land Charles II of England granted to William Penn and his heirs as a proprietary in 1681. Penn's prosperity depended on his finding European settlers to populate his province. Germans began arriving in Pennsylvania in 1683. Most became farmers and took up the land north and west of Philadelphia. The Scotch-Irish, descendants of Protestant dissenters from Northern Ireland, immigrated to Pennsylvania in large numbers beginning in 1710. They occupied the lands farther west in the Piedmont regions of the Susquehanna Valley and the mountains which rimmed it to the north and west (Bloom 1992:6).

As settlement moved westward, more of Pennsylvania's counties were formed. In 1749, part of Lancaster County lying west of the Susquehanna River was formed into York County. In 1800, portions of York's westernmost townships were formed into Adams County. A European had entered Adams County as early as 1718 to set up a trading post near what is now Zora in Liberty Township. The Penn family acquired the title to the Adams County area in 1736, clearing the way for the tide of settlement. German families had begun arriving into southeastern Adams County a few years before the Indian purchase—the first permanent settlers. By 1736, Scotch-Irish settlers were making their way into the Marsh Creek area in the central part of Adams County by way of Maryland (Bloom 1992:8–10).

The location of the boundary line between Pennsylvania and Maryland was not resolved until the Mason-Dixon Line was established in 1767. Up until that time, Maryland issued land grants in the disputed territory—encouraging settlement to strengthen its claims. Pennsylvania eventually recognized the property rights of these Maryland claimants. In the 1730s, Maryland issued two land grants containing 7,857 acres to members of the Carroll family. These tracts, known as “Carroll's Tract” and “Carrollsbury,” were located in today's Liberty, Hamiltonban and Franklin Townships. These tracts were predominantly settled by Scotch-Irish families (Bloom 1992:9-10).

Frontier-like conditions persisted in Adams County until the end of the eighteenth century. Farmers practiced subsistence agriculture. The improvement of roads in the years after the American Revolution provided better access to mills and markets. Farmers sold their meats, hides, flour, whiskey, and other products in Baltimore—fifty miles away and half the distance of a journey to Philadelphia. Hamiltonban Township was one of 11 townships created in Lancaster and then York County between 1745 and 1750. It included the territory of Liberty Township (1801), Freedom Township (1838), and Highland Township (1863) (Hively 2009:23).

Beginning in the 1740s, Adams County became a part of the colonial wagon road network that connected the Eastern Seaboard to the hinterland. The Monacacy Road ran from the Susquehanna River to the Potomac River passing through the southeastern corner of the future Adams County. In 1747, the Black's Gap Road ran through Adams County following the current alignments of U.S. Route 30 and State Route 394. It then crossed South Mountain, the northern extension of the Blue Ridge Mountain range, through Cashtown Gap into the Cumberland Valley, a route later used by travelers between Philadelphia and Pittsburgh. The third important road to pass through the county was located near the project area. It was called Nicholson's (or Nichol's) Gap Road. At New Oxford the road branched off the Black's Gap Road to the southwest, passing through the present sites of Gettysburg, Fairfield, and Fountaindale, before passing through Nicholson's Gap in South Mountain. It followed the alignments of present-day State 116, Jack's Mountain Road, and the Old Waynesboro Road in Hamiltonban Township (Bloom 1992:30–32).

In 1755, Irish immigrant John Miller purchased 247 acres in Hamiltonban Township from Charles Carroll. His plans for the founding of a town were put on hold until 1784, when he laid out the town lots of Fairfield. By 1796, 10 lots had been sold. It was a convenient stopping off place on the Nicholson's Gap Road, and an inn and other service businesses helped it develop into the principal town of southwestern Adams County. Its growth was slow when compared to towns in the eastern part of the county. Adams County was created in 1800 with the county seat at Gettysburg, which helped it develop into the county's principal place of business, as well as a transportation hub. In 1846, Fairfield was described as a busy place with 50 dwellings, several stores and taverns, two churches, a schoolhouse, and a number of mechanics' shops (Bloom 1992:48–49; 70; Fairfield Area Bicentennial Committee 1976:11).

Fountaindale, on the other side of Pine Mountain from the project area, was a village that developed around a tavern established in 1803 near Nicholson's Gap. By 1858, the spread out village along the Old Waynesboro Road included the inn, a hotel, two churches, a cemetery, a gristmill and two sawmills, a tannery, a schoolhouse, a wheelwright shop and boot shop, and at least 15 dwellings (Bloom 1992:78; Hopkins 1858).

Iron ore had been discovered in the mountainous western section of Adams County in colonial times. It was refined and used for munitions during the American Revolutionary War. In 1792, a land grant of 41.5 acres on Jack's Mountain was given to Dr. James Crawford, who presumably used it for the extraction of ores or minerals. After 1800, iron ore was neither mined in any great quantity nor had the quality to develop into a major industry, as it did in other parts of Pennsylvania. The greatest effort at developing an iron works in Adams County occurred near the project area. In 1822, Thaddeus Stevens, James D. Paxton, John B. McPherson, and General Thomas Craig Miller organized a company to mine the local iron ore, smelt it, and manufacture iron products. The Maria Furnace, named for Paxton's wife, was constructed southwest of Fairfield on Iron Springs Road. The company manufactured iron stoves, but the iron ore was not of a high enough quality and the stove plates were too brittle. In 1824, McPherson and Miller sold out their share in the enterprise. Stevens and Paxton persisted until 1836, when the site was abandoned (Bloom 1992:104; Fairfield Area Bicentennial Committee 1976:13).

In 1836, survey work began on the Wrightsville, York & Gettysburg Railroad, a state-funded rail line projected to extend from Wrightsville on the Susquehanna through York and Gettysburg to

connect via Nicholson's Gap with the Baltimore & Ohio Railroad in the Potomac Valley. It would be the first rail line built in the county and would be a means to siphon trade off to Philadelphia. Opponents of the railroad dubbed it "the tapeworm railroad" because of the circuitous route it took west of Gettysburg running through Maria Furnace before it doubled back on itself and wound around the foot of Jack's Mountain. The railroad chose this route because Thaddeus Stevens, the owner of Maria Furnace, represented Adams County in the state assembly and held a great deal of political clout in the state. As construction got underway, the railroad became a major issue in the state's political battlefield. Stevens' party lost the next gubernatorial election and construction of the railroad was halted. The railroad Thaddeus Stevens envisioned, though with a less steep grade, was built west of Gettysburg beginning in 1885. The railroad entered Hamiltonban Township near Orrtanna. It took four years to complete the line over the hills and build a tunnel through Jack's Mountain. The Western Maryland Railway Company operated it until the 1970s; CSX Transportation currently owns it (Bloom 1992:125–126).

Because of the growing demand for iron, copper, and other minerals, mines continued to be opened and operated in Adams County from the 1840s through the 1910s. The results of iron, copper, gold, and petroleum extraction in Adams County were disappointing. The amount was never sufficient to make the mining effort profitable. Stone quarrying and the development of clay deposits did become important extractive industries in Adams County (Bloom 1992:104, 250–252).

Property Ownership of Tract 33A

The 112.22-acre Glatfelter property was part of a large land acquisition in Adams County made by the Conservation Fund, a non-profit organization that partners with community, government, and corporate organizations to promote land conservation with a balance of environmental and economic goals. A survey made for the Conservation Fund divided the property into 43 tracts of land. The historic foundation investigated during the field investigation is located on "Tract 33A," a 58.5-acre parcel of land (Figure 3). This parcel has been traced back to the original land warrant issued in 1793 (Table 1).

In 1793, the Commonwealth of Pennsylvania issued a warrant for 100 acres to David Wilson, in trust for the heirs of James Wilson, deceased. The survey was made on October 20, 1795. The metes and bounds of the tract held in trust for James Wilson's heirs encompassed an area of 130 acres. A patent, whereby the commonwealth granted full and clear title to the tract, was given to James Wilson on June 25, 1836 (Hively 2009:214).

David Wilson was the son of James Wilson, a Scotch-Irish immigrant who settled in the Marsh Creek area of Adams County about 1736. David Wilson was born in 1752 and served as a captain in the York County militia during the Revolutionary War. He took out the warrant for the children of his deceased brother James, who died in 1779 from a disease contracted in the war (Egle 1895:171). David, James, and their brother Hugh had inherited farms in Hamiltonban Township from their father James when he died in 1776. Their inheritance had also included a plantation on South Mountain (Will of James Wilson 1775).

James Wilson, who lived in Fairfield, sold the entire 130-acre tract on Pine Hill to Judah Dobson. The tract's location was described as "being near the mill race of Joseph Reid" (Adams

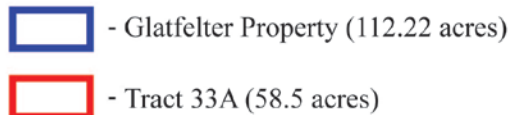


Table 1: Property Transfers

Seller	Buyer	Date	Price	Description	Reference
Commonwealth of PA, Dept. of Conservation & Natural Resources	ISP Minerals Inc.	August 5, 2011	Exchange of 115.92 acres	All of Tract Nos. 33A, 33C, 35, 36, 41, and part of Tract No. 27, 112.22 acres in Hamiltonban Twp. Study areas is located on Tract 33A containing 58.5 acres.	Deed Book 5621:290
The Conservation Fund, a non-profit corporation	Commonwealth of PA, Dept. of Conservation & Natural Resources	May 20, 2010	\$11.2 million	Premises of the Glatfelter Pulp Wood Company in 43 tracts of land, including Tract 33A.	Deed Book 5483:193
Glatfelter Pulp Wood Co.	The Conservation Fund	March 24, 2008		Premises of the Glatfelter Pulp Wood Company in 43 tracts of land, including Tract 33A.	Deed Book 5153:258
Thomas L. & Charlotte Bower, Jr., of Jamaica, NY	The Glatfelter Pulp Wood Company	December 16, 1975	\$34,500	3 parcels: 1) 58.5 acres 2) 7 acres & 48 perches 3) 3 acres & 44 square perches	Deed Book 322:113
Anna Kleinschmidt, of Baltimore, et al.	Thomas L. Bower Jr., of Ozone Park, NY and Evelyn Jane Bower Meredith, of Los Angeles, CA	March 11, 1971	\$3,500	Quitclaim to 3 parcels: 1) 58.5 acres 2) 7 acres & 48 perches 3) 3 acres & 44 square perches	Deed Book 293:409
William D. & Hannah B. Elger	J. Scott Bower & wife, L. Blanche Bower	October 18, 1907		2 parcels: 1) 58.5 acres 2) 7 acres & 48 perches Part of 130-acre tract	Deed Book 83:475
J. Scott Bower & L. Blanche Bower	William D. Elger	July 13, 1901		2 parcels: 1) 58.5 acres 2) 7 acres & 48 perches Part of 130-acre tract	Cited in Deed Book 83:475
William Smith	J. Scott Bower	June 28, 1901		2 parcels: 1) 58.5 acres 2) 7 acres & 48 perches Part of 130-acre tract	Cited in Deed Book 83:475
Phebe P. Thompson, of Phila. (niece & heir of George Thompson)	William Smith, of Fairfield	April 24, 1891	\$500	130 acres allowing 6% for roads	Deed Book 56:27
Thomas Dunlap, Esq., of Phila., assignee of Judah Dobson, of Phila.	George Thompson, of Phila.	November 4, 1846	\$50	130 acres allowing 6% for roads	Deed Book Q:358
James & Mary Wilson, of Fairfield	Judah Dobson	August 17, 1836	\$1,000	130 acres allowing 6% for roads	Deed Book N:334
Commonwealth of Pennsylvania	James Wilson	June 25, 1836			Patent Book H36:279

County Deed Book N:324). Dobson suffered financial problems that forced him to sell off his property. The Pine Hill tract was sold to George Thompson, a fellow Philadelphian, in 1846. Thompson reportedly mined low-grade copper ore on Pine Hill (described as the southwest portion of Jack's Mountain), which was not commercially profitable (Fairfield Area Bicentennial Committee 1976:14).

George Thompson was still the owner of the 130-acre tract when he died in 1876. He willed the property to his two nieces, Phebe P. Thompson and Mary Thompson. After Mary Thompson's death in 1884, the property came under the sole ownership of her sister Phebe. Phebe P. Thompson sold the entire property to William Smith of Fairfield in 1891 for \$500 (Adams County Deed Book 56:27).

The 130-acre tract was subdivided for the first time in the early 1900s. William Elger and his wife Hannah sold the 58.5-acre tract containing the study areas to J. Scott Bower and his wife, L. Blanche Bower, in 1907. J. Scott Bower died on November 7, 1929. By the right of survivorship, the 58 acres became the sole property of Blanche, who was known as Blanche LaMar Bower. In 1946, Blanche and her son, Thomas L. Bower Sr., who were residents of Baltimore, mortgaged the property described as "several tracts of unimproved land in Adams County" to Otto A. Kleinschmidt of Baltimore for a loan of \$900. Blanche died intestate in Baltimore on June 30, 1955, leaving her two grandchildren, Thomas LaMar Bower Jr. and Evelyn Jane Bower Meredith, as her sole heirs. When his sister, Evelyn Meredith, died on June 3, 1974, Thomas L. Bower Jr. became the sole owner of the 58.5-acre tract. Thomas L. Bowers Jr. and his wife Charlotte—who lived in Jamaica, Queens, New York—sold the 58.5-acre tract to the Glatfelter Pulp Wood Company in 1975 for \$34,500 (Adams County Deed Book 293409; 322:113).

The Glatfelter Pulp Wood Company sold 43 tracts of land in Hamiltonban Township, including Tract 33A, to the Conservation Fund in 2008, which in turn transferred the property to the Pennsylvania Department of Conservation and Natural Resources for \$11.2 million. In 2011, the Commonwealth of Pennsylvania granted ISP Minerals (now SGI) Tract 33A as part of a land exchange (Adams County Deed Book 5153:258; 5621:290; 5438:193; 5621:290).

Pine Hill School

None of the deeds collected during the research of the 58.5-acre tract mentioned a schoolhouse on this property or on a neighboring property. Historical maps depicting the Pine Hill area were studied for information regarding any structures within the bounds of the 112-acre tract. These maps included the 1858 Hopkins map of Adams County; the Lake 1872 atlas of Adams County; topographical surveys made by the U.S. Geological Survey between 1885 and 1946; and the 1916, 1941, 1953, and 1966 highway maps of Adams County.

The 1858 map of Hamiltonban Township (Hopkins 1858) depicts a mine within the boundary of Tract 33A (Figure 4) which was presumably the copper mine operated by George Thompson sometime between 1846 and 1876. The label "Copper Furnace Prop^y" appears to be associated with a structure to the east of the label. It appears to lie at the boundary of Tract 33A, but the inexact nature of map representations during this period of the nineteenth century must be taken into account. The remains of this structure might well be located in Tract 33A. Another map of the area was published in 1872 (Figure 5). It depicted no mines or furnaces in the area, except for

the ruins of Maria Furnace. A house William Smith owned was depicted in the 58.5-acre tract (Lake 1872). Land records indicate that the Thompsons were absentee landlords during the period from 1846 to 1891. The appearance of William Smith on the property might be explained by a long-term leasing arrangement. William Smith became the legal owner of the property in 1891.

There are no structures depicted in the 112.22-acre Glatfelter property on the maps produced from topographic surveys made by the United States Geological Survey in 1885 and 1908 (USGS 1909). Sometime between 1872 and the topographical survey, the William Smith house was destroyed or removed. (Lake 1872; USGS 1909).

The 1916 map of public roads in Adams County depicted the locations of schools, churches, mills, and railroad stations. According to this map, there was no school located in the 112.22-acre Glatfelter property (Pennsylvania State Highway Department 1916). In 1941, the Pennsylvania Highway Department made detailed county maps depicting buildings and infrastructure (Figure 6). No buildings were depicted in the 112.22-acre Glatfelter property, although there was a farmhouse south of the 112.22-acre Glatfelter property located between Iron Springs Road and Tom's Creek. Quarries were opened up in another part of Pine Hill. By 1953, a double dwelling had been built on the east side of Tom's Creek, near the intersection of Iron Springs Road and Lower Gum Springs Road. A quarry occupied the site of the house to the south of the 112.22-acre Glatfelter property (Figure 7).

Although there is a substantial amount of historical mapping available for the area, the presence of the Pine Hill School was not evident. A *Gettysburg Times* newspaper article indicated that the Pine Hill School operated from about 1910 to 1922 and was located near the house that had once belonged to John Bigham. The April 4, 1910 edition of the *Gettysburg Times* noted that "John Baker moved into the house formerly owned by John Bigham near Pine Hill school house..." Bigham's house is depicted on the 1872 map of the area south of the 112.22-acre Glatfelter property. The Bigham house is shown on current topographic maps, but has been demolished. The Pine Hill School was a one-room schoolhouse with 26 students in 1912. In 1922, the Hamiltonban Township school board announced that it would build a new schoolhouse at Gladhill (also known as Greenstone), a growing town south of the 112.22-acre Glatfelter property on Iron Springs Road and a stop on the Western Maryland Railroad. After the new schoolhouse was completed, Pine Hill would be closed. Plans were to sell Pine Hill School and advertise it as suitable for conversion into a bungalow for hunters or fishermen. Before anything could be done with the school, it burned down in August 1922 (*Gettysburg Times*, April 4, 1910:1; December 6, 1912:8; July 22, 1922:5; August 17, 1922:1; August 29, 1922:2; September 7, 1955:4).





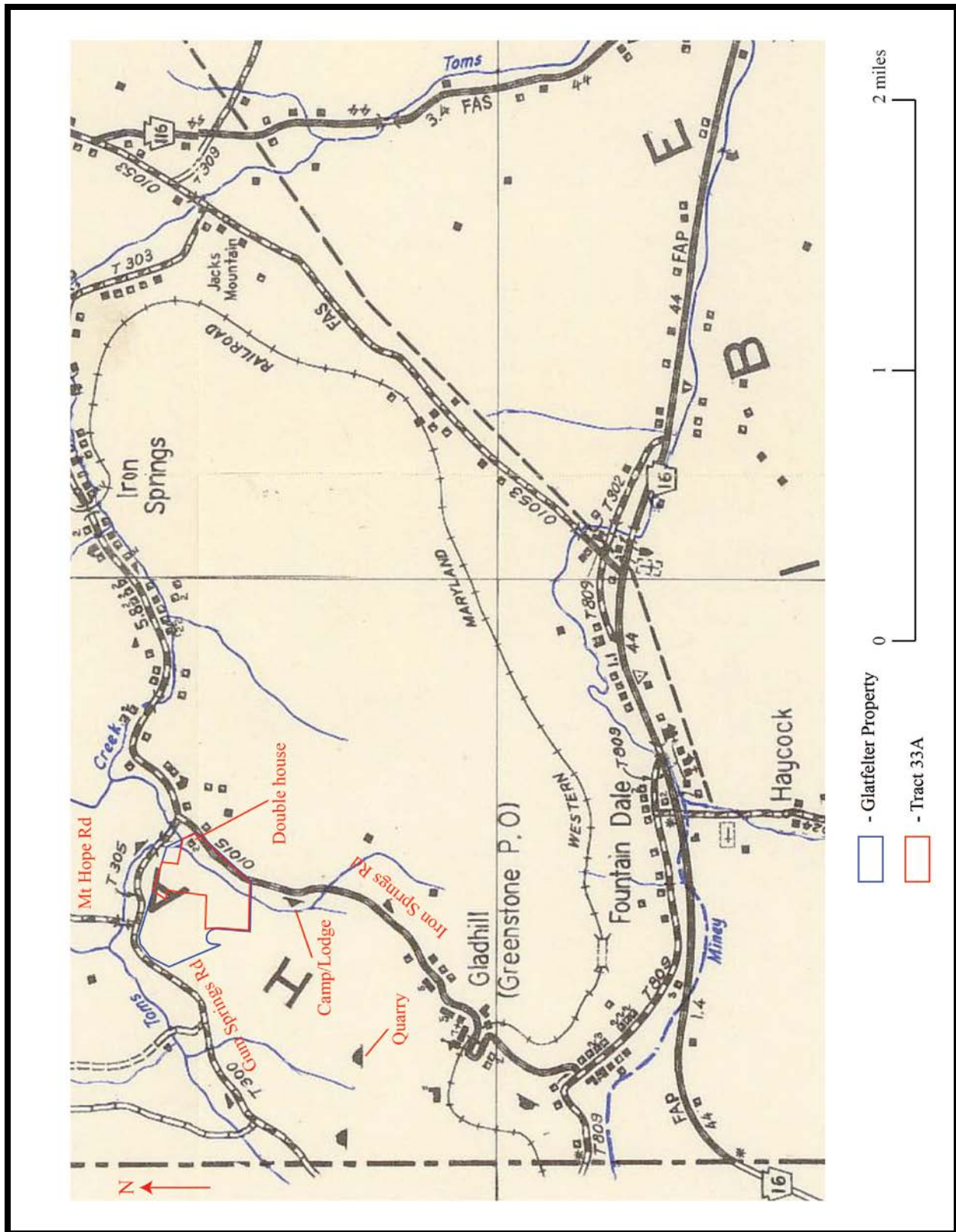


Figure 7 : 112.22-acre Glatfelter property and Tract 33A in 1953 (Source: Pennsylvania Highway Department 1953).

Field Survey Results

Archaeological field survey was conducted in two locations on the 112.22-acre Glatfelter property on May 30 and 31, 2012.

URS archaeologists conducted a pedestrian survey of the reported location of the Pine Hill School as identified by a local resident in the Pedestrian Survey Study Area (Figure 2). The area was located at the top of the ridge near the existing mine. No evidence of a historic foundation or building was found.

Subsurface testing was conducted around a small stone foundation identified on the slope below the Pedestrian Survey Study Area (see Figure 2; Figures 8 and 9). The foundation is composed of four dry-laid stone walls measuring approximately 7.6 x 7.6 meters. No cellar was evident in the interior of the foundation. No depressions indicative of a well or privy were identified near the foundation. In all, 38 STPs were excavated (Figure 10). The STPs were placed at 15-meter intervals on the level terrain surrounding the foundation and at 7.5-meter intervals in the immediate vicinity of the foundation. Terrain to the east and west of the tested area was steeply sloping; the area was examined for aboveground features, but none were identified. The wooden posts of an entrance gate were identified to the west of the foundation.

The general soil profile consisted of a brown (10YR 4/3) or dark brown (10YR 3/3) silt loam A horizon overlying a dark yellowish brown (10YR 4/4) or yellowish brown (10YR 5/6) clay loam B horizon. Rocks were found throughout most of the STPs and several reached bedrock. STP 1 was excavated within the stone foundation to determine whether a cellar was present. The STP encountered an undisturbed B horizon at a depth of 25 centimeters below the surface, indicating that a cellar was not present.

Eight brick fragments were found in STP 6. A piece of green container glass was found in STP 9 and a piece of window glass was found in STP 13. Four radial tests were excavated at 5-meter intervals around STP 13. Because of the presence of rock piles, only two radials could be excavated around STP 9. No additional artifacts were identified in radials excavated around the two finds. A sherd of whiteware ceramic was found in STP 16. Radial STPs produced no additional historic artifacts, but one biface-thinning flake of gray chert was identified. Additional radial testing produced no more prehistoric artifacts.

In all, one prehistoric and 11 historic artifacts were found in scattered locations across the tested area. The prehistoric artifact was confirmed as an isolated find. The historic assemblage consisted primarily of architectural items, including eight pieces of brick and a piece of window glass. Only two household artifacts were found, a piece of container glass and a whiteware sherd.

This stone foundation correlates with the structure labelled “William Smith” on the 1872 map of Hamiltonban Township (Figure 5). No artifacts that can be conclusively associated with a school (i.e. inkwell fragments, slate pencils, drawing slates) were recovered.



Figure 8: Southeast corner of stone foundation, facing north.



Figure 9: South wall of stone foundation, facing east.

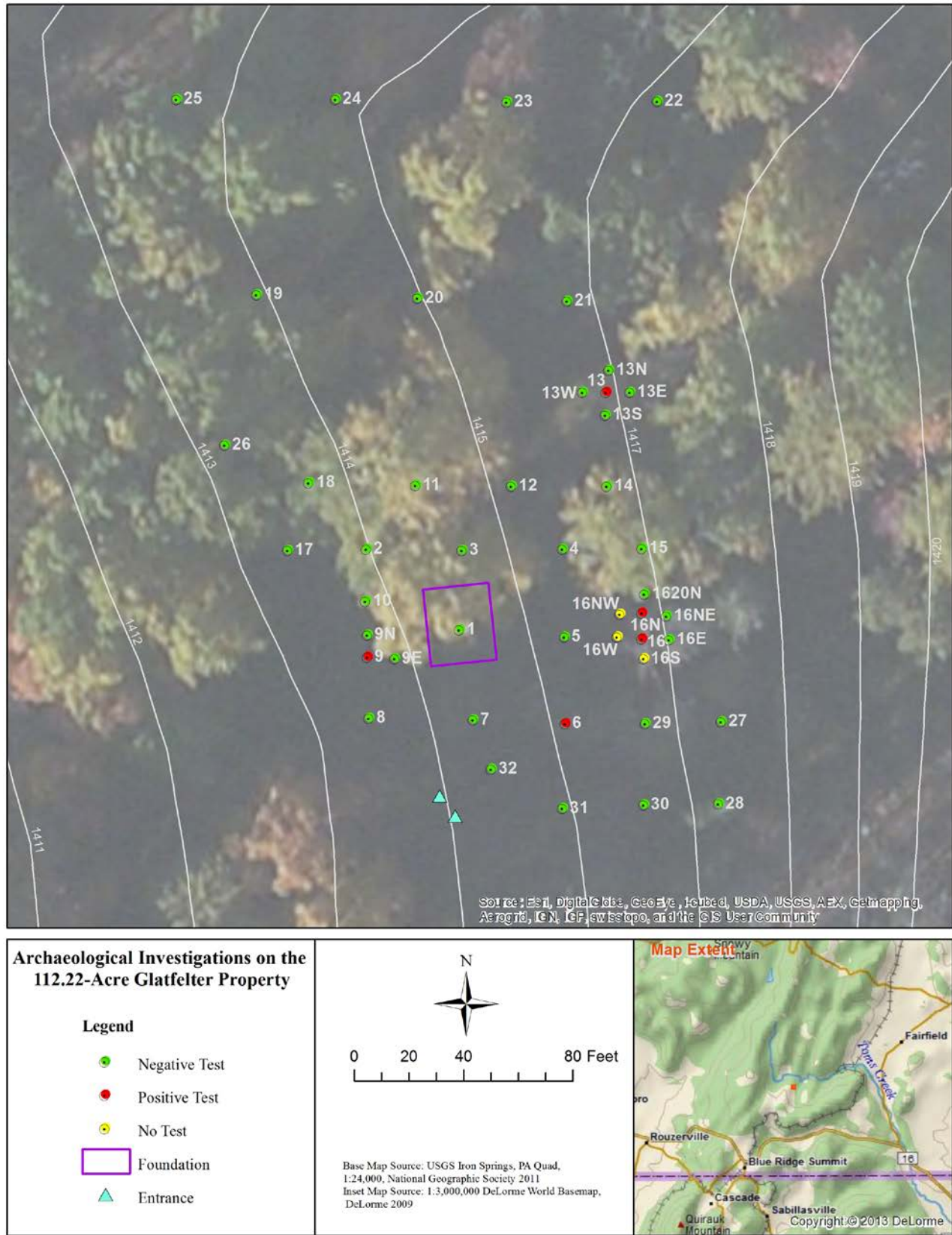


Figure 10: Stone foundation test locations.

Summary and Conclusions

URS conducted an archaeological investigation to identify whether the potential remains of the former Pine Hill School were located on Specialty Granules Incorporated's (SGI's) 112.12-acre Glatfelter property in Hamiltonban Township, Adams County, Pennsylvania. The work included background research for the property, along with pedestrian survey and subsurface testing in two study areas that were considered to have a high probability for archaeological resources possibly related to the former Pine Hill School. The fieldwork was limited to these two study areas. Subsurface testing was conducted in and around a stone foundation identified in one of the study areas.

A review of the PHMC's Cultural Resources Geographic Information System (CRGIS) database revealed no recorded archaeological sites or aboveground historic resources on the 112.22-acre Glatfelter property. The 1858 historic map of the area indicated that a mine and a structure of unknown function were present on the 112.22-acre Glatfelter property. The 1872 historic map depicted a building labelled "William Smith" at the approximate location of the stone foundation identified on the 112.22-acre Glatfelter property. Background research indicated that the Pine Hill School operated between 1910 and 1922, and was likely near the J. Bigham property shown on the 1872 map as located outside and to the south of the project area.

Pedestrian survey at the reported potential location of the Pine Hill School did not identify historic foundations or other above-ground evidence of a historic building. Subsurface testing around a stone foundation near the reported potential location of the Pine Hill School produced one prehistoric and 11 historic artifacts. Testing confirmed that the prehistoric artifact was an isolated find. The historic artifacts were found in low density and consisted primarily of architectural items. The foundation is at the approximate location of the structure labelled "William Smith" on the 1872 map and could be a residence of some type. However, the near-absence of domestic items suggests that if the building was a residence, it was only briefly occupied. No depressions suggesting a privy were found. None of the artifacts recovered support the hypothesis that the stone foundation represents a former school.

Based on the low density and diversity of artifacts recovered around this foundation, together with the absence of intact deposits, it is our opinion that this archaeological site is not eligible for listing on the National Register of Historic Places. It is our recommendation that no further investigation of this archaeological site or the two study areas is warranted.

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Will of James Wilson, of Hamiltonban Township, York County

1775 Written: December 10, 1775; Probated: May 1, 1776

Transcribed by Cal_Palmore. Ancestry.com family tree of James Wilson. Accessed on July 27, 2012.

Appendix A
Artifact Inventory

**APPENDIX C -
PENNSYLVANIA ARCHAEOLOGICAL
SITE SURVEY FORMS**

PENNSYLVANIA ARCHAEOLOGICAL SITE SURVEY
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

Identification and Location

SITE NAME Copper Mine SITE NUMBER _____ UPDATE? Y☐ / N☒

PUBLISHED REFERENCES (Including compliance reports.) Phase I Archaeological Survey, Charmian Northern Tract

ER# _____

• COUNTY Adams TWP. Hamiltonban NEAREST TOWN Blue Ridge Summit

Site Characteristics

SITE AREA 3507 SQUARE METERS BASIS: ☐ COMPUTED ON THE GROUND OR ☒ COMPUTED ON MAP

Basis for site boundary definition: Surface survey

STRATIFIED? ☒ UNKNOWN ☐ NO
☐ YES : ☐ TOP STRATUM VISIBLE OR ☐ BURIED UNDER STERILE

SITE DISCOVERY METHOD: (check primary one only) ☐ Previously Recorded (update)

<input type="checkbox"/> Unknown	<input type="checkbox"/> Auger probing
<input type="checkbox"/> Collector interview	<input type="checkbox"/> Shovel testing
<input type="checkbox"/> Collector interview with field check	<input type="checkbox"/> Systematic test units
<input type="checkbox"/> Non-systematic surface survey	<input type="checkbox"/> Extensive excavation
<input checked="" type="checkbox"/> Systematic surface survey	
<input type="checkbox"/> Systematic shovel testing	
<input type="checkbox"/> Remote sensing	

POTENTIAL FOR ORGANIC PRESERVATION: (check one)

☐ Unknown
☐ None
☒ Low potential for organic preservation
☐ Conditions favorable for organic preservation, none documented
☐ Organic material recovered, unknown quality of preservation
☐ Organic material recovered, poor quality of preservation
☐ Organic material recovered, good quality of preservation

SITE TYPE:

Prehistoric

- ☐ Unknown function surface scatter less than 20m radius
- ☐ Open habitation, prehistoric
- ☐ Rockshelter/Cave
- ☐ Quarry
- ☐ Lithic Reduction
- ☐ Village (including historic Indian)
- ☐ Shell Midden
- ☐ Earthwork
- ☐ Petroglyph/Pictograph
- ☐ Burial Mound
- ☐ Cemetery
- ☐ Other specialized aboriginal site
- ☐ Isolated fluted point locus

- ☐ Isolated find (diagnostic artifact)
- ☐ Paleontological site
- ☐ Path

Historic

- ☐ Historic and Prehistoric
- ☐ Domestic Site
- ☐ Military Site
- ☒ Industrial Site
- ☐ Shipwreck Site
- ☐ Commercial Site
- ☐ Religious Site
- ☐ Unknown/other/multiple types
- ☐ Farmstead

SITE NUMBER OR KEY NUMBER OF ANY ASSOCIATED RESOURCES: _____

CHRONOLOGY (check all that apply)

Prehistoric

- ☐ Unknown Prehistoric
☐ Paleoindian
☐ Early ☐ Middle ☐ Late
☐ Archaic
☐ Early ☐ Middle ☐ Late

- ☐ Transitional Tradition
☐ Woodland
☐ Early ☐ Middle ☐ Late
☐ Proto Historic

Historic

- ☐ Unknown Historic
☐ Contact-Historic
☐ 1550-1600
☐ 1600-1650
☐ 1650-1700
☐ 1700-1800
☐ 1700-1725 ☐ 1725-1750
☐ 1750-1775 ☐ 1775-1800

- ☒ 1800-1900
☐ 1800-1825 ☒ 1825-1850
☒ 1850-1875 ☒ 1875-1900
☐ 1900-
☐ 1900-1925 ☐ 1925-1950
☐ 1950-1975 ☐ 1975+

BASIS FOR CHRONOLOGICAL INTERPRETATION (check all that apply):

- ☐ Diagnostic lithic artifacts ☒ Historical Documentation (attach bibliography)
☐ Ceramic types ☐ Radiocarbon Dates (list below)

RADIOCARBON DATES _____ ± _____
 _____ ± _____

FEATURES? ☐ NONE FOUND ☒ YES (identify below) If count is not known, use a "P" for present.

Prehistoric

Quantity	Prehistoric Features
	Present, Prehistoric
	Bundle Burials
	Burial Mound
	Burials
	Burned Areas
	Cache Pits
	Circular Houses
	Cremation Burials
	Earthworks

Quantity	Prehistoric Features
	Extended Burials
	Fish Weir
	Flexed Burials
	Hearth/Thermal Feature
	House Pattern
	Longhouses
	Midden Areas
	Ossuary
	Other, Prehistoric _____

Quantity	Prehistoric Features
	Path
	Petroglyph/Pictograph
	Postmolds
	Quarry Pit
	Semi-Subterranean Structures (e.g. Keyhole Structures)
	Shell Heap
	Stockade
	Storage Pits/Trash Pits

Historic (Please include any **associated** features or buildings visible outside of the site areas)

Quantity	Historic Features
	Present, Historic
	Burial
	Canal Bed
	Canal Lock
	Canal Tunnel
	Cellar

Quantity	Historic Features
	Cemetery
	Cistern
	Dam
	Ditch
	Fenceline
	Flower Garden/Bed

Quantity	Historic Features
	Fortification
	Foundation
	Ice House
	Iron Furnace
	Kiln
	Midden

Quantity	Historic Features
	Millrace
	Monument/Boundary Marker
	Oil Well
2	Other, Historic <u>Vertical shaft</u>
	Oven
	Pipeline
4	Pit
	Posthole/Postmold

Quantity	Historic Features
	Privy
1	Quarry/Mine
	Railroad
1	Road
	Root Cellar
	Shipwreck
	Springhouse/Springbox
	Standing Building or Structure

Quantity	Historic Features
	Still
	Vat
	Walk/Path
	Wall
	Water Well
	Wharf

Artifacts (Complete inventories may be attached, but please complete the summaries below)

ARTIFACT DATA RECOVERY METHOD:

- | | |
|---|---|
| <input type="checkbox"/> Non-provenienced | <input type="checkbox"/> Controlled excavation |
| <input type="checkbox"/> Surface collection not representative of all artifacts | <input type="checkbox"/> Representative sample of all artifacts (tools and/or debitage, etc.) |
| <input type="checkbox"/> Non-controlled excavation (i.e. artifact location not mapped and/or not all artifacts collected) | <input type="checkbox"/> Representative sample of tools only |
| <input checked="" type="checkbox"/> Controlled surface collection | <input type="checkbox"/> Estimate based on surface collections and/or excavation |
| | <input type="checkbox"/> Estimate based on informant interview |

LITHIC MATERIALS FOUND ON SITE:

Quantity	Material
	Argillite
	Chalcedony
	Chert/Flint
	Crystal Quartz
	Diabase
	Diorite
	English Flint
	French Flint
	Granite

Quantity	Material
	Hematite
	Hornfels
	Ironstone
	Jasper
	Limestone/Dolomite
	Metabasalt/Greenstone
	Metasandstone
	Onondaga Chert
	Quartz

Quantity	Material
	Quartzite
	Rhyolite (Metarhyolite)
	Sandstone
	Shale
	Siltstone
	Slate
	Steatite
	Vanport Chert (Flint Ridge)
	Unidentified

ARTIFACT CATEGORIES (Use the comments section to list any artifacts not categorize in these tables. Include either exact quantities or relative as follows:

B	Less than 25
C	25 - 50
D	51 - 100

E	101 - 200
F	201 - 400
G	401 - 800

H	801 or More
I	Present, Quantity Unknown

J	Present, Common
---	-----------------

Prehistoric (Include quantity by material type if appropriate, using the LITHIC list above.

Examples:

D	Stone Debitage	52 rhyolite / 26 chert
2	Grooved Axes	sandstone

Quantity	Prehistoric Artifact Types	Material Type
	Adzes	
	Antler & Bone Artifacts	
	Bannerstones	
	Celts	
	Ceramics (Prehistoric)	
	Chipped Stone Tools	
	Clay Pipes (Prehistoric)	
	Cordage	
	Core	
	Fire Cracked Rock	
	Gorgets/Pendants/Non-Utilitarian Lithics	
	Grooved Axes	
	Ground & Polished Stone Tools	
	Hammerstones	

Quantity	Prehistoric Artifact Types	Material Type
	Hoes	
	Human Bone	
	Netsinkers	
	Non-Artifactual Bone or Antler	
	Non-Artifactual Floral Remains	
	Non-Artifactual Shell	
	Pestles/Grinding/Pitted Stones	
	Shell Artifacts	
	Steatite Bowls/Fragments	
	Stone Debitage	
	Stone Pipes	
	Wooden Artifacts	

Historic (Include Quantities by Group as appropriate from table below):

		Material Class						
		Ceramic	Glass	Metal	Geological	Plastic	Biological	Composite
Functional Class	Architectural							
	Personal							
	Kitchen							
	Arms/Weapons							
	Activities							
	Industrial (Tools)							
	Electrical							
	Furniture							
	Unidentified							

DIAGNOSTIC ARTIFACTS

Prehistoric Projectile Points (Include counts by material types, using the LITHIC list above.)

Examples:

7	Broadspears	5 rhyolite / 2 argillite
2	Lehigh/Snook Kill	chert

Quantity	Prehistoric Point Types	Material
-----	Paleoindian Points	-----
	Pre-Clovis	
	Clovis	
	Mid-Paleo (Folsom)	
	Late Paleo (Plano)	
	Hardaway-Dalton	
	Fluted Point	
-----	Early Archaic Points	-----
	Palmer	
	Kirk Corner-notched	
	St. Charles	
	Thebes	
	Charleston	
-----	Middle Archaic Points	-----
	Bifurcate Points	
	Middle Archaic Notched/Stemmed Points	
	MacCorkle	
	Saint Albans	
	LeCroy	
	Otter Creek	
	Kanawha	
	Kirk Stemmed	
-----	Late Archaic Points	-----
	Piedmont Tradition	

Quantity	Prehistoric Point Types	Material
	Laurentian Tradition	
	Steubenville	
-----	Transitional Tradition	-----
	Koens Crispin/Savannah River	
	Broadspears	
	Lehigh/Snook Kill	
	Perkiomen	
	Susquehanna	
-----	Early Woodland Points	-----
	Adena (Stemmed)	
	Meadowood	
	Helgramite	
	Orient	
-----	Middle Woodland Points	-----
	Raccoon Notched	
	Snyders	
	Basal Notched	
	Jacks Reef	
	Fox Creek	
-----	Late Woodland Points	-----
	Triangles (Late Woodland)	
-----	Proto Historic Points	-----
	Triangles (Proto Historic)	

Prehistoric Ceramic Types (Include counts by temper types - if not implied in name - using the LITHIC list above. Additional options include "grit", "grog" or "shell".)

Quantity	Prehistoric Ceramics	Temper
-----	Early Woodland Ceramics	-----
	Accokeek Ware	
	Adena Plain	
	Grit Tempered Flat Bottom	
	Half-Moon Cordmarked	
	Interior-Exterior Cordmarked Small Temper-Conical/Globular	
	Marcy Creek	
	Steatite Tempered	

Quantity	Prehistoric Ceramics	Temper
	Vinette I (Interior-Exterior Cordmarked Large Temper-Conical/Globular)	
-----	Middle Woodland/Middle to Late Woodland Ohio Valley Ceramics	-----
	Abbott Zoned	
	Grit Tempered Exterior Cordmarked-Conical/Globular	
	Grit Tempered Net Impressed-Conical/Globular	

Quantity	Prehistoric Ceramics	Temper
	Point Peninsula Series	
	Shell Tempered Net Impressed-Conical/Globular	
	Watson Cord Marked	
-----	Late Woodland Ceramics	-----
	Blue Rock Valanced	
	Chance Series	
	Chautauqua Cordmarked	
	Clemson Island/Princess Point Series	
	Early Ontario Iroquois	
	Erie Series	
	Funk Incised	
	Keyser Cordmarked	
	Lancaster Incised	
	Mahoning Cord Marked	
	McFate Incised	
	McFate/Quiggle Undifferentiated	
	Meade Island Series	
	Minguannan Series	
	Monongahela (Undifferentiated)	
	Monongahela Cordmarked-Late Woodland	
	Monongahela Incised	
	Monongahela Plain	
	Monongahela Somerset	

Quantity	Prehistoric Ceramics	Temper
	Phase	
	Oak Hill Series	
	Overpeck	
	Owasco Series	
	Page Cordmarked	
	Potomac Creek Cord Impressed	
	Proto-Susquehannock	
	Quiggle Incised	
	Richmond Incised	
	Schultz Incised	
	Shenks Ferry (Undifferentiated)	
	Shenks Ferry Cordmarked	
	Shenks Ferry Incised (Blue Rock Phase)	
	Shenks Ferry Incised (Stewart Phase)	
	Shepard Cordmarked	
	Strickler Cordmarked	
	Susquehannock (Undifferentiated)	
	Townsend	
	Tribal Series	
	Washington Boro Incised	
	Whittlesey	
	Wyoming Valley Series	

Historic Diagnostics (For comparable site data, using general diagnostic categories. **More specific identification related to decoration, form, or markings should be included in the comments or site inventory**).

Quantity	Historic Artifact
	<i>Ceramics</i>
	Whieldon
	Creamware
	Pearlware (All Decoration Types)
	Transitional Whiteware
	Ironstone
	Chinese Porcelain
	English Porcelain
	American Stoneware (Blue and Gray)
	European Stoneware (white salt-glazed, English Brown, Rhenish, Fulham, Nottingham)
	Redware (All types)

Quantity	Historic Artifact
	Basalt
	European Redware (Jackfield, dry-bodied)
	Tin-Glazed Earthenware
	Yellowware (Rockingham)
	Clay pipes
	<i>Glass</i>
	Blown Bottle Base
	Machine-Made Bottle Base (Owen's Scar)
	Snapcase Bottle
	Pressed Glass
	<i>Metal</i>
	Wrought Nails

Quantity	Historic Artifact
	Cut Nails
	Wire Nails
	<i>Arms & Weapons</i>
	French Gunflint
	English Gunflint
	Gun parts
	Ammunition
	<i>Miscellaneous</i>
	Coin
	Button
	Bead
	Toy

Physical Data and Site Condition

Instructions available. Please fill out as much as is known, especially those items that are measured or observed on site.

On site SOIL ASSOCIATION Highfield, Catoctin, Myersville SOIL MAPPING UNIT Highfield-Catoctin channery silt loam
 Most common other mapped SOIL UNIT(S) within 500 meters Ravenrock-Highfield-Rock outcrop (may list two)
 MAP ELEVATION 374.9 m (1230 feet) SLOPE PERCENTAGE 15-25 SLOPE DIRECTION Variable
 SLOPE BASIS ☒ MEASURED ON SITE ☐ ESTIMATED FROM SOIL SURVEY OR MAP
 BEDROCK Catoctin Formation, Metabasalt Most predominant other BEDROCK(S) within 5 km Metarhyolite (may list two)
 PHYSIOGRAPHIC PROVINCE South Mountain Section of Ridge and Valley (If within 10 km of a Physiographic Province boundary, name the neighboring PHYSIOGRAPHIC PROVINCE Piedmont Gettysburg-Newark)
 TOPOGRAPHIC SETTING (check the one that best describes the setting):

<input type="checkbox"/> Island	<input type="checkbox"/> Lower Hillslope	<input type="checkbox"/> Hill/Ridge Toe
<input type="checkbox"/> Beach	<input type="checkbox"/> Middle Hillslope	<input type="checkbox"/> Upland Flat
<input type="checkbox"/> Floodplain	<input checked="" type="checkbox"/> Upper Hillslope	<input type="checkbox"/> Hilltop
<input type="checkbox"/> Rise in Floodplain	<input type="checkbox"/> Stream Bench (along low order stream)	<input type="checkbox"/> Ridge Top
<input type="checkbox"/> Terrace (Pleistocene along river)		<input type="checkbox"/> Saddle

 IMMEDIATE VEGETATION Forest PERCENTAGE OF SITE STILL INTACT unknown
 PRIMARY DISTURBANCE Logging POSSIBILITY OF DESTRUCTION Yes

Water Drainage Area Information

Instructions available. Please fill out as much as is known, especially those items that are measured or observed on site. Distance to water is particularly critical.

SUBBASIN Potomac WATERSHED D MAJOR STREAM Monocacy River MINOR STREAM Toms Creek
 NEAREST WATER: Distance 282 M Elevation 990 ft Direction North Order 3th Type Perennial
 2ND NEAREST WATER: Distance 353 M Elevation 1022 ft Direction East Order 4th Type Perennial
 NEAREST PERENNIAL STREAM CONFLUENCE:
 Distance 513 M Elevation 932 ft Direction Northeast Order below confluence 3th
 RELATIONSHIP OF FIRST AND SECOND WATER (check one)
☐ Do not represent a stream confluence.
☐ Site is located upstream from the confluence and between the 2 water sources.
☐ Site is located upstream from the confluence, but not between the 2 water sources.
☐ Site is located downstream from the confluence.
☒ None of the above apply.

COMMENTS The copper mine tunnel was noted on the 1858 G. M. Hopkins Map of Adams County, Pennsylvania. Additional survey identified the remains of the smelter, also noted on the 1858 Map. The survey also identified four exploratory excavations and a vertical shaft, all in the same area, and a second vertical shaft on the same compass direction as the tunnel, as well as a haul road connecting the area of the tunnel to the smelter.

ATTACHMENTS:

- ☒ 7.5 MIN USGS map with **site boundaries** indicated and quad name identified
- ☐ Photographs or drawings of diagnostic artifacts with scale. Identify lithic material per artifact using description or key.
- ☒ Site plans.
- ☒ General site photographs or excavation photographs or drawings may also be included.

We encourage the inclusion of as many illustrations as possible.

ADMINISTRATIVE INFORMATION (CONFIDENTIAL ITEMS HIGHLIGHTED)7.5 QUAD NAME Iron Spring EDITION 1990 UP ACROSS

(Measure in centimeters from the bottom printed edge upward, and the right printed edge across)

-OR-U.T.M. COORDINATES: ZONE 18 NORTHING 4404847.88 EASTING 291032.32OWNER Specialty Granules, LLC ADDRESS 13424 PENNSYLVANIA AVENUE, SUITE 303, HAGERSTOWN, MARYLAND 21742TAX PARCEL ID 18A16-0032-000 TAX MAP DATE Accessed 1-25-2016☒ PRIVATE LANDOWNER ☐ PUBLIC LANDOWNER - ☐ FEDERAL ☐ STATE ☐ LOCALCOLLECTION LOCATIONS Skelly and Loy, Inc., 449 Eisenhower Boulevard, Harrisburg, PA 17111INFORMANTS

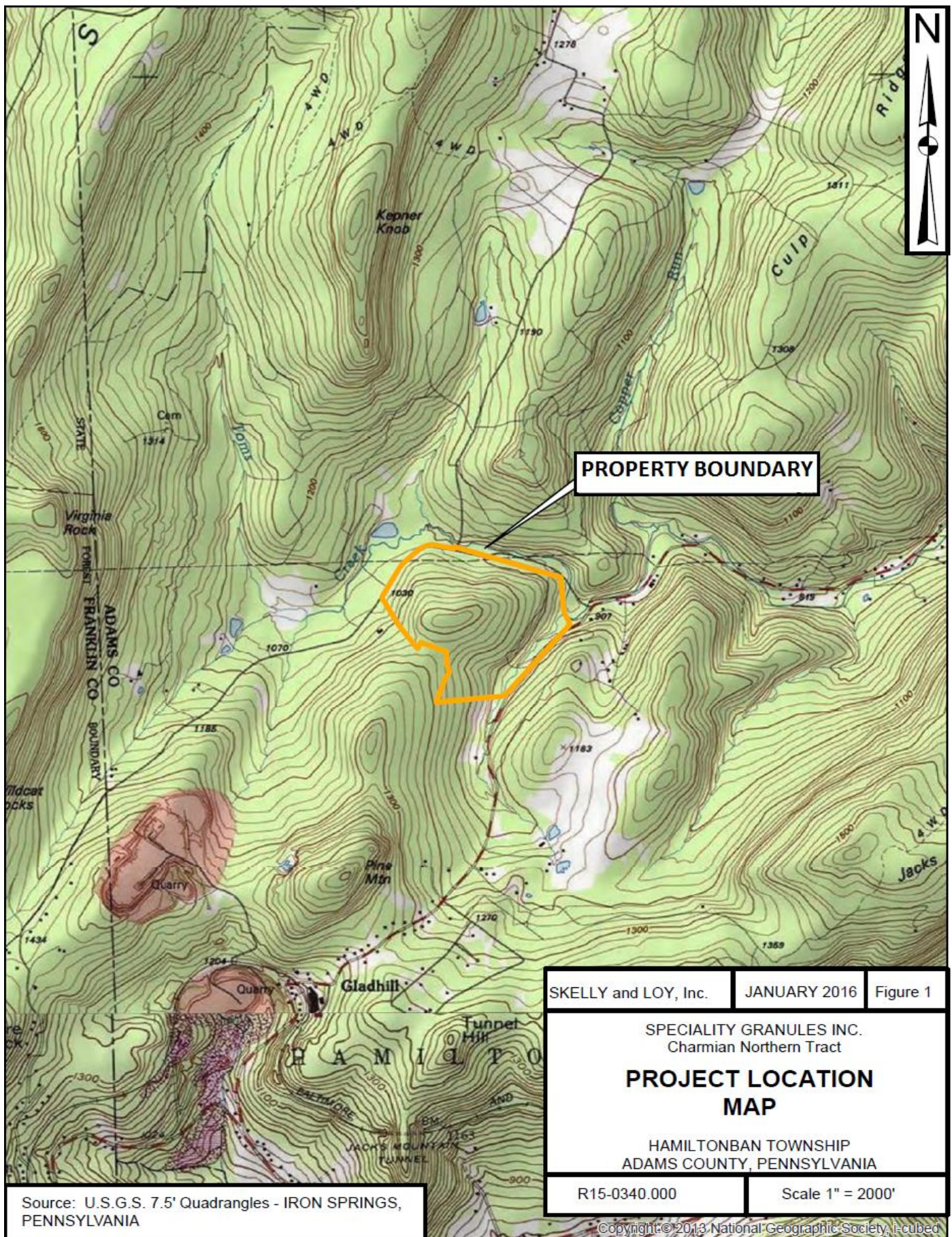
RECORDING REASON

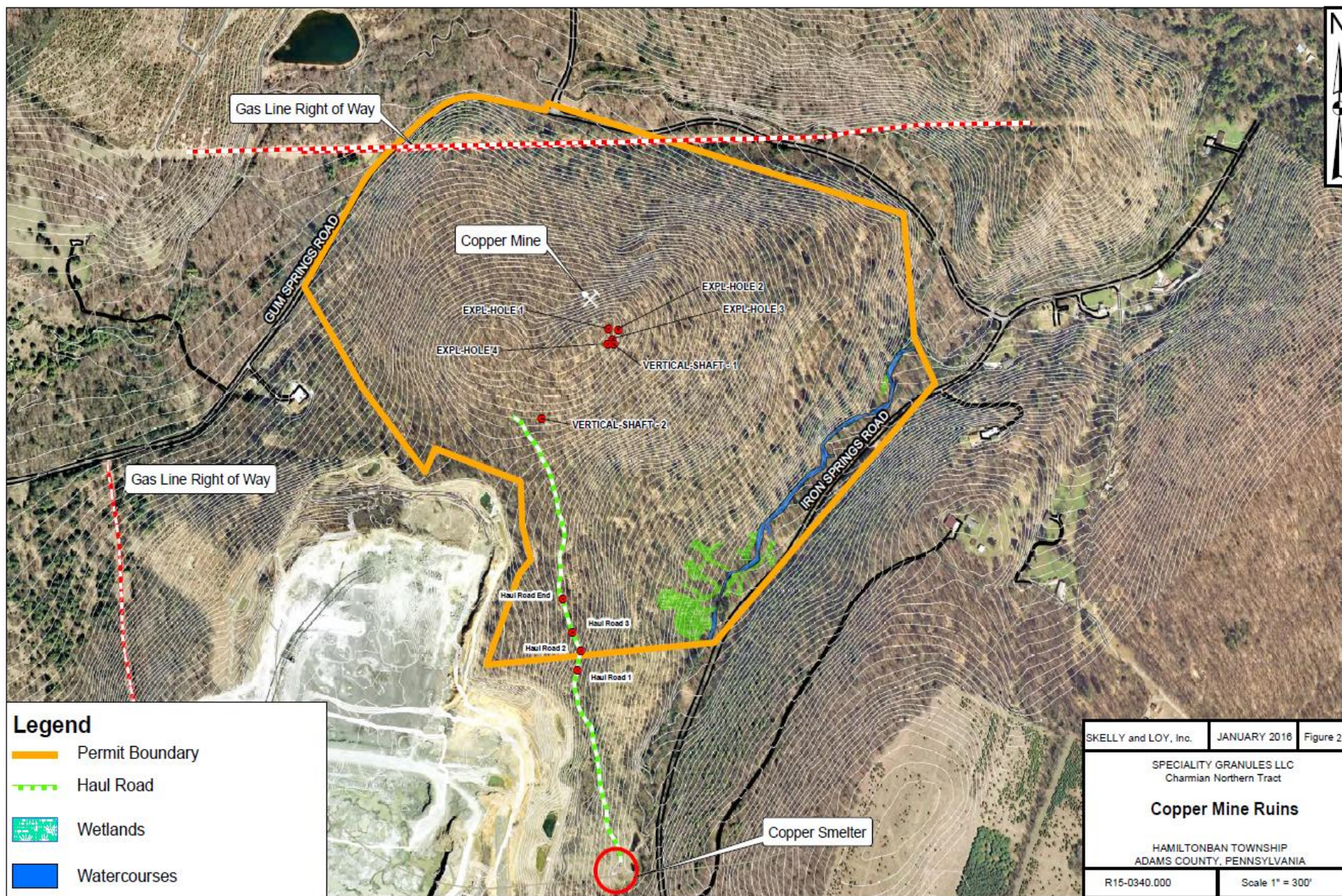
- | | |
|--|---|
| <input type="checkbox"/> Informant Interview/Amateur Survey | <input type="checkbox"/> Non-PHMC institution affiliated research |
| <input checked="" type="checkbox"/> State or Federal Compliance Survey | <input type="checkbox"/> PHMC Research |
| <input type="checkbox"/> PHMC Grant | <input type="checkbox"/> Other (Explain in 'Comments' section at end of form) |

CRITERIA FOR NATIONAL REGISTER INCLUSION UnknownSUBMITTED BY Douglas Dinsmore, Ph.D. ADDRESS 449 Eisenhower Boulevard, Suite 300CITY Harrisburg STATE PA DATE 12-2-2016PHONE NUMBER 610-823-4645 EMAIL ADDRESS ddinsmore1951@gmail.comS.P.A. CHAPTER AFFILIATION INSTITUTIONAL AFFILIATION Skelly and Loy, Inc.ADMINISTRATIVE COMMENTS **Remember!** Ask the landowner's permission before you collect artifacts on private property. It is a violation of state law to collect artifacts on state lands and a violation of federal law to collect artifacts on federal lands.

Completed forms should be sent to:

Bureau for Historic Preservation
Commonwealth Keystone Bldg, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093







Photograph 1: Copper Mine tunnel, looking south. The tunnel is five feet wide and five feet high (1.5 meters by 1.5 meters – the tunnel was likely excavated using English measure).



Photograph 2: The Copper Mine tunnel inside, looking south. The tunnel extends for at least 100 feet (33 meters) at about 150 degrees. Judging from the size of the tailings pile, the tunnel may extend for over 200 feet.



Photograph 3: The Copper Mine tunnel entrance, showing the V-shaped excavation leading to it, and the area where the overburden was stripped away.



Photograph 4: The tailings pile, looking south. It was a wedge-shaped pile, approximately 150 feet (45.7 meters) long, 50 feet (15.2 meters) wide, and 20 feet (6.1 meters) high at the thickest end. Nate Beck provided scale.



Photograph 5: Vertical Shaft 2, looking northeast. This shaft lies 250 feet (76.2 meters) south of the tunnel entrance, at the same compass direction (150 degrees) as the tunnel's direction. This shaft was likely excavated to connect with the tunnel. Judging from the tailings pile, it went no deeper than 25 feet (7.6 meters).



Photograph 6: The Haul Road, looking north, near the third point. The Haul Road connected the Copper Mine tunnel area to the smelter.



Photograph 7: The smelter walls, looking northwest. The smelter had been repurposed for another, unknown, use, as twentieth-century debris occurred around and in the ruins.



Photograph 8: In an area within about 100 feet (33 meters) to the southeast of the tunnel, four exploratory excavations and one vertical shaft were located. Exploratory 1 was small, less than two feet (0.6 meters) deep and three feet (0.9 meters) in diameter.



Photograph 9: Exploratory 2, looking north. This one was about six feet (1.8 meters) long and two feet (0.6 meters) wide.



Photograph 10: Exploratory 3, looking west. This one was about five feet (1.5 meters) long and two feet (0.6 meters) wide.



Photograph 11: Exploratory 4, looking east. This one was about ten feet (3.0 meters) long and two feet (0.6 meters) wide. Seth Hoover was taking a GPS reading.



Photograph 12: Vertical Shaft 1, looking south. It appears to have been excavated to about ten feet (3.0 meters) deep, judging from the tailings. The date of the exploratory excavations and the first vertical shaft is not known.

PENNSYLVANIA ARCHAEOLOGICAL SITE SURVEY

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

Identification and Location

SITE NAME William Smith House SITE NUMBER _____ UPDATE? Y☐ / N☒

PUBLISHED REFERENCES (Including compliance reports.) Phase I Archaeological Survey, Charmian Northern Tract

ER# _____

• COUNTY Adams TWP. Hamiltonban NEAREST TOWN Blue Ridge Summit

Site Characteristics

SITE AREA 58 SQUARE METERS BASIS: ☒ COMPUTED ON THE GROUND OR ☐ COMPUTED ON MAP

Basis for site boundary definition: Phase I survey

STRATIFIED? ☒ UNKNOWN ☐ NO

☐ YES : ☐ TOP STRATUM VISIBLE OR ☐ BURIED UNDER STERILE

SITE DISCOVERY METHOD: (check primary one only) ☐ Previously Recorded (update)

- | | |
|---|--|
| <input type="checkbox"/> Unknown | <input type="checkbox"/> Auger probing |
| <input type="checkbox"/> Collector interview | <input type="checkbox"/> Shovel testing |
| <input type="checkbox"/> Collector interview with field check | <input type="checkbox"/> Systematic test units |
| <input type="checkbox"/> Non-systematic surface survey | <input type="checkbox"/> Extensive excavation |
| <input checked="" type="checkbox"/> Systematic surface survey | |
| <input checked="" type="checkbox"/> Systematic shovel testing | |
| <input type="checkbox"/> Remote sensing | |

POTENTIAL FOR ORGANIC PRESERVATION: (check one)

- ☐ Unknown
☐ None
☒ Low potential for organic preservation
☐ Conditions favorable for organic preservation, none documented
☐ Organic material recovered, unknown quality of preservation
☐ Organic material recovered, poor quality of preservation
☐ Organic material recovered, good quality of preservation

SITE TYPE:

Prehistoric

- ☐ Unknown function surface scatter less than 20m radius
☐ Open habitation, prehistoric
☐ Rockshelter/Cave
☐ Quarry
☐ Lithic Reduction
☐ Village (including historic Indian)
☐ Shell Midden
☐ Earthwork
☐ Petroglyph/Pictograph
☐ Burial Mound
☐ Cemetery
☐ Other specialized aboriginal site
☐ Isolated fluted point locus

- ☐ Isolated find (diagnostic artifact)
☐ Paleontological site
☐ Path

Historic

- ☐ Historic and Prehistoric
☒ Domestic Site
☐ Military Site
☐ Industrial Site
☐ Shipwreck Site
☐ Commercial Site
☐ Religious Site
☐ Unknown/other/multiple types
☐ Farmstead

SITE NUMBER OR KEY NUMBER OF ANY ASSOCIATED RESOURCES: _____

CHRONOLOGY (check all that apply)

Prehistoric

- ☐ Unknown Prehistoric
☐ Paleoindian
 ☐ Early ☐ Middle ☐ Late
☐ Archaic
 ☐ Early ☐ Middle ☐ Late

- ☐ Transitional Tradition
☐ Woodland
 ☐ Early ☐ Middle ☐ Late
☐ Proto Historic

Historic

- ☐ Unknown Historic
☐ Contact-Historic
☐ 1550-1600
☐ 1600-1650
☐ 1650-1700
☐ 1700-1800
 ☐ 1700-1725 ☐ 1725-1750
 ☐ 1750-1775 ☐ 1775-1800

- ☒ 1800-1900
 ☐ 1800-1825 ☐ 1825-1850
 ☒ 1850-1875 ☒ 1875-1900
☐ 1900-
 ☐ 1900-1925 ☐ 1925-1950
 ☐ 1950-1975 ☐ 1975+

BASIS FOR CHRONOLOGICAL INTERPRETATION (check all that apply):

- ☐ Diagnostic lithic artifacts
☐ Ceramic types
☒ Historical Documentation (attach bibliography)
☐ Radiocarbon Dates (list below)

RADIOCARBON DATES _____ ± _____
 _____ ± _____

FEATURES? ☐ NONE FOUND ☒ YES (identify below) If count is not known, use a "P" for present.

Prehistoric

Quantity	Prehistoric Features
	Present, Prehistoric
	Bundle Burials
	Burial Mound
	Burials
	Burned Areas
	Cache Pits
	Circular Houses
	Cremation Burials
	Earthworks

Quantity	Prehistoric Features
	Extended Burials
	Fish Weir
	Flexed Burials
	Hearth/Thermal Feature
	House Pattern
	Longhouses
	Midden Areas
	Ossuary
	Other, Prehistoric _____

Quantity	Prehistoric Features
	Path
	Petroglyph/Pictograph
	Postmolds
	Quarry Pit
	Semi-Subterranean Structures (e.g. Keyhole Structures)
	Shell Heap
	Stockade
	Storage Pits/Trash Pits

Historic (Please include any **associated** features or buildings visible outside of the site areas)

Quantity	Historic Features
	Present, Historic
	Burial
	Canal Bed
	Canal Lock
	Canal Tunnel
	Cellar

Quantity	Historic Features
	Cemetery
	Cistern
	Dam
	Ditch
	Fenceline
	Flower Garden/Bed

Quantity	Historic Features
	Fortification
1	Foundation
	Ice House
	Iron Furnace
	Kiln
	Midden

Quantity	Historic Features
	Millrace
	Monument/Boundary Marker
	Oil Well
	Other, Historic
	Oven
	Pipeline
	Pit

Quantity	Historic Features
	Posthole/Postmold
	Privy
	Quarry/Mine
	Railroad
	Road
	Root Cellar
	Shipwreck
	Springhouse/Springbox

Quantity	Historic Features
	Standing Building or Structure
	Still
	Vat
	Walk/Path
	Wall
	Water Well
	Wharf

Artifacts (Complete inventories may be attached, but please complete the summaries below)

ARTIFACT DATA RECOVERY METHOD:

- | | |
|---|---|
| <input type="checkbox"/> Non-provenienced | <input checked="" type="checkbox"/> Controlled excavation |
| <input type="checkbox"/> Surface collection not representative of all artifacts | <input type="checkbox"/> Representative sample of all artifacts (tools and/or debitage, etc.) |
| <input type="checkbox"/> Non-controlled excavation (i.e. artifact location not mapped and/or not all artifacts collected) | <input type="checkbox"/> Representative sample of tools only |
| <input checked="" type="checkbox"/> Controlled surface collection | <input type="checkbox"/> Estimate based on surface collections and/or excavation |
| | <input type="checkbox"/> Estimate based on informant interview |

LITHIC MATERIALS FOUND ON SITE:

Quantity	Material
	Argillite
	Chalcedony
	Chert/Flint
	Crystal Quartz
	Diabase
	Diorite
	English Flint
	French Flint
	Granite

Quantity	Material
	Hematite
	Hornfels
	Ironstone
	Jasper
	Limestone/Dolomite
	Metabasalt/Greenstone
	Metasandstone
	Onondaga Chert
	Quartz

Quantity	Material
	Quartzite
	Rhyolite (Metarhyolite)
	Sandstone
	Shale
	Siltstone
	Slate
	Steatite
	Vanport Chert (Flint Ridge)
	Unidentified

ARTIFACT CATEGORIES (Use the comments section to list any artifacts not categorized in these tables. Include either exact quantities or relative as follows:

B	Less than 25
C	25 - 50
D	51 - 100

E	101 - 200
F	201 - 400
G	401 - 800

H	801 or More
I	Present, Quantity Unknown

J	Present, Common
---	-----------------

Prehistoric (Include quantity by material type if appropriate, using the LITHIC list above.

Examples:

D	Stone Debitage	52 rhyolite / 26 chert
2	Grooved Axes	sandstone

Quantity	Prehistoric Artifact Types	Material Type
----------	----------------------------	---------------

Quantity	Prehistoric Artifact Types	Material Type
	Adzes	
	Antler & Bone Artifacts	
	Bannerstones	
	Celts	
	Ceramics (Prehistoric)	
	Chipped Stone Tools	
	Clay Pipes (Prehistoric)	
	Cordage	
	Core	
	Fire Cracked Rock	
	Gorgets/Pendants/Non-Utilitarian Lithics	
	Grooved Axes	
	Ground & Polished Stone Tools	
	Hammerstones	

Quantity	Prehistoric Artifact Types	Material Type
	Hoes	
	Human Bone	
	Netsinkers	
	Non-Artifactual Bone or Antler	
	Non-Artifactual Floral Remains	
	Non-Artifactual Shell	
	Pestles/Grinding/Pitted Stones	
	Shell Artifacts	
	Steatite Bowls/Fragments	
	Stone Debitage	
	Stone Pipes	
	Wooden Artifacts	

Historic (Include Quantities by Group as appropriate from table below):

		Material Class						
		Ceramic	Glass	Metal	Geological	Plastic	Biological	Composite
Functional Class	Architectural	B	B					
	Personal							
	Kitchen	B	B					
	Arms/Weapons							
	Activities							
	Industrial (Tools)							
	Electrical							
	Furniture							
	Unidentified							

DIAGNOSTIC ARTIFACTS

Prehistoric Projectile Points (Include counts by material types, using the LITHIC list above.)

Examples:

7	Broadspears	5 rhyolite / 2 argillite
2	Lehigh/Snook Kill	chert

Quantity	Prehistoric Point Types	Material
-----	Paleoindian Points	-----
	Pre-Clovis	
	Clovis	
	Mid-Paleo (Folsom)	
	Late Paleo (Plano)	
	Hardaway-Dalton	
	Fluted Point	
-----	Early Archaic Points	-----
	Palmer	
	Kirk Corner-notched	
	St. Charles	
	Thebes	
	Charleston	
-----	Middle Archaic Points	-----
	Bifurcate Points	
	Middle Archaic Notched/Stemmed Points	
	MacCorkle	
	Saint Albans	
	LeCroy	
	Otter Creek	
	Kanawha	
	Kirk Stemmed	
-----	Late Archaic Points	-----
	Piedmont Tradition	

Quantity	Prehistoric Point Types	Material
	Laurentian Tradition	
	Steubenville	
-----	Transitional Tradition	-----
	Koens Crispin/Savannah River	
	Broadspears	
	Lehigh/Snook Kill	
	Perkiomen	
	Susquehanna	
-----	Early Woodland Points	-----
	Adena (Stemmed)	
	Meadowood	
	Helgramite	
	Orient	
-----	Middle Woodland Points	-----
	Raccoon Notched	
	Snyders	
	Basal Notched	
	Jacks Reef	
	Fox Creek	
-----	Late Woodland Points	-----
	Triangles (Late Woodland)	
-----	Proto Historic Points	-----
	Triangles (Proto Historic)	

Prehistoric Ceramic Types (Include counts by temper types - if not implied in name - using the LITHIC list above. Additional options include "grit", "grog" or "shell".)

Quantity	Prehistoric Ceramics	Temper
-----	Early Woodland Ceramics	-----
	Accokeek Ware	
	Adena Plain	
	Grit Tempered Flat Bottom	
	Half-Moon Cordmarked	
	Interior-Exterior Cordmarked Small Temper-Conical/Globular	
	Marcy Creek	
	Steatite Tempered	
	Vinette I (Interior-Exterior Cordmarked Large Temper-	

Quantity	Prehistoric Ceramics	Temper
	Conical/Globular)	
-----	Middle Woodland/Middle to Late Woodland Ohio Valley Ceramics	-----
	Abbott Zoned	
	Grit Tempered Exterior Cordmarked-Conical/Globular	
	Grit Tempered Net Impressed-Conical/Globular	
	Point Peninsula Series	
	Shell Tempered Net Impressed-Conical/Globular	

Quantity	Prehistoric Ceramics	Temper
	Watson Cord Marked	
-----	Late Woodland Ceramics	-----
	Blue Rock Valanced	
	Chance Series	
	Chautauqua Cordmarked	
	Clemson Island/Princess Point Series	
	Early Ontario Iroquois	
	Erie Series	
	Funk Incised	
	Keyser Cordmarked	
	Lancaster Incised	
	Mahoning Cord Marked	
	McFate Incised	
	McFate/Quiggle Undifferentiated	
	Meade Island Series	
	Minguannan Series	
	Monongahela (Undifferentiated)	
	Monongahela Cordmarked-Late Woodland	
	Monongahela Incised	
	Monongahela Plain	
	Monongahela Somerset Phase	
	Oak Hill Series	

Quantity	Prehistoric Ceramics	Temper
	Overpeck	
	Owasco Series	
	Page Cordmarked	
	Potomac Creek Cord Impressed	
	Proto-Susquehannock	
	Quiggle Incised	
	Richmond Incised	
	Schultz Incised	
	Shenks Ferry (Undifferentiated)	
	Shenks Ferry Cordmarked	
	Shenks Ferry Incised (Blue Rock Phase)	
	Shenks Ferry Incised (Stewart Phase)	
	Shepard Cordmarked	
	Strickler Cordmarked	
	Susquehannock (Undifferentiated)	
	Townsend	
	Tribal Series	
	Washington Boro Incised	
	Whittlesey	
	Wyoming Valley Series	

Historic Diagnostics (For comparable site data, using general diagnostic categories. **More specific identification related to decoration, form, or markings should be included in the comments or site inventory**).

Quantity	Historic Artifact
	<i>Ceramics</i>
	Whieldon
	Creamware
	Pearlware (All Decoration Types)
1	Transitional Whiteware
	Ironstone
	Chinese Porcelain
	English Porcelain
	American Stoneware (Blue and Gray)
	European Stoneware (white salt-glazed, English Brown, Rhenish, Fulham, Nottingham)
	Redware (All types)

Quantity	Historic Artifact
	Basalt
	European Redware (Jackfield, dry-bodied)
	Tin-Glazed Earthenware
	Yellowware (Rockingham)
	Clay pipes
	<i>Glass</i>
	Blown Bottle Base
	Machine-Made Bottle Base (Owen's Scar)
	Snapcase Bottle
1	Pressed Glass
	<i>Metal</i>
	Wrought Nails

Quantity	Historic Artifact
	Cut Nails
	Wire Nails
	<i>Arms & Weapons</i>
	French Gunflint
	English Gunflint
	Gun parts
	Ammunition
	<i>Miscellaneous</i>
	Coin
	Button
	Bead
	Toy

Physical Data and Site Condition Instructions available. Please fill out as much as is known, especially those items that are measured or observed on site.

On site SOIL ASSOCIATION Highfield, Catoctin, Myersville SOIL MAPPING UNIT Highfield-Catoctin channery silt loam
 Most common other mapped SOIL UNIT(S) within 500 meters Ravenrock-Highfield-Rock outcrop (may list two)
 MAP ELEVATION 327.7 m (1075 feet) SLOPE PERCENTAGE 8-15 SLOPE DIRECTION SE
 SLOPE BASIS ☒ MEASURED ON SITE ☐ ESTIMATED FROM SOIL SURVEY OR MAP
 BEDROCK Catoctin Formation, Metabasalt Most predominant other BEDROCK(S) within 5 km Metarhyolite (may list two)
 PHYSIOGRAPHIC PROVINCE South Mountain Section of Ridge and Valley (If within 10 km of a Physiographic Province boundary, name the neighboring PHYSIOGRAPHIC PROVINCE Piedmont Gettysburg-Newark)
 TOPOGRAPHIC SETTING (check the one that best describes the setting):

<input type="checkbox"/> Island	<input type="checkbox"/> Lower Hillslope	<input type="checkbox"/> Hill/Ridge Toe
<input type="checkbox"/> Beach	<input type="checkbox"/> Middle Hillslope	<input type="checkbox"/> Upland Flat
<input type="checkbox"/> Floodplain	<input checked="" type="checkbox"/> Upper Hillslope	<input type="checkbox"/> Hilltop
<input type="checkbox"/> Rise in Floodplain	<input type="checkbox"/> Stream Bench (along low order stream)	<input type="checkbox"/> Ridge Top
<input type="checkbox"/> Terrace (Pleistocene along river)		<input type="checkbox"/> Saddle

 IMMEDIATE VEGETATION Forest PERCENTAGE OF SITE STILL INTACT unknown
 PRIMARY DISTURBANCE Logging POSSIBILITY OF DESTRUCTION No

Water Drainage Area Information Instructions available. Please fill out as much as is known, especially those items that are measured or observed on site. Distance to water is particularly critical.

SUBBASIN Potomac WATERSHED D MAJOR STREAM Monocacy River MINOR STREAM Toms Creek
 NEAREST WATER: Distance 108 M Elevation 1022 ft Direction East Order 4th Type Perennial
 2ND NEAREST WATER: Distance 353 M Elevation 990 ft Direction North Order 3th Type Perennial
 NEAREST PERENNIAL STREAM CONFLUENCE:
 Distance 739 M Elevation 932 ft Direction Northeast Order below confluence 3th
 RELATIONSHIP OF FIRST AND SECOND WATER (check one)
☐ Do not represent a stream confluence.
☐ Site is located upstream from the confluence and between the 2 water sources.
☐ Site is located upstream from the confluence, but not between the 2 water sources.
☐ Site is located downstream from the confluence.
☒ None of the above apply.

COMMENTS The William Smith house was noted on the 1872 Atlas of Adams County, Pennsylvania, surveyed by D.J. Lake. Deed research by Patricia E. Miller, Ph.D., and Andrew Wyatt, for an earlier Phase I archaeological report noted that Smith owned the property at one time. The low density of artifacts indicated that the house had been occupied only briefly.

ATTACHMENTS:

- ☒ 7.5 MIN USGS map with **site boundaries** indicated and quad name identified
- ☐ Photographs or drawings of diagnostic artifacts with scale. Identify lithic material per artifact using description or key.
- ☒ Site plans.
- ☒ General site photographs or excavation photographs or drawings may also be included.

We encourage the inclusion of as many illustrations as possible.

ADMINISTRATIVE INFORMATION (CONFIDENTIAL ITEMS HIGHLIGHTED)

7.5 QUAD NAME Iron Spring EDITION 1990 UP ACROSS

(Measure in centimeters from the bottom printed edge upward, and the right printed edge across)

-OR-

U.T.M. COORDINATES: ZONE 18 NORTHING 4404323.99 EASTING 290076.37

OWNER Specialty Granules, LLC ADDRESS 13424 PENNSYLVANIA AVENUE, SUITE 303, HAGERSTOWN, MARYLAND 21742

TAX PARCEL ID 18A16-0032-000 TAX MAP DATE Accessed 1-25-2016

☒ PRIVATE LANDOWNER ☐ PUBLIC LANDOWNER - ☐ FEDERAL ☐ STATE ☐ LOCAL

COLLECTION LOCATIONS URS, 437 High Street, Burlington, NJ 08016

INFORMANTS

RECORDING REASON

- | | |
|--|---|
| <input type="checkbox"/> Informant Interview/Amateur Survey | <input type="checkbox"/> Non-PHMC institution affiliated research |
| <input checked="" type="checkbox"/> State or Federal Compliance Survey | <input type="checkbox"/> PHMC Research |
| <input type="checkbox"/> PHMC Grant | <input type="checkbox"/> Other (Explain in 'Comments' section at end of form) |

CRITERIA FOR NATIONAL REGISTER INCLUSION Unknown

SUBMITTED BY Douglas Dinsmore, Ph.D. ADDRESS 449 Eisenhower Boulevard, Suite 300

CITY Harrisburg STATE PA DATE 12-12-2016

PHONE NUMBER 610-823-4645 EMAIL ADDRESS ddinsmore1951@gmail.com

S.P.A. CHAPTER AFFILIATION

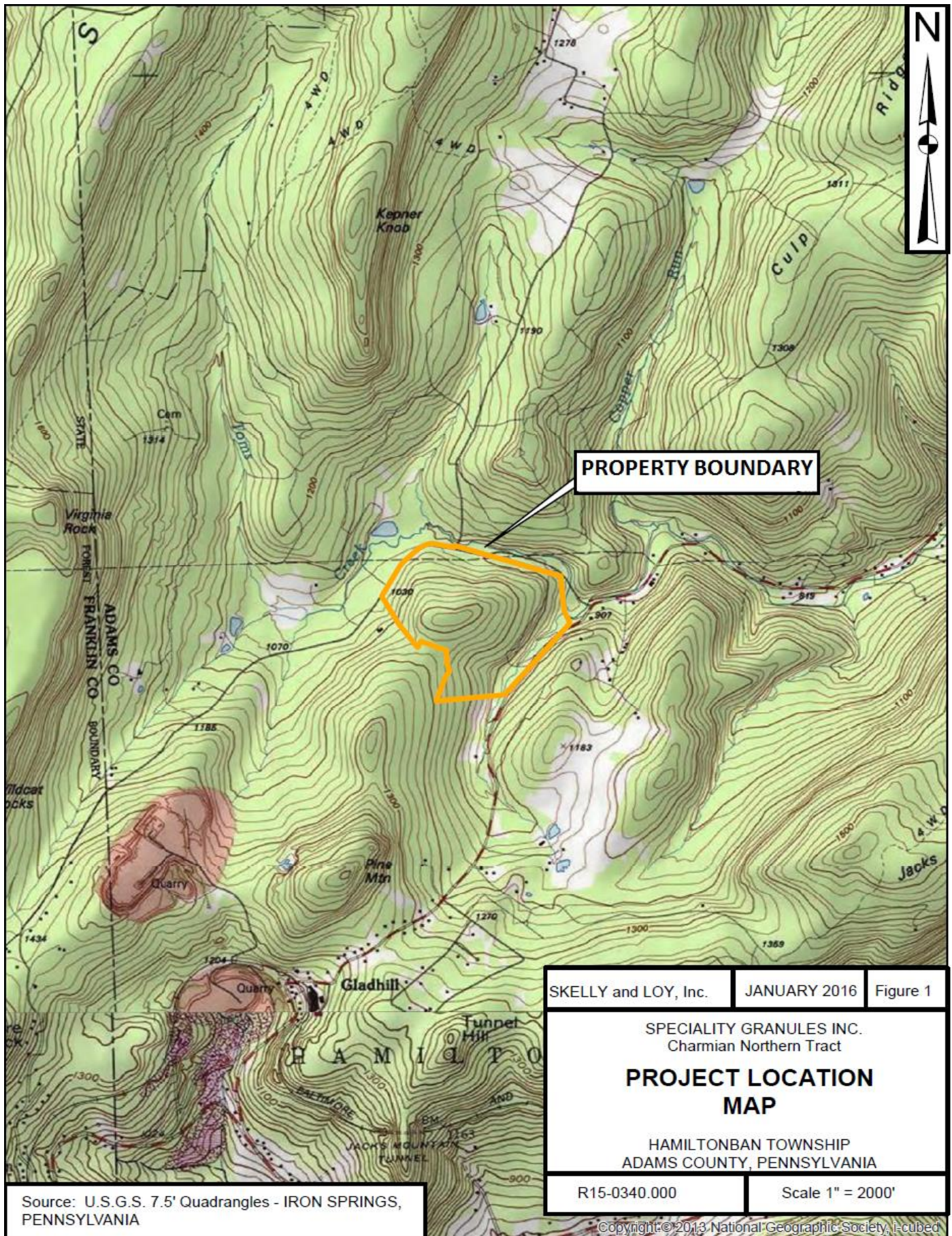
INSTITUTIONAL AFFILIATION Skelly and Loy, Inc.

ADMINISTRATIVE COMMENTS

Remember! Ask the landowner's permission before you collect artifacts on private property. It is a violation of state law to collect artifacts on state lands and a violation of federal law to collect artifacts on federal lands.

Completed forms should be sent to:

Bureau for Historic Preservation
Commonwealth Keystone Bldg, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093



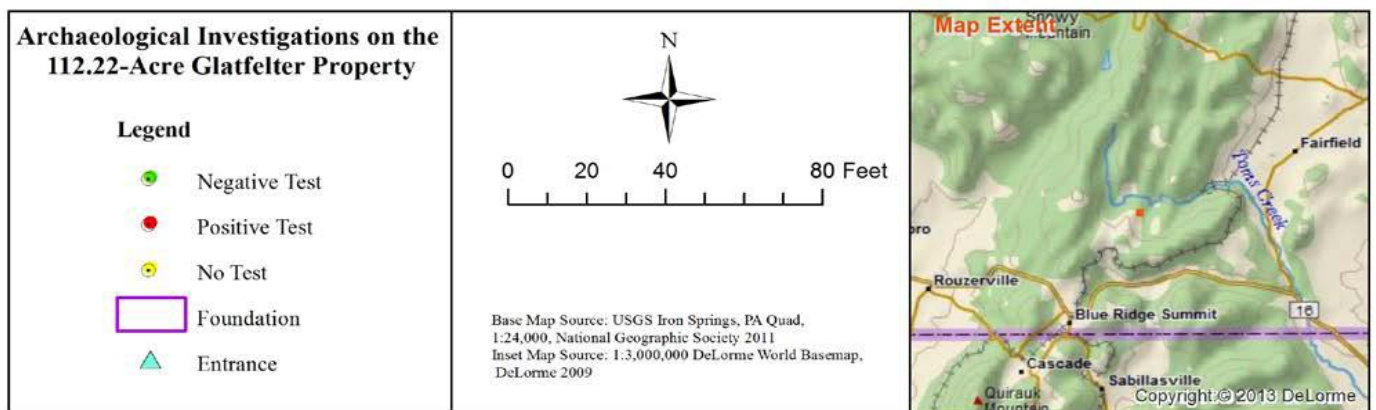


Figure 2: Map from URS's report, showing their testing strategy and the foundation location.



Photograph 1: The corner of the foundation, likely the base for the chimney, looking south.

APPENDIX D - AUTHOR'S QUALIFICATIONS

DOUGLAS DINSMORE, PH.D., Cultural Resource Specialist



EDUCATION:

Ph.D., Anthropology, 1984,
Pennsylvania State
University

M.A., History, 1997, The
Pennsylvania State
University

M.A., Anthropology, 1975,
Pennsylvania State
University

B.A., Anthropology, 1973,
University of Pennsylvania

YEARS OF EXPERIENCE:
30 Years

Dr. Dinsmore's experience includes the completion of Section 106 identification, evaluation, and mitigation for over 300 projects, ranging from large and small transportation projects to development projects and extractive operations. He has managed and/or contributed to projects that have included extensive cultural resources, unique agricultural properties, and both urban and rural historic districts. He exceeds the Secretary of the Interior's Professional Qualifications for both architectural history and pre-contact and historic archaeology.

Professional Experience

Dr. Dinsmore has extensive experience with deed, tax and historic background research. He has completed historic resource survey and evaluations of above ground structures and historic districts for numerous projects including highway improvement and bridge replacement projects throughout Pennsylvania, New York, New Jersey, Maryland, West Virginia, Ohio, Indiana, and Illinois. He has prepared historic contexts and historic resource survey forms for individual properties and historic districts.

Dr. Dinsmore has performed archaeological and historic resources investigations on CEE, EA and EIS level projects. He served as Principal Investigator for the Phase I Archaeological Survey of Sleepy Creek Development in Ridge, West Virginia. He also served as the Principal Investigator of the Phase II Archaeological Survey for the Orbisonia-Rockhill Joint Municipal Authority's expansion of their wastewater facility in Huntingdon County, Pennsylvania. He functioned as Principal Investigator for the Phase II Archaeological Survey for the York Haven Bypass for PPL, an electric company, in York County, Pennsylvania. He also served as Principal Investigator for supplemental Phase I Archaeological Survey of the Inter-County Connector in Montgomery and Prince George's Counties, Maryland. Dr. Dinsmore served as lead author on a three-volume study the Sugartown Data Recovery for Pennsylvania's I-99 (then State Route 220) of pre-contact remains and historic remains of an iron furnace company town, where over 50,000 artifacts were identified.

Dr. Dinsmore has served as Principal Investigator on projects that have developed unconventional mitigation. He designed a middle-school lesson plan emphasizing pre-contact archaeology as mitigation for archaeological survey in an area where the archaeological remains had been previously documented. He wrote a middle school lesson plan for mitigation for a late-eighteenth-century farmhouse that taught the progression of agricultural technology. He collected oral histories of a farming community, of a refractory brick company town, and of an anthracite coal mining town.

Familiar with the National Register of Historic Places, Dr. Dinsmore has successfully nominated several properties for listing, including the Allegheny River Locks and Dams, Allegheny and Armstrong Counties, Pennsylvania and the Borough of Newport, Pennsylvania.

Skelly and Loy, Inc.
Harrisburg, PA

MODULE 8

REPLACE THE EXISTING MODULE 8 WITH THE DOCUMENT PROVIDED HEREIN

MODULE 8

Module 8: Hydrology

[§§77.405/77.406/77.407]

8.1 Chemical Analysis.

Provide the following data, in accordance with 8.2 for each point in the background sampling and monitoring program and report on Module 8.1(A).

- a) pH (field & laboratory) **See attached modules 8.1(A)**
- b) Total Suspended Solids (mg/l) **See attached modules 8.1(A)**
- c) Total Dissolved Solids (mg/l) or Specific Conductance ($\mu\text{S}/\text{cm}$ at 25°C) **See attached modules 8.1(A)**
- d) Field temperature at sample source (°C).

See attached modules 8.1(A)

- e) Provide the following in addition to a) through d) above, if requested by the Department. *

Total Alkalinity (mg/l)	See attached modules 8.1(A)
Total Acidity (mg/l)	See attached modules 8.1(A)
Total Iron (Fe) (mg/l)	See attached modules 8.1(A)
Total Manganese (Mn) (mg/l)	See attached modules 8.1(A)
Sulfates (SO_4) (mg/l)	See attached modules 8.1(A)

*If the proposed noncoal minerals to be mined are located within the coal fields or other known acid producing areas or a watershed sensitive to mining impacts, additional parameters may be required by the Department. Contact the appropriate District Mining Office prior to beginning sampling to determine if these parameters are needed.

- f) Flows of perennial streams above and below the operation and surface and underground mine discharges must be measured by approved methods. In addition, other flows from springs, streams, seeps or other discharge points in the representative monitoring program should be measured to reflect seasonal variations. (The Department may waive sampling points if there is a representative sampling of the requested points.) The elevations and flows of springs, seeps, and mine discharges are required.

See attached modules 8.1(A)

- g) Provide a description of the type of sample point (e.g. well, spring, etc.) and its relationship to the mine site (e.g. up-gradient, perched aquifer, down-gradient).

See attached modules 8.1(A)

- h) Provide the name(s), address(es) and telephone number(s) of the individual(s) responsible for the collection and analysis of this data.

Collection:

SKELLY and LOY, Inc. - Dylan Woodworth
449 Eisenhower Boulevard, Suite 300
Harrisburg, Pennsylvania 17111
800-892-6532

Analysis:

Analytical Laboratory Services, Inc.
34 Dogwood Lane
Middletown, Pennsylvania 17057
717-944-5501

- i) Provide a description of the methodology used to collect and analyze this data.

BACKGROUND SAMPLING AND MONITORING METHODOLOGY

In accordance with Module 8.2 of the Large Noncoal Mine Permit application, Skelly and Loy completed a background sampling and monitoring program to characterize baseline groundwater and surface water quality and flow conditions within the proposed permit area and within 1,000 feet of the permit area. The background sampling and monitoring program was performed on a monthly basis beginning July 13, 2016, in

compliance with PADEP's requirement for a minimum of two consecutive monthly sampling events (and six consecutive monthly sampling events for those points in the proposed monitoring plan) prior to permit approval. Most of the background sampling points (all points with the exception of the private water supplies) were sampled for six consecutive months. Sampling of two private residential supply wells (PWS) was completed coincident with the first two monthly monitoring events (July 13 and August 18, 2016) to meet PADEP's requirement for two consecutive monthly sampling events (for background sampling points) of proximate PWS's prior to permit approval. An additional PWS was added to the permanent monitoring program following the Pre-Application comment letter, and therefore, background samples were collected on this third PWS (PWS-15A16) beginning in September 2017. The background monitoring program consisted of collecting monthly samples from the following:

- Each stream that potentially receives discharge, runoff or drainage from the Northern Tract Quarry mining operation (sample locations SS-TC DS, SS-CHN1 DS, and SS-4)
- Streams, springs or wetlands that are representative of the surface and groundwater flow systems in the general area (W-Pond 1, SS-DCNR CHN, SS-TC DS, SS-CHN1 DS, SS-CHN1 US; SS-4, SS-Lower Seep, SS-DCNR Seep 1, SS-DCNR Seep 2, SS-Upper Seep, W-Wetland C, W-Wetland D, and SS-PFO Wetland)
- Springs, seeps and wetlands within the permitted areas and springs, seeps, and wetlands within 1,000 feet of the permitted area (SS-Lower Seep, SS-DCNR Seep 1, SS-DCNR Seep 2, SS-Upper Seep, W-Wetland C, W-Wetland D, and SS-PFO Wetland)
- Monitoring wells developed to determine the characteristics of the groundwater (Shallow: MW-8S, MW-9S, and MW-14S; Deep: MW-8D, MW-9D, MW-10D, MW-11D, MW-12D, MW-13D, and MW-14D). Note that the monitoring wells were sampled from April to September 2015 by URS (now AECOM), and PWS data was collected by Skelly and Loy from July to November 2016. Both of these data sets are included with the attached Module 8.1(A) Background Report.

The additional PWS and NPDES monitoring locations include:

- PWS-07A16, PWS-16A16, PWS-15A16
- The proposed Northern Tract Quarry expansion will have two NPDES Permit outfalls (001 and 002), which would provide for only rare discharges from spillways from NT Pond Nos 1 and 2, respectively. Such discharges would only occur during extreme storm events, exceeding the equivalent of a 100-year storm. All water generated from the Northern Tract Quarry will be directed back to the Lower Mill Ponds for discharge through a previously permitted NPDES point. The existing Lower Mill Pond system would be used for treating and discharging water from the proposed Northern Tract Quarry expansion. The Lower Mill Pond System is located at SGI's nearby West Ridge Quarry (SMP #6477SM5) and discharges through Outfall #001 as described in NPDES Permit #PA0009059. In the unlikely event that the Northern Tract Quarry Outfalls 001 and 002 discharge (that is, during storm events greater than 100-year/24-hour events), the discharge will be sampled as part of the monitoring program as further described in the Anti-Degradation Supplement to Module 2.

The monthly background sampling and monitoring program included evaluation and measuring (when measureable flow was evident) of the rate of flow at the following seep, wetland, and stream channel locations (SS-DCNR CHN, SS-Lower Seep, SS-CHN 1 DS, SS-CHN1 US, SS-Upper Seep, SS-PFO Wetland, and SS-DCNR Seep 1) in addition to the upstream (SS-TC-US), downstream (SS-TC-DS), and midstream (SS-4) locations in Toms Creek relative to the mine operation.

There are no known discharges from backfilled areas associated with underground or surface coal mines located within the permitted areas or within 1,000 feet of the permitted areas. In addition, there are no known discharges resulting from underground mine workings within the permit areas. Skelly and Loy is not aware of water supplies abandoned because of degradation or pollution as a result of mining within the permitted areas and/or within 1,000 feet of the permitted areas. The methodologies used by Skelly and Loy to collect and analyze groundwater and surface water data are discussed in the following sections.

GROUNDWATER LEVEL AND TOTAL WELL DEPTH MEASUREMENTS

In compliance with PADEP's requirement for monitoring well depths to extend at least 25 feet below the proposed pit floor level, Specialty Granules, LLC installed ten (10) on-site monitoring wells surrounding the perimeter of the proposed Northern Tract Quarry expansion area. These wells are comprised of three (3) shallow screened bedrock wells and seven (7) deep open-rock bedrock wells extending to the 12th level (proposed pit floor) defined in the current life of mine plan. The monitoring wells were sampled along with the two private water supply wells (PWS's Shank and Holbrook).

Depth-to-water (DTW) measurements were recorded in each monitoring well from surveyed reference points at the top of each well casing. The elevation of each PWS was taken from available topographic mapping created for Exhibit 6.2. Water levels were measured using an electric, conductance-activated water level indicator graduated at intervals of 0.01-foot. The water level probe was lowered into each well through a dedicated drop tube until making contact with the groundwater surface as indicated by an audible/visual alarm. After measuring and recording the DTW, the measurement process was repeated at least once to verify that the initial DTW reading was correct and accurately recorded. The DTW from the reference point was read directly from the graduated tape and recorded on field data sheets. All DTW measurements were collected before initiating any purging/sampling of the wells. The total depths of the monitoring wells are based on the driller's logs provided by SGI. The total depths of the two private water supply wells were obtained from the drillers log and notations on the inside of the well cap. The total well depth measurement was used to calculate purge volumes prior to sampling. As mentioned previously, the required groundwater monitoring events were completed during 2015 by others on behalf of SGI. As discussed with and subsequently approved by Mr. Rock Martin of PADEP's Cambria District Mining Office, the monitoring well data collected during 2015 can be used to serve as the required monthly baseline sampling events in lieu of completing additional sampling events coincident with the surface and groundwater sampling events completed by Skelly and Loy from July-November 2016.

PURGING AND SAMPLING METHODOLOGY

Background

Background groundwater monitoring was performed in 2015 for SGI by URS (now AECOM) at the Charmian Quarry Northern Tract Quarry to support the Large Non-coal Mine Permit Application. Six monthly groundwater sampling events were conducted, from April 2015 through September 2015. The monitoring network consists of 10 monitoring wells (MW-8S, MW-9S, and MW-14S and MW-8D through 14D). Field work was conducted in accordance with the Field Investigation Work Plan for Northern Tract Quarry Development, Charmian Facility, Blue Ridge Summit dated August 26, 2013. At the request of the Department following review of the Pre-Application for the Northern Tract Quarry, additional background monitoring (static water levels only) of the wells was conducted by Skelly and Loy coincident with additional surface water flow measurements beginning in September 2017.

Field Activities

URS/AECOM staff conducted the first groundwater monitoring event completed from April 1 to 2, 2015. Prior to any groundwater sampling, water level measurements were collected from all of the accessible wells at the Northern Tract Quarry. The measurements were made prior to purging to ensure that they represented static groundwater conditions. Measurements were recorded on field logs and in a field log book. Skelly and Loy initiated additional monthly static water level collection of the monitoring wells on September 28, 2017, and this data collection is ongoing.

During URS/AECOM's 2015 monitoring activities, the shallow wells were purged using a variable speed submersible pump (Grundfos Redi-Flow 2) with new or dedicated polyethylene tubing using low flow sampling protocol (ASTM D-6771). The wells were purged at flow rates that were generally maintained at <500 mls/minute. Field measured parameters (including pH, specific conductance, DO, turbidity and temperature) were recorded during purging. Once the field parameters had stabilized (+/- 0.2 unit for pH, +/- 3% for conductivity, and +/- 10% for turbidity and DO), the wells were sampled by filling laboratory-prepared bottleware directly from the tubing at low flows. Samples were then placed in a cooler on ice and maintained at a temperature of 4° Celsius or less through delivery to a PADEP-certified laboratory (ALS in Middletown, PA), using a Chain of Custody form to document sample handling.

The deep [bedrock] wells were purged using the dedicated submersible pumps that were installed in each of the wells approximately 20 feet above the bottom of the wells. These wells have depths ranging from 314 feet below ground surface (bgs) (MW-10D) to 394 feet bgs (MW-13D). The flow rates varied depending on the pump depth and well characteristics, and ranged from 5 to 10 gallons per minute. Pumping continued until the field measurements stabilized or the well went dry. Samples were then collected through the use of a valve used to reduce the pumped water to a manageable flow to fill laboratory supplied and preserved bottleware. It should be noted that the pump in MW-8D did not produce any water during sampling events and the well was subsequently found to have silt at the base that blocked the well intake (the pump has since been pulled and the well rehabilitated and sampled).

Quality Assurance/Quality Control (QA/QC)

New, dedicated tubing was used in each shallow well that was sampled with the portable submersible Redi-flow pump. The field team wore new Nitrile gloves during well gauging or sampling, which were changed between each sample location. Any equipment that was re-used (e.g., water level indicators, Redi-Flow pumps) was decontaminated between wells. Decontamination consisted of analconox® detergent solution wash, followed by a thorough rinse with potable water. The decontamination was completed with a deionized water rinse. The decontaminated equipment was wrapped in polyethylene sheeting or aluminum foil for storage or transportation from the decontamination

Samples were collected in bottleware that was prepared with applicable preservatives by the analytical laboratory. All samples were placed in coolers on ice after collection and kept at a temperature less than 4°Celsius through delivery to the laboratory. Chain of custody forms were used to document sample handling through receipt by the laboratory. The laboratory analyzed the samples within prescribed holding times in accordance with accepted methodologies. Laboratory QA/QC procedures were conducted for the analyses and no significant deviations were reported.

Field duplicates samples were collected and submitted to the laboratory for analysis during each sampling event (with the exception of the May event) and were submitted for the same analyte groups as the field samples. Field duplicates were identified as follows: DUP-[date of collection]. The location of the field duplicate was noted in the field logbook, and not provided to the laboratory as was a 'blind sample' for quality control purposes. The identities are listed on the laboratory summary table and are:

- DUP040215 (MW-14D) 4/2/2015
- DUP (MW-9D) 6/3/2015
- DUP (MW-13D) 7/1/2015
- DUP (MW-12D) 8/6/2015
- DUP (MW-9D) 9/3/2015 2

SURFACE WATER FLOW MEASUREMENTS

In accordance with Module 8.1(f) of the Large Noncoal Mine Permit Application, Skelly and Loy measured the flow rate of streams at the designated surface sampling stations established above and below the mining operation and its proposed expansion. Surface water flow measurements were collected from sample stations SS-TC US, W-Pond 1, SS-DCNR CHN, SS-TC DS, SS-4, SS-CHN1 DS, SS-CHN1 US; SS-Lower Seep, SS-DCNR Seep 1, SS-Upper Seep, W-Wetland C, W-Wetland D, and SS-PFO Wetland. Several potential seeps were noted during the field reconnaissance associated with the sampling events. These seeps were examined during each event for flow; however, seep flow rates were often small and precise flow data could not be collected. The locations of the stream and seep sample locations are shown on Exhibit 6.2.

Given the significant flow of Toms Creek and unnamed stream channel discharging along Iron Springs Road (locations SS-TC US, SS-TC DS, SS-4, SS-CHN 1 US and SS-CHN 1 DS), surface water flow was measured using a Marsh-McBirney Flo-Mate 2000® portable electromagnetic flow meter. The flow meter provides instantaneous readouts of stream velocity. After measuring the width of the stream and section, the flow rate was measured at up to 10 locations equally spaced across the stream. The flow rate was determined to be the average of the sum of the readings. In conjunction with determining flow rate, Skelly and Loy also collected the required field measurements (pH and temperature). These flow rates along with field and laboratory data obtained for each groundwater and surface water sampling event are recorded on the attached Module 8.1(A) Background Reports.

SAMPLE STORAGE AND CHAIN-OF-CUSTODY PROCEDURES

Skelly and Loy utilized sample collection and handling procedures consistent with PADEP protocols outlined in the Groundwater Monitoring Guidance Manual (December 1, 2001). All appropriate procedures were followed during the complete sampling chain including sample collection, sample storage, transportation, and delivery to the PADEP-certified laboratory. Following collection, surface water and groundwater samples were immediately placed into labeled laboratory-supplied containers. The sample containers were promptly placed in an insulated cooler filled with ice and maintained at a temperature of 4° Celsius or less during transport and until delivery to the laboratory. Chain-of-custody (COC) forms were completed in the field and accompanied the samples to Analytical Laboratory Services (ALS), a PADEP-certified laboratory (NELAC #22-00293) located in Middletown, Pennsylvania. The COC record was used for delivery and relinquishment of the groundwater and surface water samples to ALS.

8.2 Background Sampling and Monitoring.

a) Background Sampling

Provide the results of the chemical analyses, as required by the Department, that characterize the water quality of sample points listed in 1) through 8). Background sampling points must have at least two (2) complete chemical analyses, at monthly intervals. All sampling points must be keyed to Exhibit 6.2 and identified in Module 8.1(A).

Note: Include sample(s) from a low flow period.

- 1) each stream that receives discharge, runoff or drainage from the operation.

SS-TC DS, SS-CHN1 DS, and SS-4. See Module 8.1(A)

- 2) streams, springs or wetlands that are representative of the surface and groundwater system of the general area.

See above (1). Also, SS-TC US, SS-CHN1 US, SS-Lower Seep, SS-DCNR Seep 1, SS-Upper Seep, SS-DCNR CHN, W-Pond 1, W-Wetland C, W-Wetland D, and SS-PFO Wetland. See Module 8.1(A)

- 3) springs, seeps and wetlands within the permit area and springs, seeps and wetlands within 1,000 feet of the permit area.

W-Wetland C, W-Wetland D, SS-PFO Wetland, SS-Lower Seep, SS-Upper Seep, SS-DCNR Seep 1, SS-DCNR Seep 2, and SS-DCNR Seep 2. See Module 8.1(A)

- 4) impoundments within the permit area and impoundments within 1000 feet of the permit area.

W-Pond 1

- 5) impoundments, impoundment discharges, and discharges from backfilled areas associated with previous or current underground or surface coal mines within the permit area and within 1,000 feet of the permit area.

There are no known discharges from backfilled areas associated with mining located within the permitted area or within 1000 feet of the permitted area.

- 6) discharges within the permit area resulting from underground mines and discharges resulting from underground mines that are within the permit area but discharge outside the permit area.

There are no known discharges or discharges associated with underground mines located within the permitted area or that discharge outside the permitted area.

- 7) any monitoring wells developed to determine the characteristics of the groundwater. (The Department may require additional monitoring wells.)

MW-8S, MW-8D, MW-9S, MW-9D, MW-10D, MW-11D, MW-12D, MW-13D, MW-14S, and MW-14D. See Module 8.1(A)

- 8) private water supplies and water supplies abandoned because of degradation or pollution from mining, within the permit area and within 1,000 feet of the permit area. For each water supply sampled, provide the data required on the Private Water Supply Information Exhibit 8.2(A)(8) and indicate the source of the information (e.g. owner interview, survey by operator, P.E. etc.). (Provide driller logs if available.) (The Department may require additional water supply information on a case-by-case basis.)

PWS-07A16, PWS-16A16, PWS-15A16, PWS-95BB16. See Module 8.1(A)

b) Monitoring Program

Describe the proposed surface and groundwater monitoring plan that will be conducted. The monitoring plan shall include quantity and quality measurements of discharges from the operation; points that will show any effect of the discharge on the receiving stream; and points that will show any effect on the groundwater system. Unless otherwise approved by the District Mining Office prior to permit application submittal, monitoring points must have a minimum series of six (6) complete chemical analyses collected at monthly intervals and should include the month of August, September or October to reflect low flow conditions.

See the *Background Sampling and Monitoring Methodology* narrative provided under section 8.1 above and listing below on the following page. Note that MW-9S and MW-9D will be relocated during Phase 3 of the erosion and sediment control plan to accommodate the installation of NT Pond No. 2. MW-13D will be relocated prior to the installation of NT Pond No. 1 during Phase 2 of the erosion and sediment control plan. Proposed locations for MW-9S, MW-9D, and MW-13D are shown on Exhibit 6.2 and Exhibit 9.

All monitoring points must be keyed to **Exhibit 6.2**. Monitoring plans must provide for collection and monitoring on a quarterly basis unless otherwise specified by the Department. All monitoring data must be compiled on Module 8.1(A) or equivalent facsimile. All monitoring points should be identified in the field with durable markers that can be

maintained (wooden stakes, metal or plastic tags, etc.; not just plastic flagging).

If monitoring Points are added during the pre-application field meeting, the Department will accept the application with three (3) months of sampling results for those points only.

The following monitoring locations should be included in the Northern Tract Quarry expansion monitoring program:

	Monitoring Points (Key to Exhibit 6.2)
1) receiving streams above proposed discharge points	<u>SS-TC US.</u> <u>SS-CHN1 US.</u> <u>SS-4</u>
2) receiving streams below proposed discharge points	<u>SS-TC DS.</u> <u>SS-CHN1 DS.</u> <u>SS-4</u>
3) abandoned underground or surface mine discharges that are hydrologically connected and may be impacted by the proposed mining	<u>None</u>
4) representative springs and seeps within the permit area and within 1,000 feet of the permit area	<u>DCNR Seep 1.</u> <u>Upper Seep</u>
5) representative wetlands with defined discharge points within the permit area and wetlands within 1,000 feet of the permit area that may be impacted by the proposed mining,	<u>Pond 1, Wetland</u> <u>C.</u>
6) water supplies	<u>PWS-15A16</u>
7) cased boreholes/piezometers	<u>MW-8D, MW-9D,</u> <u>MW-10D, MW-</u> <u>11D, MW-13D,</u> <u>MW-14D</u>
8) point source discharges	<u>NPDES Outfall</u> <u>Nos. 001 and 002</u>
9) treatment pond discharges	<u>None</u>
10) sedimentation pond discharges	<u>NPDES Outfall</u> <u>Nos. 001 and 002</u> <u>and NPDES</u> <u>PA0009059 #001</u>
11) pit water during active mining (identify by mineral being mined)	<u>None</u>
12) each monitoring well developed to determine the characteristics of the groundwater and MW-14D	<u>MW-10D, MW-11D,</u> <u>and MW-14D</u>

Note: In cases where cased boreholes/ piezometers or monitoring wells are not necessary, insert NA above and provide an explanation.

Module 8.1(A)
BACKGROUND (check appropriate block)

Operator: _____ Monitoring Point I.D.: _____ Description of Sample Point**: _____
 Operation Name: _____ Latitude: _____° _____' _____" N and _____° _____' _____" W
 Permit No.: _____ Longitude: _____° _____' _____" W
 Township: _____ Surface Elevation (MSL): _____
 County: _____

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/_{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							

Signature of Permittee or Responsible Official or Authorized Representative _____

Date _____

**Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

8.2(A)(8) PRIVATE WATER SUPPLY INFORMATION (key to Module 6.2)

Sample Point No	Owner	Type of Supply (Dug or Drilled Well, Spring)	Use	Surface Elevation (MSL)	Depth of Casing	Diameter of Well	Static Water Elevation (MSL) or Flow, Date of Measurement	Depth of Well	Type of Treatment If Any (iron filter, etc.)
PWS-07A16	Shank	Drilled	Domestic	1110	20'	6"	1,085.30 feet msl; 7 gpm (7/19/16); 1,068.49 feet msl (8/18/16)	250'	None
PWS-16A16	Holbrook	Drilled	Domestic	925	21'	6"	889.23 feet msl; 5 gpm (7/19/16); 890.70 feet msl (8/18/16)	225'	Sediment filter and sand separator
PWS-15A16	SGI/King	Drilled	Domestic	1084	unknown	6"	1050.34 feet msl (9/28/17)	90.45'	none
PWS-95BB16	Merryman	Drilled	Domestic	908	25'	6"	2 gpm (09/85)	86'	UV Light on water to house but not turned on. No treatment to outside spigot where background samples were collected.
PWS-97B16	Beltowski	Drilled-Well No.1	Domestic	1020	37'	6"	2 gpm (8/86)	145'	none
PWS-97B16	Beltowski	Drilled-Well No.2	Domestic	1020	40'	6"	5 gpm (10/07)	300'	none

8.3 Groundwater Information.

- a) State if and when groundwater will be intercepted (e.g., mining below the water table, installation of a production well for support or processing facilities) and describe the groundwater system that exists within the permit and adjacent area. If pumping of groundwater is planned, indicate the estimated gallons/day to be pumped. Include the depth to groundwater and the water table conditions present (artesian, regional, perched, etc.), the relationship to the mineral to be mined, known groundwater problems, and the data and references used to establish the description. Groundwater modeling may be required if the pumping has the potential to adversely impact water supplies, wetlands and other water resources and their affiliated uses. (Key groundwater elevations to cross-sections in 7.1 (c).)

Generally, the water-bearing yields of the rocks underlying the site are very poor. Based on published data, 25% of domestic wells drilled into the metabasalt and metarhyolite yield less than 3 gallons per minute (gpm) and have a specific capacity of <0.23 (Taylor and Royer, 1981, pp. 12-13). The median depth to water in the metabasalt and the metarhyolite ranges from 44 feet to 22 feet respectively (Taylor and Royer, 1981, pp. 16). This data is consistent with the data collected from the site-specific explorations. In addition, the active Pitts quarry located south of the site area has reportedly encountered minimal groundwater during the quarry operations. There are no known groundwater problems in the project area.

Only the 5th through 12th bench levels were simulated in the Groundwater Model (Final Report dated December 19, 2017) since these were the only bench levels encountering groundwater. Published data and site-specific investigations of the project area suggest that permeability decreases with depth and is relatively independent of the geologic formation. Although different geologic formations exist in Adams County including the metabasalts and metarhyolites of the Catoclin Formation, the geologic zones are not consistent with the *hydrogeologic* zones. Generally, the upper 300 to 400 feet of the geologic material provides water; below this zone no water is encountered. Groundwater is inferred to flow radially outward from the topographic high of the proposed Northern Tract Quarry expansion area. The proposed quarry expansion is bounded to the west, north, and east by surface water streams and wetlands that, in some part, receive water from the site area; however, the majority of the water discharging to the streams and wetlands is comprised of surface runoff with only minor amounts derived from groundwater base flow (flow from the bedrock). Minor fluctuations are evident in the water level elevations, however, for the most part the water levels appear to remain steady with no erratic movements or complete lack of movement. This suggests that although the geologic formation exhibits low permeability, and is considered to be a poor aquifer, the formation does act as porous media as a result of the network of small fractures present in the rock material and documented minor fluctuations in water level elevations. However, the areal extent of the fracture network is extremely limited as demonstrated by the *site-specific* subsurface explorations confirming the formation's limited capacity for transmitting any significant quantities of groundwater. The hydrogeologic conditions in the project area are anomalous to those typically encountered throughout most of Pennsylvania. The Catoclin Formation is considered an outlier in that infiltrating precipitation *does not* establish ready hydraulic communication with the underlying bedrock aquifer. This condition is most pronounced during periods of reduced recharge (i.e., drought conditions) when base flow in the bedrock is typically at its lowest level. During these periods of reduced groundwater base flow, streams and wetland features in the project area receive the majority of their recharge from precipitation events and resulting surface water runoff, not base flow seepage emanating from the bedrock aquifer. Typical hydrogeologic environments sustain streams and wetlands with groundwater base flow during the dry season despite groundwater levels being at their lowest. In the case of the proposed Northern Tract Quarry Expansion area, the opposite is true in that streams and wetlands are sustained primarily by storm events, water stored in the shallow soils, and resulting surface runoff occurring during the growing season and drier (low base flow) portion of the year.

Water level measurements from three pairs of shallow/deep wells (MW-8S/MW-8D, MW-9S/MW-9D, MW-14S/MW-14D) do suggest that vertical gradients may exist; however, based on these data, the hydraulic gradients are mixed upward and downward gradients suggesting that the separation may be more a result of the dynamics of the fractured bedrock than actual gradients resulting from either hydrogeologic recharge or discharge zones. Based on these limited data, it is evident that the shallow overburden (consisting of soil and weathered bedrock [cap rock/saprolite]) materials that directly overlie the more competent bedrock have only a limited hydraulic connection to the underlying bedrock. While surficial flow readily occurs within the weathered cap rock/saprolite, little of this surficial flow infiltrates to a depth sufficient to contribute to the base flow present within the deeper competent (unweathered) bedrock. While no significant perched zones appear to be evident, the very low groundwater recharge rate, low conductivity bedrock material, low rate of surface water infiltration, and steeply sloping terrain act to limit the groundwater base flow component to surface streams and wetlands. During development of the proposed Northern Tract Quarry expansion, groundwater pumping will continue in the active Pitts Quarry throughout the early stages of reclamation in the Pitts Quarry. The pumping rate in the proposed Northern Tract Quarry will range from roughly 1 gallon per minute (gpm) (7th bench) to 9 gpm (12th bench). Based on the model simulations, it is evident that, as the quarry expansion deepens, the general zone of influence (drawdown) from the quarry is contained to the west, north, and east by the surface water streams. These pumping rates are shown on Table 9 of the Groundwater Model Report. These relatively low discharge

rates are consistent with the permeability of the bedrock material and the reported seepage rate observed in the Pitts Quarry to the south. No residential wells are impacted from the simulated drawdown of the proposed quarry expansion. Even during drought conditions, no substantial impacts to base flow from adjacent wetlands or streams are anticipated. The results of the Groundwater Model Report enclosed with this formal application contain a detailed evaluation of the quarry dewatering impacts on water supplies, wetlands, and other water resources in the project area along with a full description of the data and references used to create the model simulations.

- b) Describe the groundwater movement of the area and the conditions that control and influence the movement and infiltration. Include the influence of any underground mines, cave systems or other karst features.

Local precipitation is the source of all groundwater in the Northern Tract Quarry project area, which lies within the South Mountain area of Hamiltonban Township. Much of the precipitation in the project area reaches surface streams as overland runoff. Overland runoff is greatest in late winter or early spring, and lowest in late summer and early fall. The remaining precipitation infiltrates into the regolith and underlying bedrock, flowing from areas of high relief (high hydraulic head) to areas of low relief (low hydraulic head), through bedding planes, joints, fractures, faults, and other secondary openings. Infiltration beneath the surficial soils is controlled primarily by the cap rock/ saprolite and upper/weathered bedrock interface. Generally, published data (Taylor and Royer, 1981, pp. 18) suggests that the permeability of the porous material decreases with depth and is relatively independent of the geologic formation. Based on published geologic data, there are generally two hydrogeologic zones; one from the ground surface to approximately 400 feet where groundwater yields are present, and a zone below 400 feet where no groundwater yield exists. In addition, based on site-specific characterization data, a shallow overburden zone also exists as discussed above. Most water supply wells produce their greatest yield at or near this stratigraphic contact or where intersecting a water-bearing fracture within the upper 200 feet of the ground surface. While groundwater flow and yield is limited within this crystalline bedrock, groundwater movement is largely controlled by strike parallel longitudinal faults, fracture density and joint patterns present in the metabasalt. Regional groundwater flow is toward the northeast coincident with the regional geologic strike. Many of the streams originating in South Mountain parallel local faults until they reach the colluvial aprons which flank most of South Mountain (Low, et. al., 2002). Although drought conditions may impact the surface water streams and wetlands as a result of a loss of surface water flow, the impact of the quarry dewatering associated with the drought conditions would have no impact relative to further groundwater base flow loss.

The median yield of wells in this region is less than 5 gpm with 25 percent of supply wells yielding less than 3 gpm. Of 66 wells inventoried, the depth to water ranges from 3 to 100 feet below land surface with a median depth of 35 feet. Water levels also show a strong seasonal influence (Low, et. al., 2002).

The Groundwater Model Report enclosed with this formal application contains additional information regarding groundwater movement and infiltration at the site.

- c) Identify all aquifers above the lowest mineral to be mined and the first aquifer below the lowest mineral to be mined and the presence of any underground mine or cave system. Include stratigraphic units, depths, and any current use.

No underground mine or cave systems are present in the project area. A small exploration adit of limited extent, presumed to be associated with a copper vein or assemblage of index minerals commonly associated with copper, is known to be present near the highest elevation of the proposed Northern Tract Quarry. However, it is evident that no significant mining activity was developed as a result of this limited exploration. Based on published geologic data, published hydraulic conductivities, and site-specific characterization data, a preliminary groundwater model was developed incorporating three hydrogeologic zones with depth; the first zone is composed of the overburden soils and caprock/saprolite present in generally the upper 50 feet (Layer 1), the second zone consisting of bedrock between roughly 50 and 400 feet below the ground surface (Layer 2), and the third zone consisting of impermeable bedrock (Layer 3) generally below 400 feet in depth. Model Layer 1 was developed using site-specific subsurface exploration data, whereas model Layers 2 and 3 correspond to the published literature sources mentioned in preceding Section b above. It should be noted that due to the hydrogeological similarities between the geologic materials, permeability is relatively independent of the geologic formation. The distribution of these hydrogeologic units (layers) within the model domain is presented on Figure 9 of the Groundwater Model Report.

SGL's adjacent quarry operation (at permitted Pitts Quarry) actively mines the same metabasalt of the Catoclin formation that underlies the proposed Northern Tract Quarry expansion area. This existing operation is included in the Groundwater Model Report.

The Groundwater Model Report enclosed with this formal application provides additional information regarding the hydrogeologic units present and aquifers to be mined in the proposed Northern Tract Quarry expansion area.

- d) Identify the effects which any previous mining has had on the quantity and quality of the groundwater in the area, including impacts from increased turbidity, suspended solids or settleable solids. Include the source, rock unit involved and the reasons for the effect.

SGL's adjacent quarry operation (the permitted Pitts Quarry) actively mines the same metabasalt of the Catoclin formation that underlies the proposed Northern Tract Quarry expansion area. Skelly and Loy has not identified any off-site water supplies that have been adversely impacted, contaminated, diminished, or interrupted as a result of mining activities conducted at the nearby mining operations operated by Specialty Granules, LLC.

The Groundwater Model Report enclosed with this formal application provides additional details related to effects of previous mining in the area on the quantity of the groundwater in the project area.

- e) Identify any other (i.e. non-mining) existing effects on the quantity and quality of the groundwater in the area. Include the source, involved and the reasons for the effect.

Objectionable quantities of background iron concentrations are reported locally (Fauth, 1978).

8.4 Surface Water Information.

- a) Identify each stream receiving drainage from the proposed operation and the 25 Pa Code Chapter 93 projected water use classification.

Stream

Unnamed Tributaries to Toms Creek

Classification

HQ-CWF, MF

Toms Creek

HQ-CWF, MF

- b) Identify the effects which previous mining has had on the quantity and quality of the surface waters in this area, including impacts from increased turbidity, suspended solids or settleable solids. Include the source, rock unit involved, and reasons for the effect.

Previous and current monitoring of the proposed Northern Tract Quarry expansion area and active areas of nearby metabasalt mining (West Ridge and Pitts Quarries) indicates no contamination, degradation of quantity/quality, or water level effects on surface waters. The Groundwater Model Report, enclosed with this formal application, provides additional details regarding this information.

8.5 Public Water Supply Information.

Provide the name, type, and location of all current public (community and non-community) surface water supplies that have intakes on the receiving stream within 10 miles downstream of the proposed permit area; public (community and non-community) water supplies (wells or springs) in or within one half mile of the proposed permit area; and public water supply wells for which any part of the permit area is within the Wellhead Protection Zone. Show the location of these supplies on Exhibit 6.1 or 6.2.

Potable water is supplied to the site by a non-transient, non-community water system consisting of two on-site supply wells equipped with sanitary seals and completed in bedrock. The two wells (designated Wells #2 and #3) are identified by the PA DEP Bureau of Water Supply Management as a Public Water Supply (PWS) #7010375. Review of the PA DEP Water Supply Inspection Report, dated August 15, 2005, indicated that Well #2 was installed in 1984 to a reported depth of 500 feet. This well is located downhill (south) and approximately 25 feet from the north side of Old Waynesboro Road (Latitude: 39°44'45.033" North, Longitude -77°27'19.006" West). Well #3 is also 500 feet in depth and located northwest of Well #2 near the southwest corner of the Specialty Granules, LLC office parking lot (Latitude: 39°44'48.572" North, Longitude -77°27'30.089" West).

According to PA DEP's Water Supply Inspection Report, Well #2 was constructed with 42 feet of 6-inch diameter permanent steel surface casing extending 6 inches below ground surface and is equipped with a submersible pump with a pumping capacity of 10 gpm. According to a July 2005 PA DEP Water Supply Inspection Report, Well #3 is only used during dry conditions, typically one month per year. It contains a submersible pump with a pumping capacity of 1.5 gpm and an unspecified amount of 6-inch diameter surface casing.

Neither Hamiltonban nor Washington Townships maintain public water supply systems within 0.5 mile from the proposed permitted areas. Additionally, there are no public surface water supplies (community and non-community) with intakes within 10 miles downstream of the permitted areas. Based on a December 2012 public records review completed by others, the Fairfield Municipal Authority (FMA) public supply wells were identified in Adams County near the Village of Maria Furnace. The FMA wellfield consists of four wells, which were identified in the United States Geological Survey's (USGS) Water-Resources Investigation Report 99-4108 titled *Summary of Hydrogeologic and Ground-Water Quality Data and Hydrogeologic Framework at Selected Well Sites, Adams County, Pennsylvania* (Low and Dugas, 1999). The *Adams County Water Supply and Wellhead Protection Plan (June 2001)* describes the wellhead protection area (WHPA) Zones 1, 2, and 3 for the FMA wellfield in addition to a number of other Adams County municipalities.

Zone 1 WHPA's were determined from a graphical interpretation of the volumetric flow equation developed by PA DEP (1996). This technique matches pumping rates to a fixed curve corresponding to a particular radius of influence needed to meet WHPA requirements based on specific well construction details. In the Adams County WHPP, Zone 2 areas were determined using safe yield well production values in gallons per day, where available, and considering drought (1 in 10 year frequency) groundwater recharge rates in gpd/square mile. From these values, the land area (in square miles) diverting water to a well under safe yield operating conditions during a 1 in 10-year drought condition can be calculated. Zone 3 WHPA's are determined by evaluating the upgradient land area (watershed) that contributes water to a Zone 2 WHPA.

The Adams County report includes a USGS topographic map depicting the WHPA for the FMA wellfield. Zone 2 is the critical wellhead protection zone. The FMA's Zone 2 WHPA extends southwest of the wellfield with the proposed

Northern Tract Quarry expansion area's permit boundary being approximately 3,500 feet east of this Zone 2 boundary. Therefore, the FMA's wellhead protection Zone 2 is located outside the 0.5 mile setback from the proposed Northern Tract Quarry permit boundary.

Additional public water supply wells owned by the Washington Township Municipal Authority (WTMA) were also identified during a public records review completed by Skelly and Loy in September 2016. Skelly and Loy's review of the wellhead protection zones established for the WTMA wellfield identified nine water supply sources (at least 4 wells and 4 springs) located southwest of the proposed Northern Tract Quarry expansion area. The locations of the wells comprising the WTMA wellfield are described in the Authority's Wellhead Protection Plan located on the Township's website. The plan includes mapping showing the locations of the Authority's Zone 1 and 2 WHPA's. The WTMA's Zone 2 WHPA is located 7,720 feet (1.5 mile) west of the permit boundary for the active Pitts Quarry and approximately 17,000 feet (3.2 miles) west of the permit boundary for the proposed Northern Tract Quarry expansion area. As a result, both the Zone 1 and Zone 2 WHPA's are located west and beyond the quarry's proposed 0.5 mile setback from the permit boundary established for the proposed Northern Tact Quarry expansion area.

8.6 Hydrologic Assessment

- a) Describe the groundwater hydrology in relation to the proposed mining operation (at maximum depth and lateral development) - i.e. - intercept regional water table, above regional water table, intercept perched water table, etc.

See Section 8.3 (above). Also, the Groundwater Model Report enclosed with this formal application contains additional detailed information associated with the groundwater hydrology (hydrogeology) and simulated water level elevations of the proposed Northern Tract Quarry expansion area at its proposed maximum depth and lateral development.

8.6 Hydrologic Assessment (continued)

- a) Identify water supply sources that may be contaminated, diminished or interrupted by the mining operation and the means to restore or replace the affected supply. Include a demonstration that the quantity of the water supply will be sufficient to meet the needs of the water supply use. Note why other water supplies will not be affected. Provide a specific capacity, step-drawdown, or other approved yield test for all water supplies that may be impacted by mining and for each proposed replacement supply source. Yield tests on other wells are at the discretion of the applicant or as requested by the Department. Provide specific capacity data on Module 8.6(A). Please refer to the guidance document, "Procedures for Establishing the Quantity of Water in Low-Yield Wells" for methods.

No residential wells are anticipated to be impacted from development of the proposed quarry based on the predictive simulations provided in the Groundwater Model Report enclosed with this formal application. Specific capacity testing was performed to establish a baseline of the groundwater yield characteristics for the Shank (07A16) and Holbrook (16A16) Private Water Supply (PWS) wells located within the 1,000-foot Permit Buffer. The well yield and capacity testing results for each location are shown below; however the yield of the Holbrook PWS decreased to 2 gpm before the well cavitated after approximately 45 minutes of pumping.

Holbrook (16A16):

Yield 4.5-5 gpm

Capacity 0.149 gpm/ft (before cavitation)

Shank (07A16):

Yield 7.3 gpm

Capacity 0.176 gpm/ft

- 1) Provide the existing operation and maintenance costs for each water supply that may be contaminated, diminished or interrupted by the mining operation and the projected operation and maintenance costs for the proposed replacement supply.

N/A. There are no identified water supplies that may be contaminated, diminished, or interrupted by the mining operation or projected operation.

- aa) If the operation and maintenance costs for the proposed replacement water supply will be more than for the existing water supply, identify the provisions for compensating the water supply owner for the increased costs or provide the consent to Lesser Water Supply Agreement Form 5600-FM-BMP0110 for the increased operation/maintenance costs.

N/A. No water supplies were identified that will be adversely affected by the proposed mining activities.

- b) Describe the probable hydrologic consequences of the proposed noncoal surface mining activities on the hydrologic system of the permit area and adjacent area both during and after the operation. Describe the impact, during and after mining, on existing quantity and quality of the surface and groundwater.

The simulated potentiometric groundwater elevation contours for the site area were used to compare the simulated bench expansions (5th bench through the 12th bench) discussed below to allow comparison and determine the potential impact that each of the anticipated expansions from the proposed Northern Tract Quarry pumping may have on the surrounding areas (i.e. wetlands, streams, residential wells). Based on the groundwater model simulations, it is evident that, as the quarry expansions deepen, the general zone of influence (drawdown) from the quarry is contained to the west, north, and east by the surface water streams. The maximum simulated quarry pit discharge (12th bench) is roughly 9 gallons per minute. This is a relatively low discharge rate but is consistent with the permeability of the bedrock material and the reported seepage rate observed in the existing Pitts Quarry to the south. The groundwater model simulations indicate that no substantial impacts in the form of diminished base flow to the streams and wetlands will occur as a result of the deeper bench advancements. However, there is a potential for water loss as a result of both the reduction in the run-off area (watershed) and the predicted decrease in elevation of the water table (especially in the western edge of Wetland D) adjacent to Wetland D caused by the dewatering of the proposed Northern Tract Quarry. This is discussed in more detail in Module 14.

The groundwater model simulations show that the reclamation water level can be maintained at an elevation of 1020 feet amsl.

The Groundwater Model Report is enclosed with this formal application.

- c) Is there evidence of sinkhole or cavern development in or within 1,000 feet of the proposed permit area? ☐ Yes ☒ No

If "yes" is checked, describe the effects mining will have on sinkhole or cavern development and the steps that will be taken to repair or alleviate sinkholes.

- d) Has groundwater modeling been conducted? ☒ Yes ☐ No

If "yes" is checked provide documentation for the modeling and the results.

ATTACHMENT A

FORM 8.1As

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: PWS-07A16
 Latitude: 39° 46' 09.447" N and
 Longitude: -77° 26' 55.083" W
 Surface Elevation (MSL): 1110 feet msl

Description of Sample Point**: Private Water Supply Well

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/_{\text{cm}}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/19/2016	Electric Tape/Purge Rate	1,085.30 feet msl; 7.0 gpm	6.02	6.90	21	134	12.5	63	27	0.22	0.030	ND	13.1		ALS; Ryan Sheidy, Skelly and Loy
8/18/2016	Electric Tape	1,068.49 feet msl	5.72	7.28	ND	130	24.4	67	13	0.12	ND	ND	9.8		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: PWS-16A16
 Latitude: 39° 46' 03.619"N and
 Longitude: -77° 25' 58.221"W
 Surface Elevation (MSL): 925 feet msl

Description of Sample Point**: Private Water Supply Well

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/_{\text{cm}}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/19/2016	Electric Tape/Purge Rate	889.23 feet msl; 5.0 gpm	6.54	7.46	ND	240	13.9	61	7	ND	ND	ND	13.7		ALS; Ryan Sheidy, Skelly and Loy
8/18/2016	Electric Tape	890.70 feet msl	5.78	7.52	ND	172	28.3	64	6	ND	ND	ND	12.2		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: PWS-15A16
 Latitude: 39° 46' 01.51"N and
 Longitude: -77° 26' 42.04"W
 Surface Elevation (MSL): 1085.74 feet msl

Description of Sample Point**: Private Water Supply Well

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
9/28/2017	Electric Tape	1053.4' msl	6.81	7.62	N.D.	77	12.4	45	8	1.5	0.097	N.D.	N.D.		ALS; Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	1052.66' msl	6.43	7.11	18	65	12.9	57	17	5.4	0.16	0.20	3.5		ALS; Dylan Woodworth, Skelly and Loy
11/21/2017	Electric Tape	1058.0' msl	6.98	7.78	5	107	10.8	53	8	2.4	0.17	N.D.	2.8		ALS; Dylan Woodworth, Skelly and Loy
12/19/2017	Electric Tape	1055.75' msl	6.64	7.86	5	136	10.9	67	8	1.9	0.13	N.D.	N.D.		ALS; Dylan Woodworth, Skelly and Loy
1/26/2018	Electric Tape	1065.77' msl	7.20	7.67	N.D.	70	10.0	68	N.D.	1.7	0.097	0.12	N.D.		ALS; Dylan Woodworth, Skelly and Loy
2/23/2018	Electric Tape	1068.48' msl	6.32	7.42	N.D.	73	10.5	61	7	1.8	0.063	N.D.	2.5		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-TC US
 Latitude: 39° 46' 4.097"N and
 Longitude: -77° 26' 55.686"W
 Surface Elevation (MSL): 1025 feet msl

Description of Sample Point**: Surface stream sample from Toms Creek, upstream
 Note: 1 With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	Marsh McBirney Flow Meter	667.54 gpm	6.24	7.94	7	41	18.8	27	ND	0.26	0.017	ND	4.1		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	Marsh McBirney Flow Meter	521.46 gpm	6.75	7.59	7	65	22.3	24	ND	0.26	0.022	0.12	3.7		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	Marsh McBirney Flow Meter	335.97 gpm	7.6	7.59	ND	57	15.9	26	ND	0.12	0.012	ND	2.8		ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	"	292.78 gpm	6.88	7.40	ND	58	8.2	27	ND	0.67	0.0068	ND	4.9		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016¹	"	1641.35 gpm	6.4	7.27	ND	59	5.9	17	ND	0.17	0.0084	0.14	6.8		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	"	836.93 gpm	6.3	7.40	ND	19	3.6	17	ND	0.085	ND	ND	5.9		ALS; Dylan Woodworth, Skelly and Loy
9/28/2017	"	321.64 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	"	270.73 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/2017	"	1279.65 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/2017	"	597.4 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/2018	"	2276.77 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/2018	"	4418.45 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: W-Pond 1
 Latitude: 39° 46' 16.368"N and
 Longitude: -77° 26' 42.309"W
 Surface Elevation (MSL): 985 feet msl

Description of Sample Point**: Surface water sample from pond/wetland

Note: 1 With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	Marsh McBirney Flow Meter	NO FLOW	4.7	8.30	53	57	26.3	50	ND	0.43	0.028	ND	2.3		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	Marsh McBirney Flow Meter	NO FLOW	7.18	9.04	ND	65	32.3	37	ND	0.21	0.0088	ND	4.1		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	Marsh McBirney Flow Meter	NO FLOW	7.1	7.70	ND	67	18.6	43	5	0.39	0.026	0.12	3.9		ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	"	NO FLOW	6.0	7.77	5	64	10.7	45	ND	0.27	0.015	ND	5.3		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016¹	"	NO FLOW	5.8	8.64	ND	39	4.7	37	ND	0.12	0.0094	ND	5.5		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	"	NO FLOW	5.7	7.63	44	35	4.5	36	ND	1.9	0.068	0.62	5.0		ALS; Dylan Woodworth, Skelly and Loy
9/28/17	"	NO FLOW	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	"	Flow too minimal to measure.	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/2017	"	Flow too minimal to measure.	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/2017	"	Flow too minimal to measure.	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/2018	"	Flow too minimal to measure.	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/2018	"	Flow too minimal to measure.	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

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Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

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Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-DCNR CHN
 Latitude: 39° 46' 18.512"N and
 Longitude: -77° 26' 32.732"W
 Surface Elevation (MSL): 998 feet msl

Description of Sample Point**: Surface water stream sample from unnamed tributary to Toms Creek
 Note: 1 With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	Marsh McBirney Flow Meter	147.67 gpm	6.27	7.73	ND	67	19.2	30	ND	0.15	0.0083	ND	3.4		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	Marsh McBirney Flow Meter	146.73 gpm	6.63	7.67	7	80	21.8	30	ND	0.21	0.017	ND	3.2		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	Marsh McBirney Flow Meter	28.64 gpm	7.7	7.71	5	72	14.8	34	ND	0.16	0.013	ND	4.3		ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	Marsh McBirney Flow Meter	18.02 gpm	6.75	7.45	ND	75	6.6	34	ND	0.24	0.010	ND	3.6		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016¹	“	197.93 gpm	6.4	7.23	ND	41	5.8	14	ND	0.20	0.0099	0.11	6.8		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	“	136.27 gpm	7.1	7.43	ND	122	3.2	18	ND	0.088	0.0062	ND	5.8		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-Lower Seep
 Latitude: 39° 46' 15.802"N and
 Longitude: -77° 26' 31.975"W
 Surface Elevation (MSL): 1003 feet msl

Description of Sample Point**: Surface water sample from seep

Note: ¹ With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	Marsh McBirney Flow Meter	NO FLOW	7.5	7.45	600	181	23.1	58	18	6.1	0.54	3.9	ND		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	Marsh McBirney Flow Meter	NO FLOW	7.5	7.64	1290	240	22.0	46	ND	9.6	1.0	6.7	21.3		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	Marsh McBirney Flow Meter	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Dylan Woodworth, Skelly and Loy
10/26/2016	Marsh McBirney Flow Meter	NO FLOW	6.18	7.20	327	195	8.1	56	12	1.4	0.21	1.2	10.6		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016¹	“	NO FLOW	6.0	6.97	111	152	6.1	31	11	0.62	0.098	0.40	11.4		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	“	NO FLOW	6.6	7.10	18	106	3.8	23	5	0.63	0.11	0.52	10.3		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-TC DS
 Latitude: 39° 46' 4.377"N and
 Longitude: -77° 26' 4.545"W
 Surface Elevation (MSL): 918 feet msl

Description of Sample Point**: Surface water sample from Toms Creek, downstream
 Note: 1 With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Laboratory and Name of Sampler	
								Submit above as requested by the Department							
7/13/2016	Marsh McBirney Flow Meter	1060.84 gpm	6.56	7.74	6	27	20.1	26	ND	0.12	0.0078	ND	4.1	ALS; Dylan Woodworth, Skelly and Loy	
8/18/2016	Marsh McBirney Flow Meter	1082.21 gpm	6.42	7.71	6	70	21.6	28	ND	0.23	0.012	ND	4.0	ALS; Dylan Woodworth, Skelly and Loy	
9/27/2016	Marsh McBirney Flow Meter	277.86 gpm	7.7	7.75	ND	60	15.0	35	ND	ND	ND	ND	2.8	ALS; Dylan Woodworth, Skelly and Loy	
10/26/2016	"	291.41 gpm	6.44	7.62	ND	76	7.1	36	ND	0.088	0.011	ND	4.3	ALS; Dylan Woodworth, Skelly and Loy	
12/7/2016¹	"	1937.92 gpm	6.3	7.39	ND	41	6.3	17	ND	0.15	0.0068	0.12	6.6	ALS; Dylan Woodworth, Skelly and Loy	
12/29/2016	"	927.25 gpm	6.8	7.51	ND	112	2.3	21	ND	ND	ND	ND	5.8	ALS; Dylan Woodworth, Skelly and Loy	
9/28/2017	"	373.27 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	"	524.22 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/2017	"	1586.97 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/2017	"	912.36 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/2018	"	4154.11 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/2018		8792.53 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

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Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-CHN1 DS
 Latitude: 39° 46' 3.652"N and
 Longitude: -77° 26' 5.031"W
 Surface Elevation (MSL): 917.5 feet msl

Description of Sample Point**: Surface water sample taken from channel, downstream

Note: 1 With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	Marsh McBirney Flow Meter	195.12 gpm	6.81	7.91	6	105	19.9	50	ND	0.15	0.010	ND	4.1		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	Marsh McBirney Flow Meter	203.53 gpm	6.84	7.90	12	126	21.4	50	ND	0.18	0.013	0.12	4.3		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	Marsh McBirney Flow Meter	65.30 gpm	7.7	7.86	ND	105	14.8	47	ND	ND	ND	ND	3.7		ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	"	106.65 gpm	6.68	7.74	ND	123	6.8	52	ND	ND	ND	ND	5.3		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016¹	"	329.54 gpm	7.1	7.72	ND	65	6.5	44	ND	0.084	ND	ND	8.0		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	"	257.14 gpm	6.6	7.69	ND	43	2.7	35	6	0.099	ND	ND	6.7		ALS; Dylan Woodworth, Skelly and Loy
9/28/2017	"	99.49 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	"	122.16 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/2017	"	379.24 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/2017	"	159.3 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/2018	"	289.23 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/2018		1466.03 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

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Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

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Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: W-Wetland C
 Latitude: 39° 45' 55.055"N and
 Longitude: -77° 26' 15.192"W
 Surface Elevation (MSL): 964 feet msl

Description of Sample Point**: Surface water sample taken from Wetland C

Note: ¹ With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	NO FLOW	964 feet msl	7.5	7.59	481	78	21.7	57	9	13.1	1.5	3.0	6.5		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	NO FLOW	964 feet msl	7.5	7.44	250	117	22.5	54	13	2.1	0.29	0.53	6.9		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	NO FLOW	964 feet msl	7.5	7.61	368	130	13.0	73	6	4.2	0.49	1.3	6.5		ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	NO FLOW	964 feet msl	6.0	7.37	231	140	6.1	66	10	3.7	0.39	0.94	7.5		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016¹	NO FLOW	964 feet msl	5.7	6.95	168	60	7.7	27	15	5.4	0.94	1.2	8.8		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	NO FLOW	964 feet msl	6.5	7.17	27	116	5.5	37	8	1.3	0.11	0.33	8.0		ALS; Dylan Woodworth, Skelly and Loy
9/28/17	No flow. < 1" deep, not flowing	964 feet msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	<1" of water present. Too minimal to measure flow		Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/2017	<1" of water present. Too minimal to measure flow		Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/2017	<1" of water present. Too minimal to measure flow		Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/2018	Noticeably more water, but still not able to sample for flow.		Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/2018	<1" of water present. Too minimal to measure flow		Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: W-Wetland D
 Latitude: 39° 45' 51.003"N and
 Longitude: -77° 26' 18.332"W
 Surface Elevation (MSL): 978 feet msl

Description of Sample Point**: Surface water sample taken from Wetland D

Note: ¹ With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	NO FLOW	978 feet msl	8.5	7.63	507	74	22	72	11	2.5	0.24	0.65	5.2		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	NO FLOW	978 feet msl	8	7.15	148	93	22.9	50	25	2.9	0.22	1.3	16.8		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	NO WATER PRESENT	978 feet msl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Dylan Woodworth, Skelly and Loy
10/26/2016	NO WATER PRESENT	978 feet msl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Dylan Woodworth, Skelly and Loy
12/7/2016¹	NO FLOW	978 feet msl	5.9	7.00	287	78	7.2	28	14	3.1	0.11	1.5	13.2		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	NO FLOW	978 feet msl	6.3	7.08	104	38	3.5	28	10	2.7	0.074	1.6	10.7		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-CHN 1 US
 Latitude: 39° 45' 50.728"N and
 Longitude: -77° 26' 17.821"W
 Surface Elevation (MSL): 975 feet msl

Description of Sample Point**: Surface water sample taken from Channel 1, upstream

Note: 1 With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	Marsh McBirney Flow Meter	195.73 gpm	6.92	7.89	13	115	20.3	45	ND	0.23	0.013	0.16	4.2		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	Marsh McBirney Flow Meter	138.75 gpm	7.00	7.87	19	134	21.1	51	ND	0.30	0.020	0.18	4.0		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	Marsh McBirney Flow Meter	90.68 gpm	7.9	7.84	ND	102	14.7	45	ND	ND	ND	ND	3.8		ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	"	117.85 gpm	6.4	7.64	ND	120	7.0	51	ND	0.11	0.0076	ND	5.2		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016'	"	328.61 gpm	6.8	7.67	ND	87	6.5	43	ND	0.071	ND	ND	7.8		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	"	216.85 gpm	6.9	7.61	ND	41	2.5	39	ND	0.11	ND	ND	6.2		ALS; Dylan Woodworth, Skelly and Loy
9/28/2017	"	125.93 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	"	157.22 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/2017	"	394.02 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/2017	"	180.27 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/2018	"	444.91 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/2018	"	1003.21 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-Upper Seep
 Latitude: 39° 46' 9.156" N and
 Longitude: -77° 26' 45.694" W
 Surface Elevation (MSL): 1.013 feet msl

Description of Sample Point**: Surface water seep (often dry during the growing season and minimal water at other times)
 Note: 1 With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/_{\text{cm}}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/16	Marsh McBirney Flow Meter	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Dylan Woodworth, Skelly and Loy
8/18/16	Marsh McBirney Flow Meter	Minimal Flow (not measureable)	6.5	6.64	618	107	22.5	11	14	3.3	0.21	1.7	14.6		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	Marsh McBirney Flow Meter	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Dylan Woodworth, Skelly and Loy
10/26/2016	"	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		Dylan Woodworth, Skelly and Loy
12/7/2016¹	"	NO FLOW	5.7	6.74	ND	63	6.0	12	9	0.41	0.0062	0.42	16.6		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	"	NO FLOW	6.1	6.88	ND	23	3.6	12	6	0.21	ND	0.16	15.1		ALS; Dylan Woodworth, Skelly and Loy
9/28/17	"	NO WATER PRESENT	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	"	Ponded Surface Water. No Flow	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/2017	"	Ponded Surface Water. No Flow	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/2017	"	Ponded Surface Water. No Flow	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/2018	"	4.56 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/2018	"	89.77 gpm	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

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Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-PFO Wetland
 Latitude: 39° 46' 15.102" N and
 Longitude: -77° 26' 35.999" W
 Surface Elevation (MSL): 1,004 feet msl

Description of Sample Point**: Surface water wetland (often dry during growing season)
 Note: 1 With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/2016	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		ALS; Dylan Woodworth, Skelly and Loy
8/18/2016	NA	NO FLOW	6.06	7.44	47	137	23.0	26	ND	0.24	0.014	0.16	13.9		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	NA	NO FLOW	4.68	6.49	360	274	8.9	43	54	14.1	0.46	2.8	ND		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016¹	NA	NO FLOW	6.1	7.11	6	79	5.9	31	10	0.17	ND	0.19	9.0		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	NA	NO FLOW	6.1	6.90	74	75	4.5	17	9	0.50	0.012	0.51	8.1		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-DCNR Seep 1
 Latitude: 39° 46' 11.258" N and
 Longitude: -77° 26' 6.147" W
 Surface Elevation (MSL): 937.5 feet msl

Description of Sample Point**: Surface water wetland (often dry during the growing season)
 Note: ¹ With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Laboratory and Name of Sampler
Submit above as requested by the Department														
7/13/16	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ALS; Dylan Woodworth, Skelly and Loy
8/18/16	NA	NO FLOW	7.0	7.22	10	114	21.3	57	24	0.27	0.081	0.16	10.3	ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ALS; Dylan Woodworth, Skelly and Loy
12/7/2016 ¹	NA	NO FLOW	6.3	7.13	ND	78	7.7	33	8	ND	ND	ND	8.0	ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	NA	NO FLOW	6.5	7.12	ND	103	4.5	28	5	ND	ND	ND	8.9	ALS; Dylan Woodworth, Skelly and Loy
9/28/17	NA	NO WATER PRESENT	NA											Dylan Woodworth, Skelly and Loy
10/23/2017	NA	NO FLOW. JUST ONE SMALL AREA OF STAGNANT WATER.												Dylan Woodworth, Skelly and Loy
11/21/2017	Marsh McBirney Flow Meter	5.34 gpm												Dylan Woodworth, Skelly and Loy
12/19/2017	NA	NO FLOW. JUST ONE SMALL AREA OF STAGNANT WATER.												Dylan Woodworth, Skelly and Loy
1/26/2018	Marsh McBirney Flow Meter	16.16 gpm												Dylan Woodworth, Skelly and Loy
2/23/2018	Marsh McBirney Flow Meter	49.71 gpm												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-DCNR Seep 2
 Latitude: 39° 46' 4.317" N and
 Longitude: -77° 26' 2.339" W
 Surface Elevation (MSL): 900 feet msl

Description of Sample Point**: Marginal surface water wetland (unlikely that samples can be collected at any time of the year)

Note: ¹ With PA DEP's prior permission, the November 2016 sampling event was completed on 12.7.2016 to reduce safety hazards to field personnel associated with the opening of Pennsylvania's antlered deer hunting (rifle) season.

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
7/13/16	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		ALS; Dylan Woodworth, Skelly and Loy
8/18/16	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		ALS; Dylan Woodworth, Skelly and Loy
9/27/2016	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		ALS; Dylan Woodworth, Skelly and Loy
10/26/2016	NA	NO WATER PRESENT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		ALS; Dylan Woodworth, Skelly and Loy
12/7/2016¹	NA	NO FLOW	4.8	6.07	ND	29	10.0	ND	10	ND	0.039	ND	6.4		ALS; Dylan Woodworth, Skelly and Loy
12/29/2016	NA	NO FLOW	5.1	6.28	9	23	6.3	7	14	0.19	0.028	ND	5.9		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-8S
 Latitude: 39° 45' 48.415"N and
 Longitude: -77° 26' 23.830"W
 Surface Elevation (MSL): 1069.84 feet msl

Description of Sample Point**: Monitoring Well located approximately 750 feet east of the current Pitts Quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Laboratory and Name of Sampler
								Submit above as requested by the Department						
4/1/2015	Electric Tape	1046.49 msl	6.63	7.16	1190	99	11.48	46	26	43.10	0.990	26.30	9.3	ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/5/2015	Electric Tape	1046.76 msl	6.10	7.03	440	73	17.59	34	36	15.20	0.380	9.80	9.5	ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	1045.15 msl	6.20	6.5	322	134	15.87	34	49	12.30	0.320	7.80	10.4	ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	1054.95 msl	5.78	6.77	628	155	18.13	46	43	13.20	0.270	8.10	8.6	ALS; L. Dunn, URS
8/10/2015	Electric Tape	1045.23 msl	5.85	6.83	831	124	17.69	48	19	41.80	1.100	27.30	9.8	ALS; B. Martin, URS
9/11/2015	Electric Tape	1043.43 msl	5.62	6.49	759	73	17.33	41	21	41.40	1.500	28.20	9.0	ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	1041.39' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy.
10/23/2017	Electric Tape	1041.25' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	1044.39' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	1040.89' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
1/26/2018	Electric Tape	1049.63' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
2/23/2018	Electric Tape	1048.49' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-8D
 Latitude: 39° 45' 48.435" N and
 Longitude: -77° 26' 23.593" W
 Surface Elevation (MSL): 1068.27 feet msl

Description of Sample Point**: Monitoring Well located approximately 750 feet east of the current Pitts Quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu S/cm$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Laboratory and Name of Sampler
								Submit above as requested by the Department						
4/1/2015	Electric Tape	1042.76 msl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/5/2015	Electric Tape	1043.55 msl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	1041.85 msl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	1052.60 msl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ALS; L. Dunn, URS
8/10/2015	Electric Tape	1042.26 msl	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ALS; B. Martin, URS
9/11/2015	Electric Tape	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	1039.53' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	1039.5' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	1041.96' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	1040.16' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
1/26/2018	Electric Tape	1046.7' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
2/23/2018	Electric Tape	1045.22' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-9S
 Latitude: 39° 45' 59.438"N and
 Longitude: -77° 26' 14.137" W
 Surface Elevation (MSL): 1018.41 feet msl

Description of Sample Point**: Monitoring Well located approximately 875 feet northeast of the current Pitts Quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
4/1/2015	Electric Tape	973.95 msl	5.97	6.46	61	35	16.46	13	52	0.38	0.045	0.42	6.1		ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/5/2015	Electric Tape	994.82 msl	5.69	6.36	62	10	14.20	14	52	0.26	0.024	0.50	5.0		ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	990.79 msl	5.19	6.25	956	50	16.00	14	35	1.30	0.220	2.70	4.9		ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	993.15 msl	5.15	6.14	187	71	18.24	14	58	0.42	0.030	0.26	<2.0		ALS; L. Dunn, URS
8/10/2015	Electric Tape	987.34 msl	5.62	6.14	619	52	14.26	15	26	0.51	0.150	0.47	2.2		ALS; B. Martin, URS
9/3/2015	Electric Tape	984.09 msl	5.59	6.50	1,260	52	18.19	24	27	2.3	0.43	6.3	2.0		ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	974.13; msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	978.32' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	977.04' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	976.99' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/18	Electric Tape	982.32' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/18	Electric Tape	985.86' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-9D
 Latitude: 39° 45' 59.354"N and
 Longitude: -77° 26' 14.235"W
 Surface Elevation (MSL): 1018.20 feet msl

Description of Sample Point**: Monitoring Well located approximately 875 feet northeast of the current Pitts Quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l	Laboratory and Name of Sampler
								Submit above as requested by the Department						
4/1/2015	Electric Tape	994.49 msl	7.51	8.07	892	140	16.41	70	<5	15.50	0.300	6.90	9.1	ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/5/2015	Electric Tape	994.06 msl	7.70	7.91	264	87	13.01	70	15	14.30	0.230	1.00	8.7	ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	991.50 msl	7.16	7.93	12	133	12.55	78	<5	2.20	0.0250	0.24	10.2	ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	993.95 msl	6.89	7.98	<5	168	17.34	95	<5	0.42	0.0034	<0.050	9.1	ALS; L. Dunn, URS
8/6/2015	Electric Tape	989.95 msl	7.86	8.08	13	123	12.65	95	<5	3.20	0.040	<0.050	8.8	ALS; B. Martin, URS
9/3/2015	Electric Tape	993.50 msl	8.32	8.09	8	136	13.30	99	<5	1.1	0.014	<0.050	9.3	ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	986.02' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	985.37' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	986.50' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	986.45' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
1/26/18	Electric Tape	989.5' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy
2/23/18	Electric Tape	992.98' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.											Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-10D
 Latitude: 39° 46' 07.603"N and
 Longitude: -77° 26' 08.441"W
 Surface Elevation (MSL): 1006.93 feet msl

Description of Sample Point**: Monitoring Well located approximately 1.425 feet northeast of the current Pitts Quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
4/1/2015	Electric Tape	945.43 msl	6.28	7.20	14	76	15.20	31	19	0.130	0.010	0.13	7.6		ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/5/2015	Electric Tape	946.94 msl	6.23	7.01	6	55	12.26	30	12	<0.067	0.007	<0.11	7.7		ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	941.12 msl	5.88	6.97	<5	71	11.33	21	11	0.052	0.0044	0.058	9.9		ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	950.40 msl	5.31	6.92	14	95	14.21	24	13	0.047	<0.0025	0.05	7.5		ALS; L. Dunn, URS
8/6/2015	Electric Tape	951.09 msl	6.28	7.23	56	65	11.93	33	20	0.089	0.035	0.11	6.2		ALS; B. Martin, URS
9/3/2015	Electric Tape	940.10 msl	6.61	7.08	<5	90	13.18	41	21	0.087	0.0069	0.12	7.1		ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	940.86' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	941.51' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	945.97' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	942.57' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/18	Electric Tape	952.35' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/18	Electric Tape	950.42' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-11D
 Latitude: 39° 46' 10.992"N and
 Longitude: -77° 26' 24.751"W
 Surface Elevation (MSL): 1046.29 feet msl

Description of Sample Point**: Monitoring Well located approximately 1.125 feet north-northeast of the current Pitts quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
4/2/2015	Electric Tape	1027.25 msl	7.78	8.03	77	158	12.27	132	<5	0.42	0.097	0.24	8.3		ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/7/2015	Electric Tape	1023.06 msl	7.49	7.83	<5	163	12.01	136	6	0.071	0.033	<0.11	10.1		ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	1021.84 msl	7.07	7.85	<5	164	12.97	146	9	0.088	0.019	0.058	11.1		ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	1023.08 msl	7.07	7.90	75	177	14.21	147	5	0.45	0.046	0.33	10.0		ALS; L. Dunn, URS
8/6/2015	Electric Tape	1021.24 msl	NS	7.98	48	186	NS	151	8	0.19	0.044	0.14	10.6		ALS; B. Martin, URS
9/3/2015	Electric Tape	1005.74 msl	6.14	8.03	7	183	12.03	165	9	0.2	0.020	0.15	10.8		ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	1020.80' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	1020.84' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	1021.06' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	1020.96' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/18	Electric Tape	1021.39' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/18	Electric Tape	1021.23' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

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Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-12D
 Latitude: 39° 46' 11.742"N and
 Longitude: -77° 26' 32.909"W
 Surface Elevation (MSL): 1077.58 feet msl

Description of Sample Point**: Monitoring Well located approximately 1.025 feet north of the current Pitts Quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
4/2/2015	Electric Tape	1067.64 msl	6.64	7.54	1,650	89	17.07	31	7	10.20	0.380	8.00	12.5		ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/5/2015	Electric Tape	1067.32 msl	6.13	7.01	104	43	13.60	24	21	8.60	0.200	1.70	12.9		ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	1048.08 msl	6.54	7.47	<5	100	11.77	56	<5	0.063	0.078	<0.050	15.7		ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	1069.96 msl	6.48	7.47	15	114	13.01	87	13	1.10	0.069	0.34	12.8		ALS; L. Dunn, URS
8/6/2015	Electric Tape	1064.53 msl	6.97	7.00	19	28	14.37	36	32	0.50	0.046	0.12	12.5		ALS; B. Martin, URS
9/3/2015	Electric Tape	1062.08 msl	7.13	7.67	<5	107	16.05	74	9	0.36	0.015	0.067	12.7		ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	1058.84' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	1059.01' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	1067.98' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/2017	Electric Tape	1065.83' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/18	Electric Tape	1069.76' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/18	Electric Tape	1068.28' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

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Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-13D
 Latitude: 39° 46' 07.853"N and
 Longitude: -77° 26' 37.402"W
 Surface Elevation (MSL): 1077.27 feet msl

Description of Sample Point**: Monitoring Well located approximately 700 feet north of the current Pitts quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S/cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
4/1/2015	Electric Tape	1047.64 msl	6.41	7.39	22	63	13.64	36	22	0.70	0.033	0.60	10.9		ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/7/2015	Electric Tape	1045.99 msl	6.07	6.87	12	36	13.24	14	10	0.42	0.021	0.38	10.9		ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	1029.03 msl	6.15	6.91	<5	64	13.27	26	14	0.044	0.0046	<0.050	12.0		ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	1048.82 msl	5.68	6.54	41	59	16.42	22	32	0.58	0.028	0.59	9.5		ALS; L. Dunn, URS
8/6/2015	Electric Tape	1042.53 msl	5.85	7.19	9	37	12.65	36	14	0.05	0.0057	0.06	10.6		ALS; B. Martin, URS
9/3/2015	Electric Tape	1037.04 msl	7.42	7.27	<5	72	11.65	38	9	0.065	0.0047	0.076	11.1		ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	1044.09' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	1044.55' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	1047.33' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	1046.78' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/18	Electric Tape	1048.79' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/18	Electric Tape	1048.2' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-14S
 Latitude: 39° 46' 01.988"N and
 Longitude: -77° 26' 42.859"W
 Surface Elevation (MSL): 1087.99 feet msl

Description of Sample Point**: Monitoring Well located approximately 400 feet north of the current Pitts Quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu S/cm$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
4/2/2015	Electric Tape	1068.33 msl	6.23	7.12	14	106	11.75	42	23	0.27	0.016	0.22	<2.0		ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/7/2015	Electric Tape	1068.10 msl	5.99	6.86	<5	72	14.57	41	27	0.068	<0.0056	<0.11	2.6		ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	1059.61 msl	5.85	7.13	<5	106	13.43	42	<5	0.13	0.0063	0.10	3.2		ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	1071.78 msl	5.80	6.76	376	129	15.89	42	31	0.52	0.032	0.44	2.3		ALS; L. Dunn, URS
8/10/2015	Electric Tape	1061.06 msl	6.00	6.72	37	111	13.50	40	28	2.60	0.061	2.10	2.4		ALS; B. Martin, URS
9/3/2015	Electric Tape	1058.01 msl	5.87	7.01	<5	72	12.25	41	21	0.33	0.016	0.28	3.3		ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	1054.35' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	1056.91' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	1059.01' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	1056.91' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/18	Electric Tape	1067.33' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/18	Electric Tape	1070.07' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: MW-14D
 Latitude: 39° 46' 02.145"N and
 Longitude: -77° 26' 41.374"W
 Surface Elevation (MSL): 1088.41 feet msl

Description of Sample Point**: Monitoring Well located approximately 400 feet north of the current Pitts Quarry operation (SMP#01930302)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
4/2/2015	Electric Tape	1060.24 msl	6.35	7.22	<5	86	12.08	43	29	2.20	0.029	<0.050	2.6		ALS; S. DeSaulniers, R. Crispino, D. Coleman, URS
5/7/2015	Electric Tape	1059.92 msl	6.44	7.00	49	79	15.50	38	28	29.00	0.084	<0.11	2.5		ALS; S. DeSaulniers, B. Martin, D. Coleman, URS
6/3/2015	Electric Tape	1046.79 msl	6.25	7.09	<5	108	12.12	51	23	3.30	0.110	<0.050	2.9		ALS, L. Dunn, D. Coleman, URS
7/1/2015	Electric Tape	1064.30 msl	6.23	7.08	26	136	16.16	68	24	10.80	0.120	<0.050	2.7		ALS; L. Dunn, URS
8/6/2015	Electric Tape	1052.14 msl	6.22	7.34	83	90	13.59	71	23	25.50	0.130	0.071	2.7		ALS; B. Martin, URS
9/3/2015	Electric Tape	1057.57 msl	6.55	7.17	21	101	15.39	47	16	11.4	0.032	<0.050	3.3		ALS; B. Martin, D. Coleman, URS
9/28/17	Electric Tape	1047.24' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
10/23/2017	Electric Tape	1046.97' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
11/21/17	Electric Tape	1052.34' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
12/19/17	Electric Tape	1050.34' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
1/26/18	Electric Tape	1059.82' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy
2/23/18	Electric Tape	1062.74' msl	Not required to collect grab sample – just flow to coincide with static water level measurements in monitoring wells.												Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☐ BACKGROUND or ☒ MONITORING REPORT*
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: SS-4
 Latitude: 39° 46' 15.43" N and
 Longitude: -77° 26' 27.21" W
 Surface Elevation (MSL): 995 feet msl

Description of Sample Point**: _____

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S/cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
9/28/2017	Marsh McBirney Flow Meter	315.46 gpm	7.05	7.57	N.D.	78	52.5	37	N.D.	0.10	0.0087	N.D.	3.2		ALS; Dylan Woodworth, Skelly and Loy
10/23/2017	Marsh McBirney Flow Meter	371.84 gpm	7.42	7.37	N.D.	39	13.1	34	N.D.	0.12	0.011	N.D.	4.5		ALS; Dylan Woodworth, Skelly and Loy
11/21/2017	Marsh McBirney Flow Meter	1373.14 gpm	7.29	7.44	N.D.	74	6.0	18	N.D.	0.069	0.0058	N.D.	5.5		ALS; Dylan Woodworth, Skelly and Loy
12/19/2017	Marsh McBirney Flow Meter	833.53 gpm	7.17	7.61	N.D.	110	5.4	22	N.D.	0.075	N.D.	N.D.	5.0		ALS; Dylan Woodworth, Skelly and Loy
1/26/2018	Marsh McBirney Flow Meter	2878.67 gpm	6.74	7.22	N.D.	45	2.7	11	N.D.	0.080	N.D.	N.D.	6.3		ALS; Dylan Woodworth, Skelly and Loy
2/23/2018	Marsh McBirney Flow Meter	6435.25 gpm	5.32	7.12	N.D.	50	6.1	13	N.D.	0.12	0.0069	0.13	6.4		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: PWS-95BB16
 Latitude: 39° 46' 04.64" N and
 Longitude: -77° 25' 57.80" W
 Surface Elevation (MSL): 908.1 feet msl

Description of Sample Point**: private water supply (well)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
1/26/2018	Electric Tape	896.9' MSL	5.83	6.73	N.D.	144	9.9	32	25	N.D.	N.D.	N.D.	14.2		ALS; Dylan Woodworth, Skelly and Loy
2/23/2018	Electric Tape	898.27' MSL	5.82	6.79	N.D.	131	10.5	32	27	N.D.	N.D.	0.56	13.4		ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

Module 8.1(A)

☒ **BACKGROUND** or ☐ **MONITORING REPORT***
(check appropriate block)

Operator: Specialty Granules LLC
 Operation Name: Northern Tract Quarry
 Permit No.: pending
 Township: Hamiltonban
 County: Adams

Monitoring Point I.D.: PWS-97B16
 Latitude: 39° 45' 57.90" N and
 Longitude: -77° 25' 53.17 " W
 Surface Elevation (MSL): 1016.8 feet msl

Description of Sample Point**: private water supply (well)

Instructions: Use a separate sheet for each sample point and list results consecutively by date.

Date Sampled	Method of Flow Measurement	Flow (GPM) or Static Water Elevation	Field pH	Laboratory pH	Suspended Solids mg/l	Total Dissolved Solids mg/l or Specific Conductance $\mu\text{S}/\text{cm}$ @25°C	Field Temp. °C	Alkalinity mg/l	Acidity mg/l	Iron Mg/l	Manganese mg/l	Aluminum mg/l	Sulfate mg/l		Laboratory and Name of Sampler
								Submit above as requested by the Department							
1/26/2018	There are two drilled wells on site, but there are no mechanical means in either well to collect a water sample. The wells are not currently in use and are not conducive for collecting a water sample. No occupied dwelling on-site. No additional attempts will be made to collect a sample.														ALS; Dylan Woodworth, Skelly and Loy

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature of Permittee or Responsible Official or Authorized Representative ***

Date

* Water Monitoring Report Cover Sheet Form 5600-FM-MR0113 may be used for multiple monitoring point sample submittals.

** Description should include type of sample point, relation to mine site, treatment and other comments (such as odor, color, etc.)

*** Written notification of delegation of signatory authority must be submitted to the Department if signature is other than company official. Signature not necessary if this report is submitted as part of the permit application.

ATTACHMENT B

PRIVATE WATER SUPPLY OWNER COORDINATION

Attached letter sent to the following addresses

006-A16

Mr. George G. Warner
Property Owner
Post Office Box 277
Blue Ridge Summit, PA 17214

007-A16

Mr. and Mrs. Kenneth Shank
Property Owners
15469 Norwood Avenue
Post Office Box 309
Blue Ridge Summit, PA 17214

016-A16

Mr. Stephen W. Holbrook
Property Owner
1698 Iron Springs Road
Fairfield, PA 17320

019-A16

Mr. and Mrs. William Deardorff
Property Owners
220 Petes Lane
Fairfield, PA 17320

034-A17

Mr. and Mrs. David A. Paolini
Property Owners
2150 Iron Springs Road
Fairfield, PA 17320

005-B15

PA Department of Conservation
and Natural Resources
Property Owner
Post Office Box 8451
Harrisburg, PA 17105

095-B16*

J P Morgan Chase Bank, National
Association
Property Owner
111 Polaris Parkway
Columbus, OH 43240

Parcel 097-B16

Beltowski, David D. & Denise L.
1648A Iron Springs Rd.
Fairfield, PA 17320

095A-B16

Mr. and Mrs. John D. Craig
Property Owners
1748 Iron Springs Road
Fairfield, PA 17320

095B-B16**

Wells Fargo Bank
Property Owner
3476 Stateview Boulevard
Fort Mill, SC 29715

99-B16

Mr. and Mrs. Thomas A. Estes, Jr.
Property Owners
Post Office Box 346
Fairfield, PA 17320

99A-B16

Ms. Crystal J. Heller
Property Owner
245 Pete's Lane
Fairfield, PA 17320

96-B16

Mr. Eric E. Shaffer
13902 Wolfsville Road
Smithburg, Maryland 21783-9331

* Note: Since original letter was sent to J P Morgan Chase, parcel ownership for 095-B16 was updated to the landowner (below), and a letter was sent to:

Mr. Bryon Dick
26 Echo Trail
Fairfield, PA 17320

** Note: Since original letter was sent to Wells Fargo, parcel ownership for 095B-B16 was updated to the landowner (below), and a letter was sent to:

Mr. and Mrs. Scott H. Merryman
1682 Iron Springs Road
Fairfield, PA 17320

449 Eisenhower Boulevard, Suite 300
Harrisburg, PA 17111-2302

E-mail: skellyloy@skellyloy.com
Internet: www.skellyloy.com



Phone: 717-232-0593
800-892-6532

Fax: 717-232-1799

October 10, 2017

Mr. Eric E. Shaffer
13902 Wolfsville Road
Smithburg, Maryland 21783-9331

Re: Residential Monitoring Access
Request, Parcel 18B16-96
Specialty Granules, LLC
Hamiltonban Township,
Adams County, Pennsylvania

Dear Mr. Shaffer:

Skelly and Loy, Inc. is an environmental engineering and consulting firm based in Harrisburg, Pennsylvania, that will be completing water sampling to evaluate flow conditions in the vicinity of the Specialty Granules, LLC (SGL) Charmian Quarry located on Old Waynesboro Road near Blue Ridge Summit, Adams County, Pennsylvania. The quarry property is located approximately 1 mile northeast of Greenstone, 2 miles northeast of Charmian, and 3.2 miles northeast of Blue Ridge Summit. Skelly and Loy has been engaged to initiate these efforts on behalf of SGL having its principal place of business in Hagerstown, Maryland.

We are requesting written authorization from selected property owners with potable water supply wells, wetland seeps, springs, or surface water stream access in the immediate vicinity of the project area to allow their properties to be accessed for the purpose of monitoring the *quality* and *quantity* of the above water features. Our "monitoring" will consist of collecting monthly flow measurements and water quality samples from streams, wetlands, and springs for a period of six consecutive months (total of six water samples). Our monitoring of private wells will consist of collecting monthly groundwater samples for a period of two consecutive months (total of two water samples). The total time required to collect each sample is estimated to take no more than 30 minutes and includes ingress and egress from your property. If your property contains a private supply well, we should note that *up to four hours* may be necessary for conducting an initial yield test to assess the quantity or discharge rate of the source. Access to these water features will be coordinated directly with you or with an authorized individual of your selection to ensure that access to your property and any needed subsequent visits can be scheduled at a convenient time for you and/or other occupants.

At this time, we anticipate that these samples will be acquired over a consecutive six-month period extending ~~from September 2017~~ through February 2018. Please also be aware that, while this water monitoring is expected to be completed over a six-month period for surface water sources and a two-month period for private groundwater wells, the projected testing schedule may be modified, delayed, or extended slightly for a variety of reasons (e.g., unfavorable weather conditions [heavy rainfall], low-flow conditions, etc.).

Mr. Eric E. Shaffer
Page 2
October 10, 2017


Water quality and flow data gathered during the monitoring program will be used to establish baseline conditions and evaluate the effects of quarry operations on surrounding groundwater users and surface water resources. These data will further enable us to determine the baseline water quality and avoid any adverse impacts to local water levels, potable groundwater supplies relied on by nearby residential well owners, and surface water resources. Monitoring data generated during the testing program will be compiled into a report documenting the results of our monitoring and testing activities. A copy of these data will be provided to the Pennsylvania Department of Environmental Protection's Cambria District Mining Office. Please note that a copy of the water monitoring results obtained from monitoring your private sources during this monitoring program will be provided to you upon request.

Please understand that you are under no obligation to grant access to your property or water sources per this request; however, we urge you to utilize this opportunity to allow our representatives to access your property for the purpose of collecting the data necessary to perform an appropriate analysis of the water resources in the project area. Having access to water sources located on or adjacent to your property will enable Skelly and Loy to fully characterize the existing water sources on or near your property and enhance the accuracy of the baseline data generated during the monitoring program. Please consider providing Skelly and Loy temporary access to your private residential well and/or nearby surface water resources and acknowledge such approval by providing your signature in the space below.

For your convenience, we are enclosing a self-addressed stamped envelope for returning your signed letter. If you have any questions or concerns regarding this temporary monitoring request or proposed testing schedule, please contact me. Thank you for your time and cooperation in this matter. It is very much appreciated.

Sincerely yours,

SKELLY and LOY, Inc.

 Douglas J. Hess, P.G.
Director of Groundwater and
Site Characterization Services

Enclosures

cc: Laura Berra, P.E., Skelly and Loy
R15-0340.000
File: SHAFFER_DJH.docx

Mr. Eric E. Shaffer
Page 3
October 10, 2017

I WILL allow access to my property for
monitoring

Signature of Property Owner

Name of Property Owner (Please Print)

Date

I WILL NOT allow access to my property for
monitoring

Signature of Property Owner

Name of Property Owner (Please Print)

Date

UNITED STATES POSTAL SERVICE

MD 212

16 OCT 2017

• Sender: Please print

RECEIVED
OCT 18 2017

RV:.....

2952 ET46 0000 0520 9T02

U.S. Postal Service™
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<input type="checkbox"/> Return Receipt (hardcopy)	\$	
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<input type="checkbox"/> Certified Mail Restricted Delivery	\$	
<input type="checkbox"/> Adult Signature Required	\$	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$	

Postage

\$

Total

\$

Sent

Street

City, State

R15-0340.000-DJH/LDB
ERIC E SHAFFER
13902 WOLFSPVILLE RD
SMITHBURG MD 21783-9331

Postmark
Here

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-0340.000-DJH/LDB
ERIC E SHAFFER
13902 WOLFSSVILLE RD
SMITHBURG MD 21783-9331

COMPLETE THIS SECTION ON DELIVERY

A. Signature



☐ Agent

☐ Addressee

B. Received by (Printed Name)

Eric Shaffer

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes

If YES, enter delivery address below:

☐ No

3. Service Type

☐ Certified Mail®



☐ Priority Mail Express™



☐ Registered



☐ Return Receipt for Merchandise

☐ Insured Mail

☐ Collect on Delivery

USPS TRACKING#		U.S. Postal Service TM CERTIFIED MAIL[®] RECEIPT <i>Domestic Mail Only</i>	
		For delivery information, visit our website at www.usps.com .	
9590 9402 1391 5285		OFFICIAL USE	
United States Postal Service		Postage \$	Postmark Here
• Send		Certified Fee	
BY:		Return Receipt Fee (Endorsement Required)	
JUN 08 2016		Restricted Delivery Fee (Endorsement Required)	
7014 259 000 0212 4102		R15-340.000-DJH MR & MRS JOHN D CRAIG 1748 IRON SPRINGS RD FAIRFIELD PA 17320	
		PS Form 3800, July 2014 See Reverse for Instructions	

USPS TRACKING#		U.S. Postal Service TM CERTIFIED MAIL[®] RECEIPT <i>Domestic Mail Only</i>	
		For delivery information, visit our website at www.usps.com .	
9590 9402 1391 5285		OFFICIAL USE	
United States Postal Service		Postage \$	Postmark Here
• Send		Certified Fee	
BY:		Return Receipt Fee (Endorsement Required)	
JUN 08 2016		Restricted Delivery Fee (Endorsement Required)	
7014 259 000 0212 4102		Total R15-340.000-DJH STEPHEN W HOLBROOK 1698 IRON SPRINGS RD FAIRFIELD PA 17320	
		PS Form 3800, July 2014 See Reverse for Instructions	

USPS TRACKING#		U.S. Postal Service TM CERTIFIED MAILTM RECEIPT <i>(Domestic Mail Only; No Insurance Coverage Provided)</i>	
		For delivery information visit our website at www.usps.com .	
9590 9402 1793 6074		OFFICIAL USE	
United States Postal Service		Postage \$	Postmark Here
• Send		Certified Fee	
BY:		Return Receipt Fee (Endorsement Required)	
JUN 17 2016		Restricted Delivery Fee (Endorsement Required)	
7013 060 000 1000 0090 0702		Total Poste R15-0340.000-DJH BRYON DICK 26 ECHO TRAIL FAIRFIELD PA 17320	
		PS Form 3800, August 2006 See Reverse for Instructions	

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-340.000-DJH
MR & MRS JOHN D CRAIG
1748 IRON SPRINGS RD
FAIRFIELD PA 17320



9590 9402 1391 5285 0172 66

2. A

7014 2120 0003 6527 1052

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent
☐ Addressee

B. Received by (Printed Name)

Doug Craig

C. Date of Delivery

6-6-16

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature ☐ Priority Mail Express®
☐ Adult Signature Restricted Delivery ☐ Registered Mail™
☐ Certified Mail® ☐ Registered Mail Restricted Delivery
☐ Certified Mail Restricted Delivery ☐ Return Receipt for Merchandise
☐ Collect on Delivery ☐ Signature Confirmation™
☐ Collect on Delivery Restricted Delivery ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-340.000-DJH
STEPHEN W HOLBROOK
1698 IRON SPRINGS RD
FAIRFIELD PA 17320



9590 9402 1391 5285 0172 11

2. Article Number (Transfer from service label)

7014 2120 0003 6527 1069

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent
☐ Addressee

B. Received by (Printed Name)

Stephen W. Holbrook

C. Date of Delivery

6-4-16

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature ☐ Priority Mail Express®
☐ Adult Signature Restricted Delivery ☐ Registered Mail™
☐ Certified Mail® ☐ Registered Mail Restricted Delivery
☐ Certified Mail Restricted Delivery ☐ Return Receipt for Merchandise
☐ Collect on Delivery ☐ Signature Confirmation™
☐ Collect on Delivery Restricted Delivery ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-0340.000-DJH
BRYON DICK
26 ECHO TRAIL
FAIRFIELD PA 17320



9590 9402 1793 6074 7476 89

2. Article Number (Transfer from service label)

7013 0600 0001 8349 4976

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X ☐ Agent
☐ Addressee

B. Received by (Printed Name)

Bryon Dick

C. Date of Delivery

8/15/16


D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No


3. Service Type


☐ Adult Signature ☐ Priority Mail Express®
☐ Adult Signature Restricted Delivery ☐ Registered Mail™
☐ Certified Mail® ☐ Registered Mail Restricted Delivery
☐ Certified Mail Restricted Delivery ☐ Return Receipt for Merchandise
☐ Collect on Delivery ☐ Signature Confirmation™
☐ Collect on Delivery Restricted Delivery ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none">■ Complete items 1, 2, and 3.■ Print your name and address on the reverse so that we can return the card to you.■ Attach this card to the back of the mailpiece, or on the front if space permits.		A. Signature X <i>Gayle Carr</i> <input type="checkbox"/> Agent <input checked="" type="checkbox"/> Addressee	
1. Article Addressed to: R15-340.000-DJH PA DCNR P O BOX 8451 HARRISBURG PA 17105		B. Received by (Printed Name)	C. Date of Delivery JUN 06 2016
2. A		D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No	
 9590 9402 1391 5285 0172 42		3. Service Type <input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express® <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery	
7013 0600 0001 8349 7205		Restricted Delivery	
PS Form 3811, July 2015 PSN 7530-02-000-9053		Domestic Return Receipt	

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none">■ Complete items 1, 2, and 3.■ Print your name and address on the reverse so that we can return the card to you.■ Attach this card to the back of the mailpiece, or on the front if space permits.		A. Signature X <i>Sharon L. Warner</i> <input type="checkbox"/> Agent <input checked="" type="checkbox"/> Addressee	
1. Article Addressed to: R15-340.000-DJH GEORGE G WARNER P O BOX 277 BLUE RIDGE SUMMIT PA 17214		B. Received by (Printed Name)	C. Date of Delivery 6-6-16
2. A		D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No	
 9590 9402 1391 5285 0171 98		3. Service Type <input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express® <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery	
7013 0600 0001 8349 7045		all Restricted Delivery (over \$500)	
PS Form 3811, July 2015 PSN 7530-02-000-9053		Domestic Return Receipt	

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none">■ Complete items 1, 2, and 3.■ Print your name and address on the reverse so that we can return the card to you.■ Attach this card to the back of the mailpiece, or on the front if space permits.		A. Signature X <input type="checkbox"/> Agent <input checked="" type="checkbox"/> Addressee	
1. Article Addressed to: R15-340.000-DJH MR & MRS THOMAS A ESTES JR P O BOX 346 FAIRFIELD PA 17320		B. Received by (Printed Name)	C. Date of Delivery
2. A		D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No	
 9590 9402 1391 5285 0172 80		3. Service Type <input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express® <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery	
7014 2120 0003 6527 0659		all Restricted Delivery (over \$500)	
PS Form 3811, July 2015 PSN 7530-02-000-9053		Domestic Return Receipt	

USPS TRACKING#
9590 9402 1391 5285

United States Postal Service

RECEIVED
JUN 08 2006

5022 6488 1000 0090 7202

U.S. Postal ServiceTM
CERTIFIED MAILTM RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com

OFFICIAL USE

Postage	\$	Postmark Here
Certified Fee		
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		

1 R15-340.000-DJH
PA DCNR
P O BOX 8451
HARRISBURG PA 17105

PS Form 3800, August 2006 See Reverse for Instructions

USPS TRACKING#
9590 9402 1391 5285

United States Postal Service

RECEIVED
JUN 08 2006

5402 6488 1000 0090 7045

U.S. Postal ServiceTM
CERTIFIED MAILTM RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)
For delivery information visit our website at www.usps.com

OFFICIAL USE

Postage	\$	Postmark Here
Certified Fee		
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		

Total R15-340.000-DJH
Sent To GEORGE G WARNER
P O BOX 277
BLUE RIDGE SUMMIT PA 17214

PS Form 3800, August 2006 See Reverse for Instructions

USPS TRACKING#
9590 9402 1391 5285 0172 80

United States Postal Service

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

• Sender: Please print your name, address, and ZIP+4® in this box •

R15-340.000-DJH
SKELLY AND LOY INC
449 EISENHOWER BLVD #300
HARRISBURG, PA 17111-2302

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<p>■ Complete items 1, 2, and 3.</p> <p>■ Print your name and address on the reverse so that we can return the card to you.</p> <p>■ Attach this card to the back of the mailpiece, or on the front if space permits.</p>		<p>A. Signature <input checked="" type="checkbox"/> <i>[Signature]</i> <input type="checkbox"/> Agent <input type="checkbox"/> Addressee</p>	
<p>1. Article Addressed to:</p> <p>R15-340.000-DJH WELLS FARGO BANK 3476 STATEVIEW BLVD FORT MILL SC 29715</p>		<p>B. Received by (Printed Name) <i>ALBERT LANGE</i></p> <p>C. Date of Delivery <i>8/1/16</i></p>	
<p>2. Article Number (Transfer from service label) 7014 2120 0003 6527 0901</p>		<p>D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No</p>	
<p>3. Service Type</p> <p><input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express® <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery <input type="checkbox"/> Insured Mail <input type="checkbox"/> Restricted Delivery</p>			


PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt


SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<p>■ Complete items 1, 2, and 3.</p> <p>■ Print your name and address on the reverse so that we can return the card to you.</p> <p>■ Attach this card to the back of the mailpiece, or on the front if space permits.</p>		<p>A. Signature <input checked="" type="checkbox"/> <i>[Signature]</i> <input type="checkbox"/> Agent <input type="checkbox"/> Addressee</p>	
<p>1. Article Addressed to:</p> <p>R15-340.000-DJH MR & MRS KENNETH SHANK P O BOX 309 BLUE RIDGE SUMMIT PA 17214</p>		<p>B. Received by (Printed Name) <i>CHRIS SHANK</i></p> <p>C. Date of Delivery <i>8/1/16</i></p>	
<p>2. Article Number (Transfer from service label) 7013 0600 0001 8349 7489</p>		<p>D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No</p>	
<p>3. Service Type</p> <p><input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express® <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery <input type="checkbox"/> Insured Mail <input type="checkbox"/> Restricted Delivery</p>			


PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

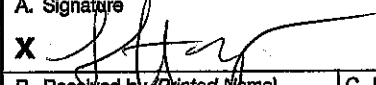

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<p>■ Complete items 1, 2, and 3.</p> <p>■ Print your name and address on the reverse so that we can return the card to you.</p> <p>■ Attach this card to the back of the mailpiece, or on the front if space permits.</p>		<p>A. Signature <input checked="" type="checkbox"/> <i>[Signature]</i> <input type="checkbox"/> Agent <input checked="" type="checkbox"/> Addressee</p>	
<p>1. Article Addressed to:</p> <p>R15-340.000-DJH CRYSTAL J HELLER 245 PETES LN FAIRFIELD PA 17320</p>		<p>B. Received by (Printed Name) <i>Crystal Heller</i></p> <p>C. Date of Delivery <i>6/7/2016</i></p>	
<p>2. Article Number (Transfer from service label) 7013 0600 0001 8349 7069</p>		<p>D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No</p>	
<p>3. Service Type</p> <p><input type="checkbox"/> Adult Signature <input type="checkbox"/> Priority Mail Express® <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Registered Mail Restricted Delivery <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Collect on Delivery Restricted Delivery <input type="checkbox"/> Signature Confirmation Restricted Delivery <input type="checkbox"/> Insured Mail <input type="checkbox"/> Restricted Delivery</p>			

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

USPS TRACKING  9590 9402 1441 5285 United States Postal Service JUN 10 2016 RECEIVED		U.S. Postal Service™ CERTIFIED MAIL® RECEIPT <i>Domestic Mail Only</i> For delivery information, visit our website at www.usps.com ® OFFICIAL USE	
• Send to:		Postage \$ Certified Fee Return Receipt Fee (Endorsement Required) Restricted Delivery Fee (Endorsement Required) Total:	Postmark Here
R15-340.000-DJH WELLS FARGO BANK 3476 STATEVIEW BLVD FORT MILL SC 29715			
PS Form 3800, July 2014		See Reverse for Instructions	


USPS TRACKING  9590 9402 1391 5285 United States Postal Service JUN 10 2016 RECEIVED		U.S. Postal Service™ CERTIFIED MAIL™ RECEIPT <i>(Domestic Mail Only; No Insurance Coverage Provided)</i> For delivery information visit our website at www.usps.com ® OFFICIAL USE	
• Send to:		Postage \$ Certified Fee Return Receipt Fee (Endorsement Required) Restricted Delivery Fee (Endorsement Required) Total:	Postmark Here
R15-340.000-DJH MR & MRS KENNETH SHANK P O BOX 309 BLUE RIDGE SUMMIT PA 17214			
PS Form 3800, August 2006		See Reverse for Instructions	


USPS TRACKING  9590 9402 1391 5285 United States Postal Service JUN 09 2016 RECEIVED		U.S. Postal Service™ CERTIFIED MAIL™ RECEIPT <i>(Domestic Mail Only; No Insurance Coverage Provided)</i> For delivery information visit our website at www.usps.com ® OFFICIAL USE	
• Send to:		Postage \$ Certified Fee Return Receipt Fee (Endorsement Required) Restricted Delivery Fee (Endorsement Required) Total:	Postmark Here
R15-340.000-DJH CRYSTAL J HELLER 245 PETES LN FAIRFIELD PA 17320			
PS Form 3800, August 2006		See Reverse for Instructions	


SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<div>■ Complete items 1, 2, and 3.</div> <div>■ Print your name and address on the reverse so that we can return the card to you.</div> <div>■ Attach this card to the back of the mailpiece, or on the front if space permits.</div>		<div>A. Signature<div><div>X</div><div></div><div><input type="checkbox"/> Agent <input checked="" type="checkbox"/> Addressee</div></div></div> <div>B. Received by (Printed Name)<div></div>C. Date of Delivery<div>8/16</div></div> <div>D. Is delivery address different from item 1? If YES, enter delivery address below:<div></div></div>	
<div>1. Article Addressed to:<div>R15-0340.000-DJH MR & MRS SCOTT H MERRYMAN 1682 IRON SPRINGS RD FAIRFIELD PA 17320</div></div> <div><div>9590 9402 1793 6074 7476 72</div></div>		<div>3. Service Type<div><div><input type="checkbox"/> Adult Signature <input type="checkbox"/> Adult Signature Restricted Delivery <input type="checkbox"/> Certified Mail® <input type="checkbox"/> Certified Mail Restricted Delivery <input type="checkbox"/> Collect on Delivery <input type="checkbox"/> Delivery Restricted Delivery <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Registered Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Signature Confirmation Restricted Delivery</div><div><input type="checkbox"/> Priority Mail Express® <input type="checkbox"/> Registered Mail™ <input type="checkbox"/> Registered Mail Restricted Delivery <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Signature Confirmation™ <input type="checkbox"/> Signature Confirmation Restricted Delivery</div></div></div>	
<div>2. Article Number (Transfer from PS Form 3811)<div>7014 2120 0003 6527 0864</div></div>		<div>4. Total Value of Mail Restricted Delivery (over \$500)<div></div></div>	


PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

U.S. Postal Service TM CERTIFIED MAIL [®] RECEIPT <i>Domestic Mail Only</i>	
For delivery information, visit our website at www.usps.com [®] .	
OFFICIAL USE	
USPS TRACKING#  9590 9402 1793 6074	<div>Postage \$</div> <div>Certified Fee</div> <div>Return Receipt Fee (Endorsement Required)</div> <div>Restricted Delivery Fee (Endorsement Required)</div> <div>Total</div> <div>Sent</div> <div>Street or PO</div> <div>City, State</div>
United States Postal Service	
• Send to	
RECEIVED AUG 18 2016	
4990 259 0000 0272 4102	
R15-0340.000-DJH MR & MRS SCOTT H MERRYMAN 1682 IRON SPRINGS RD FAIRFIELD PA 17320	
PS Form 3800, July 2014 See Reverse for Instructions	

USPS TRACKING  9590 9402 1391 5285		U.S. Postal Service™ CERTIFIED MAIL™ RECEIPT <i>(Domestic Mail Only; No Insurance Coverage Provided)</i> For delivery information visit our website at www.usps.com ®	
United States Postal Service BY: JUN 08 2006 RECEIVED		OFFICIAL USE	
• Sent To:		Postage \$ Certified Fee Return Receipt Fee (Endorsement Required) Restricted Delivery Fee (Endorsement Required)	Postmark Here
Total: R15-340.000-DJH		MR & MRS DAVID A PAOLINI 2150 IRON SPRINGS RD FAIRFIELD PA 17320	
Sent To:		Street or PO: City, State:	
PS Form 3800, August 2006		See Reverse for Instructions	

USPS TRACKING  9590 9402 1391 5285		U.S. Postal Service™ CERTIFIED MAIL™ RECEIPT <i>(Domestic Mail Only; No Insurance Coverage Provided)</i> For delivery information visit our website at www.usps.com ®	
United States Postal Service BY: JUN 08 2006 RECEIVED		OFFICIAL USE	
• Sent To:		Postage \$ Certified Fee Return Receipt Fee (Endorsement Required) Restricted Delivery Fee (Endorsement Required)	Postmark Here
Total: R15-340.000-DJH		MR & MRS WILLIAM DEARDORFF 220 PETES LN FAIRFIELD PA 17320	
Sent To:		Street or PO: City, State:	
PS Form 3800, August 2006		See Reverse for Instructions	

USPS TRACKING  9590 9402 1391 5285		U.S. Postal Service™ CERTIFIED MAIL™ RECEIPT <i>(Domestic Mail Only; No Insurance Coverage Provided)</i> For delivery information visit our website at www.usps.com ®	
United States Postal Service BY: JUN 13 2006 RECEIVED		OFFICIAL USE	
• Sent To:		Postage \$ Certified Fee Return Receipt Fee (Endorsement Required) Restricted Delivery Fee (Endorsement Required)	Postmark Here
To: R15-340.000-DJH		JP MORGAN CHASE BANK NA 111 POLARIS PARKWAY COLUMBUS OH 43240	
Sent To:		Street or PO: City, State:	
PS Form 3800, August 2006		See Reverse for Instructions	

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-340.000-DJH
MR & MRS DAVID A PAOLINI
2150 IRON SPRINGS RD
FAIRFIELD PA 17320



9590 9402 1391 5285 0172 35

2. Article Number (Transfer from service label)

7013 0600 0001 8349 7038

COMPLETE THIS SECTION ON DELIVERY

A. Signature

☐ Agent
☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

6-4-16

D. Is delivery address different from item 1? ☐ Yes
 If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery

☐ Priority Mail Express®☐ Registered Mail™☐ Registered Mail Restricted Delivery☐ Return Receipt for Merchandise☐ Signature Confirmation™☐ Signature Confirmation Restricted Delivery

Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-340.000-DJH
MR & MRS WILLIAM DEARDORFF
220 PETES LN
FAIRFIELD PA 17320



9590 9402 1391 5285 0172 28

2. Article Number (Transfer from service label)

7013 0600 0001 8349 4907

COMPLETE THIS SECTION ON DELIVERY

A. Signature

☐ Agent
☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

6-6-16

D. Is delivery address different from item 1? ☒ Yes
 If YES, enter delivery address below: ☐ No

PO Box 472
-0472

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery

☐ Priority Mail Express®☐ Registered Mail™☐ Registered Mail Restricted Delivery☐ Return Receipt for Merchandise☐ Signature Confirmation™☐ Signature Confirmation Restricted Delivery

all Restricted Delivery

(over \$500)

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-340.000-DJH
JP MORGAN CHASE BANK NA
111 POLARIS PARKWAY
COLUMBUS OH 43240



9590 9402 1391 5285 0172 59

2. Article Number (Transfer from service label)

7013 0600 0001 8349 7472

COMPLETE THIS SECTION ON DELIVERY

A. Signature

☐ Agent
☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
 If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery

☐ Priority Mail Express®☐ Registered Mail™☐ Registered Mail Restricted Delivery☐ Return Receipt for Merchandise☐ Signature Confirmation™☐ Signature Confirmation Restricted Delivery

all Restricted Delivery

Mr. and Mrs. Scott H. Merryman
Page 3
December 19, 2017

I WILL allow access to my property for
monitoring

[Signature]
Signature of Property Owner

DAYNA MERRYMAN
Name of Property Owner (Please Print)

12-20-17
Date

I WILL NOT allow access to my property for
monitoring

Signature of Property Owner

Name of Property Owner (Please Print)

Date

UNITED STATES POSTAL SERVICE

• Sender: Please print

DEC 26 2017

4533 E746 0000 0520 9702

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

OFFICIAL USE

Certified Mail Fee

\$

Extra Services & Fees (check box, add fee as appropriate)

<input type="checkbox"/> Return Receipt (hardcopy)	\$
<input type="checkbox"/> Return Receipt (electronic)	\$
<input type="checkbox"/> Certified Mail Restricted Delivery	\$
<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$

Postage

\$

Total P

R15-0340.000-LDB/DJH
MR & MRS SCOTT H MERRYMAN
1682 IRON SPRINGS RD
FAIRFIELD PA 17320

Sent To

Street

City, S

State

Zip

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-0340.000-LDB/DJH ~~0316-007~~
MR & MRS SCOTT H MERRYMAN
1682 IRON SPRINGS RD
FAIRFIELD PA 17320

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

Scott H Merryman

☐ Agent

☐ Addressee

B. Received by (Printed Name)

Scott Merryman

C. Date of Delivery

12-21

D. Is delivery address different from item 1? ☐ Yes

If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Certified Mail®
- ☐ Registered
- ☐ Insured Mail
- ☐ Priority Mail Express™
- ☐ Return Receipt for Merchandise
- ☐ Collect on Delivery

4. Restricted Delivery? (Extra Fee)

☐ Yes

U.S. Postal ServiceTM
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®

OFFICIAL USE



14J3 336L

Certified Mail Fee	
Extra Services & Fees (check box, add fee as appropriate)	\$
<input type="checkbox"/> Return Receipt (hardcopy)	\$
<input type="checkbox"/> Return Receipt (electronic)	\$
<input type="checkbox"/> Certified Mail Restricted Delivery	\$
<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$

Postmark
Here

Postage
R15-0340.000-LDB/DJH

Total Post

Sent To
Street
City, State

MR & MRS DAVID D BELTOWSKI
1648A IRON SPRINGS RD
FAIRFIELD PA 17320

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

MR AND MRS DAVID D BELTOWSKI
1648A IRON SPRINGS RD
FAIRFIELD PA 17320

HARRISBURG PA 171

19 DEC 2017 PM 6 12/19/17

Happy Holidays
neopost
USPS

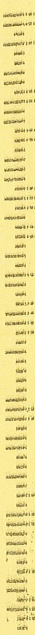


ZIP 17111
041110248679

NIXIE 176 DE 1 0012/27/17

RETURN TO SENDER
NO MAIL RECEIPT
UNABLE TO FORWARD

BC: 1/11/230139 11/19-1/434-19-41



7016 0750 0000 9413 336L

AL: 93260160330139

NMK
17111>2301

DO NOT WRITE IN THESE SPACES
PLACE STICKER TOP OF ENVELOPE TO THE RIGHT

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R15-0340.000-LDB/DJH
MR & MRS DAVID D BELTOWSKI
1648A IRON SPRINGS RD
FAIRFIELD PA 17320

COMPLETE THIS SECTION ON DELIVERY

A. Signature

☒ X

☐ Agent

☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

D. Is delivery address different from item 1?

If YES, enter delivery address below:

☐ Yes
☐ No

3. Service Type

- ☐ Certified Mail® ☐ Priority Mail Express™
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ Collect on Delivery

4. Restricted Delivery? (Extra Fee)

☐ Yes

2. Article

7016 0750 0000 9413 3361

(Track)

PS Form 3811, July 2013

Domestic Return Receipt

Wells Fargo Home Mortgage

One Home Campus

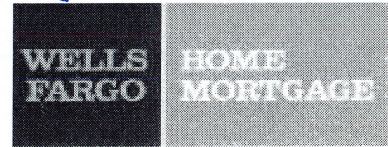
MAC: N0012-01G

Des Moines, IA 50328

Phone: 1-877-617-5274

Fax: 1-866-512-0757

JUG, DSH



RECEIVED
JUN 27 2016

BY: _____

June 23, 2016

Skelly and Loy
449 Eisenhower Blvd
Suite 300
Harrisburg, PA 17111

Subject: Notice of violation on the property

To Whom It May Concern:

Wells Fargo Home Mortgage is returning the enclosed notice of violation for the reason that we do not have enough information to identify the property to address the violation.

Before we can process the violation you will need to provide us with the information below along with the notice of violation.

Parcel/Tax ID Number 095-B / 8-16
Owner's Name (Prior to Wells Fargo Home Mortgage) _____
Complete Property Address, Including Zip Code _____
Wells Fargo Home Mortgage Account Number _____

Please send to the address at the top of this letter.

If you have any questions or need further assistance on the preservation and maintenance of a loan serviced by Wells Fargo Home Mortgage, please contact us by:

Email: codeviolations@wellsfargo.com

Phone: 1-877-617-5274

Fax 1-866-512-0757

Sincerely,

Tiffany Ketcham
Building Code and Compliance
Wells Fargo Home Mortgage

Enclosure

Wells Fargo Home Mortgage is a division of Wells Fargo Bank, N.A. ©2016 Wells Fargo Bank, N.A. All rights reserved.
NMLSR ID 399801

449 Eisenhower Boulevard, Suite 300
Harrisburg, PA 17111-2302

E-mail: skellyloy@skellyloy.com
Internet: www.skellyloy.com



Phone: 717-232-0593
800-892-6532
Fax: 717-232-1799

June 2, 2016

Wells Fargo Bank
Property Owner
3476 Stateview Boulevard
Fort Mill, South Carolina 29715

Re: Monitoring Access Request, Parcel
B-16, 095-B
Specialty Granules, LLC
Hamiltonban Township,
Adams County, Pennsylvania

To Whom It May Concern:

Skelly and Loy, Inc. is an environmental engineering and consulting firm based in Harrisburg, Pennsylvania, that will be completing water sampling to evaluate flow conditions in the vicinity of the Specialty Granules, LLC (SGL) Charmian Quarry located on Old Waynesboro Road near Blue Ridge Summit, Adams County, Pennsylvania. The quarry property is located approximately 1 mile northeast of Greenstone, 2 miles northeast of Charmian, and 3.2 miles northeast of Blue Ridge Summit. Skelly and Loy has been engaged to initiate these efforts on behalf of SGL having its principal place of business in Hagerstown, Maryland.

We are requesting written authorization from selected property owners with potable water supply wells, wetland seeps, springs, or surface water stream access in the immediate vicinity of the project area to allow their properties to be accessed for the purpose of monitoring the *quality* and *quantity* of the above water features. Our "monitoring" will consist of collecting monthly flow measurements and water quality samples from streams, wetlands, and springs for a period of six consecutive months (total of six water samples). Our monitoring of private wells will consist of collecting monthly groundwater samples for a period of two consecutive months (total of two water samples). The total time required to collect each sample is estimated to take no more than 30 minutes and includes ingress and egress from your property. If your property contains a private supply well, we should note that *up to four hours* may be necessary for conducting an initial yield test to assess the quantity or discharge rate of the source. Access to these water features will be coordinated directly with you or with an authorized individual of your selection to ensure that access to your property and any needed subsequent visits can be scheduled at a convenient time for you and/or other occupants.

At this time, we anticipate that these samples will be acquired over a consecutive six-month period extending from June through November 2016. Please also be aware that, while this water monitoring is expected to be completed over a six-month period for surface water sources and a two-month period for private groundwater wells, the projected testing schedule may be modified, delayed, or extended slightly for a variety of reasons (e.g., unfavorable weather conditions [heavy rainfall], low-flow conditions, etc.). The maximum monitoring period should not exceed eight consecutive months (i.e., through January 2017).

Wells Fargo Bank
Page 2
June 2, 2016

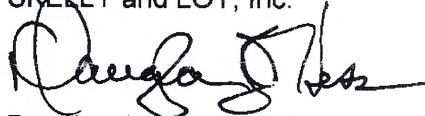
Water quality and flow data gathered during the monitoring program will be used to establish baseline conditions and evaluate the effects of quarry operations on surrounding groundwater users and surface water resources. These data will further enable us to determine the baseline water quality and avoid any adverse impacts to local water levels, potable groundwater supplies relied on by nearby residential well owners, and surface water resources. Monitoring data generated during the testing program will be compiled into a report documenting the results of our monitoring and testing activities. A copy of these data will be provided to the Pennsylvania Department of Environmental Protection's Cambria District Mining Office. Please note that a copy of the water monitoring results obtained from monitoring your private sources during this monitoring program will be provided to you upon request.

Please understand that you are under no obligation to grant access to your property or water sources per this request; however, we urge you to utilize this opportunity to allow our representatives to access your property for the purpose of collecting the data necessary to perform an appropriate analysis of the water resources in the project area. Having access to water sources located on or adjacent to your property will enable Skelly and Loy to fully characterize the existing water sources on or near your property and enhance the accuracy of the baseline data generated during the monitoring program. Please consider providing Skelly and Loy temporary access to your private residential well and/or nearby surface water resources and acknowledge such approval by providing your signature in the space below.

For your convenience, we are enclosing a self-addressed stamped envelope for returning your signed letter. If you have any questions or concerns regarding this temporary monitoring request or proposed testing schedule, please contact me. Thank you for your time and cooperation in this matter. It is very much appreciated.

Sincerely yours,

SKELLY and LOY, Inc.



Douglas J. Hess, P.G.
Director of Groundwater and
Site Characterization Services

Enclosures

cc: Matthew McClure, Specialty Granules, LLC
Matt Watson, Specialty Granules, LLC
Tony Shepeck, P.G., Specialty Granules, LLC
Robert Shusko, P.E., D'Appolonia
Laura Berra, P.E., Skelly and Loy
R15-0340.000
File: OWNERS_DJH.doc

Wells Fargo Bank
Page 3
June 2, 2016

I **WILL** allow access to my property for
monitoring

Signature of Property Owner

Name of Property Owner (Please Print)

Date

I **WILL NOT** allow access to my property for
monitoring

Signature of Property Owner

Name of Property Owner (Please Print)

Date

Well Survey Form

Name: _____

Address: _____

Telephone No.: _____

1) Are you connected to the public water system? ☐ YES ☐ NO

2) Do you have a water supply well on your property? ☐ YES ☐ NO

If you answered yes to question 2, please complete questions 3 through 10 as best you can

3) Is the well still actively used? ☐ YES ☐ NO

4) Is well accessible? ☐ YES ☐ NO

If yes, where is it located? _____

5) If actively used, what is the well used for (i.e., drinking or bathing; watering garden, lawn, flowers, trees, shrubs; washing vehicles; filling kid's swimming pools; etc.)?

6) If actively used, is the well plumbing connected to the household plumbing that supplies water for drinking and bathing?

☐ YES, If Yes How is it Controlled? _____

☐ NO _____

7) If actively used, does the well have a treatment/filtration system in use (i.e., ultra-violet [UV] light, sediment filter, water softner, etc.)?

8) If actively used, has the well water been tested? ☐ YES ☐ NO

If Yes, what is the most recent date tested? _____

Laboratory/Analyses: _____

Are the results available? ☐ YES ☐ NO

9) If you know any details regarding the construction of your well, please provide as much of the following information as possible

a) Date Installed/Installer: _____

b) Total Depth: _____ d) Depth of Pump Setting: _____

c) Depth of Surface Casing: _____ e) Diameter of well: _____

10) If actively used, are there any known or existing problems (i.e., low water pressure, turbid, odors, taste, etc.)?

Contact Name/Daytime Number: _____

Property Owner Signature: _____ Date: _____

Well Survey Form

Name: STEPHEN WILLIAM HOLBROOK
Address: 1698 IRON SPRINGS Rd. Fairfield, Pa. 17320
Telephone No.: 717-642-3705

1) Are you connected to the public water system? ☐ YES ☒ NO

2) Do you have a water supply well on your property? ☒ YES ☐ NO

If you answered yes to question 2, please complete questions 3 through 10 as best you can

3) Is the well still actively used? ☒ YES ☐ NO

4) Is well accessible? ☒ YES ☐ NO

If yes, where is it located? Across The back deck, down the sidewalk, and behind my shed w/ bucket covering it.

5) If actively used, what is the well used for (i.e., drinking or bathing; watering garden, lawn, flowers, trees, shrubs; washing vehicles; filling kid's swimming pools; etc.)?

Drinking, Bathing, washing dishes, Laundry, and water for my Late dog + my chickens. We eat the eggs.

6) If actively used, is the well plumbing connected to the household plumbing that supplies water for drinking and bathing?

☒ YES, If Yes How is it Controlled? It is Run by electricity to the well pump.
☐ NO

7) If actively used, does the well have a treatment/filtration system in use (i.e., ultra-violet [UV] light, sediment filter, water softner, etc.)?

Sediment filter and sand separator at bottom of well. My aerators are still getting slimy + Blocked often.

8) If actively used, has the well water been tested? ☒ YES ☐ NO

If Yes, what is the most recent date tested? 2 years or more

Laboratory/Analyses: Never recieved an answer from Negleys (SGIS CO.)

Are the results available? ? Probably ☐ YES ☐ NO NOT

9) If you know any details regarding the construction of your well, please provide as much of the following information as possible

a) Date Installed/Installer: Dont know exact date. 225' / Alexanders pl.
b) Total Depth: 225' d) Depth of Pump Setting: ?
c) Depth of Surface Casing: ? e) Diameter of well: ?

10) If actively used, are there any known or existing problems (i.e., low water pressure, turbid, odors, taste, etc.)?

Lowering pressure, Blocking of aerators, shower heads blocking too. Installed a new washer and it is ruined by silt. wont fill!

Contact Name/Daytime Number: Steve or Stephanie Holbrook

Property Owner Signature: Stephen W. Holbrook Date: 717-642-3705 6-4-16

Mr. Stephen W. Holbrook
Page 3
June 2, 2016

I WILL allow access to my property for
monitoring

Stephen W. Holbrook

Signature of Property Owner

STEPHEN W. HOLBROOK

Name of Property Owner (Please Print)

6-4-16

Date

I WILL NOT allow access to my property for
monitoring

Signature of Property Owner

Name of Property Owner (Please Print)

Date

WATER WELL INFORMATION REPORT

PA Well ID: **49672**

Local Well ID: **UL0359**

Local Permit #:

LOCATION INFORMATION

Owner: **RODGERS D**

Original Paper Record
Image Available: **No**

Address of Well:

County: **ADAMS**

Municipality: **HAMILTONBAN
TWP.**

Latitude:

Coordinate Method:

Longitude:

Data Reliability: **LOCATION MAY NOT BE
ACCURATE (WWI paper)**

Description of Well

Location and Other Notes: **RT=GREENSTONE**

WELL CONSTRUCTION INFORMATION

Well Driller:	RANDALL ALEXANDER ALEXANDER'S WELL DRILLING	License:	1665	Driller Well ID:
Type of Activity:	New Well	Date Drilled:	7/1/1986	Drilling Method:
Well Depth (ft):	225	Well Finish:	OPEN HOLE	

CASING

<u>Top (ft)</u>	<u>Bottom (ft)</u>	<u>Diameter (in)</u>	<u>Casing Material</u>	<u>Seal Top</u>	<u>Seal Bottom</u>	<u>Seal Type</u>
0	21	6				NONE

GROUNDWATER AND GEOLOGICAL INFORMATION

Well Yield (GPM - gal per min):	2	Yield Measurement Method:	ESTIMATED
Water Level when not pumped: (ft below land surface)	30	Water Level after yield test: (ft below land surface)	180
Length of Yield Test (minutes):	1	Saltwater Zone (ft):	
Use of Well:	WITHDRAWAL	Use of Water:	DOMESTIC

LEVELS WHERE WATER ENTERS WELL

<u>Top (ft)</u>	<u>Bottom (ft)</u>	<u>Yield (GPM)</u>
60		

Well Survey Form

CHRIS SHANK

717.794.2799

Name: M. Patricia Shank

Address: 201 Gum Springs Road, Fairfield, PA 17320

Telephone No.: 717-794-2799

1) Are you connected to the public water system? ☐ YES ☒ NO

2) Do you have a water supply well on your property? ☒ YES ☐ NO

If you answered yes to question 2, please complete questions 3 through 10 as best you can

3) Is the well still actively used? ☒ YES ☐ NO

4) Is well accessible? ☒ YES ☐ NO

If yes, where is it located? behind the house

5) If actively used, what is the well used for (i.e., drinking or bathing, watering garden, lawn, flowers, trees, shrubs, washing vehicles, filling kid's swimming pools, etc.)?

drinking, bathing, watering flowers + shrubs, washing vehicles

6) If actively used, is the well plumbing connected to the household plumbing that supplies water for drinking and bathing?

☒ YES, If Yes How is it Controlled? _____

☐ NO _____

7) If actively used, does the well have a treatment/filtration system in use (i.e., ultra-violet [UV] light, sediment filter, water softner, etc.)?

No

8) If actively used, has the well water been tested? ☒ YES ☐ NO

If Yes, what is the most recent date tested? 2013

Laboratory/Analyses: tested by WRS

Are the results available? ☐ YES ☐ NO

9) If you know any details regarding the construction of your well, please provide as much of the following information as possible

a) Date Installed/Installer: 1997 Alexander's Plumbing + Pumps, Inc.

b) Total Depth: 250 ft. d) Depth of Pump Setting: _____

c) Depth of Surface Casing: _____ e) Diameter of well: _____

10) If actively used, are there any known or existing problems (i.e., low water pressure, turbid, odors, taste, etc.)?

No

Contact Name/Daytime Number: M. Patricia Shank 717-794-2850

Property Owner Signature: M. Patricia Shank Date: June 12, 2016

Mr. and Mrs. Kenneth Shank
Page 3
June 2, 2016

I WILL allow access to my property for
monitoring

M. Patricia Shank
Signature of Property Owner

M. Patricia Shank
Name of Property Owner (Please Print)

June 12, 2016
Date

I WILL NOT allow access to my property for
monitoring

Signature of Property Owner

Name of Property Owner (Please Print)

Date

**SKELLY AND LOY**

449 Eisenhower Boulevard, Suite 300
Harrisburg, PA 17111
717-232-0593 (Office)
800-892-6532
717-232-1799 (Fax)

LETTER OF TRANSMITTAL

TO: Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry, Michaux State Forest, District #1

10099 Lincoln Way East, Fayetteville, PA 17222

DATE	6.27.2016	JOB NO.	R14-0108.000
ATTENTION	Mr. Roy Brubaker, District Forester		
RE	LOA Transmittal for Monitoring Access Request		
	Michaux State Forest		

WE ARE SENDING YOU: ☒ Attached ☐ Under separate cover via _____ the following items:☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications☐ Copy of Letter ☐ Change Order ☐ Bid Proposal for Geotechnical Oversight of Well Redevelopment

COPIES	DATE	DESCRIPTION
1	6.22.2016	Executed Letter of Authorization (for State forest access)

THESE ARE TRANSMITTED as checked below:

- | | | |
|--|---|---|
| <input type="checkbox"/> For Approval | <input type="checkbox"/> Approved as Submitted | <input type="checkbox"/> Resubmit _____ Copies for Your Approval. |
| <input checked="" type="checkbox"/> For your Use | <input type="checkbox"/> Approved as Noted | <input type="checkbox"/> Submit _____ Copies for Distribution. |
| <input checked="" type="checkbox"/> As Requested | <input type="checkbox"/> Return for Corrections | <input type="checkbox"/> Return _____ Corrected Prints. |
| <input type="checkbox"/> For Review and Comment | <input type="checkbox"/> Other _____ | |

FOR BIDS DUE _

☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS: Mr Brubaker:

Please find the above-listed Letter of Authorization for access to Michaux State Forest land for the purpose of collecting surface water samples.

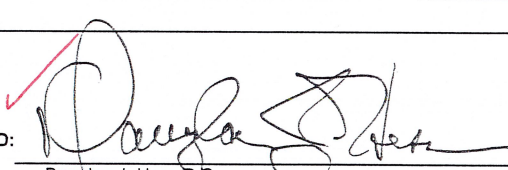
We would like to access the identified location on a monthly basis for 6 consecutive months beginning in July 2016. We appreciate your cooperation in providing authorization for access to this location.

Please let me know if you have any other questions concerning the enclosed sampling location or schedule.

COPY TO: DJH; R14-0108.000

SIGNED:

FROM:


Douglas J. Hess P.E.
Director of Groundwater and Site Characterization
Geo-Environmental Services



pennsylvania

DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

BUREAU OF FORESTRY

LETTER OF AUTHORIZATION

June 22, 2016

Mr. Douglas Hess
Skelly and Loy, Inc.
449 Eisenhower Blvd, Suite 300
Harrisburg, PA 17111


Dear Mr. Hess:

In follow-up to our conversation and correspondence, we are writing to confirm permission for you to collect surface water samples in the Michaux State Forest in July, 2016. Your activity must be confined to the area shown on the ACTIVITY Map. See Attachment "B".

The Special Requirements for your event are included in Attachment "E". General Conditions for events held on Pennsylvania State Forests are given in Attachment "A". Event participants must observe State Forest Rules and Regulations. Attachment "C" is a summary of the rules and regulations for you to review with the participants. The Participant/Spectator Risk Management Plan, Attachment "D", which you completed and filed with this office, is attached. **Please complete Attachment "I"** (if not applicable, write N/A for each question) **and return it to this office.**

Please sign the Acknowledgement on page 2 of this letter. Keep the original packet and return the remaining copy to this office. Please contact this office during business hours at the number given below if you have any questions on the enclosed materials, or if for any reason you are canceling this event. Best wishes for a safe and successful event.

Sincerely yours,


Roy D. Brubaker
District Forester
Michaux State Forest

Attachments

conserve

sustain

enjoy

10099 Lincoln Way East, Fayetteville, PA 17222, ph. 717-352-2211, fax 717-352-3007

Mr. Douglas Hess

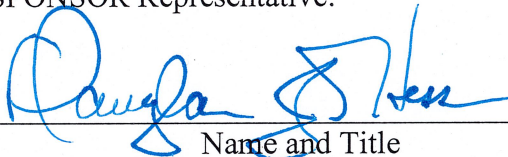
2

June 22, 2016

ACKNOWLEDGEMENT

I have read and shall abide by this Letter of Authorization and the attached conditions and provisions regarding the use of State Forest land and facilities.

SPONSOR Representative:



Name and Title

6.27.16

Date

*DIRECTOR OF GROUNDWATER AND SITE
CHARACTERIZATION SERVICES*

Attachments

- "A" General Conditions
- "B" ACTIVITY Map
- "C" State Forest Rules and Regulations
- "D" Participant/Spectator Risk Management Plan
- "E" Special Requirements
- "G" Contractor Integrity Provisions
- "H" Nondiscrimination/Sexual Harassment Clause
- "I" Recreation Data

cc: File
Operations and Recreation Div., Recreation Section

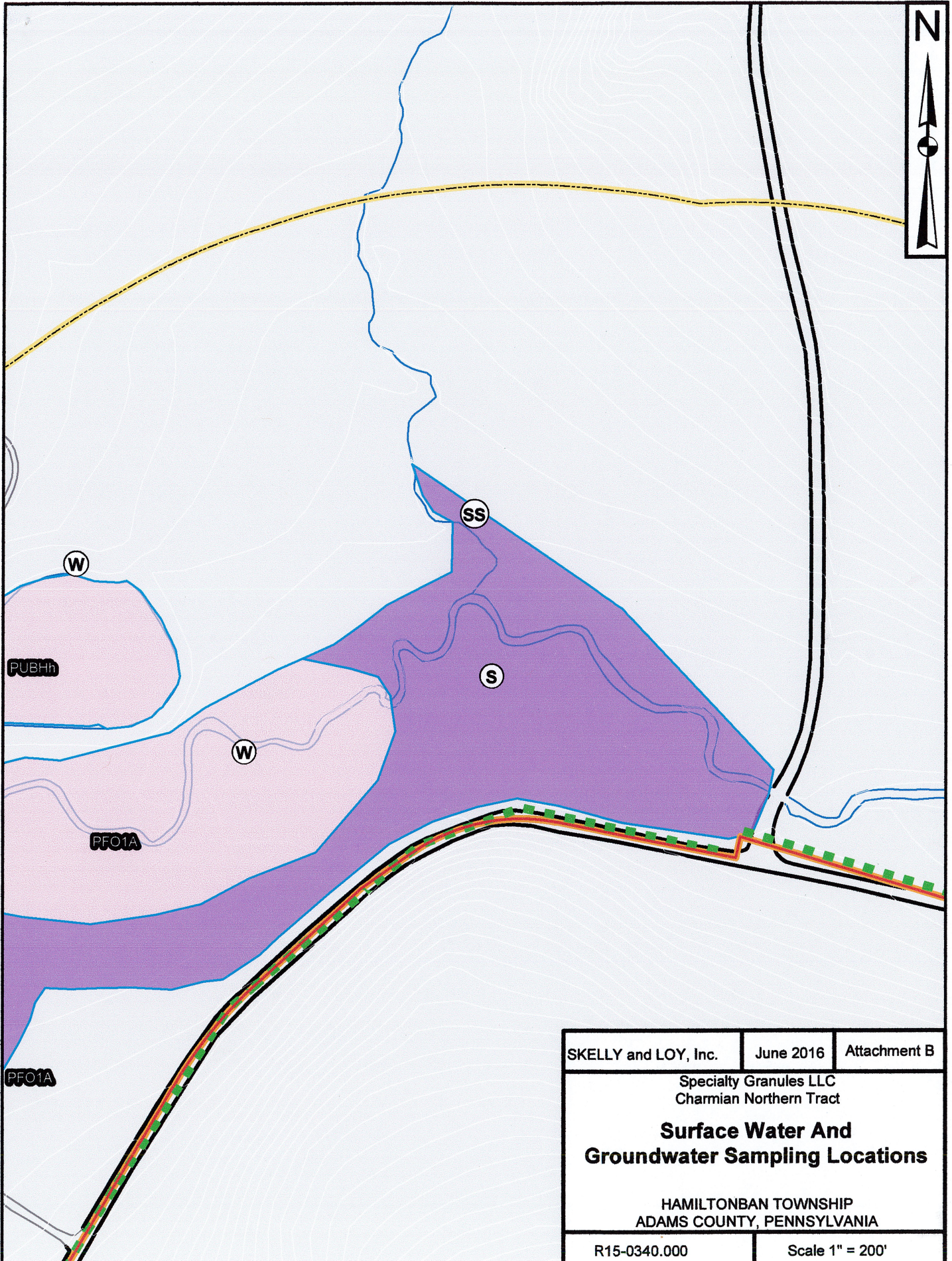
**Letter of Authorization
ATTACHMENT "A"**

**COMMONWEALTH OF PENNSYLVANIA
Department of Conservation and Natural Resources
BUREAU OF FORESTRY**

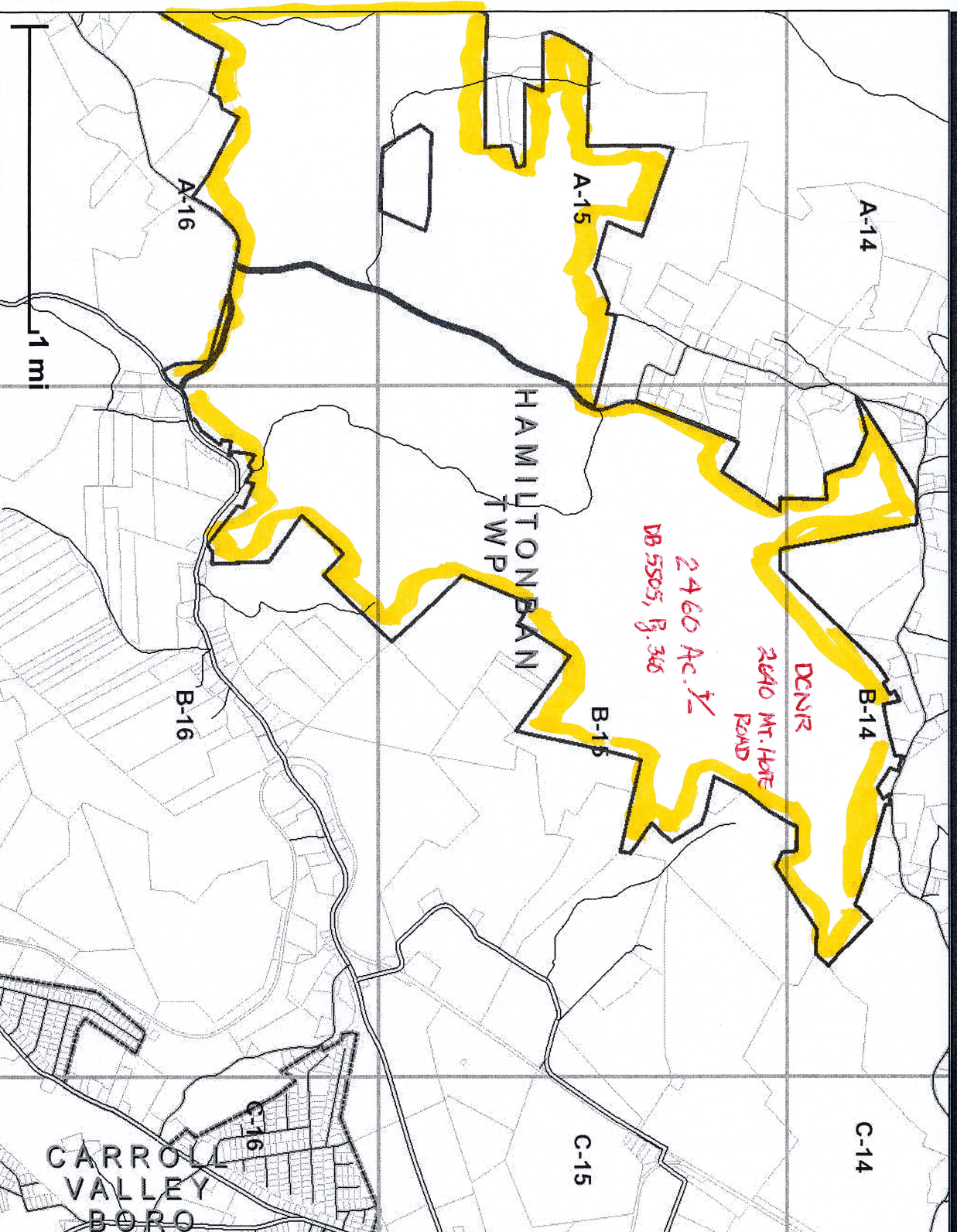
GENERAL CONDITIONS

The conditions listed below will apply to any and all individuals or groups, hereinafter called SPONSORS, who use Bureau of Forestry lands or facilities to conduct special activities, hereinafter called ACTIVITIES, approved by the District Forester in conjunction with a Letter of Authorization given to that SPONSOR for conducting said ACTIVITY:

1. The SPONSOR shall indemnify and hold harmless the Department of Conservation and Natural Resources, hereinafter called DEPARTMENT, from and against claims of damages to property or injuries including death to any persons and other losses, damages, expenses claims, demands, suits and actions by any party against the DEPARTMENT in connection with this ACTIVITY, the condition of the property of the DEPARTMENT or the DEPARTMENT's actions or failure to act hereunder.
2. The SPONSOR understands that the DEPARTMENT assumes no responsibility or liability for the safety of the SPONSOR, or the safety of participants in or spectators of this ACTIVITY, or for the consequences of the SPONSOR'S ACTIVITY, nor shall this Letter of Authorization be construed as a waiver of any immunity the DEPARTMENT has, or may have in the future.
3. The SPONSOR shall comply with all applicable federal, state, and local statutes, rules and regulations, including but not limited to the Pennsylvania State Forest Rules and Regulations, ATTACHMENT "C". The SPONSOR has full responsibility to have knowledge of all applicable rules and regulations.
4. The SPONSOR shall be aware of and comply with 1) Department of Agriculture (Bureau of Food Safety and Laboratory Services) requirements for food establishments and 2) local (municipal) sewage enforcement guidelines for adequate sanitary sewage facilities at mass gatherings. The SPONSOR is responsible for acquiring necessary licenses.
5. The SPONSOR shall fully coordinate this ACTIVITY with the District Forester. The SPONSOR shall provide any additional facilities or services, as the District Forester deems necessary. The District Forester has full authority to place further conditions on, suspend, or terminate the ACTIVITY as deemed in the best interest of the Commonwealth of Pennsylvania. The SPONSOR is fully responsible for the conduct of the ACTIVITY.
6. The District Forester shall be the sole judge of any conflict between normal recreational activities carried on by the public within the forest and subject ACTIVITY. The District Forester shall have the full authority to resolve the conflict in the best interest of the DEPARTMENT. SPONSOR shall abide by the decision of the District Forester.
7. Upon completion of this ACTIVITY, there shall be a joint inspection of the premises by the SPONSOR and the District Forester or his assigns. The SPONSOR shall clean up all litter and other debris resulting from the ACTIVITY. SPONSOR is responsible for repairs of damages to DEPARTMENT property caused by SPONSOR, participants or spectators of the ACTIVITY.
8. Should SPONSOR fail to complete said clean-up and / or repairs, DEPARTMENT may complete said work with District personnel and invoice SPONSOR for same. The SPONSOR shall pay said invoice within thirty (30) days after invoice date.
9. This Letter of Authorization shall remain in effect until
 - the SPONSOR has cleaned and repaired, if needed, the area and facilities used during the ACTIVITY
 - the District Forester has inspected and approved the area and facilities used during the ACTIVITY.
10. Should ACTIVITY be postponed due to inclement weather or other reasons approved by the District Forester, a new ACTIVITY date(s) may be agreed upon in writing by SPONSOR and the District Forester. These conditions shall remain in effect for the new date(s).

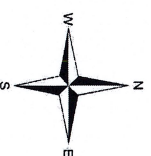


SKELLY and LOY, Inc.	June 2016	Attachment B
Specialty Granules LLC Charmian Northern Tract		
Surface Water And Groundwater Sampling Locations		
HAMILTONBAN TOWNSHIP ADAMS COUNTY, PENNSYLVANIA		
R15-0340.000	Scale 1" = 200'	



Legend

- Adams County Parks
- Municipal Boundaries
- Municipal Building
- Major Streams
- Stream Tributaries
- FEMA 100 Year Flood Zone
- Soils
- Geologic Formations
- 25' Contours
- Fire Stations
- Police Stations
- Interstate
- Major Roads
- Roads
- Railroads
- Polling Places
- Voting Districts
- School Districts
- Gettysburg National Military Park
- Michaux State Forest
- Pa. State Game Lands #240
- Adams County Land Conservancy
- Preserved Farms
- Agricultural Security Areas
- 1" = 100' Tax Maps
- 1" = 400' Tax Maps



The geographic information contained on this page is NOT to be construed as a "legal description." While every effort has been made to ensure the highest accuracy, the information at best is only as good as the source document. The County of Adams assumes no liability either for any errors, omissions, or inaccuracies in the information provided regardless of their cause or for any decision made, action taken, or action not taken by the user in reliance upon any maps or information provided herein.

Mon., 06/06/2016

RULES AND REGULATIONS
TITLE 17. PENNSYLVANIA CODE, PART I. DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
Subpart C. STATE FORESTS

CHAPTER 21. GENERAL PROVISIONS

§ 21.101. Definitions.

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

Act—The Conservation and Natural Resources Act (71 P.S. §§ 1340.101—1340.1103).

All-terrain vehicle—The term as defined in section 7702 of the Vehicle Code (relating to definitions).

Commercial activity—An activity in which a person directly or indirectly accepts consideration of value as compensation for the provision of goods or services, including transportation.

Crimes Code—Title 18 *Pennsylvania Consolidated Statutes*.

Department—

(i) The Department of Conservation and Natural Resources of the Commonwealth.

(ii) The term includes authorized officials of the Department.

Fish and Boat Code—Title 30 *Pennsylvania Consolidated Statutes*.

Game and Wildlife Code—Title 34 *Pennsylvania Consolidated Statutes*.

Motor vehicle—

(i) The term as defined in section 102 of the Vehicle Code (relating to definitions).

(ii) The term does not include a snowmobile or all-terrain vehicle as defined in section 7702 of the Vehicle Code.

Motorized off-road vehicle—

(i) A motorized recreational vehicle designed for either off-road use or for both off-road and road use.

(ii) The term does not include a snowmobile or all-terrain vehicle.

Permission of the Department or permitted by the Department—Approval obtained from the Department, including a district forester or designee.

Permit—Written approval obtained from the Department, including a district forester or designee, on a form prescribed by the Department.

Person—A corporation, company, club, firm, association, society, partnership, joint stock company, governmental agency or individual.

Picnic area—An area in a State forest designated by the Department as a State forest picnic area.

Snowmobile—The term as defined in section 7702 of the Vehicle Code.

State forest—An area under the jurisdiction of the Department acquired or administered as a State forest under section 302 of the act (71 P.S. § 1340.302).

Vehicle—The term as defined in section 102 of the Vehicle Code.

Vehicle Code—Title 75 *Pennsylvania Consolidated Statutes*.

Watercraft—The term as defined in section 102 of the Fish and Boat Code (relating to definitions).

§ 21.102. Scope.

This chapter applies to State forests.

§ 21.103. Trespass.

(a) A person who violates this chapter or disregards instructions or warnings given by a State forest officer or Department-commissioned officer or interferes in the performance of the duties of a State forest officer or Department-commissioned officer may be ordered to leave a State forest.

(b) A person who refuses to leave a State forest after receiving an order to leave from a State forest officer or Department-commissioned officer commits an act of criminal trespass under section 3503(b) of the Crimes Code (relating to criminal trespass).

§ 21.104. Closure.

(a) *Closings and restrictions.* The Department may close a State forest, portion of a State forest or State forest facility, or may restrict it to certain uses or activities.

(b) *Prohibited activities.* The Department may prohibit certain uses or activities in a State forest, portion of a State forest or State forest facility.

(c) *Informing the public.* The public will be informed of the closure, restriction or prohibition under subsection (a) or (b) by any form of communication, including this chapter or posting, or by fencing, barricade, gate, or other structure or device manifestly designed to exclude the public.

(d) *Prohibitions.*

(1) Entering, using or remaining in a State forest, area or facility that is not open to the public or that has been closed under this section is prohibited, unless permitted by the Department.

(2) Using, or engaging in activities in, a State forest, area or facility in violation of a restriction or prohibition under subsection (a) or (b) is prohibited, unless permitted by the Department.

§ 21.105. Property left in a State forest.

(a) Leaving personal property in a State forest for more than 24 hours without written permission of the Department is prohibited, unless permitted under § 21.120 (relating to ground blinds and tree stands).

(b) The following personal property may be moved or removed by the Department, placed in storage and is subject to disposal in accordance with law:

(1) Personal property that has been left in a State forest for more than 24 hours without written permission of the Department as required in subsection (a).

(2) Personal property that impedes public access or navigation.

(3) Vehicles or other personal property parked in violation of § 21.111 (relating to parking).

(c) Personal property that is in storage under this section will be released from storage only upon adequate proof of ownership and, if appropriate, payment of a reasonable storage fee.

§ 21.106. Picnic areas.

(a) Picnic areas are open to the public between sunrise and sunset.

(b) Entering a picnic area when it is not open to the public under subsection (a) is permitted for the purpose of fishing or gaining access to another area of State forest land that is open for public use.

(c) Except as provided in subsection (b) or with written permission of the Department, entering, using or remaining in a picnic area when it is not open to the public under subsection (a) is prohibited.

(d) Possessing or consuming alcoholic beverages is prohibited.

(e) An owner, keeper or handler of a pet may have the pet in a picnic area only under the following conditions, a violation of which is prohibited:

(1) The pet is on a leash with a maximum length of 6 feet.

(2) The pet is attended and under physical control of an individual.

(3) The pet does not behave in a manner that may reasonably be expected to disturb or intimidate another person.

(4) The pet does not behave in a manner that may cause damage to property or resources.

(5) The pet's droppings are disposed of in trash receptacles or outside the State forest.

(f) Removing facilities, including picnic tables, fire rings and containers for disposal of waste or charcoal, is prohibited.

(g) Hunting, trapping and using a device that is capable of discharging or propelling a projectile is prohibited.

§ 21.107. Hunting, trapping and shooting.

- (a) Hunting and trapping are permitted unless otherwise posted.
- (b) Hunting and trapping shall be in accordance with the Game and Wildlife Code and 58 Pa. Code Part III (relating to Game Commission).
- (c) Using a device that is capable of discharging or propelling a projectile is prohibited except in accordance with the Game and Wildlife Code and except for target shooting at a location authorized by the Department.
- (d) This section applies to State forest land other than picnic areas.

§ 21.108. Fishing.

- (a) Fishing is permitted unless otherwise posted.
- (b) Fishing shall be in accordance with the Fish and Boat Code and 58 Pa. Code Part II (relating to Fish and Boat Commission).

§ 21.109. Boating.

(a) *Operation.* Watercraft may be operated on State forest waters unless posted as closed.

(b) *Statutes and regulations.* Boating shall be in accordance with the Fish and Boat Code and 58 Pa. Code Part II (relating to Fish and Boat Commission).

(c) *Prohibition.* The use of a motor type other than electric motor for propulsion of motorized watercraft is prohibited.

(d) *Mooring.*

(1) Mooring watercraft at a location without possession of a valid watercraft mooring permit issued by the Department for that location is prohibited.

(2) A decal issued by the Department evidencing issuance of the permit shall be affixed aft of amidship on the starboard (right) side of the watercraft.

(3) The Department will establish a schedule of fees for mooring permits. The schedule and subsequent revisions will be effective upon publication in the *Pennsylvania Bulletin*.

(e) *Launching.*

(1) Subject to paragraph (2), watercraft may be launched or removed at any location except where prohibited by posting.

(2) Watercraft launched from trailers may be launched and removed only at designated launching areas.

(3) Launching watercraft without one of the following is prohibited:

(i) A valid watercraft launching or mooring permit issued by the Department. If a decal evidencing the issuance of a permit has been provided by the Department, the decal shall be affixed to the watercraft aft of amidship on the starboard (right) side. If another form of evidence of the issuance of a permit has been provided by the Department instead of a decal, this evidence shall be carried on the watercraft.

(ii) A valid registration number and validation decal, or a valid use permit, issued and displayed in accordance with 58 Pa. Code Part II.

(4) The Department will establish a schedule of fees for launching permits. The schedule and subsequent revisions will be effective upon publication in the *Pennsylvania Bulletin*.

(f) *Docks.* Maintaining a dock at any location without possession of a valid dock permit issued by the Department for that location is prohibited. A dock tag evidencing issuance of a permit shall be securely attached to the offshore end of the dock. The Department will establish a schedule of fees for dock permits. The schedule and subsequent revisions will be effective upon publication in the *Pennsylvania Bulletin*.

§ 21.110. Traffic.

(a) Operating a vehicle or a motor vehicle is permitted in accordance with this section.

(b) The following are prohibited:

(1) Operating a vehicle in a manner that is any of the following:

(i) Reckless or negligent.

(ii) Creates a nuisance or excessive noise.

(iii) Demonstrates careless disregard for the safety of persons or property.

(2) Operating a motor vehicle in excess of the posted speed limit or, where a speed limit is not posted, in excess of 25 miles per hour.

(3) Operating a motor vehicle on roads, trails or other areas posted as closed to motor vehicles unless permitted in writing by the Department.

(4) Using State forest roads, trails or other areas in connection with or arising out of commercial activity without written permission of the Department. Occasional deliveries to residents of property adjoining a State forest are permitted.

(5) Operating an unregistered, uninspected or uninsured motor vehicle.

(6) Operating a motor vehicle without a valid driver's license.

(c) A violation of this section constitutes a summary offense under section 7505 of the Crimes Code (relating to violation of governmental rules regarding traffic).

§ 21.111. Parking.

(a) *Prohibitions.* The following are prohibited:

(1) Parking a vehicle in an area designated by the Department for persons with a disability unless one of the following requirements is met:

(i) The Department has given written permission.

(ii) A valid plate or valid placard has been issued to a user of the vehicle under section 1338 or 1342(a) or (b) of the Vehicle Code (relating to person with disability plate and placard; and veteran plates and placard). A valid plate or valid placard for a person with a disability issued by a jurisdiction outside of this Commonwealth is deemed to be in compliance with the plate and placard requirements of this subparagraph. Placards shall be displayed in the manner required under section 1338(b) or 1342(b) of the Vehicle Code.

(2) Parking a vehicle as follows without written permission of the Department:

(i) In a location that obstructs a gate, road, trail, access way, drinking fountain, entrance, exit or road turnaround.

(ii) In an area that is posted as closed.

(iii) When the State forest is closed under § 21.104 (relating to closure).

(b) *Violations.*

(1) *Summary offense.* A violation of this section constitutes a summary offense under section 7505 of the Crimes Code (relating to violation of governmental rules regarding traffic).

(2) *Parking tickets.*

(i) For a violation of subsection (a) or a parking provision of the Vehicle Code, the Department may issue a parking ticket, as provided for in 234 Pa. Code Rule 401 (relating to means of instituting proceedings in summary cases charging parking violations), which will be handed to the violator or placed on the windshield of the violator's vehicle.

(ii) If the Department has issued a parking ticket, the Department will file a citation if the violator fails to pay a charge to the Department in the amount provided in this subparagraph within 5 days of the violation and in the manner specified on the ticket.

(A) For violations of subsection (a), the charge will be in the amount of the maximum fine as provided in section 7505 of the Crimes Code.

(B) For violations of a parking provision of the Vehicle Code other than section 3354(d)(3) or (e) of the Vehicle Code (relating to additional parking regulations), the charge will be in the amount of the maximum fine as provided in the Vehicle Code.

(C) For violations of section 3354(d)(3) or (e) of the Vehicle Code, the charge will be in the amount of the minimum fine required under section 3354(f) of the Vehicle Code.

(iii) If the Department has not issued a parking ticket, the Department may issue a citation as provided for in 234 Pa. Code Rule 401.

§ 21.112. Snowmobiles.

(a) Operating a snowmobile is permitted in accordance with this section.

(b) Operating a snowmobile in violation of Chapter 77 of the Vehicle Code (relating to snowmobiles and all-terrain vehicles) is prohibited.

(c) The following are prohibited except with written permission of the Department:

(1) Operating a snowmobile on a road, trail or area that has not been posted as open for snowmobiles.

(2) Operating a snowmobile outside of the period from the day following the last day of regular or extended rifle deer season as established by the Game Commission through the following April 1, unless the district forester designates an earlier date that is prior to April 1.

(3) Operating or riding on a snowmobile without wearing a securely fastened helmet which meets the specifications established for motorcycle helmets in 67 Pa. Code Chapter 107 (relating to motorcycle helmets).

§ 21.113. All-terrain vehicles.

(a) Operating an all-terrain vehicle is permitted in accordance with this section.

(b) Operating an all-terrain vehicle in violation of Chapter 77 of the Vehicle Code (relating to snowmobiles and all-terrain vehicles) is prohibited.

(c) The following are prohibited except with written permission of the Department:

(1) Operating an all-terrain vehicle on a road, trail or area that has not been posted as open for all-terrain vehicles.

(2) Operating an all-terrain vehicle outside of the period from the Friday before Memorial Day through the last full weekend in September and from the day following the last day of regular or extended rifle deer season as established by the Game Commission through the following April 1.

(3) Operating or riding on an all-terrain vehicle without wearing a securely fastened helmet which meets the specifications established for motorcycle helmets in 67 Pa. Code Chapter 107 (relating to motorcycle helmets).

§ 21.114. Motorized off-road vehicles.

(a) Operating a motorized off-road vehicle is permitted in accordance with this section.

(b) The following are prohibited except with written permission of the Department:

(1) Operating a motorized off-road vehicle on a road, trail or area that has not been posted as open for motorized off-road vehicles.

(2) Operating a motorized off-road vehicle on a road, trail or area that has not been posted as open outside of the following periods:

(i) From the Friday before Memorial Day through the last full weekend in September.

(ii) From the day following the last day of the regular or extended rifle deer season as established by the Game Commission through the following April 1.

(3) Operating or riding a motorized off-road vehicle without wearing a securely fastened helmet which meets the specifications established for motorcycle helmets in 67 Pa. Code Chapter 107 (relating to motorcycle helmets).

§ 21.115. Natural resources.

(a) The following activities are prohibited without written permission of the Department:

(1) Cutting, picking, digging, damaging or removing, in whole or in part, a living or dead plant, vine, shrub, tree or flower, including fungus, lichen and moss, except as permitted in subsection (b) and § 21.120 (relating to ground blinds and tree stands).

(2) Removing rocks, shale, sand, clay, soil or other mineral products.

(3) Removing peat, bark, mulch, pine straw or other natural resources.

(4) Planting a tree, shrub or plant.

(5) Releasing an animal that was brought into a State forest.

(b) The following activities are permitted:

(1) Gathering edible wild plants or plant parts for an individual's personal or family consumption, unless the plant is listed in Chapter 45 (relating to conservation of Pennsylvania native wild plants) as threatened, endangered, rare or vulnerable.

(2) Gathering dead and down wood for building fires on State forest land as permitted in § 21.118 (relating to fires).

§ 21.116. Feeding wildlife.

(a) Except as provided in subsection (b), feeding wildlife or laying or placing food, fruit, hay, grain, chemical, salt or other minerals is prohibited without written permission of the Department.

(b) Placing of elevated songbird feeders of less than 1/2 bushel capacity is permitted.

§ 21.117. Camping.

(a) *Primitive camping.* Primitive camping without a permit is prohibited if the camper stays more than one night at a campsite. Primitive camping is overnight camping when a motor vehicle is not used for storage or transportation during the camping experience. Primitive camping does not include water trail camping.

(b) *Motorized camping.* Motorized camping without a permit is prohibited. Motorized camping is overnight camping in or near a vehicle when the vehicle is used for storage or transportation during the camping experience.

(c) *Group camping.* Group camping without written permission of the Department is prohibited. Group camping is primitive or motorized camping by a group consisting of more than ten persons.

(d) *Water trail camping.* Water trail camping is allowed without a permit but is limited to two nights at a site. Water trail camping is overnight camping at sites designated for water trail camping along designated water trails.

§ 21.118. Fires.

(a) *Prohibition.* Fires are prohibited except in accordance with this section.

(b) *Gas grills and camp stoves.* Fires are permitted in gas grills and camp stoves when these appliances are used as designed.

(c) *Charcoal fires.* Charcoal fires are permitted in appliances designed for them. Disposing of hot charcoal, except in a facility designed for charcoal disposal, is prohibited.

(d) *Fire rings.* Fires are permitted in fire rings that are either provided by the Department or, if not provided by the Department, do not exceed 2 feet in diameter. Fire rings must be constructed of noncombustible material.

(e) *Fireplaces.* Fires are permitted in fireplaces provided by the Department.

(f) *Forest-fire danger.* Fires in fire rings and fireplaces are prohibited at the following times unless permitted by the Department:

(1) When the forest-fire danger is determined by the Department to be high, very high or extreme.

(i) The Department will notify the public of these danger ratings by means of the Department's web site, signs, news releases, fire wardens or volunteer fire departments.

(ii) The public may contact the district forester to obtain forest-fire danger ratings.

(2) From March 1 through May 25.

(g) *Attending a fire.* Failure to attend a fire at all times is prohibited.

(h) *Extinguishing a fire.* Leaving a fire that has not been completely extinguished is prohibited.

(i) *Liability.* A person who has caused a wildfire, in addition to possible criminal penalty, is liable for damages, costs of extinction and fines.

§ 21.119. Group activities.

(a) Participating in a group that engages in any of the following types of activity is prohibited without written permission of the Department:

(1) An activity that the Department determines requires a large land area or unique land formation.

(2) An activity that the Department determines may impact or conflict with normal or traditional visitor uses or experiences on State forest land.

(3) An activity that the Department determines may have a greater than normal impact on natural resources or the environment.

(b) This section does not apply to group hunting that is in compliance with 58 Pa. Code §§ 141.22 and 141.42 (relating to small game; and big game animal hunting roster).

§ 21.120. Ground blinds and tree stands.

(a) Ground blinds and tree stands may be placed, used and occupied subject to the following requirements:

(1) They must be portable.

(2) Their placement, use or occupation may not cause damage to a tree.

(3) They may not be left overnight except as follows:

(i) They may be left for any length of time within the period beginning 2 weeks prior to the first deer season and ending 2 weeks after the close of the last deer season.

(ii) Ground blinds may be left for any length of time during the spring turkey season and the water fowl season.

(iii) They may be left overnight outside of the periods in subparagraphs (i) and (ii) with written permission of the Department.

(4) Ground blinds must be constructed in accordance with the requirements for turkey blinds under the Game and Wildlife Code.

(b) Ground blinds or tree stands that do not comply with this section and accompanying personal property may be removed, stored or disposed of by the Department.

(c) This section applies to State forest land other than picnic areas.

§ 21.121. Pets.

(a) An owner, keeper or handler of a pet may have the pet in a State forest only under the following conditions:

(1) It is attended and under control of an individual.

(2) It does not behave in a manner that may reasonably be expected to disturb or intimidate another person.

(3) It does not behave in a manner that may cause damage to property or resources.

(b) This section applies to State forest land other than picnic areas.

§ 21.122. Other prohibitions.

(a) The following activities are prohibited without written permission of the Department:

(1) Using State forest land in connection with or arising out of commercial activity.

(2) Removing or disturbing historical or archeological resources.

(3) Posting signs or soliciting.

(4) Plowing or removing snow.

(5) Constructing, altering or removing a structure or other improvement. This paragraph does not apply to ground blinds and tree stands under § 21.120 (relating to ground blinds and tree stands).

(6) Excavating.

(b) The following activities are prohibited:

(1) Littering or disposing of trash, garbage, paper, refuse, waste, pollutants or other materials, except that any materials that have been accumulated during a visit to a State forest may be placed in receptacles or facilities provided by the Department for this purpose.

(2) Damaging or defacing any sign, structure, equipment or other material.

(3) Disorderly conduct, including any of the following:

(i) Fighting.

(ii) Threatening.

(iii) Engaging in violent or tumultuous behavior.

(iv) Making unreasonable noise.

(v) Using obscene language.

(vi) Making an obscene gesture.

(vii) Creating a hazardous or physically offensive condition by any act which does not serve a legitimate purpose of the actor.

(4) Operating a chainsaw, snowmobile, all-terrain vehicle or motorized off-road vehicle without a fully functioning spark arrestor.

(5) Possessing or consuming alcoholic beverages by persons under 21 years of age.

(6) Washing in water outlets, springs, lakes or waterways.

(7) Discharging trailer, camper or motor home sewage, sink water or bath water except in receptacles or facilities provided by the Department for this purpose and in accordance with posted instructions.

(8) Placing or leaving personal property where it obstructs or impedes access to a gate, road, trail, path, access way, drinking fountain, entrance, exit, road turnaround, vehicle parking area or other facility.

(9) Failing to comply with a condition of a permit issued by the Department.

§ 21.123. Violation of rules regarding conduct in State forests.

Engaging in activity prohibited under §§ 21.104—21.109 and 21.112—21.122 constitutes a summary offense under section 7506 of the Crimes Code (relating to violation of rules regarding conduct on Commonwealth property).

SPONSOR: Please complete Items 1 through 8 below.

**Letter of Authorization
ATTACHMENT “_D_”**

**COMMONWEALTH OF PENNSYLVANIA
Department of Conservation and Natural Resources
BUREAU OF FORESTRY**

PARTICIPANT/SPECTATOR RISK MANAGEMENT PLAN

Sampling surface water from streams, seeps, and/or springs

Activity

SKELLY and LOY, Inc.

Sponsor

449 Eisenhower Blvd., Suite 300

Address

Harrisburg, PA, 17111

City, State, Zip Code

Micheaux

State Forest

Douglas Hess

Sponsor's Contact Person

717-574-3961

Home Telephone Number

800-892-6532

Business Telephone Number

Estimated Number of Participants: 3

Estimated Number of Spectators: 0

Date(s) of ACTIVITY Early-mid July 2016

1. Describe the ACTIVITY to be conducted.
Access to DCNR property for collecting surface water samples (springs, unnamed tributary stream and seeps) needed to complete PA DEP mine permit modules for adjacent (to the south) Specialty Granules, LLC non-coal surface mining operation.
2. Identify the State Forest area or roads within or upon which the ACTIVITY will be held.
(Delineate area or route on a State Forest Public Use Map or other appropriate map, and label as Attachment “B”.)
You must provide (2) two copies of your event map. A map labeled as Attachment B is provided showing the proposed surface water sampling location as location “SS”. The location is on DCNR property and 500’ west of the nearest roadway.
3. Identify any special requirements the participants must meet. Part 46 MSHA and OSHA HAZWOPER hazardous site operations safety training.
4. Identify the procedures used to screen participants. Maintenance of the above certifications.

Participant / Spectator Risk Management Plan

**Letter of Authorization
ATTACHMENT "D"**

5. Identify the procedures used to make sure that participants and spectators recognize the risks involved in the ACTIVITY and, where appropriate, agree to release and hold harmless the DEPARTMENT from any and all liability arising from participation in the ACTIVITY. SKELLY and LOY agrees to hold harmless the DEPARTMENT from any and all liability arising from access to the identified DCNR property arising from participation in the ACTIVITY.

6. List possible safety risks involving personal injury or property damage to participants, spectators and the forest due to the ACTIVITY. Possible safety risks include slips, trips, and falls as well as bites from ticks, mosquitoes, and snakes.

7. Provide a Safety Plan for the protection of the participants, spectators and the forest in reference to the ACTIVITY and to the safety risks identified above, detailing, but not limited to, type and number of personnel/staff, equipment and procedures for monitoring ACTIVITY, traffic control procedures, and emergency response procedures.

A site-specific Health and Safety Plan (HASP) for protecting the participants and forest during the ACTIVITY is attached. The number of participants will be limited to three (3) during the ACTIVITY. Due to the surface water sampling location approximately 500 feet from any paved or unpaved roadway, no traffic control procedures will be necessary.

8. Other provisions: N/A

Letter of Authorization
ATTACHMENT "E"

COMMONWEALTH OF PENNSYLVANIA
Department of Conservation and Natural Resources
BUREAU OF FORESTRY

SPECIAL REQUIREMENTS

SPONSOR: Douglas Hess
ACTIVITY: Collection of surface water samples
DATES: July, 2016

1. This agreement is for the Michaux State Forest only; not private property or State Parks.
2. DEPARTMENT does not grant exclusive use of any site on the state forest. Other forest users may be encountered. Participants shall not conflict with normal forest activities or users.
3. SPONSOR shall review and abide by the state forest rules and regulations.
4. SPONSOR shall conduct a thorough litter cleanup and shall remove all trash from the area. No receptacles are available.
5. SPONSOR and participants must not damage living trees in any manner.
6. This Letter of Authorization may be terminated by either party upon 30 days written notification to the other party.
7. SPONSOR shall minimize disturbance to surrounding soil and vegetation.

CONTRACTOR INTEGRITY PROVISIONS

It is essential that those who seek to contract with the Commonwealth of Pennsylvania ("Commonwealth") observe high standards of honesty and integrity. They must conduct themselves in a manner that fosters public confidence in the integrity of the Commonwealth contracting and procurement process.

1. DEFINITIONS. For purposes of these Contractor Integrity Provisions, the following terms shall have the meanings found in this Section:

- a. **"Affiliate"** means two or more entities where (a) a parent entity owns more than fifty percent of the voting stock of each of the entities; or (b) a common shareholder or group of shareholders owns more than fifty percent of the voting stock of each of the entities; or (c) the entities have a common proprietor or general partner.
- b. **"Consent"** means written permission signed by a duly authorized officer or employee of the Commonwealth, provided that where the material facts have been disclosed, in writing, by prequalification, bid, proposal, or contractual terms, the Commonwealth shall be deemed to have consented by virtue of the execution of this contract.
- c. **"Contractor"** means the individual or entity, that has entered into this contract with the Commonwealth.
- d. **"Contractor Related Parties"** means any affiliates of the Contractor and the Contractor's executive officers, Pennsylvania officers and directors, or owners of 5 percent or more interest in the Contractor.
- e. **"Financial Interest"** means either:
 - (1) Ownership of more than a five percent interest in any business; or
 - (2) Holding a position as an officer, director, trustee, partner, employee, or holding any position of management.
- f. **"Gratuity"** means tendering, giving, or providing anything of more than nominal monetary value including, but not limited to, cash, travel, entertainment, gifts, meals, lodging, loans, subscriptions, advances, deposits of money, services, employment, or contracts of any kind. The exceptions set forth in the Governor's Code of Conduct, Executive Order 1980-18, the 4 Pa. Code §7.153(b), shall apply.
- g. **"Non-bid Basis"** means a contract awarded or executed by the Commonwealth with Contractor without seeking bids or proposals from any other potential bidder or offeror.

2. In furtherance of this policy, Contractor agrees to the following:

- a. Contractor shall maintain the highest standards of honesty and integrity during the performance of this contract and shall take no action in violation of state or federal laws or regulations or any other applicable laws or regulations, or other requirements applicable to Contractor or that govern contracting or procurement with the Commonwealth.

ATTACHMENT "G"

- b. Contractor shall establish and implement a written business integrity policy, which includes, at a minimum, the requirements of these provisions as they relate to the Contractor activity with the Commonwealth and Commonwealth employees and which is made known to all Contractor employees. Posting these Contractor Integrity Provisions conspicuously in easily-accessible and well-lighted places customarily frequented by employees and at or near where the contract services are performed shall satisfy this requirement.
- c. Contractor, its affiliates, agents, employees and anyone in privity with Contractor shall not accept, agree to give, offer, confer, or agree to confer or promise to confer, directly or indirectly, any gratuity or pecuniary benefit to any person, or to influence or attempt to influence any person in violation of any federal or state law, regulation, executive order of the Governor of Pennsylvania, statement of policy, management directive or any other published standard of the Commonwealth in connection with performance of work under this contract, except as provided in this contract.
- d. Contractor shall not have a financial interest in any other contractor, subcontractor, or supplier providing services, labor, or material under this contract, unless the financial interest is disclosed to the Commonwealth in writing and the Commonwealth consents to Contractor's financial interest prior to Commonwealth execution of the contract. Contractor shall disclose the financial interest to the Commonwealth at the time of bid or proposal submission, or if no bids or proposals are solicited, no later than Contractor's submission of the contract signed by Contractor.
- e. Contractor certifies to the best of its knowledge and belief that within the last five (5) years Contractor or Contractor Related Parties have not:
 - (1) been indicted or convicted of a crime involving moral turpitude or business honesty or integrity in any jurisdiction;
 - (2) been suspended, debarred or otherwise disqualified from entering into any contract with any governmental agency;
 - (3) had any business license or professional license suspended or revoked;
 - (4) had any sanction or finding of fact imposed as a result of a judicial or administrative proceeding related to fraud, extortion, bribery, bid rigging, embezzlement, misrepresentation or anti-trust; and
 - (5) been, and is not currently, the subject of a criminal investigation by any federal, state or local prosecuting or investigative agency and/or civil anti-trust investigation by any federal, state or local prosecuting or investigative agency.

If Contractor cannot so certify to the above, then it must submit along with its bid, proposal or contract a written explanation of why such certification cannot be made and the Commonwealth will determine whether a contract may be entered into with the Contractor. The Contractor's obligation pursuant to this certification is ongoing from and after the effective date of the contract through the termination date thereof. Accordingly, the Contractor shall have an obligation to immediately notify the Commonwealth in writing if at any time during the term of the contract it becomes aware of any event which would cause the Contractor's certification or explanation to change. Contractor acknowledges that the Commonwealth may, in its sole discretion, terminate the contract for cause if it learns that any of the certifications made herein are currently false due to intervening factual circumstances or were false or should have been known to be false when entering into the contract.

ATTACHMENT "G"

- f. Contractor shall comply with the requirements of the *Lobbying Disclosure Act (65 Pa.C.S. §13A01 et seq.)* regardless of the method of award. If this contract was awarded on a Non-bid Basis, Contractor must also comply with the requirements of the *Section 1641 of the Pennsylvania Election Code (25 P.S. §3260a)*.
- g. When Contractor has reason to believe that any breach of ethical standards as set forth in law, the Governor's Code of Conduct, or these Contractor Integrity Provisions has occurred or may occur, including but not limited to contact by a Commonwealth officer or employee which, if acted upon, would violate such ethical standards, Contractor shall immediately notify the Commonwealth contracting officer or the Office of the State Inspector General in writing.
- h. Contractor, by submission of its bid or proposal and/or execution of this contract and by the submission of any bills, invoices or requests for payment pursuant to the contract, certifies and represents that it has not violated any of these Contractor Integrity Provisions in connection with the submission of the bid or proposal, during any contract negotiations or during the term of the contract, to include any extensions thereof. Contractor shall immediately notify the Commonwealth in writing of any actions for occurrences that would result in a violation of these Contractor Integrity Provisions. Contractor agrees to reimburse the Commonwealth for the reasonable costs of investigation incurred by the Office of the State Inspector General for investigations of the Contractor's compliance with the terms of this or any other agreement between the Contractor and the Commonwealth that results in the suspension or debarment of the Contractor. Contractor shall not be responsible for investigative costs for investigations that do not result in the Contractor's suspension or debarment.
- i. Contractor shall cooperate with the Office of the State Inspector General in its investigation of any alleged Commonwealth agency or employee breach of ethical standards and any alleged Contractor non-compliance with these Contractor Integrity Provisions. Contractor agrees to make identified Contractor employees available for interviews at reasonable times and places. Contractor, upon the inquiry or request of an Inspector General, shall provide, or if appropriate, make promptly available for inspection or copying, any information of any type or form deemed relevant by the Office of the State Inspector General to Contractor's integrity and compliance with these provisions. Such information may include, but shall not be limited to, Contractor's business or financial records, documents or files of any type or form that refer to or concern this contract. Contractor shall incorporate this paragraph in any agreement, contract or subcontract it enters into in the course of the performance of this contract/agreement solely for the purpose of obtaining subcontractor compliance with this provision. The incorporation of this provision in a subcontract shall not create privity of contract between the Commonwealth and any such subcontractor, and no third party beneficiaries shall be created thereby.
- j. For violation of any of these Contractor Integrity Provisions, the Commonwealth may terminate this and any other contract with Contractor, claim liquidated damages in an amount equal to the value of anything received in breach of these Provisions, claim damages for all additional costs and expenses incurred in obtaining another contractor to complete performance under this contract, and debar and suspend Contractor from doing business with the Commonwealth. These rights and remedies are cumulative, and the use or non-use of any one shall not preclude the use of all or any other. These rights and remedies are in addition to those the Commonwealth may have under law, statute, regulation, or otherwise.

NONDISCRIMINATION/SEXUAL HARASSMENT CLAUSE

The Contractor agrees:

1. In the hiring of any employee(s) for the manufacture of supplies, performance of work, or any other activity required under the contract or any subcontract, the Contractor, each subcontractor, or any person acting on behalf of the Contractor or subcontractor shall not discriminate in violation of the *Pennsylvania Human Relations Act* (PHRA) and applicable federal laws against any citizen of this Commonwealth who is qualified and available to perform the work to which the employment relates.
2. Neither the Contractor nor any subcontractor nor any person on their behalf shall in any manner discriminate in violation of the PHRA and applicable federal laws against or intimidate any employee involved in the manufacture of supplies, the performance of work, or any other activity required under the contract.
3. The Contractor and each subcontractor shall establish and maintain a written nondiscrimination and sexual harassment policy and shall inform their employees of the policy. The policy must contain a provision that sexual harassment will not be tolerated and employees who practice it will be disciplined. Posting this Nondiscrimination/Sexual Harassment Clause conspicuously in easily-accessible and well-lighted places customarily frequented by employees and at or near where the contract services are performed shall satisfy this requirement.
4. The Contractor and each subcontractor shall not discriminate in violation of PHRA and applicable federal laws against any subcontractor or supplier who is qualified to perform the work to which the contract relates.
5. The Contractor and each subcontractor represents that it is presently in compliance with and will maintain compliance with all applicable federal, state, and local laws and regulations relating to nondiscrimination and sexual harassment. The Contractor and each subcontractor further represents that it has filed a Standard Form 100 Employer Information Report ("EEO-1") with the U.S. Equal Employment Opportunity Commission ("EEOC") and shall file an annual EEO-1 report with the EEOC as required for employers subject to *Title VII of the Civil Rights Act of 1964*, as amended, that have 100 or more employees and employers that have federal government contracts or first-tier subcontracts and have 50 or more employees. The Contractor and each subcontractor shall, upon request and within the time periods requested by the Commonwealth, furnish all necessary employment documents and records, including EEO-1 reports, and permit access to their books, records, and accounts by the contracting agency and the Bureau of Small Business Opportunities (BSBO), for purpose of ascertaining compliance with provisions of this Nondiscrimination/Sexual Harassment Clause.

6. The Contractor shall include the provisions of this Nondiscrimination/Sexual Harassment Clause in every subcontract so that those provisions applicable to subcontractors will be binding upon each subcontractor.
7. The Contractor's and each subcontractor's obligations pursuant to these provisions are ongoing from and after the effective date of the contract through the termination date thereof. Accordingly, the Contractor and each subcontractor shall have an obligation to inform the Commonwealth if, at any time during the term of the contract, it becomes aware of any actions or occurrences that would result in violation of these provisions.
8. The Commonwealth may cancel or terminate the contract and all money due or to become due under the contract may be forfeited for a violation of the terms and conditions of this Nondiscrimination/Sexual Harassment Clause. In addition, the agency may proceed with debarment or suspension and may place the Contractor in the Contractor Responsibility File.

COMMONWEALTH OF PENNSYLVANIA
Department of Conservation and Natural Resources
BUREAU OF FORESTRY

RECREATION DATA

Has this event/activity been relocated here from another state forest?

NO

If so, why?

Has Marcellus shale gas related activities changed your recreational use of another state forest?

NO

If so, which forest?

Has Marcellus shale gas related activities changed your recreational use of this forest? If so, how?

NO

Has Marcellus shale gas related activities changed your experience in another state forest? If so, how?

YES. TRAFFIC IN NORMALLY QUIET AND PRISTINE AREAS.
SEGMENTED / FRAGMENTED TRACTS OF OTHERWISE CONTIGUOUS
FOREST LAND WITH INDUSTRIAL OPERATIONS / ACTIVITIES.

If so, which forest?

Has Marcellus shale gas related activities changed your experience in this state forest? If so, please describe.

NO

ATTACHMENT C

MONITORING WELL AQUIFER TESTING

**[EXCERPTED FROM HYDROGEOLOGIC AND HYDRAULIC ANALYSIS
REPORT FOR PITTS QUARRY BY URS]**

Summary of Well Drawdown/Recovery Test Results
 Specialty Granules Inc. Charmian Facility
 Blue Ridge Summit, Pennsylvania

Well Location	Total Depth (ft)	Depth to Water (ft)	Aquifer Thickness (ft) ⁽¹⁾	Drawdown (Δs) (ft) ⁽²⁾	Transmissivity (T) (ft ² /day) ⁽³⁾	Hydraulic Conductivity (K) (ft/day) ⁽⁴⁾	Hydraulic Conductivity (cm/sec) ⁽⁴⁾
MW-3R	560	37.26	522.74	50.18	3.52	5.13×10^{-3}	1.8×10^{-6}
MW-4R	720	51.56	668.44	84.302	0.837	1.22×10^{-3}	4.0×10^{-7}
MW-5	550	8.65	541.35	31.076	6.81	9.59×10^{-3}	3.3×10^{-6}
MW-7	500	28.15	471.85	94.271	0.75	1.07×10^{-3}	3.0×10^{-7}

Notes:

- (1) Aquifer thickness (b) = total well depth - depth to water.
 (2) Change in Drawdown (Δs) between two times (10 and 10 minutes) whose ratio is 10
 (3) Coefficient of transmissivity (T) calculated using the equation $T = 264 Q / \Delta s$ where Q = pumping rate. $\Delta s = h_0 - h_1$
 (4) Hydraulic conductivity (K) is calculated as $K = T/b$ and expressed as feet/day.
 ft = feet

DEP CAMBRIA OFFICE
 NOV 18 2013

ATTACHMENT D
GROUNDWATER MODEL REPORT



V.F. Britton Group, LLC

ENVIRONMENTAL AND HYDROGEOLOGICAL CONSULTING

**GROUNDWATER MODEL REPORT
EVALUATION OF POTENTIAL EXPANSION IMPACTS
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA**

Prepared For:

Skelly and Loy, Inc.
449 Eisenhower Blvd., Suite 300
Harrisburg, PA 17111-2302

Prepared By:

V.F. Britton Group, LLC
326 Conestoga Road
Wayne, PA 19087
(215) 870-5881

April 16, 2018

Val F. Britton, P.G.
Senior Hydrogeologist

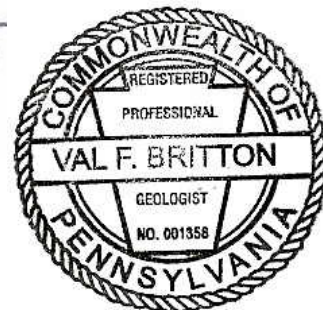


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1.0 General

1.1 Background

The Specialty Granules LLC (SGI) Charmian Facility – Northern Tract Quarry is a proposed surface mining operation that is located in Hamiltonban Township (Blue Ridge Summit), Adams County, Pennsylvania (site). The site quarry is situated west of Jacks Mountain and just east of the Franklin/Adams County line. **Figure 1** presents the location of the site.

The Pitts Quarry, an existing and operating quarry located south of the site, has currently been mined to an elevation of 990 feet above mean sea level (ft-amsl) – 7th level. Reportedly, minimal groundwater has been encountered in this quarry; however, inflow into the quarry is very limited due to the low permeability characteristics of the rock being quarried at the Pitts Quarry location. It is SGI's intention to utilize the Pitts Quarry for the placement of rock fines generated from their processing plant as well as overburden soils and cap rock to support the quarrying operations at the proposed Northern Tract Quarry. The backfilling of the Pitts Quarry precludes the need to control groundwater.

It is anticipated that 12 levels will be developed on the 112-acre Northern Tract Quarry parcel, each 50 feet in depth extending upward from the proposed quarry base elevation (Level 12) of 740 ft-amsl. **Table 1** provides an inventory of the anticipated level expansions and their associated floor elevation. It should be noted that proposed levels 1 through 3 do not encounter the potentiometric groundwater surface and; therefore; were not evaluated as part of this groundwater model evaluation. Surface water streams and wetland areas are present along the perimeter of the proposed quarry area. In addition, several residential properties are located west and east of the proposed quarry area.

Monitoring wells have been installed as part of the characterization activities of the proposed quarry and their locations have been included on **Figure 1**. An inventory of the monitoring wells used as part of the groundwater model evaluation is provided on **Table 2**. In addition, water levels in four core holes (NT-13-07, NT-13-08, NT-13-09, and NT-13-12) were evaluated relative to the model development. Due to erratic water level data at the core hole locations, these data were not used in the development of the groundwater model. It should be noted that other subsurface explorations were advanced on or around the site area (e.g. shallow test borings to evaluate site soil infiltration properties, geotechnical core holes, etc.); however, groundwater data from these explorations were either repeated and provided no relevant information or the data sets associated with these explorations were incomplete when compared to the range of dates used in the evaluation. For instance, groundwater observed in any of the shallow test borings that were completed down to or above bedrock is associated with a perched water zone that exists within the overburden soil, above the impervious rock layer, and is not representative of the regional groundwater table. As a result, the results of these other explorations were not used as part of the groundwater model evaluation.

1.2 Physical Site Characteristics

Topography

The site is located in the Blue Ridge province of Pennsylvania which consists of moderate to rugged topography with subparallel ridges and valleys resulting from alternating belts of volcanic and sedimentary rocks. **Figure 2** provides the topography in the area of the site based on a United States Geologic Survey (USGS) 3-meter digital elevation model of the area. **Figure 3** provides a three-dimensional oblique view of the site. The proposed Northern Tract Quarry is situated on a topographic knob located just north of the Pitts Quarry.

Geology

The Precambrian (Proterozoic) age rocks under the site area proposed for mining consist of alternating layers of metabasalt and metarhyolite of the Catoclin Formation. The relationship of deposition of these subaerial volcanic flows is unknown; however, they are believed to occur in alternating layers (Fauth, 1978, pp. 31-35). The Catoclin Formation is approximately 2,500 feet thick and trends from the southwest to the northeast along the west side of Adams County. The competent bedrock material is relatively dense with apparent cleavage planes (Fauth, 1978, pp.11). A geologic map of the general area of the Northern Tract Quarry is provided as **Figure 4**.

A fault is mapped on the eastern edge of the Northern Tract Quarry with the up-thrown side of the fault (metabasalt) to the east and the down-thrown side (metarhyolite) to the west. It should be noted that there are no topographic features identifying the location of the fault, suggesting that the two rock types are very similar in physical characteristics (i.e. weathering, erosion, etc.).

Explorations advanced at the site confirm the presence of metabasalt and metarhyolite bedrock material. In addition, based on the site-specific explorations, the site stratigraphy is composed of overburden soils, overlying a weathered metabasalt zone (saprolitic cap rock) that overlies the competent metabasalt. The overburden saprolitic soils/cap rock zone ranges from 0 to 50 feet in thickness and may tend to be thicker in the valleys than the top of the hills. The overburden soil has been described as sand, silt, or clay, and the cap rock does appear to be a saprolite of the parent rock material. The boundary of the cap rock to the competent bedrock (metabasalt) appears to be transitional.

Hydrogeology

Generally, the water-bearing yields of the rocks underlying the site are very poor. Based on published data, 25% of domestic wells drilled into the metabasalt and metarhyolite yield less than 3 gallons per minute (gpm) and have a specific capacity of < 0.23 (Taylor and Royer, 1981, pp. 12-13). The median depth to water in the metabasalt and the metarhyolite ranges from 44 feet to 22 feet respectively (Taylor and Royer, 1981, pp. 16). These data are consistent with the data collected from the site-specific explorations. In

addition, the active Pitts Quarry located south of the site area has reportedly encountered minimal groundwater during the quarry operations.

Perched water in the cap rock material (saprolite) has been observed on the site as a result of past shallow explorations and is unassociated with the deeper bedrock groundwater that is the focus of this report.

Metabasalt and Metarhyolite are relatively low permeability (low hydraulic conductivity) rock materials known to have poor intrinsic porosity (pore space available for transmitting water). Aquifer testing (pumping and slug testing) has been completed at the site producing site-specific values that were relied upon to develop the groundwater model. Based on the observed site conditions and characteristic low permeability of the bedrock, extended constant rate discharge aquifer testing at this site is not feasible for providing estimates of hydraulic conductivity. Slug testing and short duration pumping test methods provide a more adaptable method to these types of site conditions and are often used to provide reliable estimates of hydraulic conductivity. Given these constraints, slug testing and short duration pumping test results were used to create the representative aquifer hydraulic input parameters necessary for constructing the groundwater model. In addition to Skelly and Loy's pumping tests inclusive of all Northern Tract perimeter wells, aquifer tests were previously completed by others on wells MW-3R, MW-4R, MW-5, and MW-7 surrounding the Pitts Quarry from March 1 through 4, 2011. These test results were previously provided to the Pennsylvania Department of Environmental Protection's (PA DEP) Cambria District Mining Office (CDMO) in a Hydrogeologic and Hydraulic Analysis Report of December 2011.

Aquifer testing completed in the site area associated with 9 of the monitoring wells have provided hydraulic conductivity values for the underlying bedrock that range from 0.0047 to 0.6384 feet/day and overburden hydraulic conductivities that range from 0.025 to 1.31 feet/day. These data are consistent with the characteristics described in the published data. **Table 3** provides a summary of the hydraulic conductivity values obtained from site wells.

Although different geologic formations exist in Adams County including the metabasalts and metarhyolites of the Catoclin Formation, the geologic zones are not consistent with the hydrogeologic zones. Generally, the upper 300 to 400 feet of the geologic material provides water; below this zone no water is encountered (Taylor and Royer, 1981, pp. 18).

Based on the general site topography, groundwater flow is inferred to flow radially outward from the topographic high of the proposed quarry location. The proposed quarry area is bounded to the west, north, and east by surface water streams and wetlands that, in some part, receive surface water and groundwater from the site area. **Figure 5** provides the locations of the streams and wetlands. Several of these streams are unnamed tributaries and as a result, for the purpose of reference throughout this groundwater model report document, have been assigned names. The stream reach to the west of the site is referred to as Stream Reach A, the stream to the north is referred to as Stream Reach B,

and the stream to the east is referred to as Stream Reach C (see **Figure 5**). Wetlands associated with these stream reaches have also been categorized (based on documents provided by Skelly and Loy, Inc.) as Delineated Wetland Areas A, B, C, D, and E, Wetland Seep Areas 1 through 4, and National Wetland Inventory Area (National Wetland Area). The locations of the wetland areas are provided on **Figure 5**.

Skelly and Loy also collected surface water flow associated with the stream reaches (A, B, and C) and both low flow and high flow rates were recorded. Based on these data, low flow and high flow rates for Stream Reach A, B, and C are provided on **Figure 5**.

The hydrogeology of the wetland areas has not been well characterized; however, due to the low permeability of the geologic formation, the large area of the water basins associated with the streams and wetlands, and precipitation in the area, it is likely that the majority of the water that is discharging to the streams and wetlands is surface runoff with only minor amounts from groundwater base flow. The Wetland Seep Areas all appear to be associated with areas in the valleys that may have more alluvial type sediments associated with them and as a result, surface water may flow more readily through these shallow surface sediments allowing seeps to develop over the areal extent of the Wetland Seep Areas.

Groundwater level measurements have been collected from the network of monitoring wells since 2010; however, as new monitoring wells have been installed, complete sets of water level data from the existing monitoring wells have only been available since 2013. Five sets of water level monitoring data collected between 12/20/13 and 12/1/14 were used to determine the mean groundwater elevation at each well location to calibrate the steady state groundwater model (discussed below). **Table 4** provides a tabulation of the data used to determine the mean groundwater elevation data collected from the site monitoring wells used to calibrate the groundwater model.

Minor fluctuations are evident in the water elevations, however, for the most part the water levels appear to remain steady with no erratic movements or complete lack of movement. This suggests that although the geologic formation exhibits low permeability, the formation does act as porous media likely through networks of small fractures in the rock material; however, the areal extent of the fracture network is most likely poorly connected.

Water level data collected from existing bedrock monitoring wells located along the perimeter of both the existing Pitts and proposed Northern Tract Quarries have historically demonstrated a very strong correlation with local surface topography. Throughout the period of record (2000-2016), only minor fluctuations in the depth to water have been recorded in these monitoring wells resulting in correspondingly minor deviations in both the regional and secondary (local) groundwater flow directions within the bedrock. The semi-radial groundwater flow direction in the bedrock closely mimics surface topography which variably slopes moderately to steeply from the higher elevations at the center of the Northern Tract area to the northwest, north, northeast, and

east toward discharge areas situated at lower elevations along the unnamed tributary and Toms Creek (Stream Reaches A, B and C).

Based on the high degree of correlation between these water level data, hydraulic gradient mapping of the potentiometric surface, and predictive simulations performed using the groundwater model, the proposed Northern Tract Quarry perimeter wells were found to provide depth to water data consistently representative of the observed groundwater elevations and hydraulic gradients observed in the bedrock throughout the proposed Northern Tract Quarry area. As a result, the existing Northern Tract Quarry perimeter wells are judged to be effective for evaluating the impacts to surrounding areas from the proposed development of the Northern Tract quarry.

There are no monitoring wells in the interior portion of the proposed quarry area; however, four core holes (NTs) remaining from past rock quality evaluation were maintained and used to collect some water level data. In addition, approximately thirty-eight shallow Infiltration Test Borings (ITBs) were installed along the eastern and western perimeters of the proposed Northern Tract. The ITBs were completed by others for the purpose of identifying and evaluating potential locations suitable for storm water infiltration. As such, the ITBs were designed to be open (screened) only within the overburden soil for the purpose of evaluating infiltration. These field evaluations showed unfavorable conditions for on-site infiltration of storm water runoff as a result of relatively low permeability of the soils and the underlying shallow rock causing isolated and shallow perched groundwater conditions in many areas of the site.

The core hole and ITB water level data are generally not consistent with water levels measured in the bedrock monitoring wells. The ITBs were generally established at relatively shallow depths within the overburden soils and thus are monitoring a perched water zone within the soil overburden. Elevated water levels in the core holes could be related to the construction details (e.g., potentially inadequate casing seals) of the core holes. Depending on the configuration of the core holes, the perched water in the overburden soil could be interfering (mixing) with the bedrock ground water resulting in water levels that are not representative of the bedrock groundwater. Therefore, the core holes and ITBs are not considered to be representative of the true (bedrock potentiometric heads) water levels and the water levels in the ITBs and core holes would not be relevant to evaluating potential quarry expansion impacts to streams, wetlands, residential wells, or groundwater drawdown within the bedrock being mined. Additionally, the perched water zone in the overburden soil will have no impact on the groundwater budget since this overburden will be removed when the bedrock mining begins. For these reasons, these data are deemed to be unreliable, and were excluded from the database used to generate the model simulations.

Water level measurements from three pairs of shallow/deep wells (MW-8S/MW-8D, MW-9S/MW-9D, MW-14S/MW-14D) do suggest that vertical gradients may exist; however, based on these data, the hydraulic gradients are mixed upward and downward gradients suggesting that the separation may be more a result of the dynamics of the fractured bedrock than actual gradients resulting from either hydrogeologic recharge or

discharge zones. Based on the data, it is evident that the shallow overburden material in places may not be well connected to the underlying bedrock material.

The rock to be quarried is the metabasalt. Based on observations in the Pitts Quarry to the south (same formation), the metabasalt is structurally massive, crystalline, and lacks bedding planes. This suggests that preferential flow along bedding planes or joint sets does not likely exist in the area of the site.

Precipitation and Recharge

Precipitation in the area of the site has been estimated to be between 47 and 49 inches per year (Reese and Risser, 2010, Plate 1). Recharge rates in southwestern Adams County in the general area that include the metabasalt and metarhyolite formations have been as low as 5.3 inches per year; however, this includes some geologic formations (part of the watershed) that are much more permeable than the metabasalts and metarhyolites (Reese and Risser, 2010, Plate 6) and as a result the recharge rates may be skewed higher where recharge rates in the metabasalt and metarhyolite alone are likely significantly lower than 5.3 inches per year. The domain of the model falls solely within the metabasalt and metarhyolite zones and as a result, would be expected to have a lower recharge rate.

Conceptual Model

A schematic cross section of the general conceptual model that the groundwater model construction was based upon is provided as **Figure 6**. It should be noted that the model layers have been constructed independently of the geologic formations (discussed in detail in Section 2.0). This was based on published data that suggests that permeability decreases with depth and is relatively independent of the geologic formation (Taylor, and Royer, 1981, pp. 18).

1.3 Purpose and Reliance

The purpose of the groundwater model discussed in this report is to provide the anticipated zone of influence impacts from the anticipated expansion of the newly proposed Northern Tract Quarry north of the existing Pitts Quarry.

Water level data collected between 12/30/13 and 12/1/14 (mean groundwater elevation data) have been used to calibrate the groundwater model associated with the site. The model is a numeric representation of the hydro-geologic conditions existing at the site and the surrounding area based on the existing site conceptual model. The model has allowed the evaluation of groundwater flow at the site and in the surrounding areas under existing site conditions through numeric simulations based on existing data. The model has been relied upon for the predictive evaluation of the groundwater impact on surrounding areas as a result of the proposed level expansions.

Others have collected hydro-geologic data (i.e. water level data, stream flow data, aquifer parameter data, etc.) and related site characteristic data relied upon for the construction of

the groundwater model. It is not the intent of this groundwater model document to describe the methods used to collect these data, however, in some cases a brief explanation of the quality of the data is discussed where interpretation is warranted.

Groundwater Modeling Systems (GMS) software, Version 10.0, developed by the United States Department of Defense and distributed by Aquaveo, Inc. was utilized in the development of the groundwater model for the site. This modeling software consists of numerous modules that are interfaced to allow more accurate representation of hydrogeologic conditions and greater flexibility in simulating and evaluating flow conditions on the site and surrounding area.

As discussed above, data provided by others was incorporated into the model. The data included drilling logs, static water levels, site topography, aquifer testing results, and other physical site characteristic data.

The “site” generally encompasses the entire region of the groundwater model that incorporates numerous properties within the general drainage basin of the site.

It is not the intent of the groundwater model to solely define the hydrogeologic characteristics that exist at the site, but rather the model is intended to be used as an additional evaluation tool in conjunction with the more conventional evaluation methods (i.e. soil borings, monitoring wells, aquifer testing, etc.) that have been applied to the site.

Figures that have been included as part of this report are provided in an 11 x 17 paper size format and are in color allowing the data to be graphically presented. Black and white copies and/or smaller paper size copies of the figures may not present the data in the clarity originally intended.

2.0 Model Construction

2.1 General

Some assumptions and speculation relative to the site's geologic or hydro-geologic characteristics have been made during the development of this groundwater model. All of the assumptions and speculations have been based on sound and accepted geologic and hydro-geologic theory and are identified and explained when utilized.

The model was constructed in three stages. The first stage consisted of developing a three-dimensional conceptual model representing the physical characteristics of the site. The second stage consisted of converting the three-dimensional conceptual model into a numeric model for calibration. MODFLOW 2005, a finite difference computer model, was utilized for creating the numeric model. The model was constructed as a steady-state model, which allows the input data to be interpolated through numerous iterations to solve the finite difference equation. The third step consisted of running predictive flow simulations to represent existing groundwater conditions at the site and the subsequent simulation of the proposed level expansions used to determine the zone of influence and the potential impact to neighboring properties and surface water areas. The modeled simulations presented in this report are steady state conditions.

2.2 Numeric Flow Model Construction

Boundary Conditions

The boundary conditions of the model are presented on **Figure 7**. The selection of the model boundary was based on isolating the groundwater drainage basin that the quarry lies within: groundwater that flows into the basin interacts with the model domain and becomes incorporated into the water budget and water that flows outside of the basin does not interact with the model domain and is not part of the water budget and; therefore, is not part of the model domain.

The general model area (model domain) is bordered to the north, south, and west by well-defined groundwater divides (MODFLOW no flow boundaries). The eastern boundary is also a groundwater divide; however, this boundary allows surface water flow out of the drainage basin that was modeled. The model boundaries were set far enough from the proposed quarry area so as not to interfere with the modeling results.

Surface Water

MODFLOW drain arcs represent locations where natural (undisturbed by mining operations) surface water drainage would simulate the removal of water from the model domain as base flow. Drain arcs were used to simulate the tributaries that, based on the geomorphology, likely only have discharge as base flow and surface water would not likely enter the porous media as recharge. As discussed earlier, relatively rugged topography exists in the area resulting in relatively fast overland run-off and drainage.

The elevations of the surface water bodies (drain nodes) were based on the United States Geologic Survey (USGS) topographic quadrangle map of the area. The natural creek elevations were estimated from the USGS maps and then 2.0 feet was subtracted from the estimated surface water elevation at each node location to estimate the bottom of the bed elevation. The bottom of the stream bed elevation was used in the model as the node elevation. The node locations used for the construction of the model are presented on **Figure 7**.

The starting conductance values assigned to the drain traces were determined from the estimated creek dimensions and the estimated hydraulic conductivity of the stream bed material. In addition, the calibration of the model also guided the conductance values used in the drain traces. Typically, conductance is the leakage of water through the stream bed material that can discharge as base flow to the stream or leak back into the aquifer as recharge. Conductance is calculated by the product of the creek width and the hydraulic conductivity divided by the creek bed thickness. This provides a conductance value per unit distance (per foot) for the stream bed material. When this value is assigned to MODFLOW, the unit distance is multiplied by the length of the stream bed material in each cell of the model and the conductance of each cell is assigned to the MODFLOW model.

It has been assumed that much of the stream bed length sits on the surface of saprolitic material derived from the bedrock; therefore, the hydraulic conductivity of the saprolitic material was used in the calculation of the conductance value. The natural creek bed conductance values were initially set at 3.33 feet per day per foot (ft/day/ft). This was based on an average stream width of 15 feet, a mean hydraulic conductivity of the overburden material (saprolite) of 0.6675 ft/day (see Table 3), and a stream bed thickness of 3 feet. Based on the calibration of the model (discussed below), a stream conductance value of 0.5 allowed the best calibration and was used in the model as the final stream conductance.

Model Grid

Based on site specific geologic information collected from the quarry (provided by Skelly and Loy, Inc.), observations in the Pitts Quarry to the south (same formation), and available publication data, structural components of the bedrock material promoting preferential flow directions (bedding planes, joint sets) are not apparent and as a result, the model grid was oriented north to south. However, a very fine grid was used to allow detailed components of flow to be registered in the model. No preferential flow was assigned in the model.

A grid spacing of approximately 50 by 50 feet was assigned to the entire domain of the model. The general model grid is presented on **Figure 8**.

Hydraulic Conductivity Assignment

The model layer configuration (discussed below) was based on the distribution of the hydraulic conductivities associated with the site and in the model domain area. **Figure 6** provides the general conceptual model of the site used in the numeric model. Generally, publication data (Taylor and Royer, 1981, pp. 18) suggests that the permeability of the porous material decreases with depth and is relatively independent of the geologic formation. Based on published geologic data, there are generally two hydrogeologic zones; one from the ground surface to approximately 400 feet where groundwater yields are present, and a zone below 400 feet where no groundwater yield exists. In addition, based on site-specific characterization data, a shallow overburden zone also exists as discussed above.

As discussed below and presented on **Figure 6**, the groundwater model layers were divided into three units: the uppermost model layer (Layer 1) consists of the overburden and saprolitic cap rock, Layer 2 consists of the upper 400 feet of competent bedrock where groundwater yields exist, and Layer 3 consists of competent bedrock below 400 feet in depth where no groundwater yields exist.

Published data suggests the hydraulic conductivity (groundwater yield) of the underlying bedrock is very low (Taylor and Royer, 1981, pp. 12-13). In addition, aquifer testing completed in the site area associated with 9 of the monitoring wells have provided hydraulic conductivity values for the underlying bedrock that range from 0.0047 to 0.6384 feet/day and overburden hydraulic conductivities that range from 0.025 to 1.31 feet/day. This data is consistent with the characteristics described in the published data. **Table 3** provides a summary of the site-specific hydraulic conductivity values. Typical of groundwater modeling, these values were initially used in the model prior to the calibration process as starting values for hydraulic conductivity. During the calibration process these values were adjusted to allow a better calibration to be achieved. To achieve the best calibration, a hydraulic conductivity value of 0.0011 feet/day was used for the overburden material (Layer 1 of the model), 0.0014 feet/day was used for the competent bedrock material to a depth of 400 feet, and 0.0005 feet/day was used for the bedrock material below 400 feet. **Table 5** provides a summary of the hydraulic conductivity parameters used in the model.

Generally, lower hydraulic conductivity values were used in the model relative to the site-specific hydraulic conductivity values obtained from on-site testing. The reason for this is that site-specific hydraulic conductivity testing evaluates specific site locations and does not evaluate the average regional hydraulic conductivity of the domain of the model. To achieve calibration, the model requires that the entire domain of the model meets a hydraulic conductivity value that allows the simulated water levels in the calibrated target wells to match the water levels observed in the site wells. Hydraulic conductivity values obtained from site-specific aquifer testing are typically a starting point for the calibration process and not necessarily the final value(s) ultimately used in the model.

Horizontal Anisotropy

No horizontal anisotropy (preferential flow) was used in the model calibration since no preferential flow was identified on the site as discussed above.

Vertical Anisotropy

No vertical anisotropy ratios were available; therefore, these values were assigned a value of 1.0 for all of the geologic material within the model. It should be noted that this parameter is typically not a sensitive parameter in this type of groundwater model. Geologic formations with distinct horizontal structure (i.e. horizontal shales, sediments with flat lying mica flakes, etc.) that can impede vertical flow require vertical anisotropy values to simulate the preferential flow along the horizontal axis. It can be assumed that structurally massive rocks, as exist at the site, with no apparent horizontal structural components typically can be modeled with the assumption that the vertical flow is equivalent to the horizontal flow and no preferential flow exists.

Model Layers and Geologic Characteristics

Three hydrogeologic layers (Layers 1, 2 and 3) were recognized and simulated in the model domain. Divisions of the layers were based on the published hydraulic conductivities discussed above. Based on published geologic data and site-specific characterization data, there are generally three hydrogeologic zones with depth; the first zone is the overburden soil and saprolitic cap rock that is present in the upper 50 feet (Layer 1), the second zone consisting of bedrock between 50 and 400 feet below the ground surface (Layer 2), and the third zone consisting of impermeable bedrock (Layer 3) below 400 feet in depth. It should be noted that due to the hydrogeological similarities between the geologic materials, permeability is relatively independent of the geologic formation. The distribution of these hydrogeologic units (layers) within the model domain is presented on **Figure 9**. Generally, Layer 1 and Layer 2 of the model have similar hydrogeologic characteristics and are the two layers that will be impacted by dewatering of the proposed quarry.

Recharge

Recharge is not a value that can be evaluated through exploration, but a hydraulic parameter typically evaluated on a regional watershed basis. This parameter is typically based on measured rates of precipitation, stream flow, surface runoff, etc. These values are published by the USGS and are used as a starting point in the groundwater model. The groundwater model provides an evaluation tool that is much better suited to refining a regional recharge rate to match site-specific conditions than any type of site exploration or evaluation method. The amount of site-specific recharge is essentially defined as the hydrologic balance between the amount of water moving into the model domain (recharge) and water leaving the model domain (discharge). As such, the rate of site-specific recharge must closely match the measured groundwater elevations recorded in both the nearby wells and stream flow rates. As stated below, a regional recharge rate

was initially used with the site-specific recharge rate refined by adjusting the recharge rate until the resultant monitoring well groundwater levels and adjacent stream flows closely matched existing site conditions.

Groundwater recharge is based on annual precipitation, infiltration rates, stream base flow rates, and evapotranspiration rates. As a general “rule of thumb”, typical recharge is approximately 1/3 of the actual precipitation that occurs in relatively flat and porous terrain. Initial recharge values were obtained from publication data (Reese and Risser, 2010, Plate 6) and were refined during the calibration process. Based on these publication data, recharge in the general site region ranges from 5.3 to 8.5 inches per year. The recharge values used in the model were initially the published values and were modified based on the model calibration. The final mean recharge value used to obtain the best fit calibration for the model domain was approximately 1.0 inch per year.

A lower recharge value than the published range (5.3 to 8.5 inches per year) is justifiable because general recharge rates in southwestern Adams County in the general area of the metabasalt and metarhyolite formations have been as low as 5.3 inches per year as stated above; however, calculation of these values included some geologic formations (part of the watershed) that are much more permeable than the metabasalts and metarhyolites (Reese and Risser, 2010, Plate 6). As a result, recharge in the metabasalt and metarhyolite alone could be significantly lower than 5.3 inches per year due to the low permeability of these specific rock types (i.e. metabasalt and metarhyolite) which directly underlie the site area. The domain of the model falls solely over the metabasalt and metarhyolite and does not include the more permeable rock types used to establish the recharge values in the published data.

A sensitivity analysis of average recharge (1.0 inch per year) was conducted to better understand the impact that this parameter has on groundwater movement beneath the site. Average recharge was used for the sensitivity analyses because the head elevation data collected from the site monitoring wells is more consistent with average recharge conditions. Higher and lower values of recharge were evaluated. It was determined that the model was very sensitive to recharge: the use of higher values caused flooding in the model in areas where none was observed, and the lower recharge values resulted in “dry cells” in the model where groundwater was known to exist. Additionally, the sensitivity analysis was compared to the residual error between the observed groundwater elevations and simulated groundwater elevations.

Table 5 provides a summary of all the final hydrogeological parameters used in the model based on the model calibration producing the least amount of error.

2.3 Numeric Flow Model Calibration

General

Calibration refers to the process of demonstrating that the model is capable of producing field measured heads and flows. Calibration can be evaluated both qualitatively and quantitatively; however, even in a quantitative evaluation, the judgment of when the fit

between model and reality is satisfactory is a subjective one (Anderson and Woessner, 1992, pp. 223).

The groundwater model was calibrated to the mean groundwater elevation (head) data collected from the site monitoring wells. **Table 4** provides the data utilized to calculate the mean groundwater elevation level for each monitoring well location. An inventory of these wells is provided on **Table 2**.

Groundwater level measurements have been collected from the network of monitoring wells since 2010; however, as new monitoring wells have been installed since 2010, complete sets of water level data for the existing monitoring wells have been available since 2013. The five sets of water level monitoring data collected between 12/20/13 and 12/1/14 (provided on **Table 4**) were used to determine the mean groundwater elevation at each well location and to calibrate the steady state groundwater model (discussed below). Again, these monitoring events provided the most complete sets of groundwater elevation data.

From 4/1/15 through 9/11/15, an additional six monthly water level monitoring events were completed by others utilizing the proposed Northern Tract monitoring well network. This data was used in the Northern Tract pre-application as the background monitoring data for the on-site groundwater monitoring locations. Because these 2015 water level elevation data are within the range of the water level data (2013 to 2014) already used to construct and calibrate the existing model, and would not have any significant effect on the model output, the 2015 water level data were not incorporated as model inputs.

Monitoring Well Calibration (Head Elevation)

The mean groundwater elevation data collected from the site monitoring wells and tabulated on **Table 4** were used for the model calibration of hydraulic heads. It should be noted that the data obtained from the monitoring wells from the period of 12/30/13 through 12/1/14 represent no active pumping from the proposed Northern Tract Quarry; however, active pumping at the Pitts Quarry located south of the proposed Northern Tract Quarry was simulated in the calibration of the model. The Pitts Quarry was simulated with a dewatering level floor elevation of 1040 ft-amsl (the pit floor elevation at the time of the model calibration as well as at the time the monitoring well data was collected). The dewatering of the existing Pitts Quarry floor elevation of 1040 ft-amsl was simulated with a MODFLOW drain polygon configured to match the existing floor elevation.

Groundwater elevation data used to calibrate the groundwater model were collected at the site at the time that the Pitts Quarry was actively being mined to a level elevation of 1040 ft-amsl. Groundwater elevation levels at the site would be impacted by the dewatering of the Pitts Quarry at the elevation of 1040 ft-amsl at the time they were collected. For this reason, the Pitts Quarry dewatering level was simulated in the model calibration process at an elevation of 1040 ft-amsl which allowed the existing site conditions (i.e. Pitts Quarry at 1040 ft-amsl) to be replicated and calibrated to the associated groundwater elevation data from the same time period. Based on this calibration, the Pitts Quarry is

pumping a negligible amount of groundwater to dewater the quarry (9 gpm). Based on observations at the quarry, very little pumping has been reported, and when pumping does occur it is associated with the removal of storm water runoff, not groundwater. Only a small portion of the accumulated water consists of groundwater infiltration. The pumping system is primarily used to remove rainfall or snowmelt runoff. Therefore, the pumping rate in the Pitts Quarry would not be indicative of groundwater infiltration alone and thus would only have limited applicability to the groundwater model. Completing a new calibration of the model once the Pitts quarry reaches the maximum depth will require the quarry operations to first reach the maximum depth in the Pitts Quarry along with an associated set of groundwater level measurements at that time in nearby monitoring wells for comparison. This is not anticipated to occur for many years. Secondly, this calibration will have no impact on the accuracy of the current calibration.

During the calibration process, sensitivity analyses of the recharge values and hydraulic conductivity values for each modeled layer were conducted to identify the most unique parameter values that best matched the calibration targets (head elevations in the wells). The final hydrogeological parameter values used in the model are discussed above and provided on **Table 5**. The sensitivity analysis is provided on **Table 6**.

The result of the monitoring well calibration (residual error) is presented in tabular format on **Table 7** and is graphically presented on **Figure 10** and **Figure 11**. Based on the distribution of calibration points (groundwater head values) associated with the perfect fit line (see **Figure 10**), a calibration was achieved using the mean monitoring well data. The model calibrated with a mean error of 5.03 feet, an absolute mean error of 17.58 feet, a root mean square (RMS) error of 22.75 feet, and a normalized RMS percent error of 6.1%.

It should be noted that although a mean error of 5.03 feet was achieved, several of the wells diverged significantly from the target elevations (i.e. MW-2, MW-4, MW-7, and MW-12D). All reasonable attempts were made to reduce the error in these wells; however, it was determined that due to the characteristics of the geologic formation, a closer calibration was not likely. Review of well logs for these wells and others identified isolated fractures that may be poorly connected to the entire formation and as a result, some wells may not fall into place with the modeled potentiometric groundwater elevation for the site. Isolated fractures filled with water result in anomalous water level readings in wells that are associated with these types of fracture characteristics.

Flow Budget

The flow budget of the MODFLOW model was evaluated to determine if reasonable balance between inflows and outflows of the model had been achieved. Based on a conceptual understanding of the site's hydrologic cycle, it was apparent that the aquifer on the site was recharged from precipitation. Groundwater was lost from the aquifer through drainage into surface water streams. Results of the flow budget are presented on **Table 8**.

Based on the results of the flow budget, it is evident that the inflow of water to the model domain closely matches the outflow of water from the model domain suggesting a reasonable water budget balance.

3.0 Simulated Groundwater Flow

3.1 Existing Site Groundwater Elevation Conditions

Based on the calibrated groundwater model, **Figure 12** provides the simulated existing regional potentiometric groundwater elevations associated with the domain of the model. **Figure 13** presents the same simulation; however, it provides only the area proximate to the site. This simulation (presented on **Figures 12 and 13**) represents the current site conditions used in the calibration process with no active pumping of the proposed Northern Tract Quarry area; however, the Pitts Quarry south of the site is actively being dewatered to an elevation of 1040 ft-amsl.

For the purpose of the proposed level expansion simulations, active pumping of the Pitts Quarry was removed and a “no pumping” static groundwater scenario was simulated. While the exact quarry level sequencing is unknown at this time and will depend on time to permit the Northern Tract, field conditions encountered, and market demand, once the maximum depth of mining is reached in the Pitts Quarry (840 ft-amsl), we understand that SGI plans to reclaim the Pitts Quarry by depositing rock fines, overburden, and cap rock in the quarry at a rate greater than the groundwater inflow rate. As a result, we have assumed that any dewatering of the Pitts Quarry will not involve pumping groundwater, but will be comprised of primarily surface (storm) water discharge. **Figure 14** provides the no pumping simulated potentiometric groundwater elevation contours for the site area that were used to compare the simulated level expansion water levels (4th level through the 12th level) discussed below to allow comparison and determine the potential impact that each of the anticipated expansions from the proposed Northern Tract Quarry pumping may have on the surrounding areas (i.e. wetlands, streams, residential wells).

3.2 Simulation of Level Elevation Expansion

To simulate the level expansion of the Northern Tract Quarry area (4th level through the 12th level), the proposed level configuration areas were simulated with the MODFLOW “drain” package. This package simulates the dewatering of the quarry to the assigned elevation and level configuration. It should be noted that groundwater was not encountered until the 4th level, therefore, the first three levels were not evaluated.

The Pitts Quarry was assumed to be developed to its final configuration with the lowest level at an elevation of 840 ft-amsl for this simulation. SGI proposes to backfill the Pitts Quarry in a manner which will not require active dewatering of the Pitts Quarry. Therefore, no active pumping was assumed in the Pitts Quarry for the de-watering simulations for the proposed Northern Tract Quarry.

As discussed in Section 1, the proposed level elevation expansions were simulated to determine potential impact to the proximate areas. The areas of the proposed quarry level configurations are provided on **Figure 5** and a tabulation of the level expansions is provided in **Table 1**. Each level elevation was expanded inward from the level elevation being simulated with the same elevation which simulated the removal of the entire

elevation of rock from the quarry from the specific level elevation. The quarry levels were simulated as steps as the quarry was deepened allowing the actual three-dimensional configuration of the proposed quarry to be simulated. **Figure 15 through Figure 23** provide the results of the potentiometric groundwater elevations for the proposed 4th level through the 12th level. **Figure 24 through Figure 32** provide the associated drawdown for the proposed 4th level through the 12th level. It should be noted that the model simulation, and the associated figures, represent long term, steady state groundwater conditions.

Based on the model simulations, it is evident that, as the quarry expansions deepen, the general zone of influence (drawdown) from the quarry is contained to the west, north, and east by the surface water streams. The maximum simulated quarry pit discharge (12th level) is 1749 ft³/day (13,083 gallons per day or 9.0 gallons per minute). This is a relatively low discharge rate but is consistent with the permeability of the bedrock material and the reported seepage rate observed in the Pitts Quarry to the south.

Table 9 provides a tabulation of the quarry discharge rates for each level expansion. In addition, based on the model simulations, **Table 9** provides the base flow stream and wetland water loss volumes associated with each level expansion. Comparisons of each level expansion were made to the “no pumping” site groundwater flow volumes associated with each of the stream reaches and each of the wetland areas. The MODFLOW model allows each of the level simulation solutions to be queried for the flow rates of each stream reach and each wetland area. These values were recorded on **Table 9**. **Table 9** results only include base flow loss (loss from groundwater) contributions to the surface water bodies and do not include the contribution of overland flow to the total stream flows. With the contribution from overland flow, no significant impact to the surface water bodies is likely.

The extent of the drawdown influence on **Figures 24 through 32** was set at a 10-foot contour interval. A 0-foot drawdown contour does not exist and 1-foot contour did not fit the 10-foot contour interval provided on the Figures. In addition, it should be noted that a steady state model typically over predicts drawdown since the model solution reaches a “steady state” which typically does not occur in a natural condition. For these reasons the outer edges of the drawdown contours used on the figures were set at 10 feet.

At the 6th level (**Figure 26**) the outermost contour reaches the approximate elevation of the Delineated Wetland Area (Area D) and has a maximum drawdown of 20 feet below this area. From this level forward through the 12th level expansion, drawdown is exhibited under this wetland area and progresses under other wetland areas (see **Figures 26 through 32**). The groundwater loss from each of the wetland areas and the perimeter streams (Stream Reach A through C) is tabulated on **Table 9**.

Although water losses from the wetlands and the streams exist, the amount of water loss is relatively very small as a result of the simulated drawdown from the quarry shown on **Figures 26 through 32**. It is apparent that the connection between the groundwater and

the streams/wetlands is poor. The streams and wetlands are likely perched on the ground surface due to the low permeability of the underlying geologic material. While some connection exists due to fractures, the overall hydraulic connection is poor. It has been estimated, based on field observations, that the surface water flow through the streams ranges from 65 gallons per minute to 1,938 gallons per minute (see **Figure 5**). Water losses from the wetlands as a result of the simulated quarry drawdown would be only a small percentage of the overall flow through these areas. Overall, very little impact to the streams and wetlands was evident.

No residential wells are impacted from the simulated drawdown of the proposed quarry expansion.

3.3 Drought Conditions

Drought conditions are typically simulated in a groundwater model by reducing the mean recharge. The mean recharge used in the model was 1.0 inch per year. As previously discussed, a recharge rate of 1.0 inch per year was necessary to achieve the best model calibration due to the extremely low hydraulic conductivity of the underlying geologic formation. Because of these site-specific characteristics, drought conditions would not likely have any significant impact on groundwater underlying the site. A simulation was run for the 12th level expansion that reduced the recharge by 15% and produced no noticeable change in drawdown or flow losses. Although drought conditions would likely impact the surface water streams and wetlands as a result of a loss of surface water flow, the impact of the quarry dewatering associated with the drought conditions would have no impact relative to further groundwater base flow loss.

3.4 Static Groundwater Conditions - Quarry Pit Reclamation

Static groundwater elevation conditions were simulated for the final static conditions of the proposed Northern Tract Quarry once dewatering is discontinued from the 12th level expansion (740 ft-amsl) and the water level in the quarry recovers to a static level. **Figure 33** presents this simulation. Based on the model simulation, the water in the quarry returns to a static level of approximately 1020 ft-amsl. The reclamation elevation of the quarry rim (lowest point) will be elevation 1030 ft-amsl.

Once the maximum depth of mining is reached in the Pitts Quarry (840 ft-amsl), we understand that SGI plans to reclaim the Pitts Quarry by depositing rock fines, overburden soils, and cap rock in the quarry at a rate greater than the groundwater inflow rate. As a result, we have assumed that any dewatering of the Pitts Quarry will not involve pumping groundwater, but will be comprised of primarily surface (storm) water discharge.

4.0 Summary and Conclusions

Based on the results of the groundwater model simulation discussed in this document, the following conclusions have been reached:

- The geologic material underlying the proposed Northern Tract Quarry area consists of metabasalt and metarhyolite both with very low permeability which significantly limits the movement of groundwater through the material.
- The maximum pumping rate of the proposed Northern Tract Quarry at the 12th Level expansion is approximately 9.0 gallons per minute which is a direct result of the low hydraulic conductivity of the geologic formations.
- The drawdown (zone of influence) from the maximum quarry dewatering depth (12th Level) does not extend beyond the surface water streams bounding the quarry area.
- Although drawdown of the groundwater levels as a result of developing the proposed Northern Tract Quarry occurs beneath the streams and wetland areas proximate to the quarry area, the actual maximum dewatering rate (12th Level) associated with the quarry pumping has no significant water loss impact on the surface water features (Wetlands, Unnamed Tributary to Toms Creek–HQCWF and Toms Creek-HQCWF).
- The reclamation water level in the quarry is estimated to be at an elevation of 1020 ft-amsl. The reclamation elevation of the quarry rim (lowest point) will be elevation 1030 ft-amsl.
- No residential wells are impacted from the simulated drawdown of the proposed quarry expansion.

5.0 Limitations

The modeling in this report was performed using a commercially available software package (Groundwater Modeling System-GMS, Version 8.1 developed by the United States Department of Defense) designed to simulate groundwater flow. Where available, actual data from the site was utilized to calibrate the models and develop the graphical representations presented in this document. In other instances, assumptions were necessary to complete the model and limitations associated with the site data result in a level of uncertainty in the model predictions. Therefore, the results of the model predictions should be independently evaluated using actual site monitoring data.

The results of the model may differ from actual site conditions because of unknown subsurface conditions. The results of the models presented in this document shall not be construed to create any warranty or representation with regard to the site. The conclusions presented in this report were based on the services described, and not on scientific tasks or procedures beyond the described scope of services.

6.0 References

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TABLES

TABLE 1

Anticipated Quarry Level Elevations
SGI Charmian Facility - Proposed Northern Tract Quarry
Blue Ridge Summit, Pennsylvania

Level ID	Quarry Level Base Elevation (feet above mean sea level)
4th	1140
5th	1090
6th	1040
7th	990
8th	940
9th	890
10th	840
11th	790
12th	740

NOTES:

Groundwater was first encountered in the 4th level, therefore, model simulations are for Level 4 through Level 12.

TABLE 2

Monitoring Well Inventory
SGI Charmian Facility-Proposed Northern Tract Quarry
Blue Ridge Summit, Pennsylvania

Well ID	Well Depth (feet)	Reference Elevation (ft-amsl)	Ground Surface Elevation (ft-amsl)	Open Borehole or Screen Interval Length (feet)	Top of Open Borehole or Screen Interval (ft-amsl)	Bottom of Well Elevation (ft-amsl)	Approximate Depth To Competent Rock (feet)	Approximate Elevation of Competent Rock (feet)	Mean Groundwater Elevation (ft-amsl)
MW-1	No Data	1059.9	1056.75	No Data	No Data	791.75	No Data	No Data	1036.09
MW-2	No Data	1263.73	1258.57	No Data	No Data	794.57	No Data	No Data	1230.25
MW-3	No Data	1181.83	1178	No Data	No Data	793	No Data	No Data	1105.90
MW-3R	560	1161.5	1158.96	502	1098.96	596.96	47	1111.96	1122.09
MW-4	No Data	1274.77	1270.83	No Data	No Data	790.83	No Data	No Data	1227.21
MW-4R	720	1308.95	1309.62	623	1212.62	589.62	35	1274.62	1267.84
MW-5	550	1148.56	1147.13	No Data	No Data	597.13	No Data	No Data	1135.90
MW-6	325	1354.52	1354.52	307	1336.52	1030	7	1347.52	1315.26
MW-7	550	1084.44	1083.98	470	1003.98	534	94	989.98	1058.38
MW-8S	30	1073.33	1069.84	16	1055.84	1039.84	Not Applicable	Not Applicable	1045.75
MW-8D	374	1070.26	1068.27	336	1030.27	694.27	30	1038.27	1043.69
MW-9S	45	1020.39	1018.41	23	996.41	973.41	Not Applicable	Not Applicable	983.28
MW-9D	325	1019.95	1018.2	275	968.2	693.2	45	973.20	991.22
MW-10D	315	1008.37	1006.93	300	991.93	691.93	9	997.93	941.54
MW-11D	350	1047.16	1046.29	338	1034.29	696.29	7	1039.29	1023.09
MW-12D	380	1079.18	1077.58	368	1065.58	697.58	5.5	1072.08	1068.52
MW-13D	382	1079.23	1077.27	369	1064.27	695.27	8	1069.27	1047.59
MW-14S	74	1090.71	1087.99	10	1023.99	1013.99	74	1013.99	1066.16
MW-14D	394	1090.34	1088.41	316	1010.41	694.41	72	1016.41	1058.83

NOTES:

See Table 4 for mean groundwater elevation data.

TABLE 3

Hydraulic Conductivity Values
SGI Charmian Facility-Proposed Northern Tract Quarry
Blue Ridge Summit, Pennsylvania

Monitoring Well ID	Hydraulic Conductivity (ft/day)
Slug Testing	
MW-9S	0.025
MW-14S	1.31
Pumping Tests	
MW-8D	0.0058
MW-9D	0.0074
MW-10D	0.0693
MW-11D	0.0058
MW-12D	0.0047
MW-13D	0.1591
MW-14D	0.6384

NOTES:

Aquifer testing results provided by Skelly and Loy, Inc.

TABLE 4

Mean Groundwater Elevation Data
SGI Charmian Facility-Proposed Northern Tract Quarry
Blue Ridge Summit, Pennsylvania

Monitoring Well ID	Reference Elevation Top of Casing (ft-amsl)	Groundwater Elevation Measurement Date					Mean Groundwater Elevation (ft-amsl)
		12/20/2013	1/20/2013	2/27/2014	3/20/2014	12/1/2014	
MW-1	1059.90	1035.45	1035.41	1041.33	1034.95	1033.30	1036.09
MW-2	1263.73	1218.90	1233.15	1235.12	1233.82	No Data	1230.25
MW-3	1181.83	No Data	1109.18	No Data	No Data	1102.61	1105.90
MW-3R	1161.5	1120.83	1123.38	1127.21	1123.89	1115.14	1122.09
MW-4	1274.77	1226.48	1228.48	1230.81	1228.77	1221.53	1227.21
MW-4R	1308.95	1271.18	1274.45	No Data	No Data	1257.90	1267.84
MW-5	1148.56	1134.19	1136.32	1140.48	1137.16	1131.33	1135.90
MW-6	1354.52	1318.20	1319.66	1321.40	1302.61	1314.44	1315.26
MW-7	1084.44	1057.41	1059.42	1059.82	1060.23	1055.04	1058.38
MW-8S	1073.33	1046.55	1047.94	1052.42	1047.41	1034.43	1045.75
MW-8D	1070.26	1042.37	1043.70	1050.30	1043.14	1038.96	1043.69
MW-9S	1020.39	979.64	984.38	987.00	988.39	977.00	983.28
MW-9D	1019.95	986.64	990.97	992.11	992.70	993.70	991.22
MW-10D	1008.37	924.09	946.27	948.60	945.52	943.22	941.54
MW-11D	1047.16	1021.38	1022.12	1022.83	1022.25	1026.89	1023.09
MW-12D	1079.18	1068.21	1068.91	1069.31	1068.42	1067.77	1068.52
MW-13D	1079.23	1046.82	1047.58	1048.56	1047.55	1047.45	1047.59
MW-14S	1090.71	1064.80	1068.14	1071.29	1068.04	1058.54	1066.16
MW-14D	1090.34	1057.88	1061.19	1064.00	1060.77	1050.29	1058.83

NOTES:

- Groundwater elevation data was provided from 9/9/10 through 12/1/14; however, the majority of this data was incomplete and many of the wells either did not exist at the time earlier measurements were made or were not accessible. As a result, the most complete date sets of data were used in determining the mean groundwater elevation. The five sets presented above provided the most complete date sets of data and were the basis for determining the mean groundwater elevation for each well.
- ft-amsl - Feet Above Mean Sea Level.

TABLE 5

Hydrogeological Parameters Used in Model
SGI Charmian Facility - Proposed Northern Tract Quarry
Blue Ridge Summit, Pennsylvania

Material Identification	Model Layer Identification	Range of Hydraulic Conductivity ¹ (k - ft/day)	Model Hydraulic Conductivity (k - ft/day)	Horizontal Anisotropy* (y/x ratio)	Vertical Anisotropy (x/z ratio)	Source of Data
Overburden Material	Layer 1	0.025 to 1.31	0.0011	1	1	Estimated based on Model Calibration and Site Data
Catoctin Formation	Layer 2	0.0047 to 0.6384	0.0014	1	1	Estimated based on Model Calibration and Site Data
Catoctin Formation	Layer 3	No Data	0.0005	1	1	Estimated based on Model Calibration

NOTES:

1. * Ratio based on GMS MODFLOW using y/x instead of x/y.
2. Hydraulic conductivity values based on data provided by Skelly and Loy, Inc.

Recharge (see report text)

Model Domain: 0.00019 ft/day (1 Inch per year)

TABLE 6

Parameter Sensitivity
SGI Charmian Facility – Proposed Northern Tract Quarry
Blue Ridge Summit, Pennsylvania

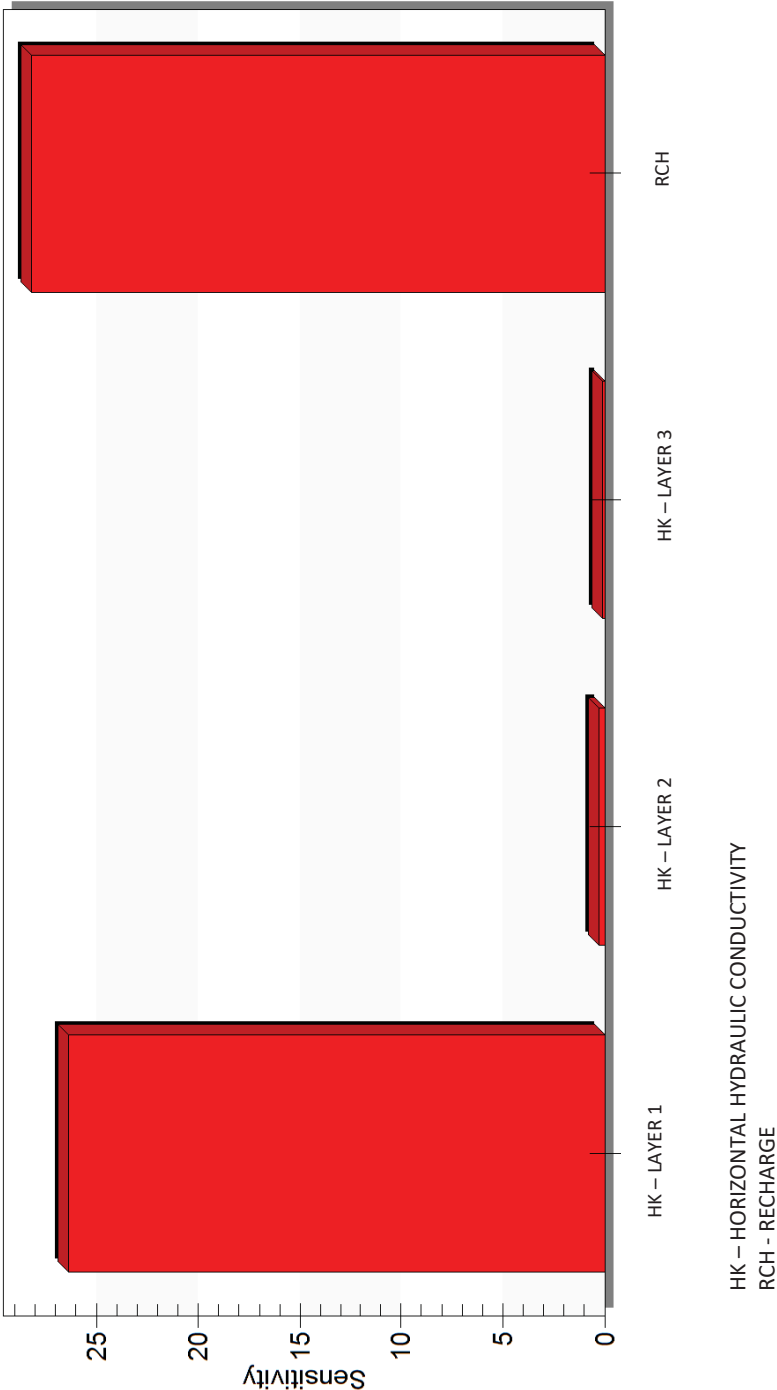


TABLE 7

Calibration (Residual Error) of Target Well Data
 SGI Charmian Facility-Proposed Northern Tract Quarry
 Blue Ridge Summit, Pennsylvania

Well ID	Computed (Simulated) Groundwater Elevation (feet/msl)	Observed Mean Groundwater Elevation (2014 Data Set) (feet-msl)	Residual Error (feet)
MW-1	1047.33	1036.09	-11.24
MW-2	1271.17	1230.25	-40.92
MW-3	1104.6	1105.90	1.30
MW-3R	1100.68	1122.09	21.41
MW-4	1172.05	1227.21	55.16
MW-4R	1248.53	1267.84	19.31
MW-5	1146.99	1135.90	-11.09
MW-6	1291.8	1315.26	23.46
MW-7	1094.59	1058.38	-36.21
MW-8S	1038	1045.75	7.75
MW-8D	1036.04	1043.69	7.65
MW-9S	984.3	983.28	-1.02
MW-9D	985.07	991.22	6.15
MW-10D	957.16	941.54	-15.62
MW-11D	1021.86	1023.09	1.23
MW-12D	1032.77	1068.52	35.75
MW-13D	1060.13	1047.59	-12.54
MW-14S	1085.45	1066.16	-19.29
MW-14D	1085.07	1058.83	-26.24

Mean Residual Error:	5.03 Feet
Absolute Mean Error:	17.58 Feet
Root Mean Square (RMS) Error:	22.75 Feet
Normalized RMS:	6.10%

TABLE 8

Flow Budget
SGI Charmian Facility - Proposed Northern Tract Quarry
Blue Ridge Summit, Pennsylvania

	Flow In (ft ³ /day)	Flow Out (ft ³ /day)
Source/Sinks		
Drains (Creeks)	0.00	25987.94
Recharge	25979.41	0.00
Total	25979.41	25987.94
% Difference		-0.0340

TABLE 9

Base Flow Stream and Wetland Loss Volumes
SGI Charmian Facility - Proposed Northern Tract Quarry
Blue Ridge Summit, Pennsylvania

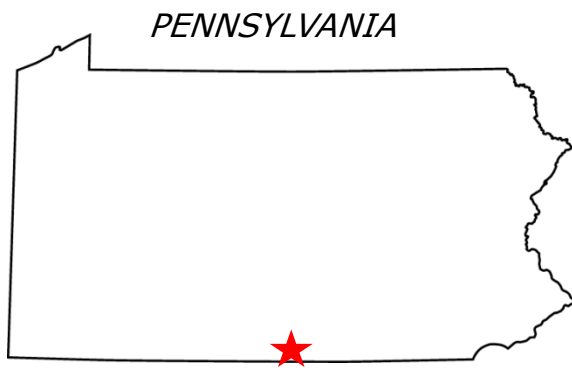
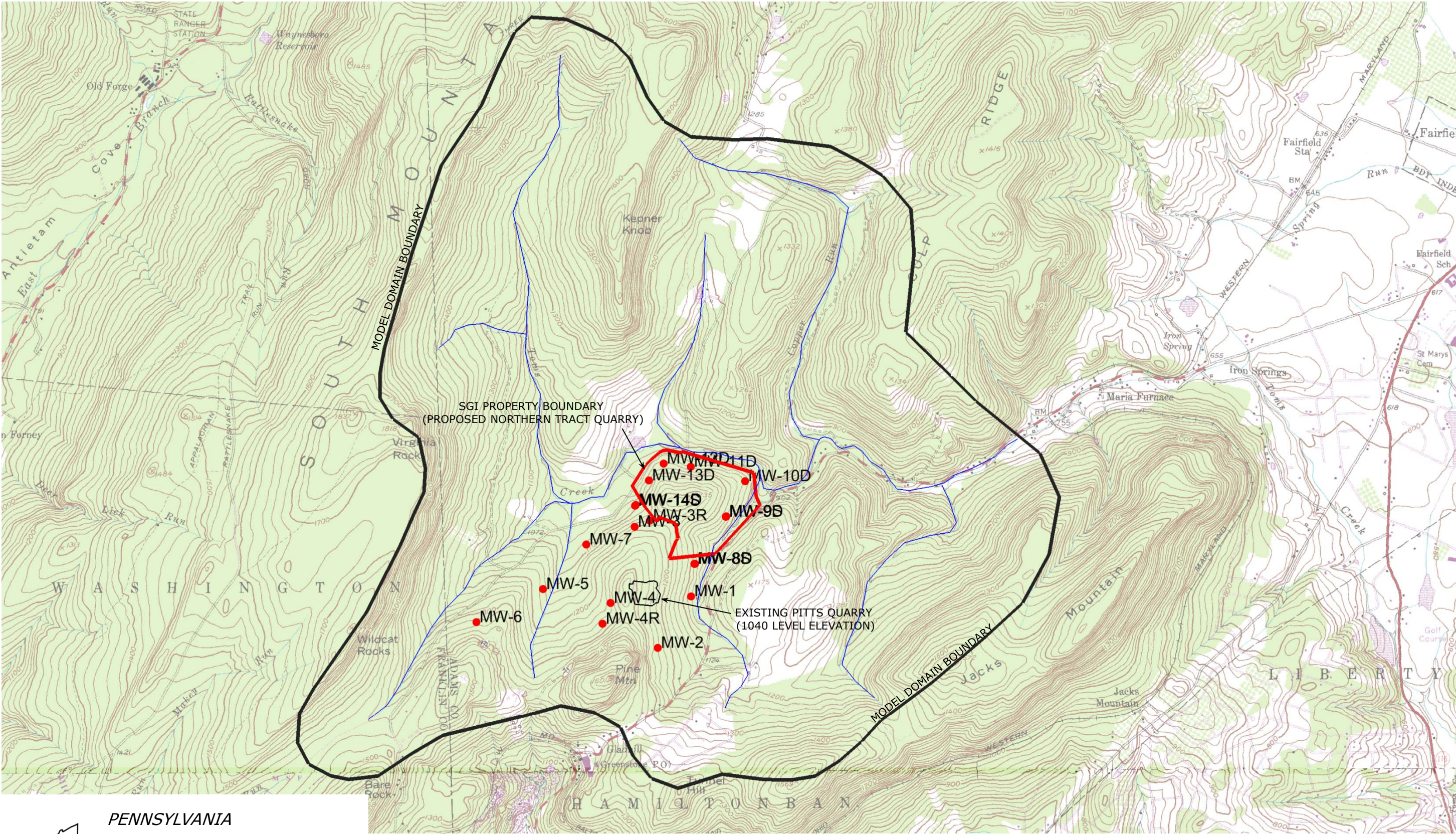
	Existing Conditions Base Flow Volume (Model Calibration) (feet ³ /day)	Existing Conditions Base Flow Loss (Model Calibration) (feet ³ /day)	No Quarry Pumping Base Flow Volume (feet ³ /day)	No Quarry Pumping Base Flow Loss (feet ³ /day)	4th Level Elevation 1140 ft-amsl Base Flow Volume (feet ³ /day)	4th Level Elevation 1140 ft-amsl Base Flow Loss (feet ³ /day)	5th Level Elevation 1090 ft-amsl Base Flow Volume (feet ³ /day)	5th Level Elevation 1090 ft-amsl Base Flow Loss (feet ³ /day)	6th Level Elevation 1040 ft-amsl Base Flow Volume (feet ³ /day)	6th Level Elevation 1040 ft-amsl Base Flow Loss (feet ³ /day)	7th Level Elevation 990 ft-amsl Base Flow Volume (feet ³ /day)	7th Level Elevation 990 ft-amsl Base Flow Loss (feet ³ /day)
Stream Reach A	2117	406	2523	0	2507	16	2440	83	2328	195	2205	318
Stream Reach B	576	13	589	0	587	2	569	20	537	52	465	124
Stream Reach C	2463	609	3072	0	3052	20	2969	103	2847	225	2701	371
Delineated Wetland Area A	25	0	25	0	25	0	25	23	23	2	22	3
Delineated Wetland Area B	40	0	40	0	40	0	38	2	35	5	30	10
Delineated Wetland Area C	28	0	28	0	28	0	26	2	24	4	20	8
Delineated Wetland Area D	107	19	126	0	125	1	113	13	96	30	73	53
Delineated Wetland Area E	28	0	28	0	27	1	25	3	21	7	16	12
Wetland Seep Area 1	721	91	812	0	806	6	765	47	689	123	589	223
Wetland Seep Area 2	48	0	48	0	48	0	47	1	47	1	45	3
Wetland Seep Area 3	20	0	20	0	19	1	18	2	18	2	16	4
Wetland Seep Area 4	23	0	23	0	22	1	22	1	21	2	19	4
National Wetland Area	235	20	255	0	254	1	247	8	231	24	203	52
N.T. Quarry Discharge (ft ³ /day)	0	0	0	0	36	36	208	208	421	421	914	914

	8th Level Elevation 940 ft-amsl Base Flow Volume (feet ³ /day)	8th Level Elevation 940 ft-amsl Base Flow Loss (feet ³ /day)	9th Level Elevation 890 ft-amsl Base Flow Volume (feet ³ /day)	9th Level Elevation 890 ft-amsl Base Flow Loss (feet ³ /day)	10th Level Elevation 840 ft-amsl Base Flow Volume (feet ³ /day)	10th Level Elevation 840 ft-amsl Base Flow Loss (feet ³ /day)	11th Level Elevation 790 ft-amsl Base Flow Volume (feet ³ /day)	11th Level Elevation 790 ft-amsl Base Flow Loss (feet ³ /day)	12th Level Elevation 740 ft-amsl Base Flow Volume (feet ³ /day)	12th Level Elevation 740 ft-amsl Base Flow Loss (feet ³ /day)
Stream Reach A	2126	397	2072	451	2038	485	2021	502	2014	509
Stream Reach B	323	266	219	370	171	418	133	456	112	477
Stream Reach C	2572	500	2449	623	2389	683	2368	704	2349	723
Delineated Wetland Area A	19	6	14	11	12	13	11	14	10	15
Delineated Wetland Area B	23	17	17	23	12	28	11	29	10	30
Delineated Wetland Area C	15	13	14	14	10	18	10	18	10	18
Delineated Wetland Area D	56	70	43	83	37	89	36	90	35	91
Delineated Wetland Area E	9	19	6	22	4	24	3	25	2	26
Wetland Seep Area 1	520	292	475	337	447	365	433	379	428	384
Wetland Seep Area 2	40	8	35	13	33	15	32	16	31	17
Wetland Seep Area 3	11	9	7	13	5	15	4	16	3	17
Wetland Seep Area 4	14	9	8	15	6	17	5	18	4	19
National Wetland Area	183	72	168	87	157	98	151	104	148	107
N.T. Quarry Discharge (ft ³ /day)	1252	1252	1538	1538	1632	1632	1729	1729	1749	1749

NOTES:

- The *Existing Condition* is the simulation used to calibrate the model in which the Pitts Quarry was mined to a depth of 1040 ft-amsl and is actively pumping 711 cubic feet of water per day (3.7 gpm) .
- The *No Quarry Pumping* simulation, neither the Pitts Quarry or the Northern Tract Quarry is actively pumping.
- Base flow volumes are base flow from groundwater only and do not include stream flow volumes from surface runoff or other surface discharge. Comparisons for flow loss were made to the No Quarry Pumping simulation that allows the total flow loss from the quarry to be calculated (worst-case scenario).
- The 4th Level (elevation 1140 ft-amsl) is the first level to penetrate the groundwater surface at the Northern Tract Quarry.
- ft-amsl - Feet Above Mean Sea Level. N.T. - Northern Tract

FIGURES



EXPLANATION

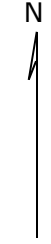
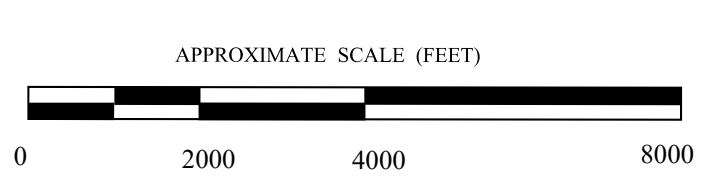
MONITORING WELL LOCATION

SURFACE WATER STREAM

- NOTES
1.

BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE MAP.
2.

NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).



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SITE LOCATION MAP

(USGS TOPOGRAPHIC QUADRANGLE CONTOUR BASE MAP)

PROJECT LOCATION

SGI CHARMIAN FACILITY

PROPOSED NORTHERN TRACT QUARRY

BLUE RIDGE SUMMIT, PENNSYLVANIA

DRAWN BY

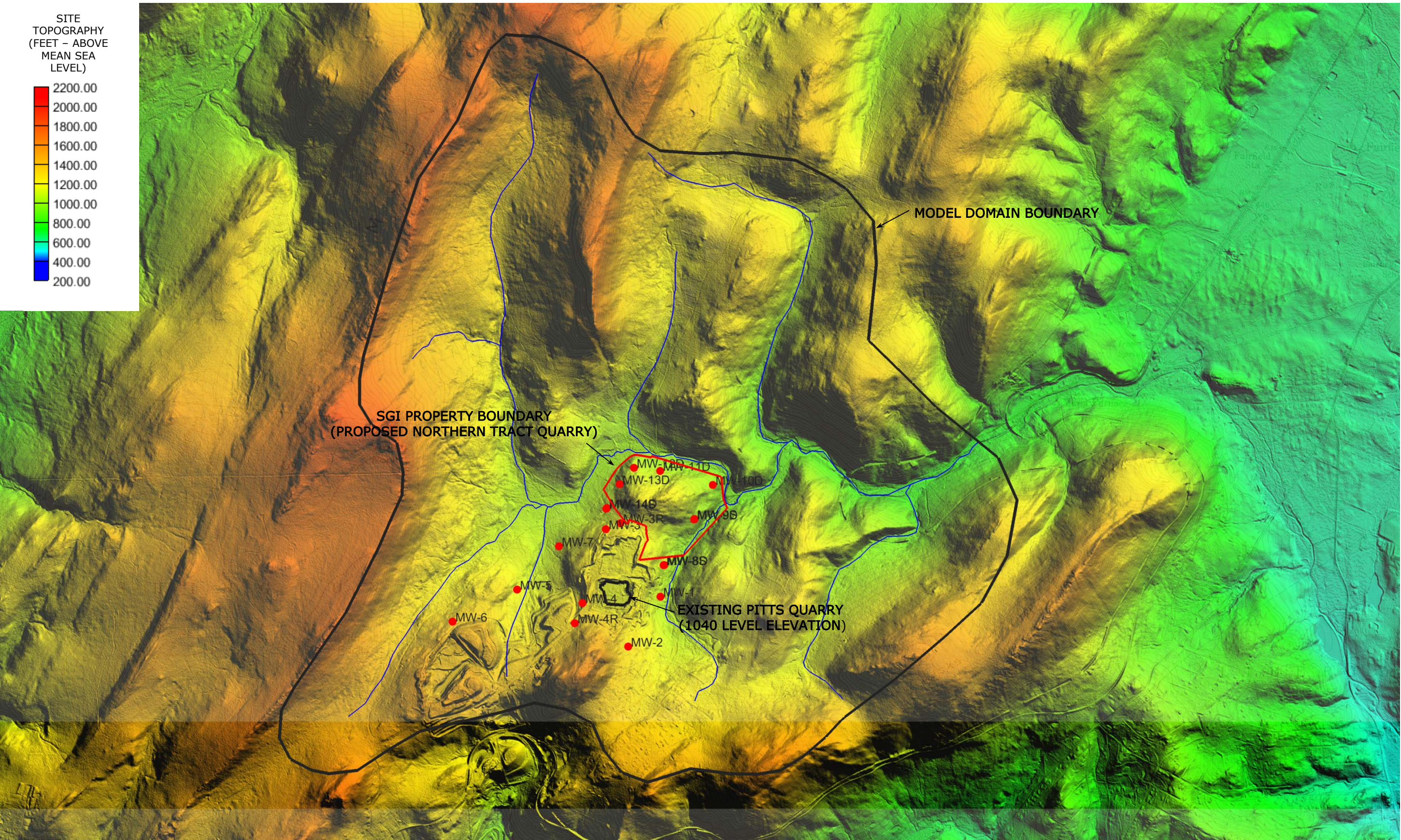
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DATE

12-12-17

FIGURE NUMBER

1



SITE
TOPOGRAPHY
(FEET - ABOVE
MEAN SEA
LEVEL)

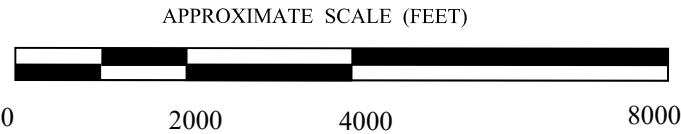
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NOTES:

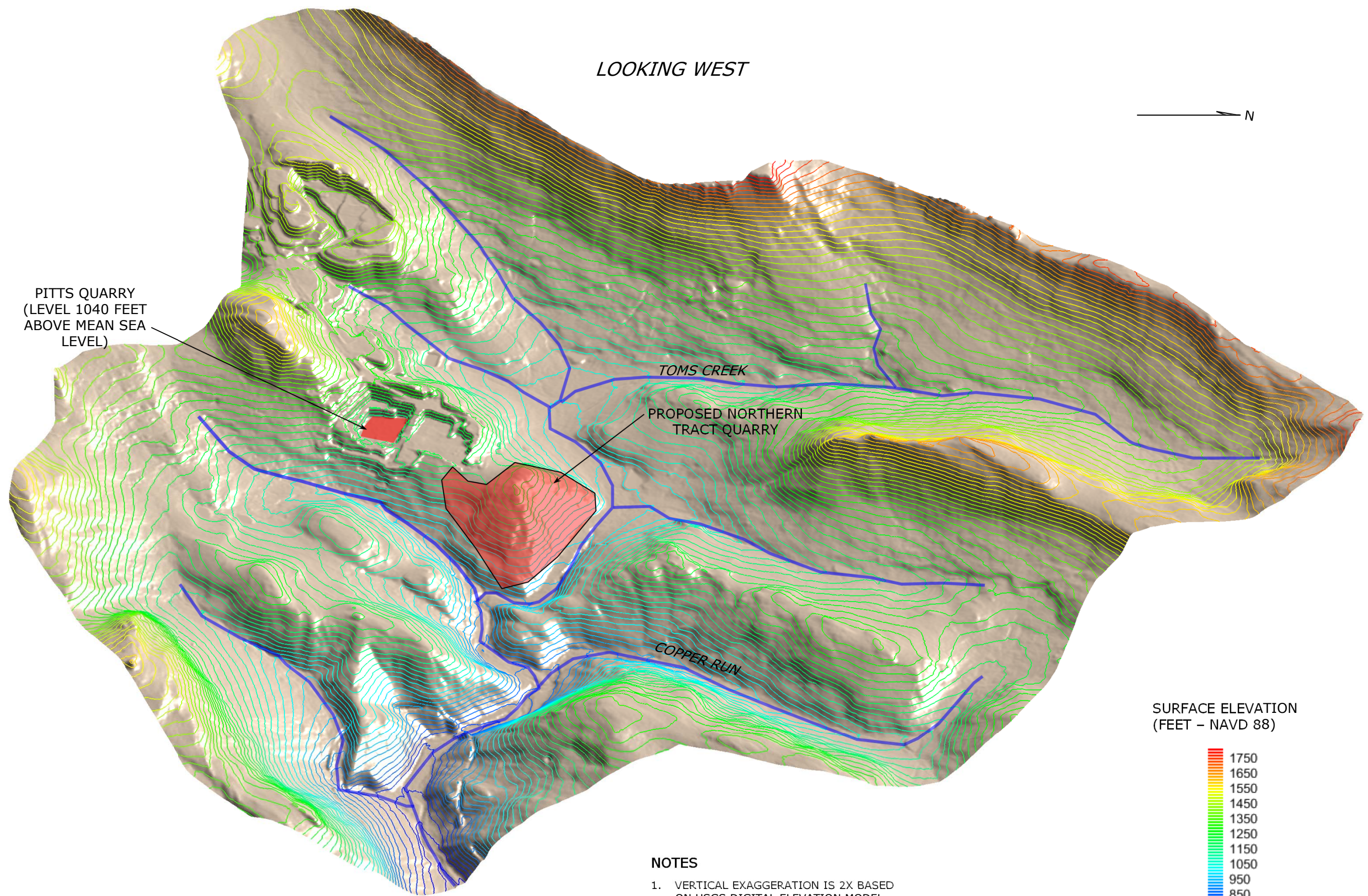
1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE DIGITAL ELEVATION MODEL (DEM) DATA (3-METER).
2. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

- MONITORING WELL LOCATION
- SURFACE WATER STREAM



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	SITE LOCATION MAP (DIGITAL ELEVATION BASE MAP)	
PROJECT LOCATION SGI CHARMIAN FACILITY PROPOSED NORTHERN TRACT QUARRY BLUE RIDGE SUMMIT, PENNSYLVANIA	DRAWN BY VFB	DATE 12-12-17
FIGURE NUMBER 2		



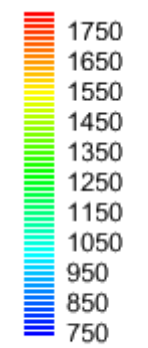
PITTS QUARRY
(LEVEL 1040 FEET
ABOVE MEAN SEA
LEVEL)

TOMS CREEK

PROPOSED NORTHERN
TRACT QUARRY


COPPER RUN

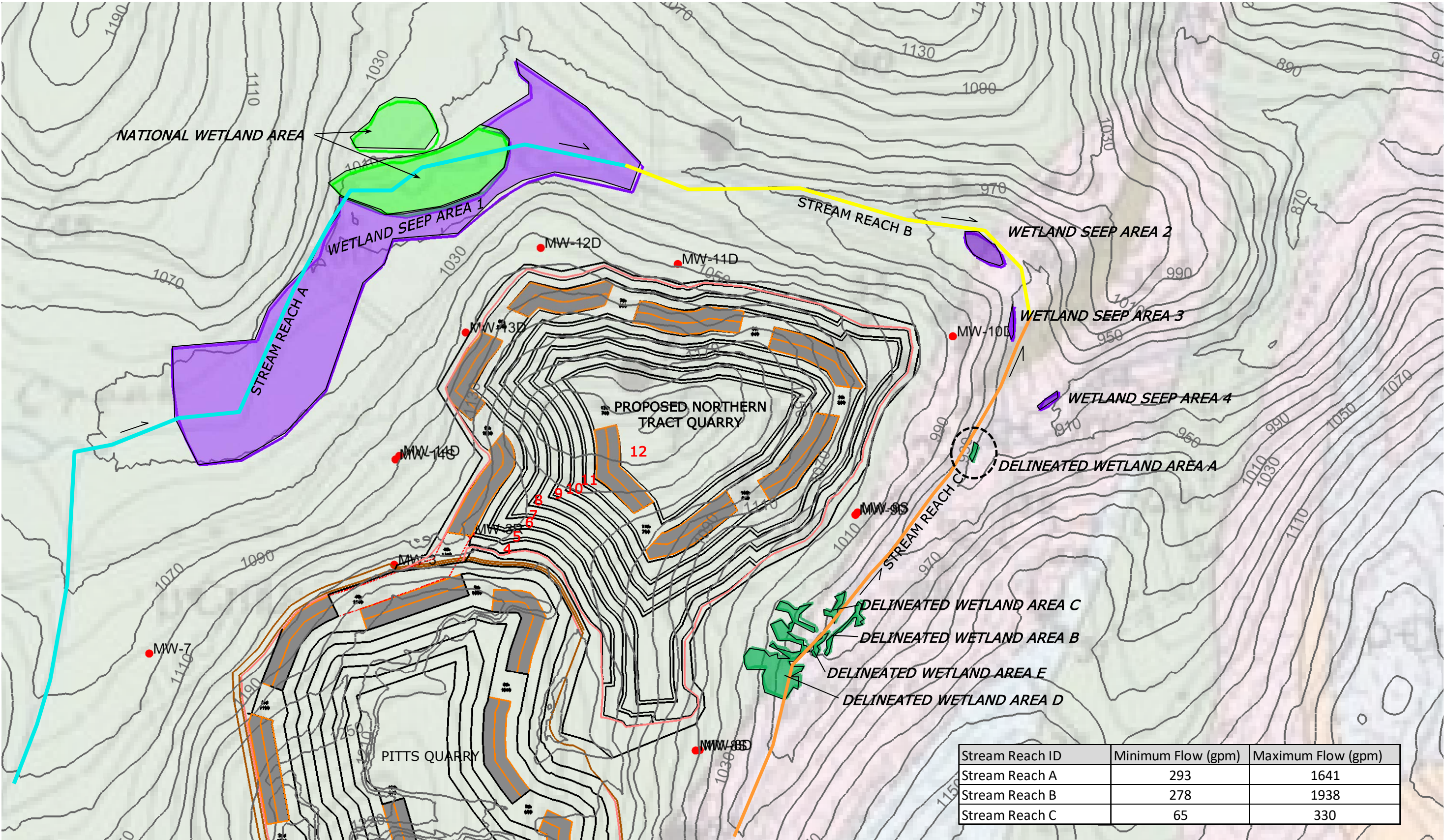
SURFACE ELEVATION
(FEET - NAVD 88)



NOTES

- 1. VERTICAL EXAGGERATION IS 2X BASED ON USGS DIGITAL ELEVATION MODEL DATA (3-METER).

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THREE-DIMENSIONAL MODEL DOMAIN		
PROJECT LOCATION SGI CHARMIAN FACILITY PROPOSED NORTHERN TRACT QUARRY BLUE RIDGE SUMMIT, PENNSYLVANIA	DRAWN BY VFB	DATE 12-12-17
	FIGURE NUMBER 3	



NOTES

- 1. GEOLOGY BASE MAP (FAUTH, J.L., 1978, PLATE 1).
- 2. TOPOGRAPHIC CONTOURS FROM USGS TOPOGRAPHIC DEM DATA (3 METER).
- 3. STREAM REACH FLOW RATES ARE BASED ON STREAM FLOW MEASUREMENTS PROVIDED BY SKELLY AND LOY.
- 4. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

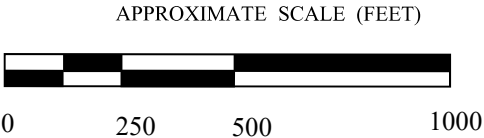
EXPLANATION

- DELINEATED WETLAND AREA
- WETLAND SEEP AREA
- NATIONAL WETLAND AREA
- 12 PROPOSED QUARRY LEVEL

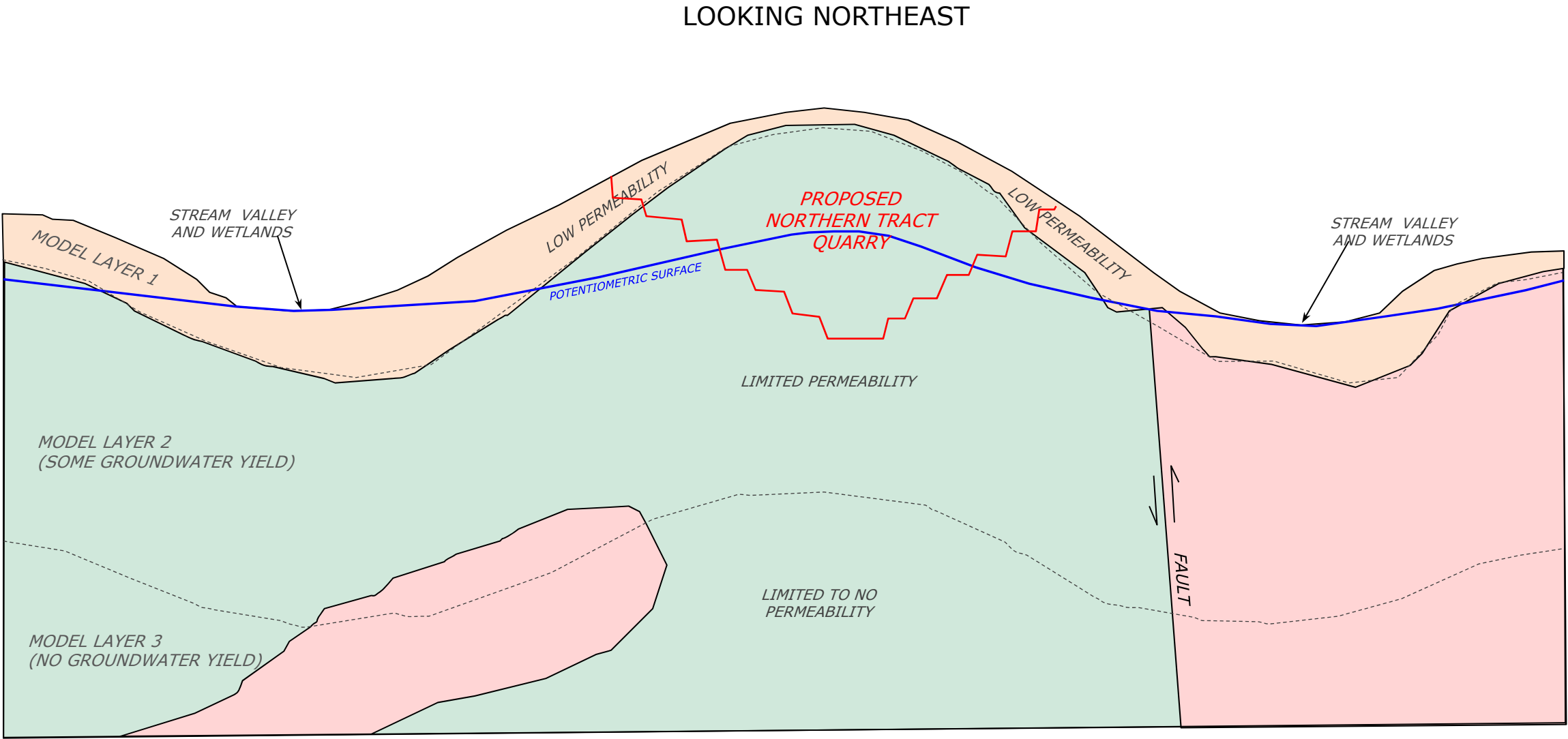


- MONITORING WELL LOCATION
- STREAM REACH A
- STREAM REACH B
- STREAM REACH C

Stream Reach ID	Minimum Flow (gpm)	Maximum Flow (gpm)
Stream Reach A	293	1641
Stream Reach B	278	1938
Stream Reach C	65	330






GENERAL SITE LAYOUT
AND HYDROGEOLOGIC FEATURES

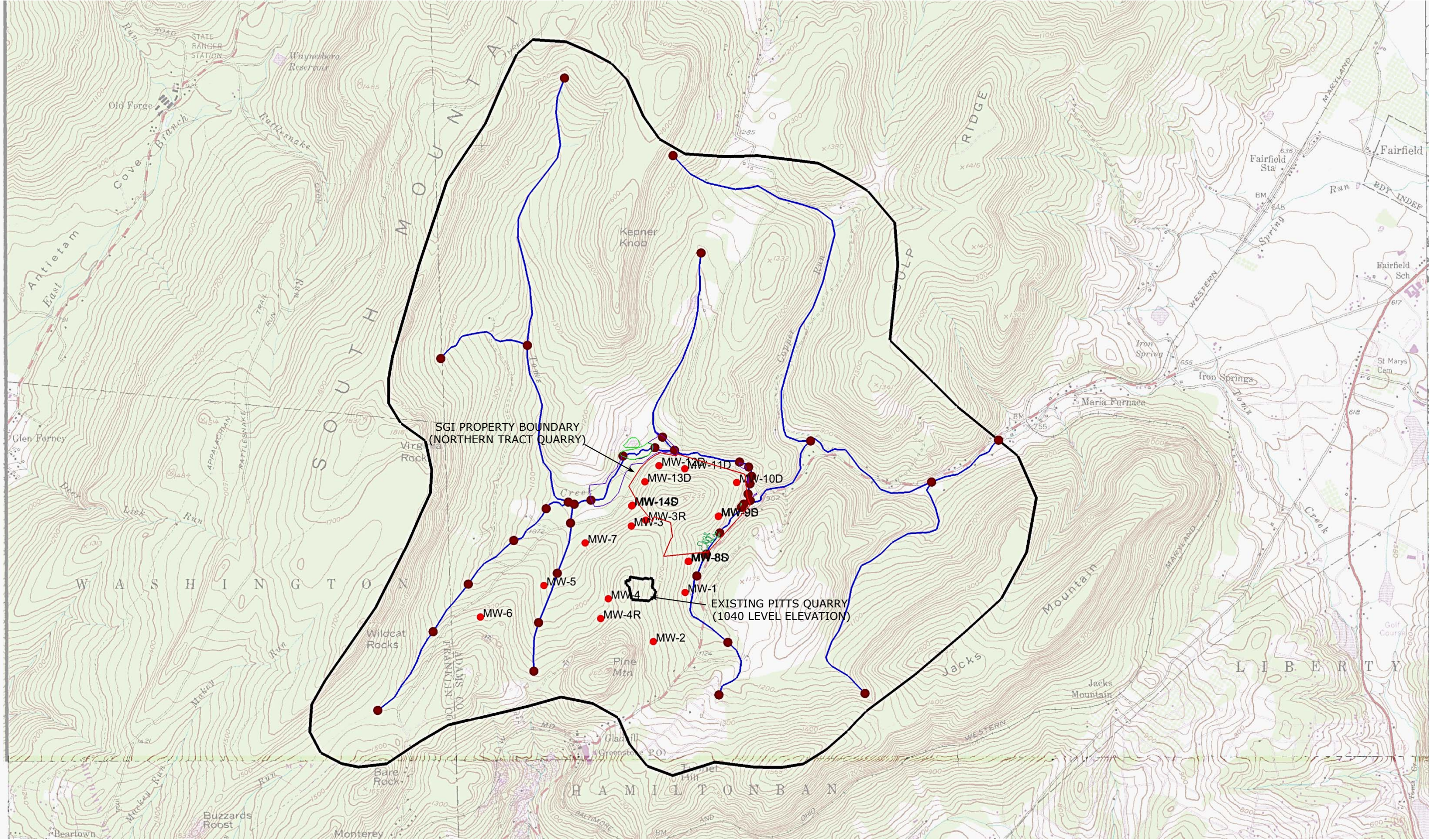


NOTES

1. DRAWING IS A SCHEMATIC AND IS NOT TO SCALE.
2. CONCEPTUAL MODEL IS BASED ON SITE SPECIFIC DATA AND REGIONAL CHARACTERISTICS PROVIDED IN PUBLICATION DATA .
3. LAYER DESIGNATIONS ARE ASSOCIATED WITH MODEL CONSTRUCTION DISCUSSED IN SECTION 2.0 OF REPORT.

EXPLANATION

- | | |
|---|---|
|  | SOIL/WEATHERED ZONE (SAPROLITIC CAP ROCK) |
|  | PRECAMBRIAN AGE METABASALT |
|  | PRECAMBRIAN AGE METARHYOLITE |



NOTES

- 1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE MAP.
- 2. NODAL ELEVATION VALUES WERE BASED ON THE TOPOGRAPHIC ELEVATION AT THE NODE LOCATION AND TWO FEET WAS SUBTRACTED FOR THE FINAL NODAL ELEVATION. THIS REPRESENTS THE BOTTOM OF THE STREAM BED MATERIAL.

EXPLANATION

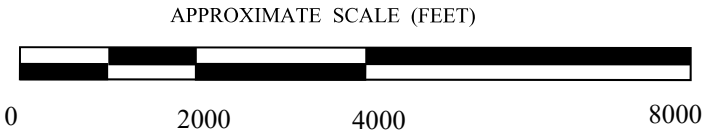
BOUNDARY CONDITIONS

DRAIN

NO FLOW

NODAL ELEVATION

MONITORING WELL LOCATION



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ENVIRONMENTAL AND HYDROGEOLOGIC CONSULTING

326 Conestoga Road Wayne, PA 19087
610-964-1462
val@vbritton.com www.vbritton.com

GENERAL MODEL CONSTRUCTION
BOUNDARY CONDITIONS

PROJECT LOCATION

SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

DRAWN BY

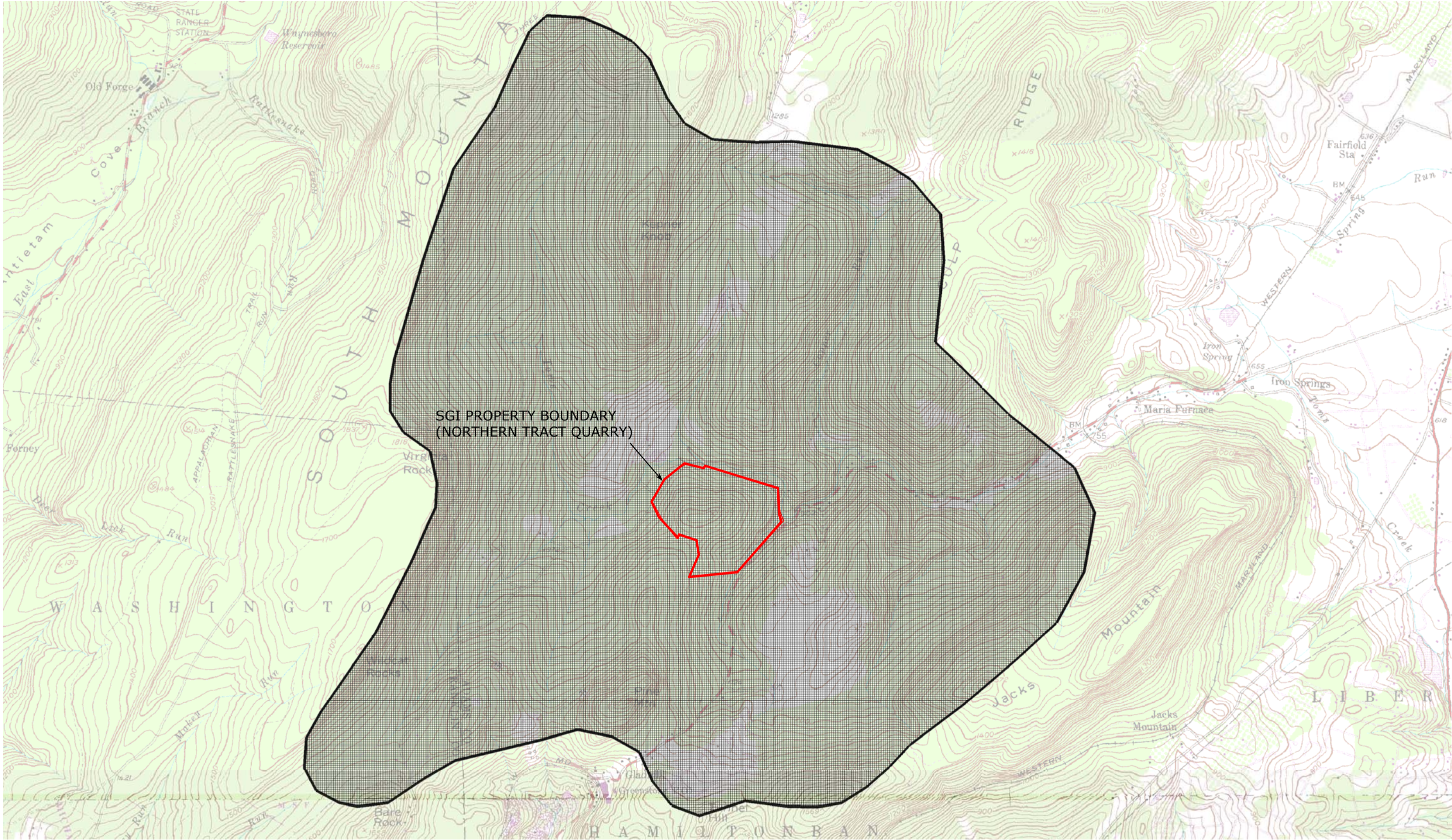
VFB

DATE

12-12-17

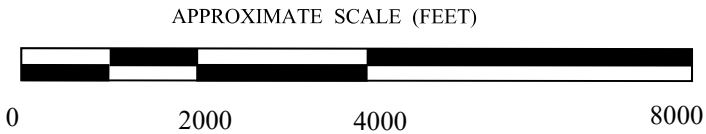
FIGURE NUMBER

7



NOTES

1. NO SPECIFIC PREFERENTIAL FLOW DIRECTIONS WERE IDENTIFIED EITHER THROUGH PUBLISHED DATA OR BASED ON SITE-SPECIFIC DATA. THEREFORE THE GRID WAS ORIENTATED NORTH TO SOUTH.
2. GRID DIMENSION OVER ENTIRE MODEL DOMAIN IS 50 FEET BY 50 FEET.



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GENERAL MODEL CONSTRUCTION MODEL GRID			
PROJECT LOCATION SGI CHARMIAN FACILITY PROPOSED NORTHERN TRACT QUARRY BLUE RIDGE SUMMIT, PENNSYLVANIA		DRAWN BY VFB	DATE 12-12-17
FIGURE NUMBER 8			

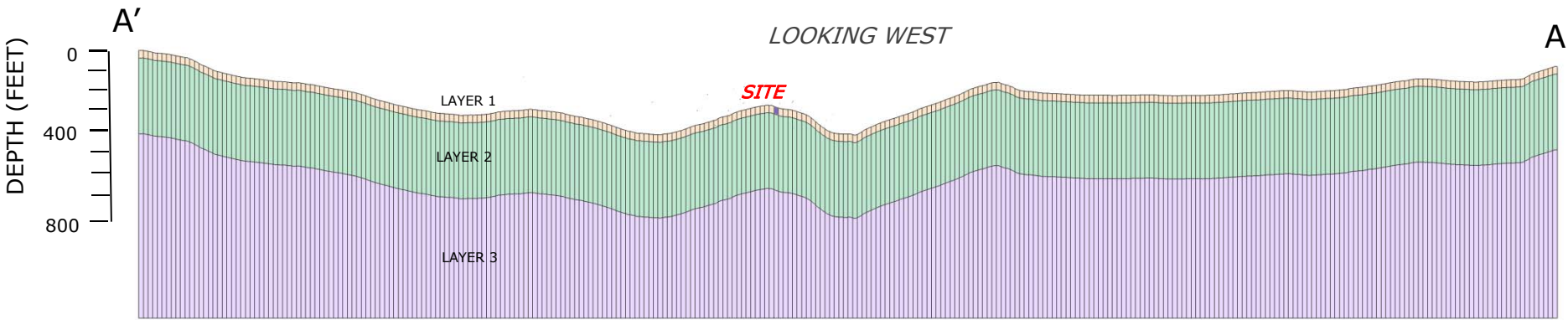
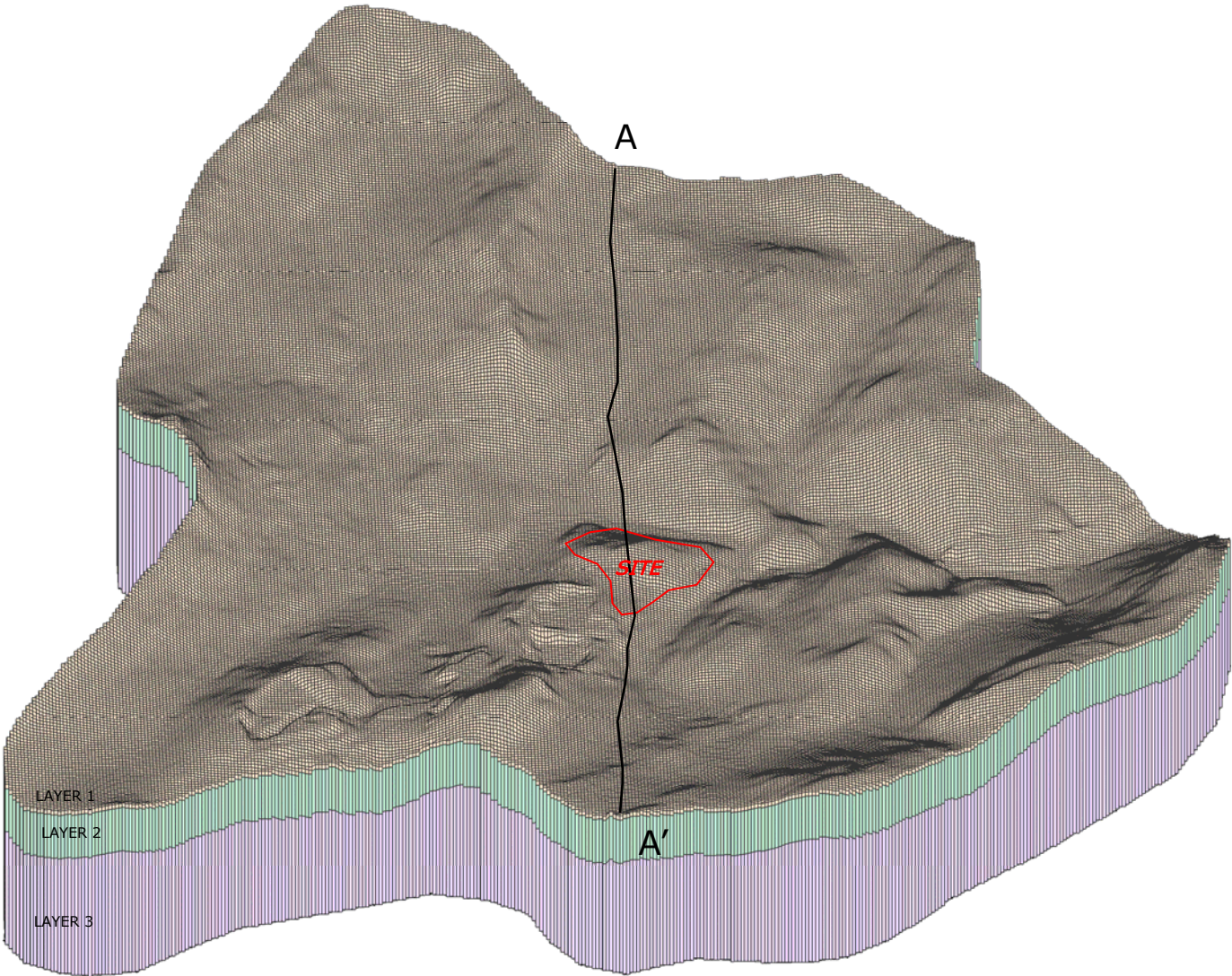
EXPLANATION

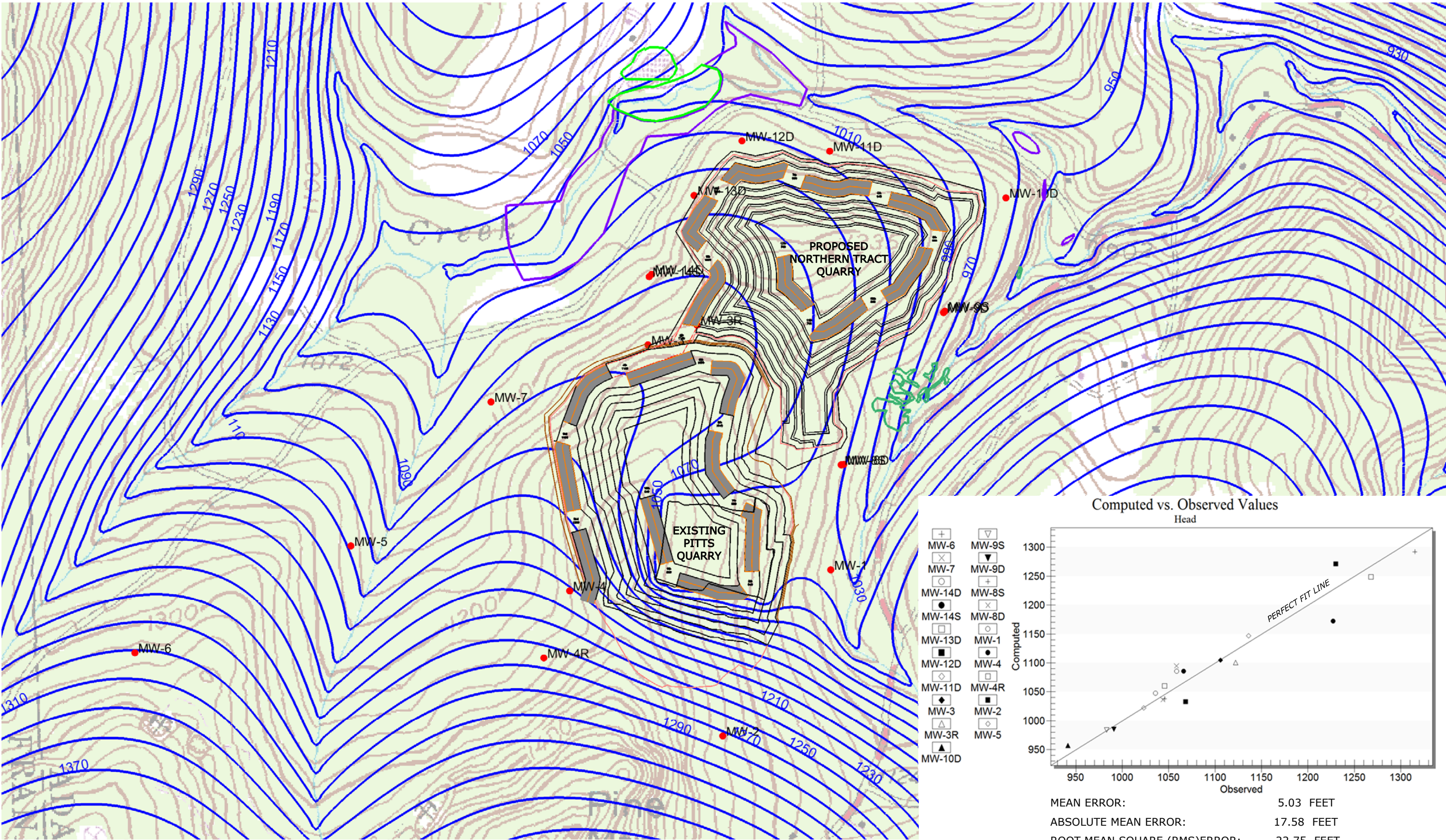
HYDROGEOLOGIC ZONES

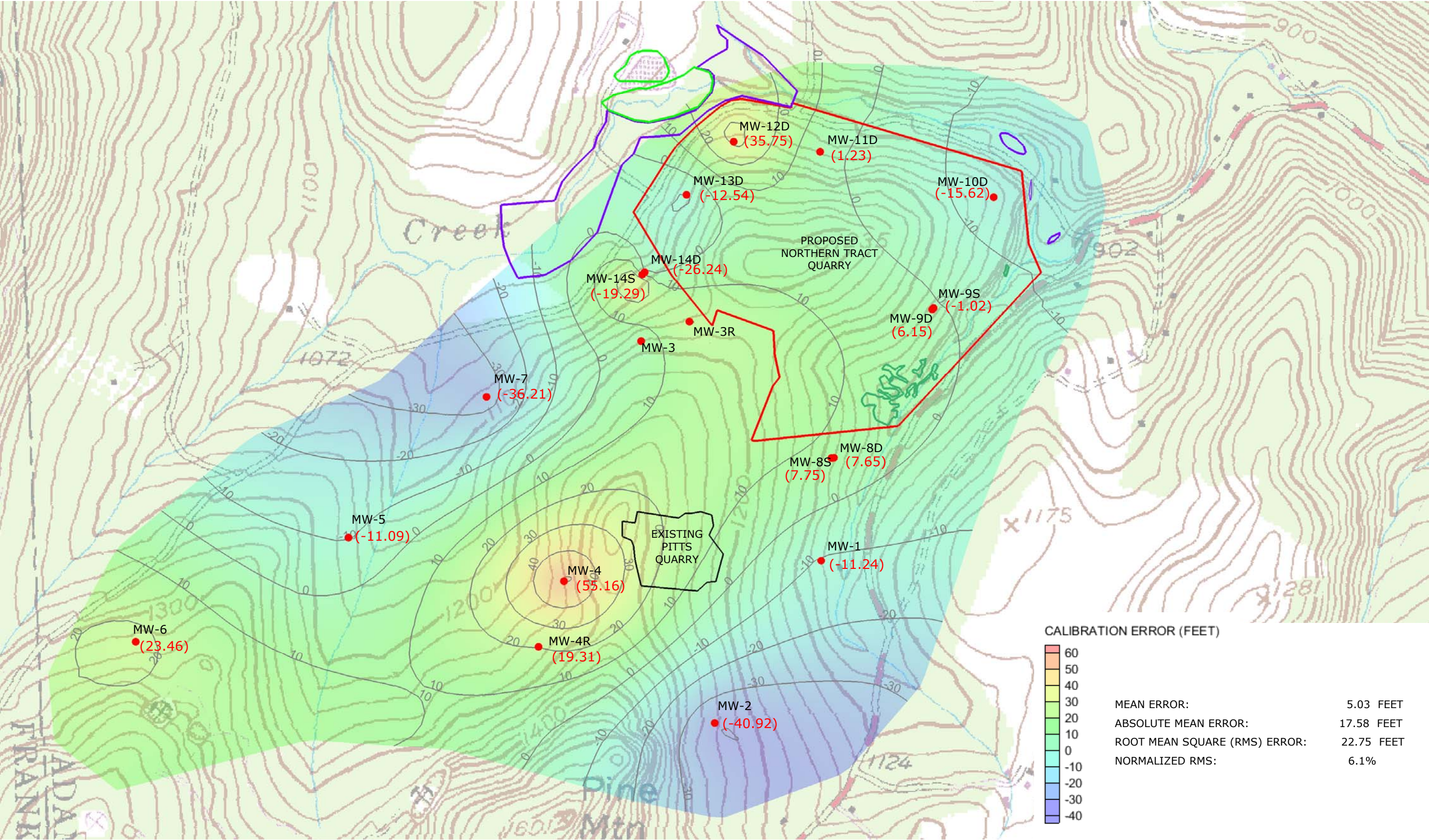
- OVERBURDEN /SAPROLITIC CAP ROCK (LIMITED PERMEABILITY)
- BEDROCK (LIMITED PERMEABILITY)
- BEDROCK (NO PERMEABILITY)

NOTES

1. VERTICAL EXAGGERATION IS 2X.
2. SEE TABLE 5 FOR HYDRAULIC PARAMETERS ASSIGNED TO MODEL LAYERS.







NOTES

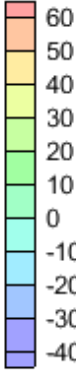
1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. RESIDUAL ERROR FOR EACH WELL IS PROVIDED ON TABLE 7.
3. NEGATIVE RESIDUAL CALIBRATION ERROR VALUE INDICATES CALIBRATED WATER LEVEL IS BELOW OBSERVED TARGET VALUE. POSITIVE RESIDUAL CALIBRATION ERROR VALUE INDICATES CALIBRATED WATER LEVEL IS ABOVE OBSERVED TARGET VALUE.

EXPLANATION

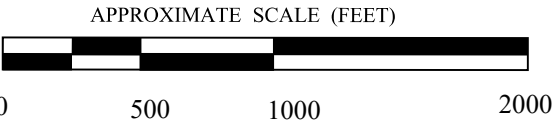
- MONITORING LOCATION (CALIBRATION TARGET)
- (1.23) RESIDUAL CALIBRATION ERROR (FEET)
- 10 RESIDUAL CALIBRATION ERROR CONTOUR (FEET)

- DELINEATED WETLAND AREA
- WETLAND SEEP AREA
- NATIONAL WETLAND AREA

CALIBRATION ERROR (FEET)



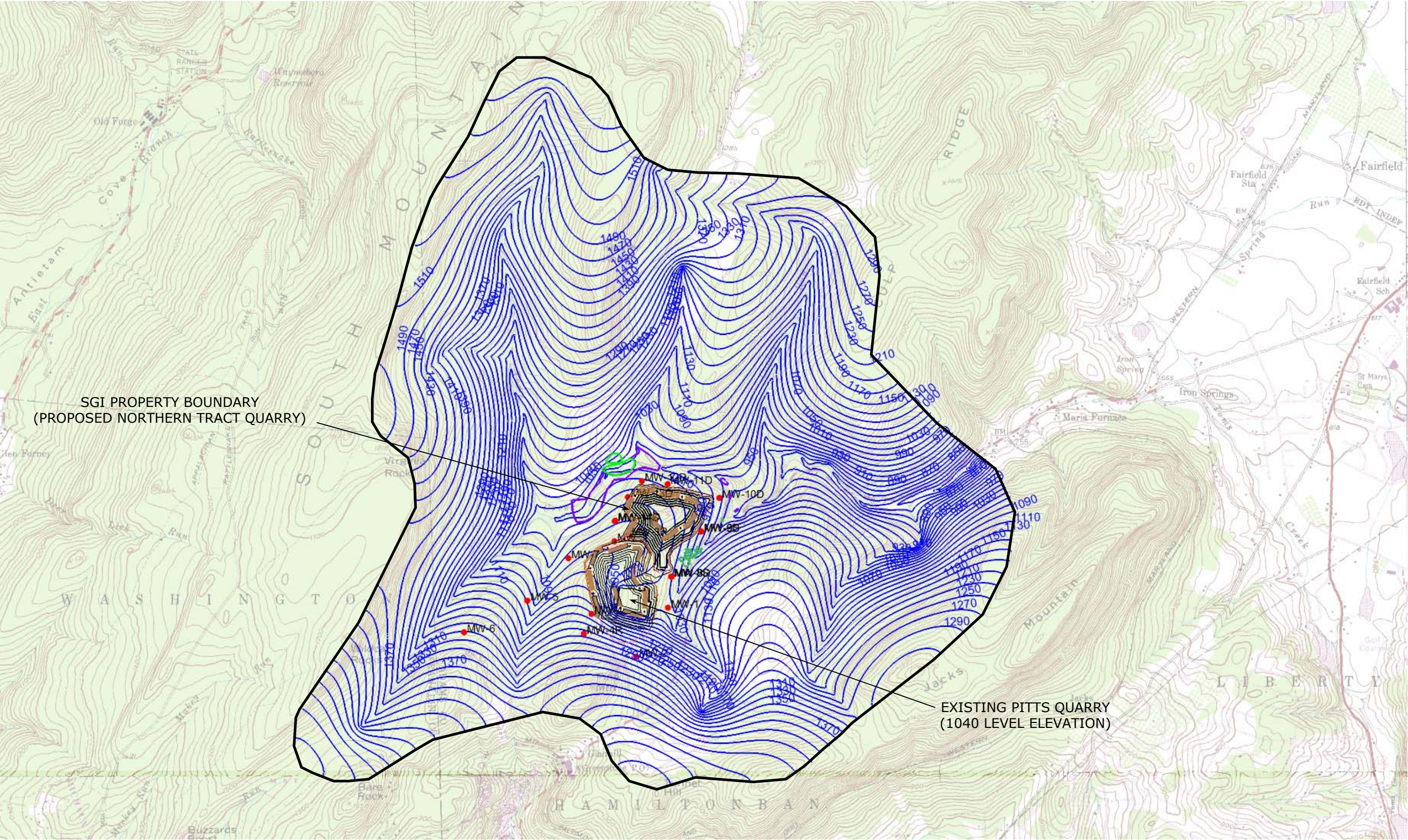
MEAN ERROR:	5.03 FEET
ABSOLUTE MEAN ERROR:	17.58 FEET
ROOT MEAN SQUARE (RMS) ERROR:	22.75 FEET
NORMALIZED RMS:	6.1%



CALIBRATION - REGIONAL
DISTRIBUTION OF RESIDUAL ERROR

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

FIGURE NUMBER

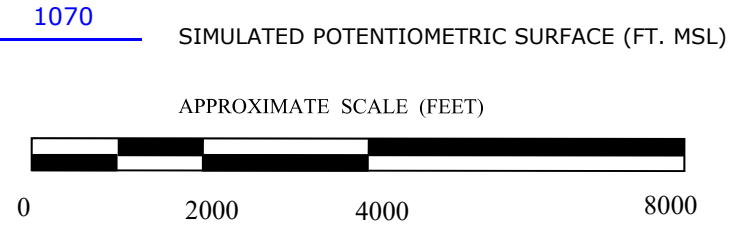


NOTES

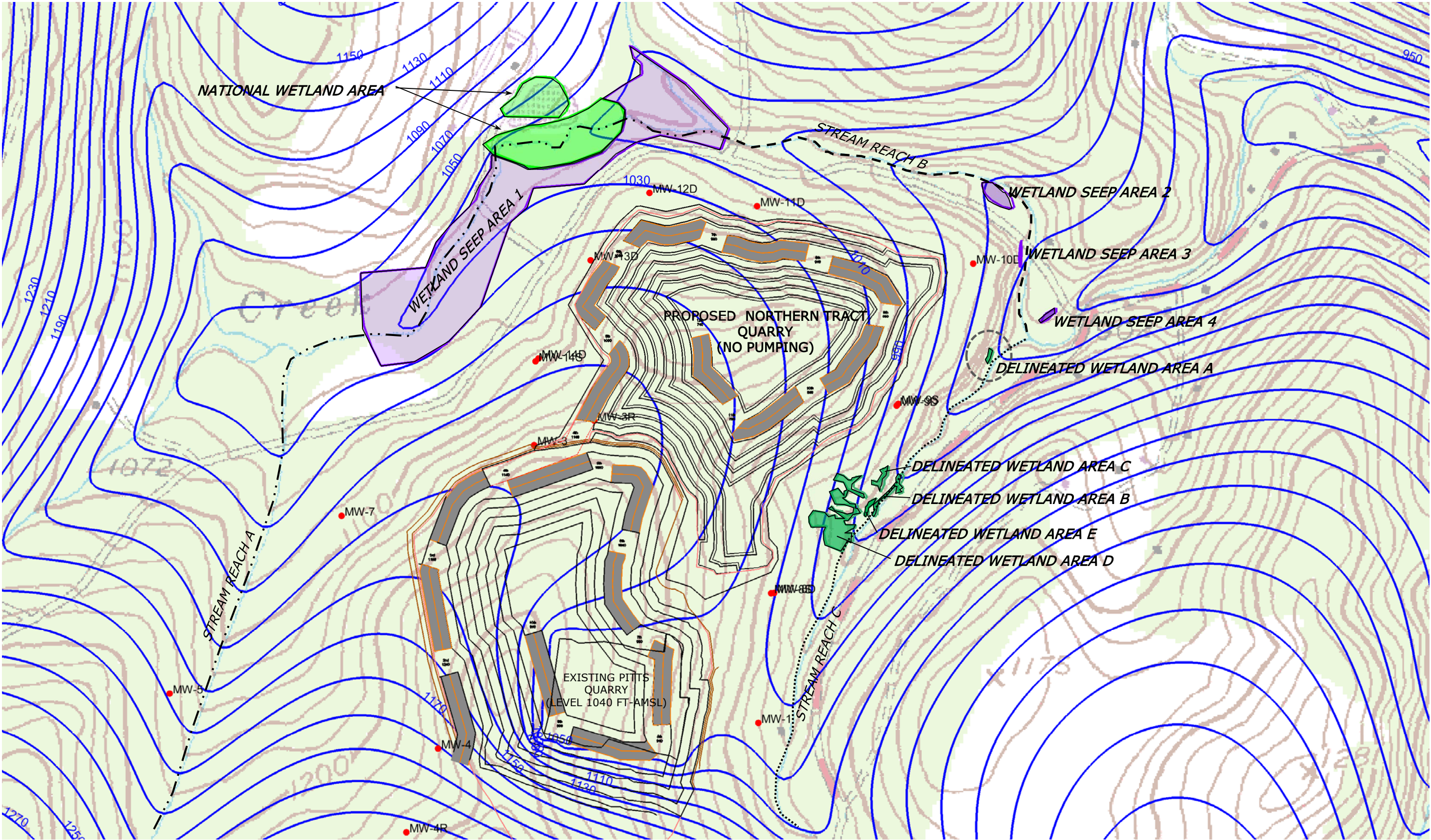
- 1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
- 2. EXISTING PITTS QUARRY IS ACTIVELY PUMPING AT FLOOR LEVEL ELEVATION 1040 FEET MSL (SIMULATED).
- 3. ANTICIPATED LEVEL CONFIGURATION WAS PROVIDED BY SKELLY AND LOY, INC.
- 4. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING LOCATION



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REGIONAL SIMULATED EXISTING CONDITIONS POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP			
PROJECT LOCATION SGI CHARMIAN FACILITY PROPOSED NORTHERN TRACT QUARRY BLUE RIDGE SUMMIT, PENNSYLVANIA		DRAWN BY VFB	DATE 12-12-17
FIGURE NUMBER		12	



NOTES

- 1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
- 2. EXISTING PITTS QUARRY IS ACTIVELY PUMPING AT LEVEL 1040 FT-AMSL. (SIMULATED)
- 3. NORTHERN TRACT QUARRY HAS NO ACTIVE PUMPING.
- 4. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
- 5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

1070 SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000



SITE AREA
SIMULATED EXISTING SITE
CONDITIONS
POTENTIOMETRIC GROUNDWATER
ELEVATION CONTOUR MAP

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

DRAWN BY VFB DATE 12-12-17

FIGURE NUMBER

13

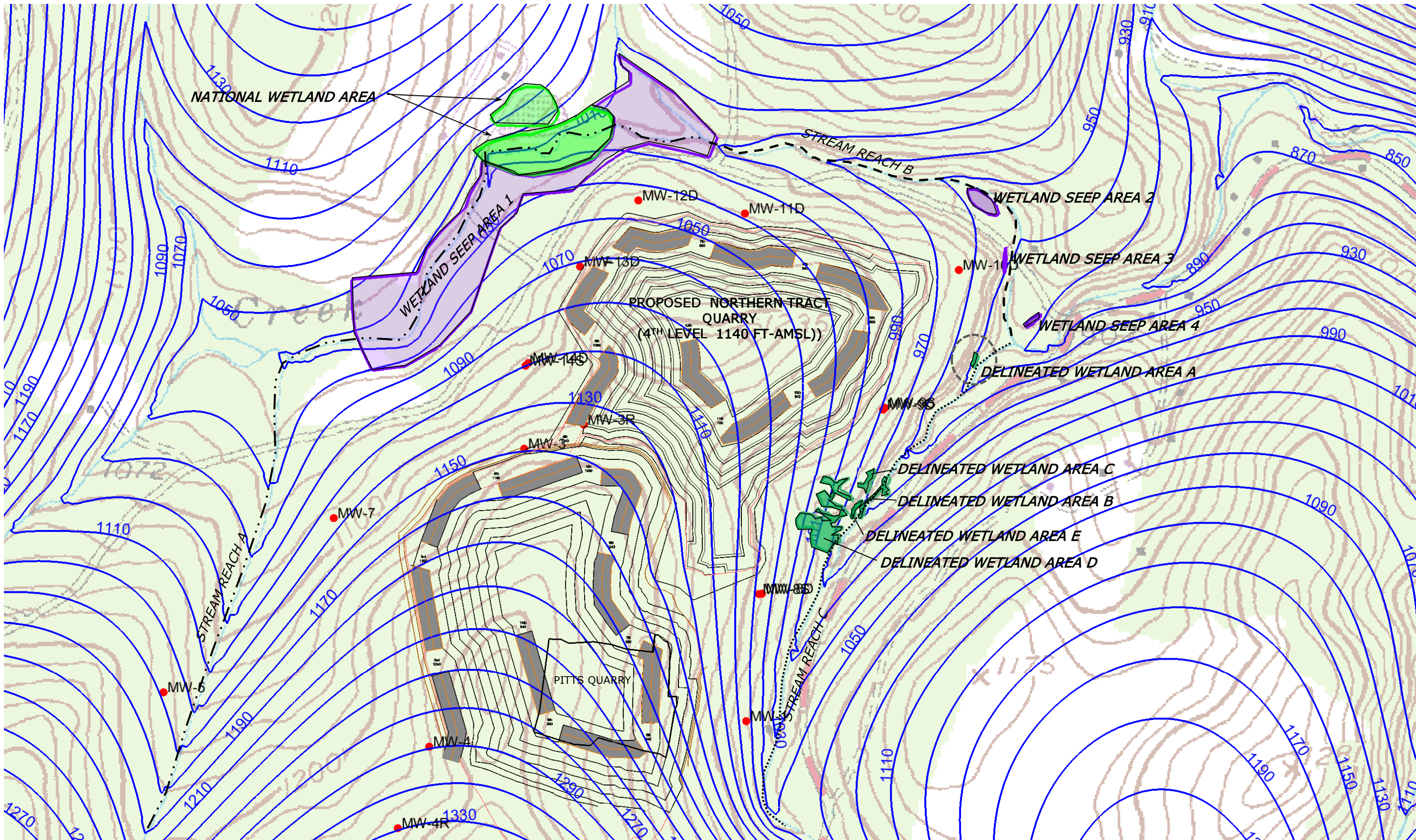
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NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 4TH LEVEL AT 36 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

1070 SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000

N

PROJECT LOCATION

SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

SITE AREA

SIMULATED 4TH LEVEL (1140 FT-AMSL)
POTENTIOMETRIC GROUNDWATER
ELEVATION CONTOUR MAP

V.F. Britton Group, LLC

ENVIRONMENTAL AND HYDROGEOLOGIC CONSULTING

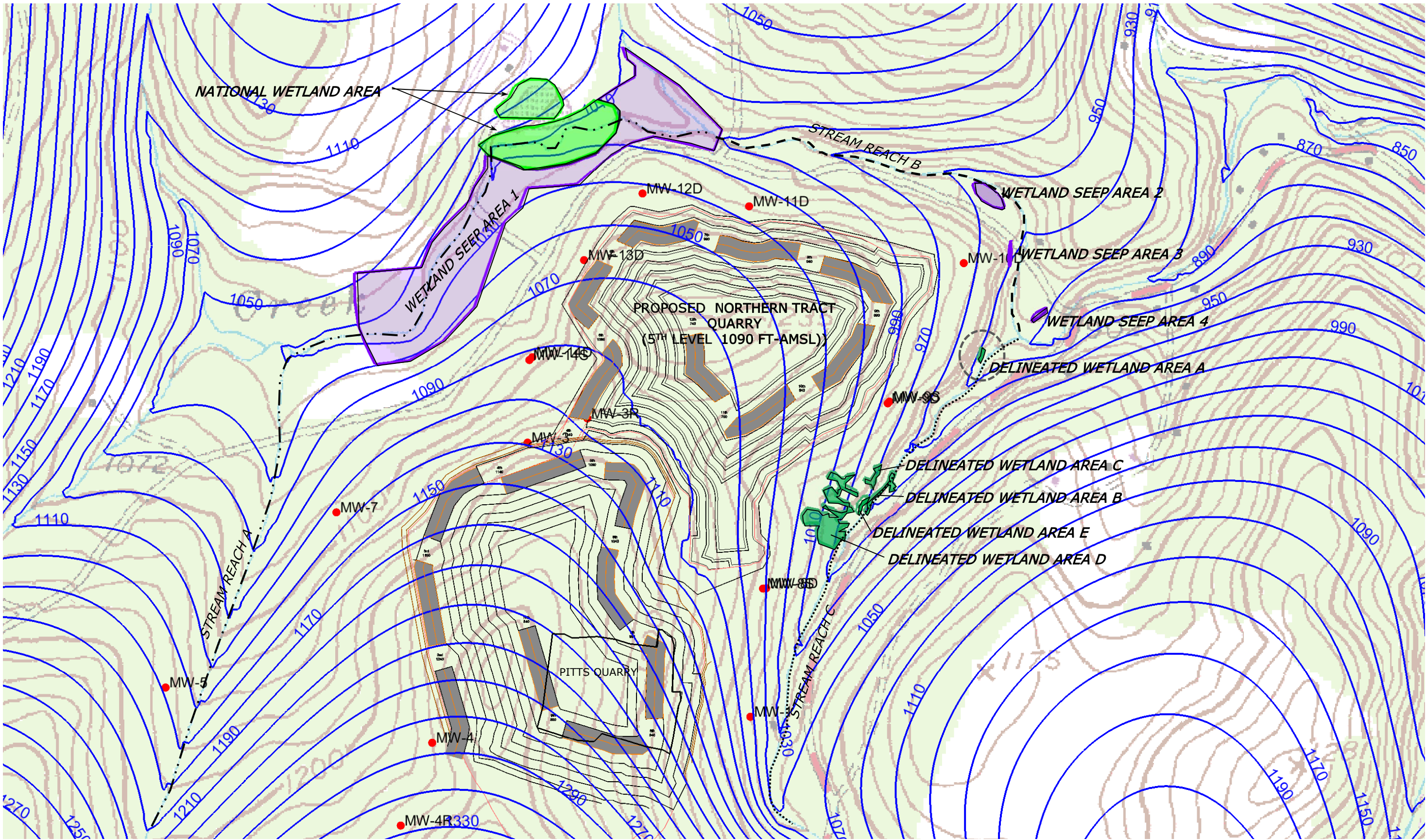
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FIGURE NUMBER

15



NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 5TH LEVEL AT 208 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

1070 SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000

N

PROJECT LOCATION

SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

SITE AREA

SIMULATED 5TH LEVEL (1090 FT-AMSL)
POTENTIOMETRIC GROUNDWATER
ELEVATION CONTOUR MAP

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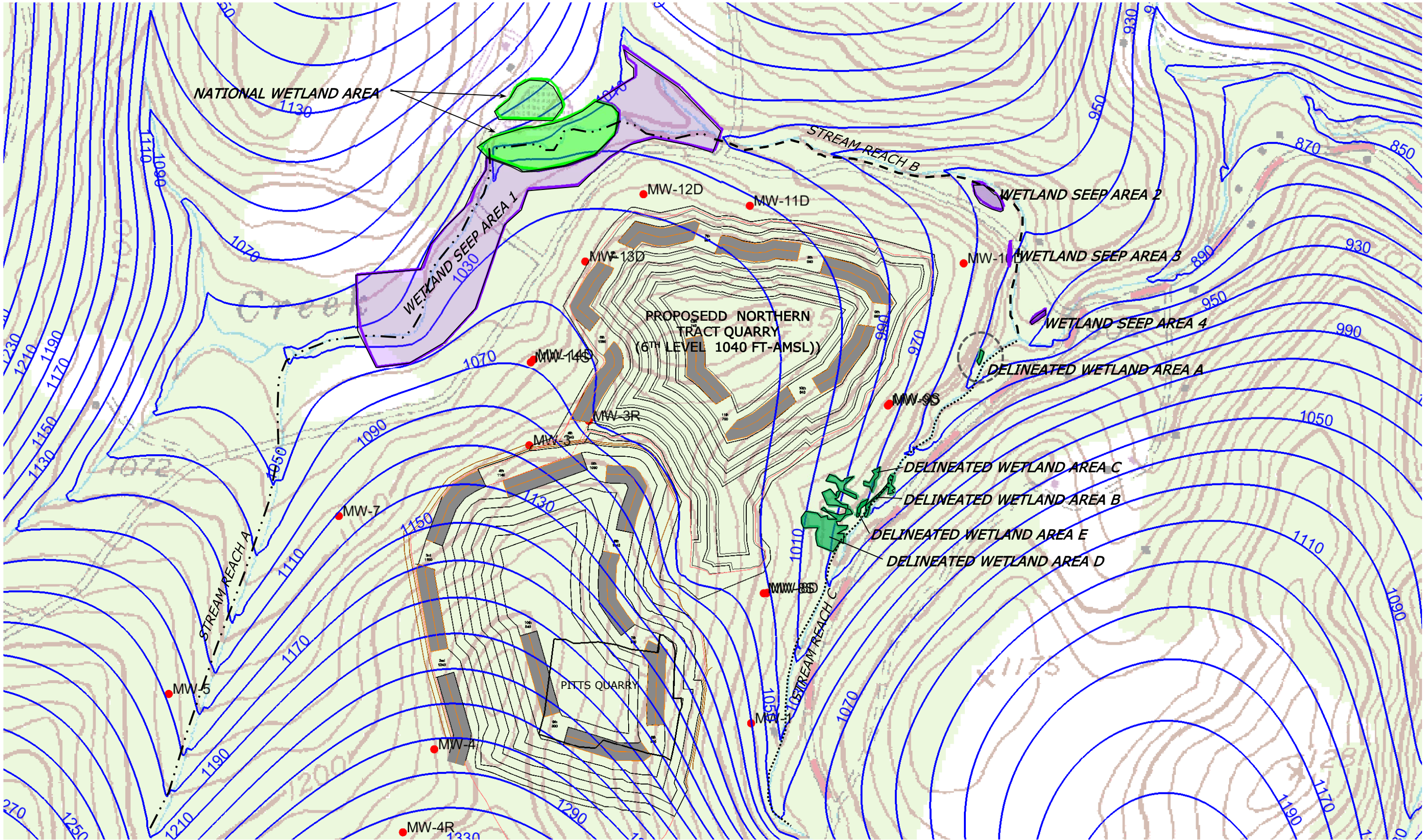
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FIGURE NUMBER

16



NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 6TH LEVEL AT 421 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

1070 SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000

N

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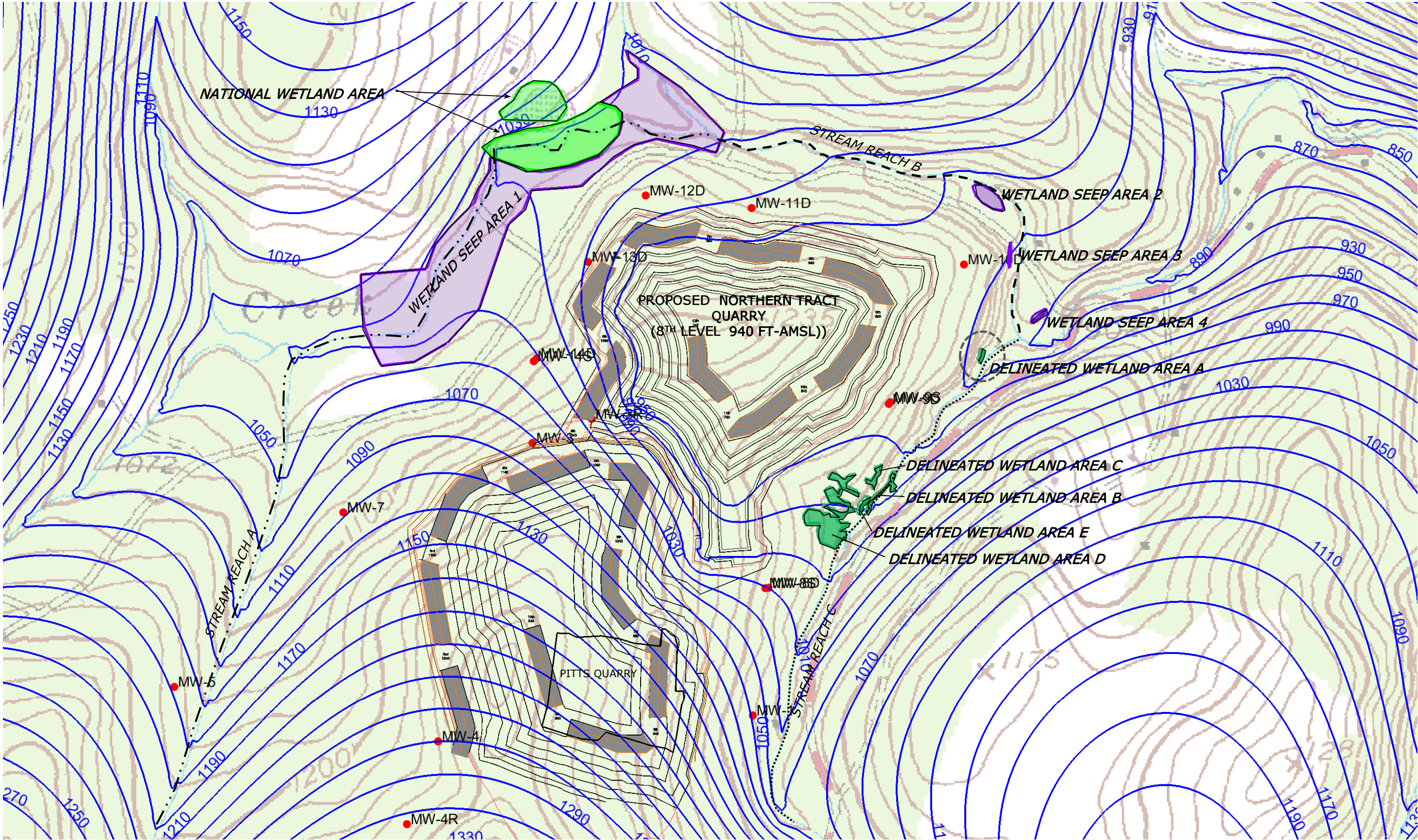
SITE AREA
SIMULATED 6TH LEVEL (1040 FT-AMSL)
POTENTIOMETRIC GROUNDWATER
ELEVATION CONTOUR MAP

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

DRAWN BY VFB DATE 12-12-17

FIGURE NUMBER

17



NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 8TH LEVEL AT 1252 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

1070 SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000

N

PROJECT LOCATION

SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

SITE AREA

SIMULATED 8TH LEVEL (940 FT-AMSL)
POTENTIOMETRIC GROUNDWATER
ELEVATION CONTOUR MAP

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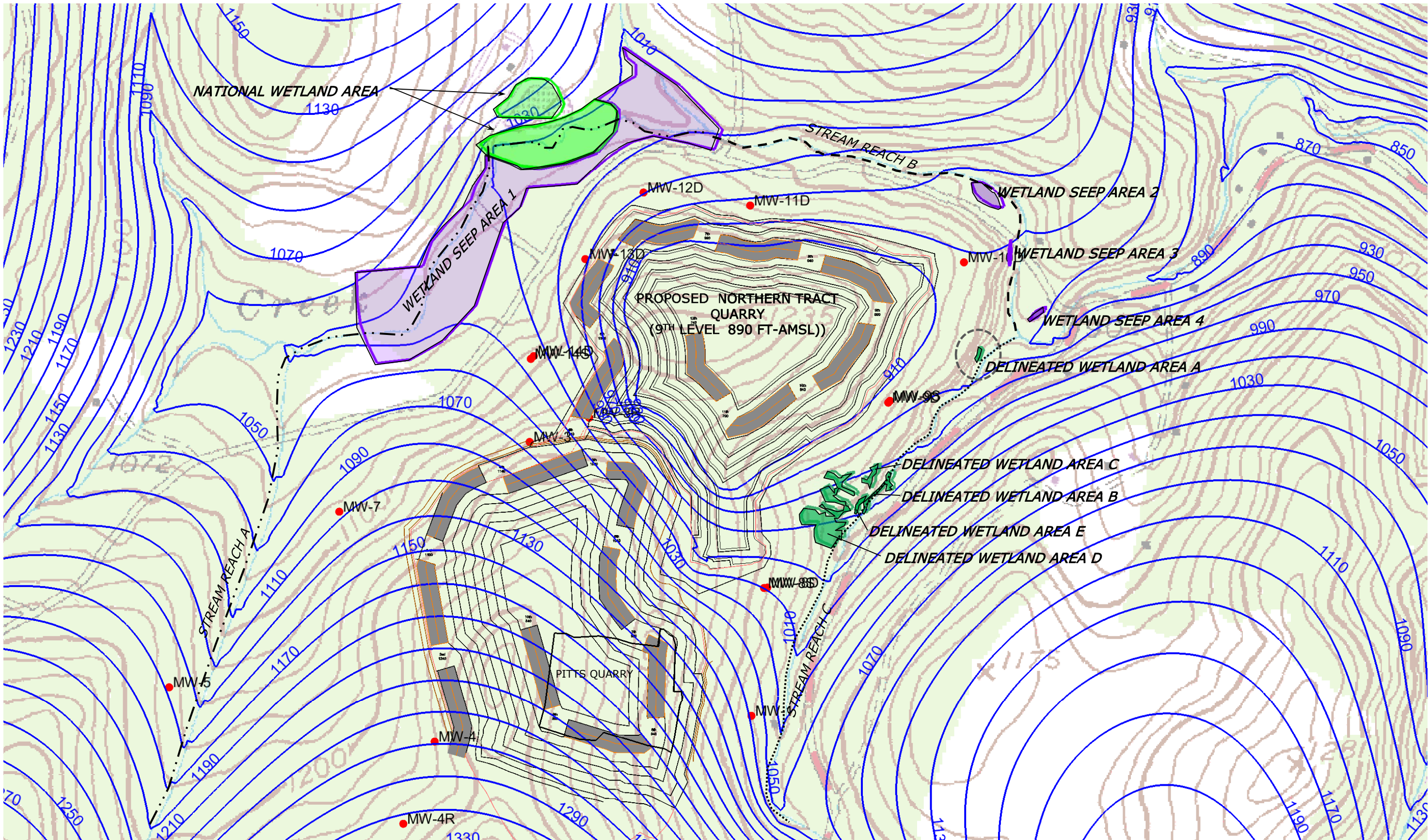
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FIGURE NUMBER

19



NOTES

- 1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
- 2. NORTHERN TRACT QUARRY PUMPING 9TH LEVEL AT 1538 FT³/DAY.
- 3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
- 4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
- 5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

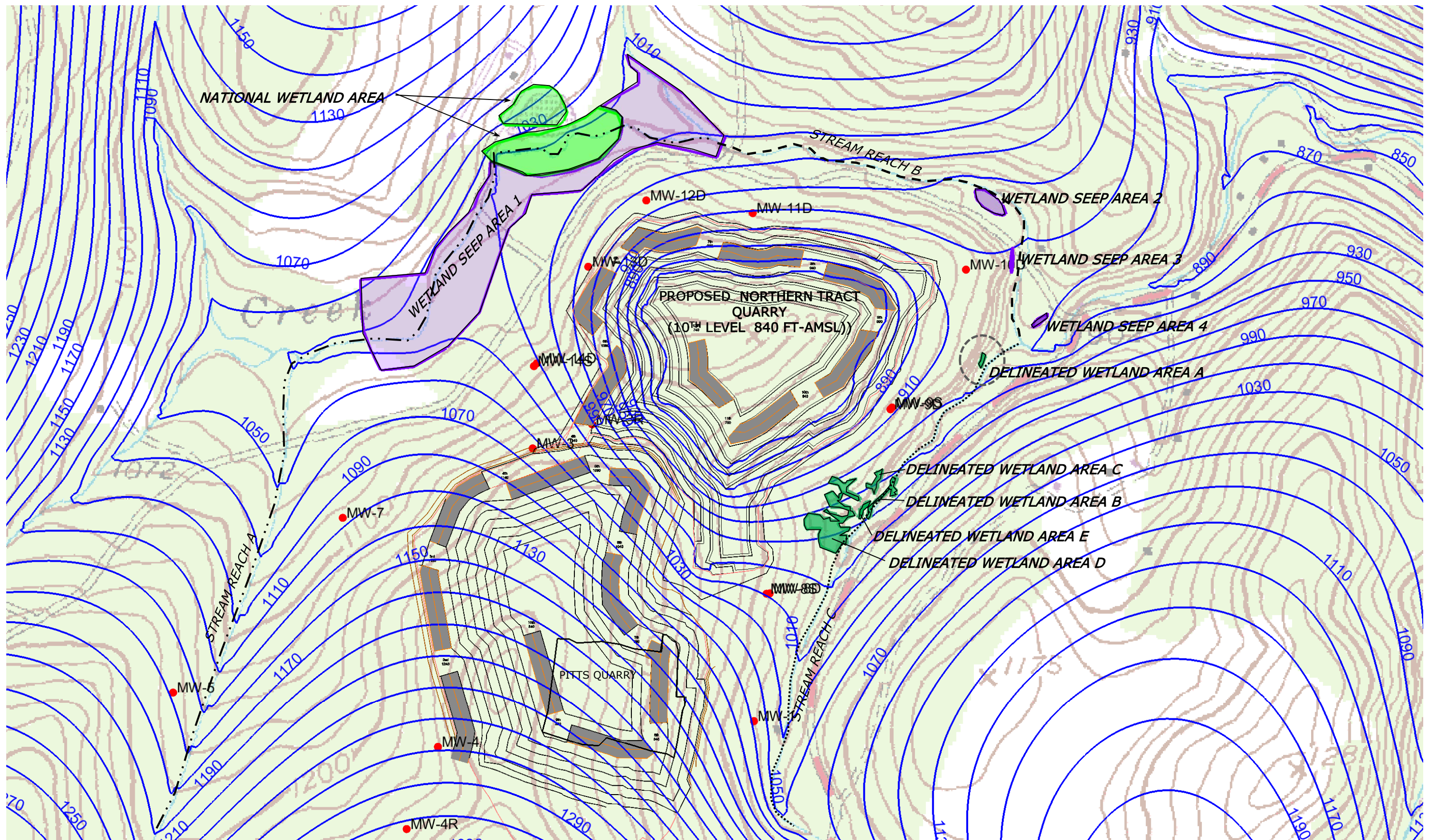
1070 SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000

N



NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 10TH LEVEL AT 1632 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

- MONITORING WELL LOCATION

1070

SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000



STIE AREA

**SIMULATED 10TH LEVEL (840 FT-AMSL)
POTENTIOMETRIC GROUNDWATER
ELEVATION CONTOUR MAP**

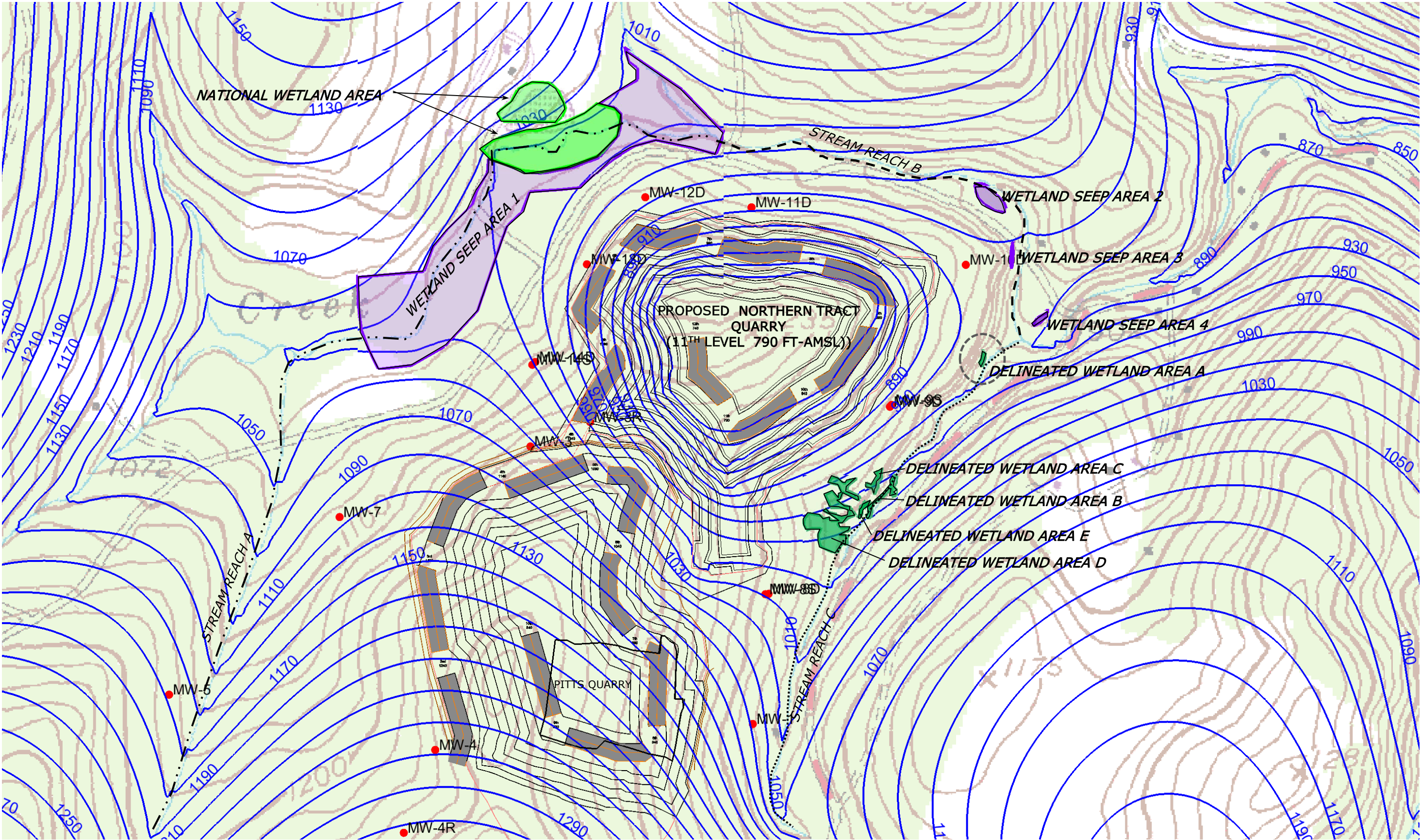
100

SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

DRAWN BY	VFB	DATE	12-12-17
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FIGURE NUMBER

21



NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 11TH LEVEL AT 1729 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

1070 SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000

N

PROJECT LOCATION

SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

SITE AREA

SIMULATED 11TH LEVEL (790 FT-AMSL)
POTENTIOMETRIC GROUNDWATER
ELEVATION CONTOUR MAP

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ENVIRONMENTAL AND HYDROGEOLOGIC CONSULTING

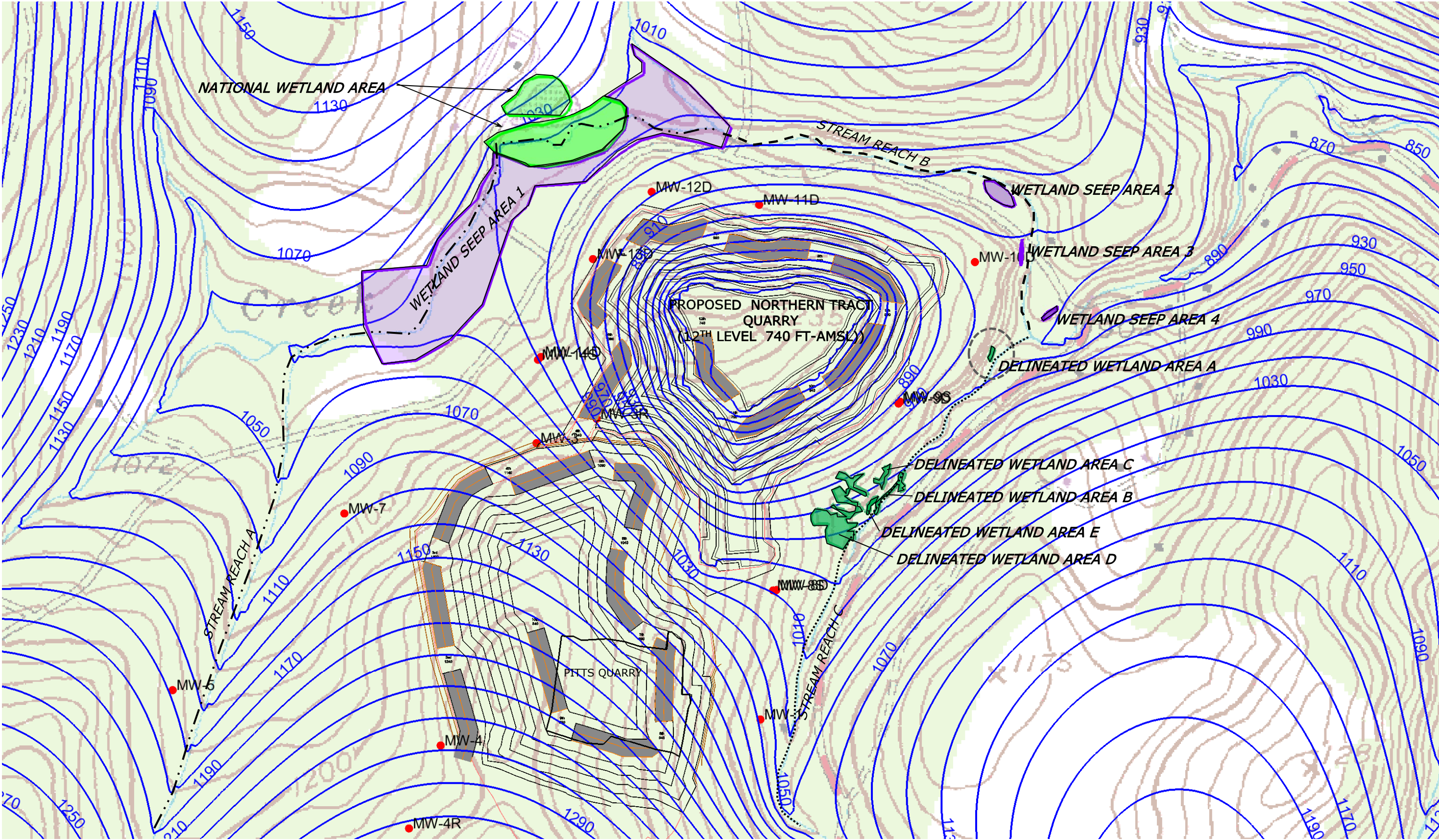
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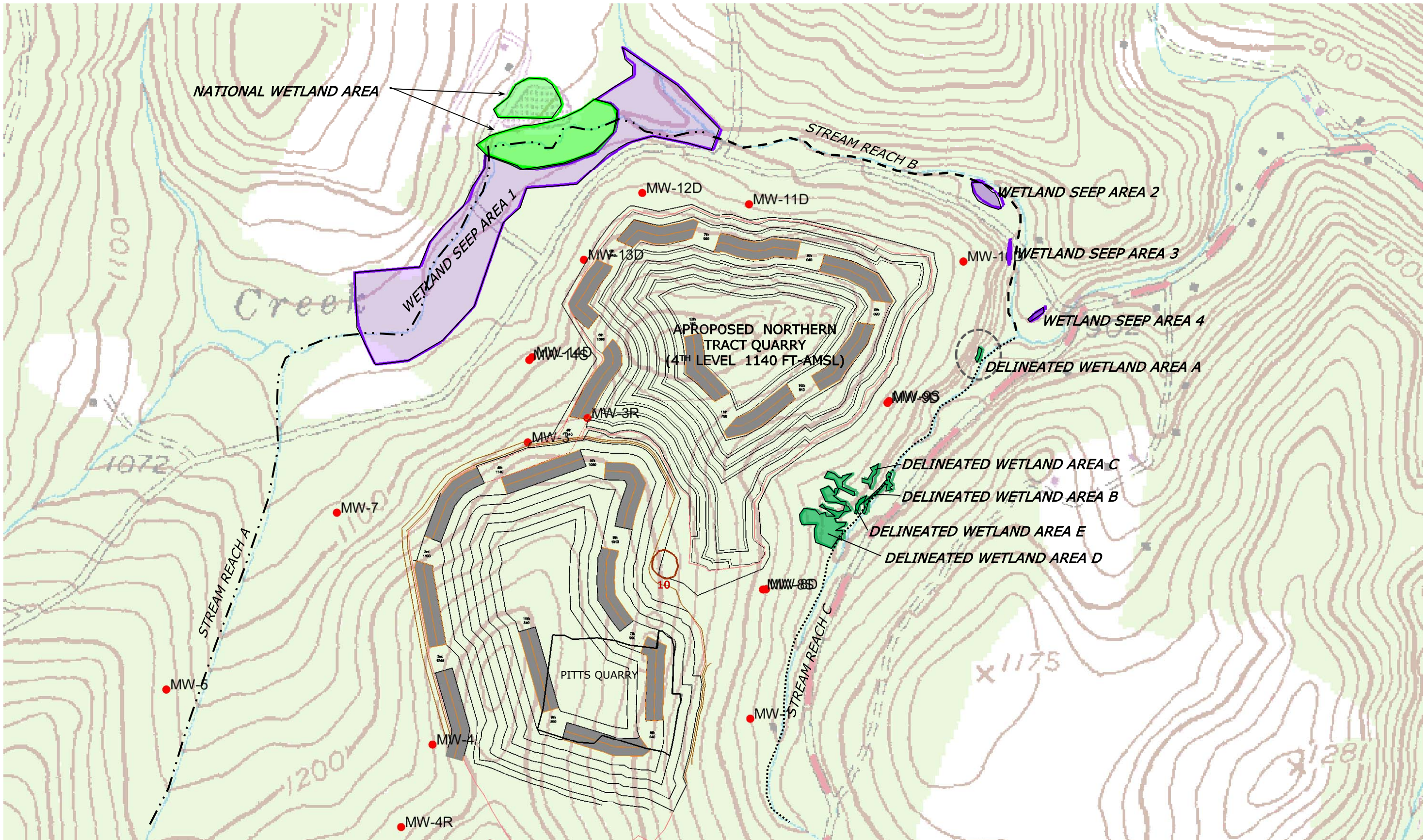
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FIGURE NUMBER

22





NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 4TH LEVEL AT 36 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

— 10 — SIMULATED DRAWDOWN (FEET)

APPROXIMATE SCALE (FEET)



0 1000 2000 4000



SITE AREA
SIMULATED 4TH LEVEL
(1140 FT-AMSL)
DRAWDOWN

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

FIGURE NUMBER

24

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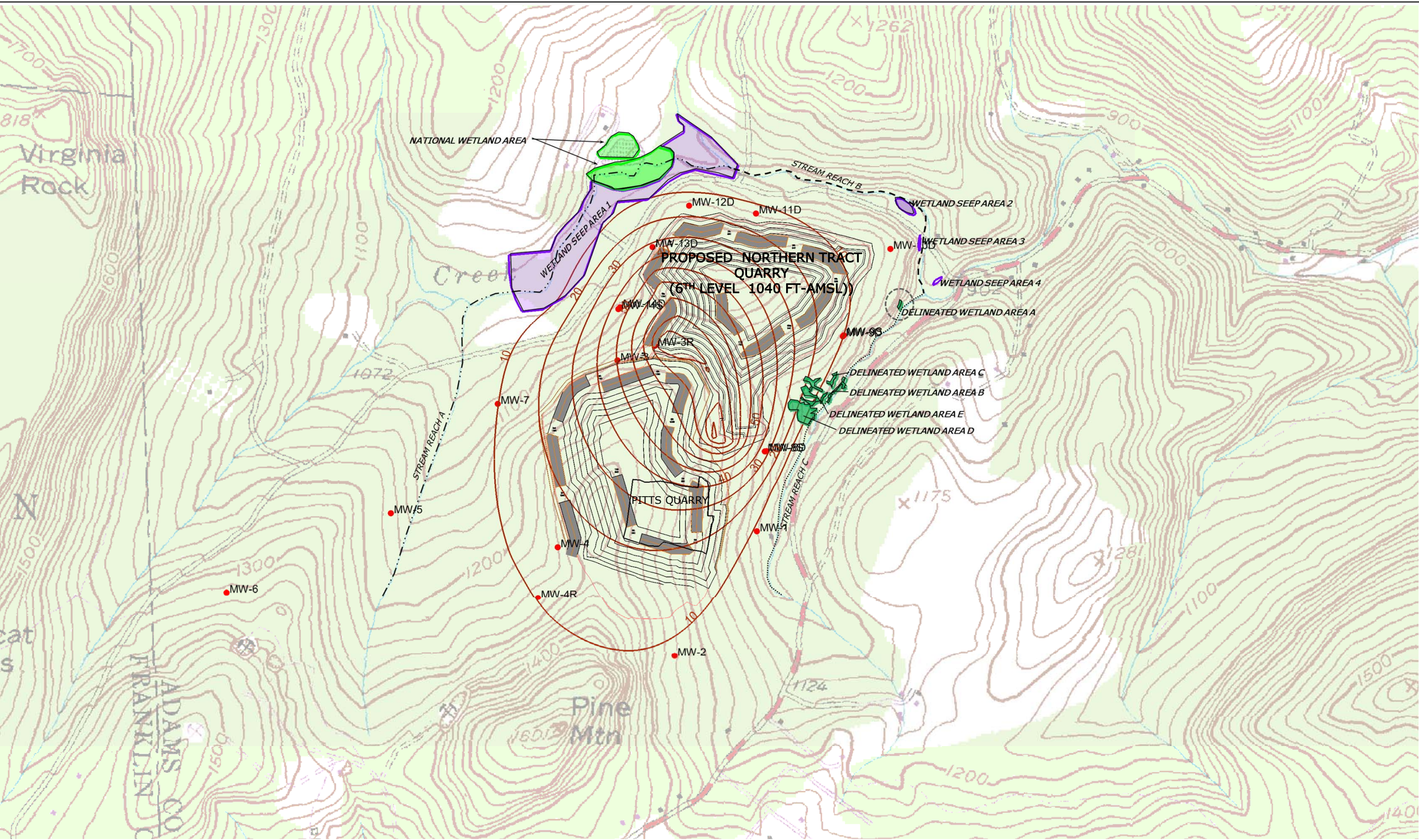
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NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 6TH LEVEL AT 421 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

10 SIMULATED DRAWDOWN (FEET)

APPROXIMATE SCALE (FEET)



SITE AREA
SIMULATED 6TH LEVEL
(1040 FT-AMSL)
DRAWDOWN

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

FIGURE NUMBER

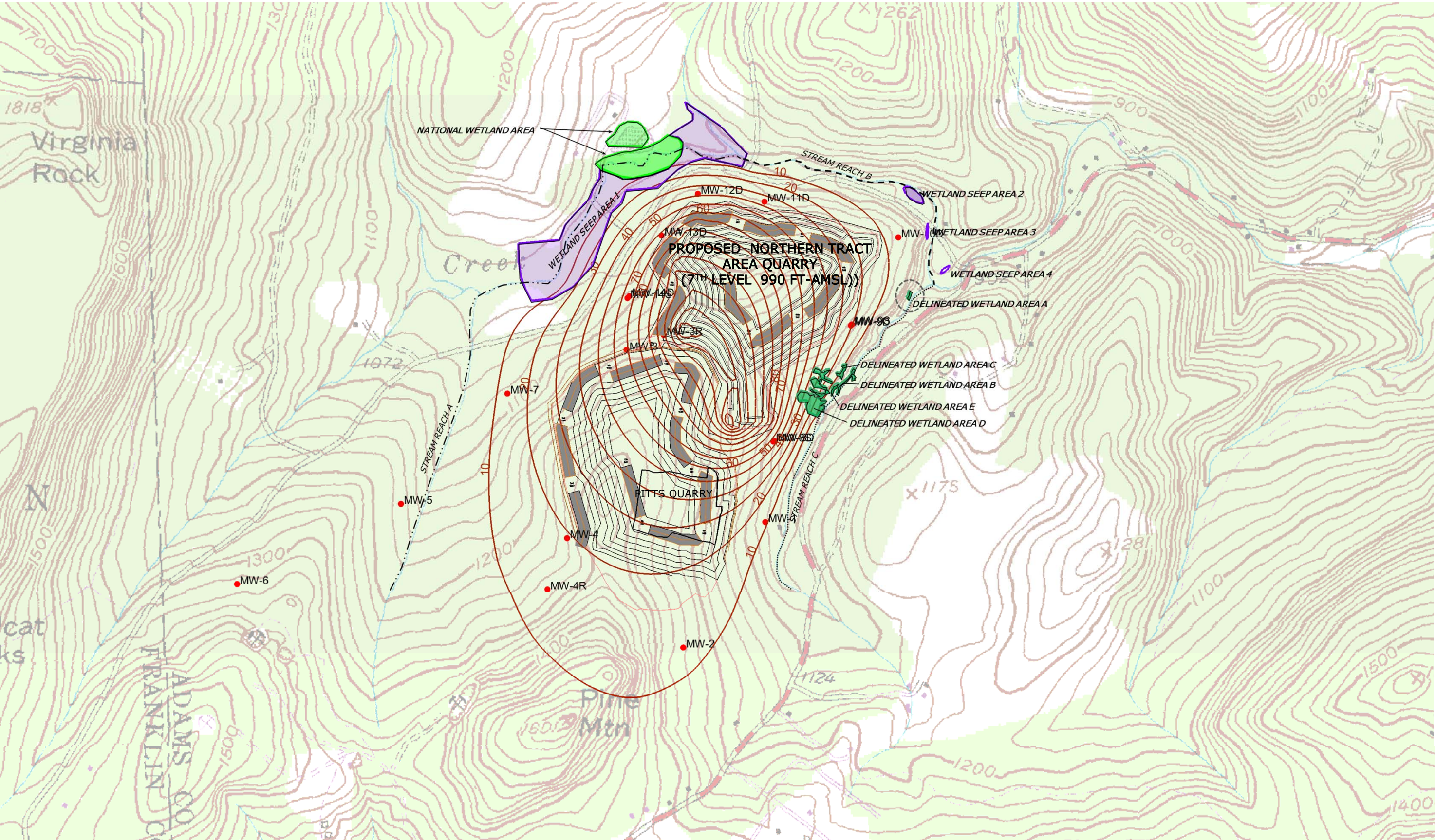
26

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NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 7TH LEVEL AT 914 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

10 SIMULATED DRAWDOWN (FEET)

APPROXIMATE SCALE (FEET)



SITE AREA
SIMULATED 7TH LEVEL
(990 FT-AMSL)
DRAWDOWN

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

FIGURE NUMBER

27

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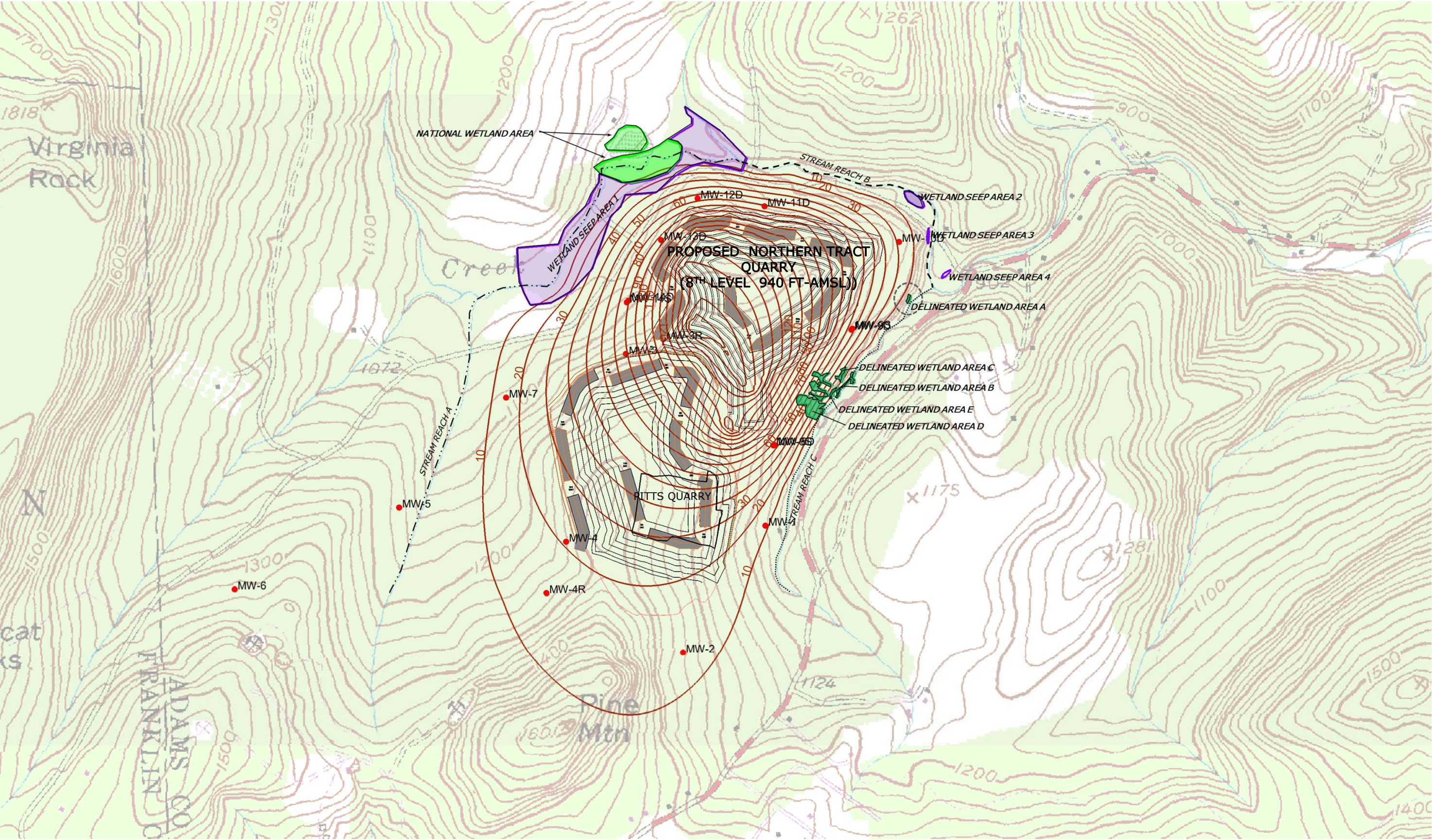
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DATE 12-12-17



NOTES

- 1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
- 2. NORTHERN TRACT QUARRY PUMPING 8TH LEVEL AT 1252 FT³/DAY.
- 3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
- 4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
- 5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

10 SIMULATED DRAWDOWN (FEET)

APPROXIMATE SCALE (FEET)



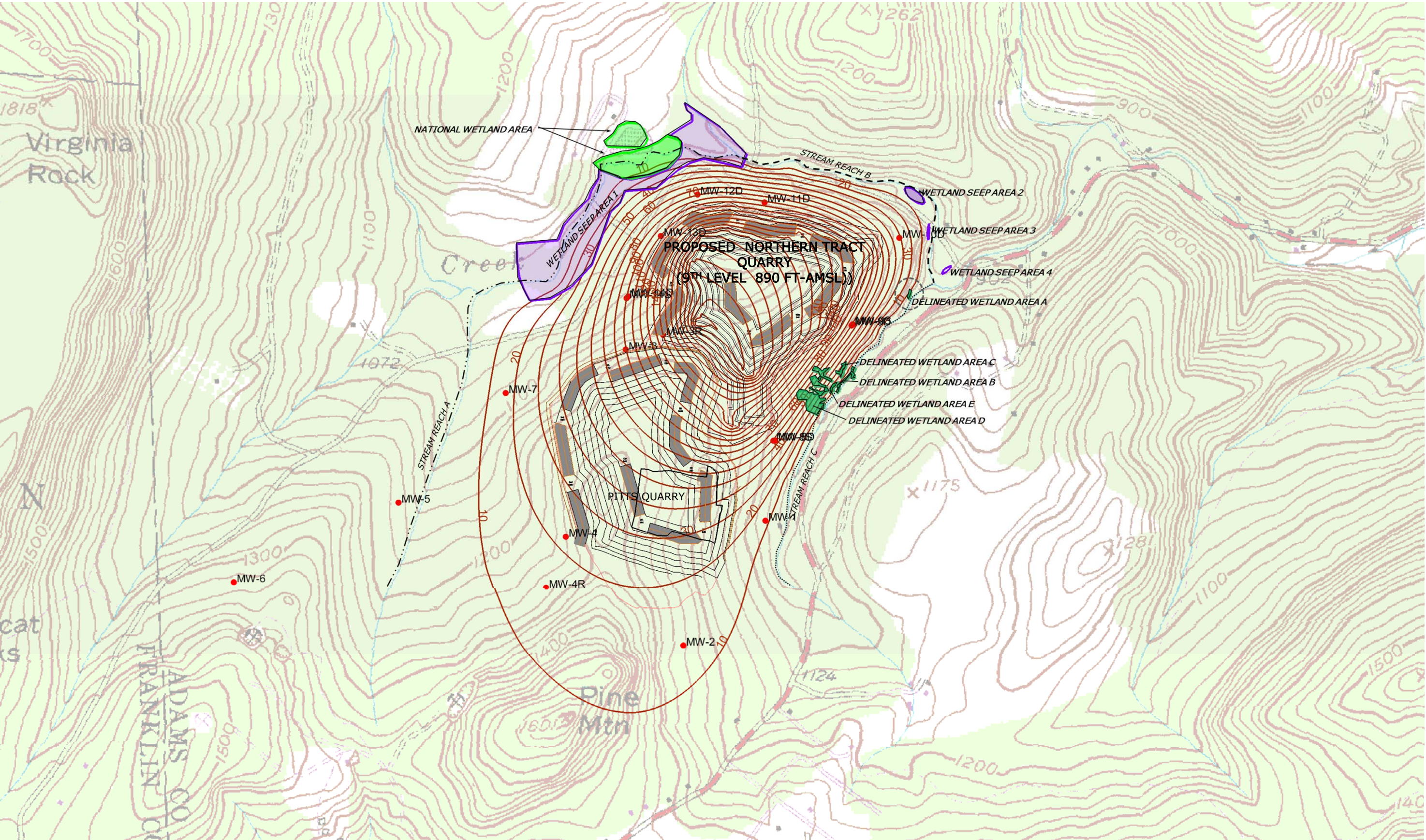
SITE AREA
SIMULATED 8TH LEVEL
(940 FT-AMSL)
DRAWDOWN

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

DRAWN BY VFB DATE 12-12-17

FIGURE NUMBER

28



NOTES

- 1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
- 2. NORTHERN TRACT QUARRY PUMPING 9TH LEVEL AT 1538 FT³/DAY.
- 3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
- 4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
- 5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

10 SIMULATED DRAWDOWN (FEET)

APPROXIMATE SCALE (FEET)



SITE AREA
SIMULATED 9TH LEVEL
(890 FT-AMSL)
DRAWDOWN

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

FIGURE NUMBER

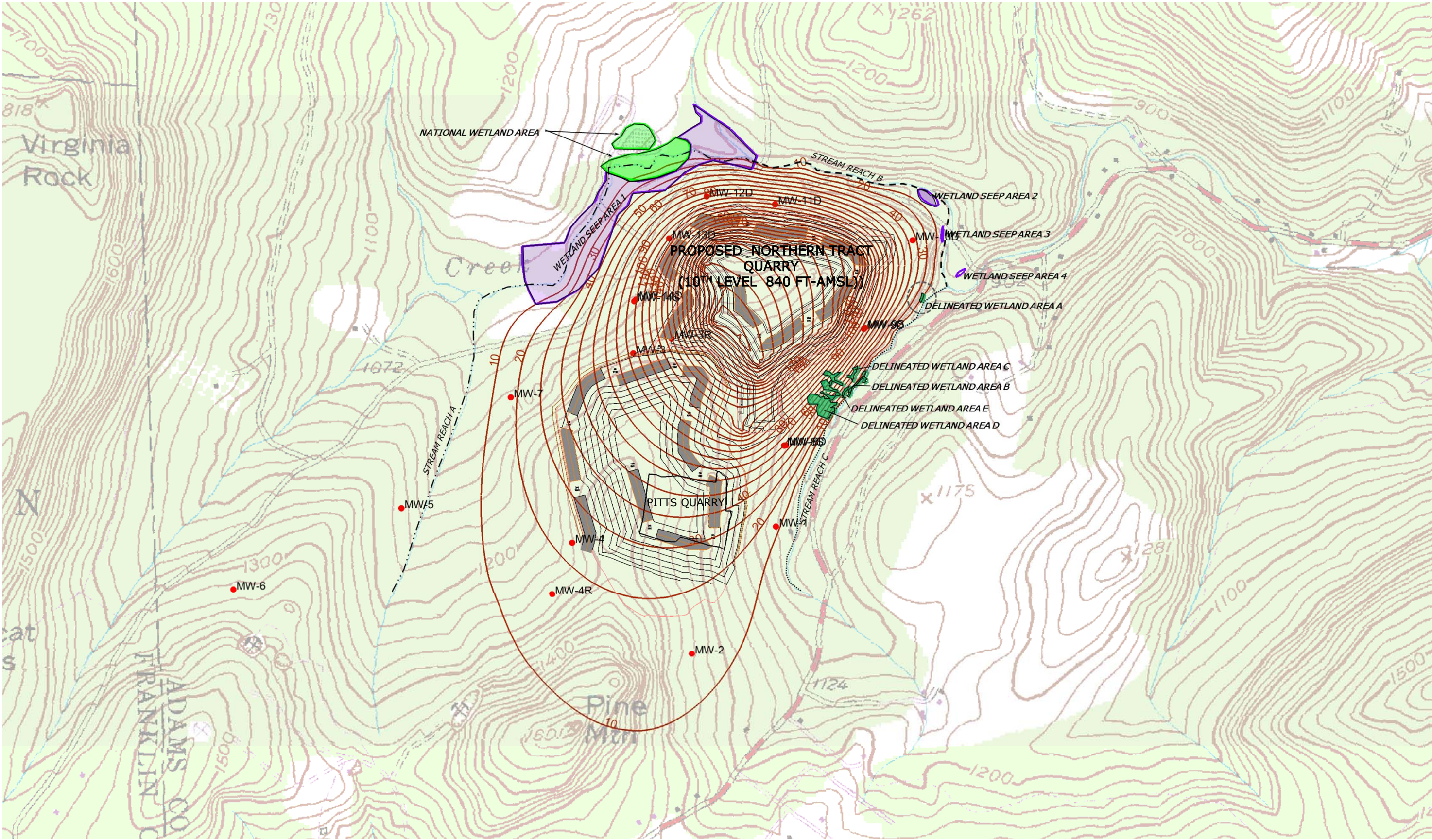
29

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NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 10TH LEVEL AT 1632 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

10 SIMULATED DRAWDOWN (FEET)

APPROXIMATE SCALE (FEET)



SITE AREA
SIMULATED 10TH LEVEL
(840 FT-AMSL)
DRAWDOWN

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

FIGURE NUMBER

30

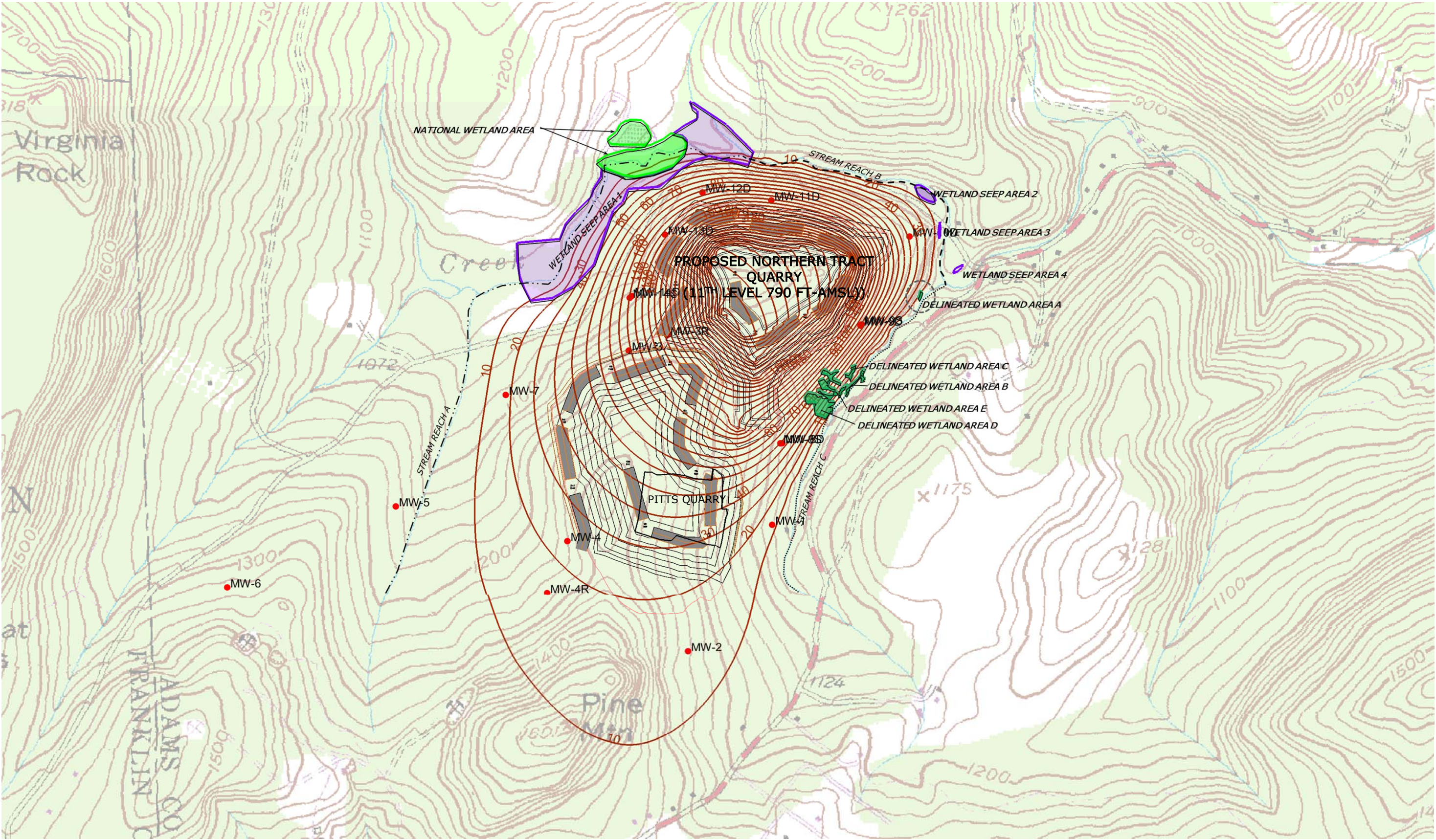
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NOTES

1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
2. NORTHERN TRACT QUARRY PUMPING 11TH LEVEL AT 1729 FT³/DAY.
3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL.
5. NESTED WELL PAIRS OVERLAP DUE TO CLOSE PROXIMITY OF WELLS TO EACH OTHER (MW-8S/D, MW-9S/D, AND MW-14S/D).

EXPLANATION

● MONITORING WELL LOCATION

10 SIMULATED DRAWDOWN (FEET)

APPROXIMATE SCALE (FEET)



SITE AREA
SIMULATED 11TH LEVEL
(790 FT-AMSL)
DRAWDOWN

PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

FIGURE NUMBER

31

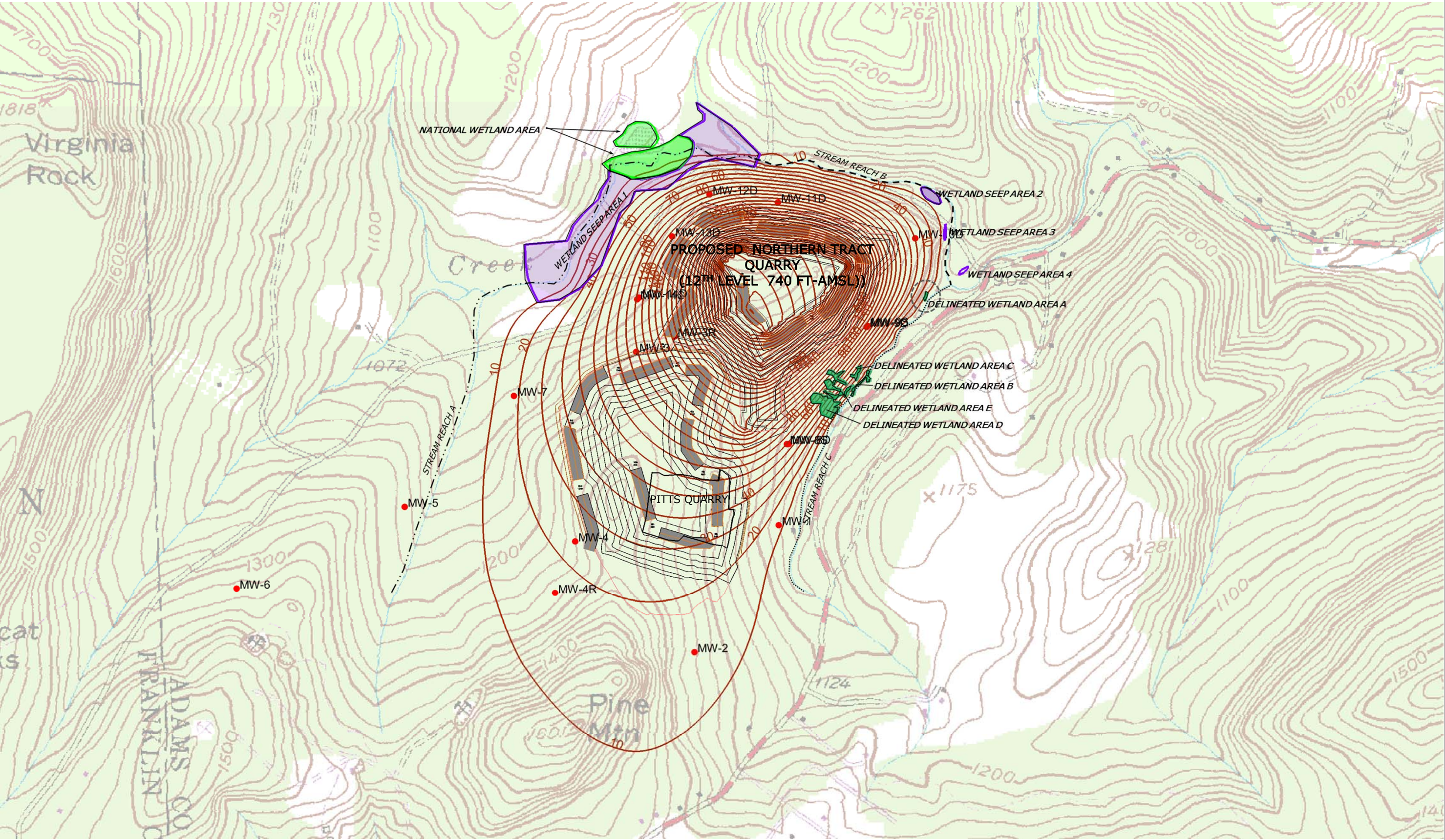
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NOTES

- 1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
- 2. NORTHERN TRACT QUARRY PUMPING 12TH LEVEL AT 1749 FT³/DAY.
- 3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
- 4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL

EXPLANATION

● MONITORING WELL LOCATION

10 SIMULATED DRAWDOWN (FEET)

APPROXIMATE SCALE (FEET)



SITE AREA
SIMULATED 12TH LEVEL
(740 FT-AMSL)
DRAWDOWN

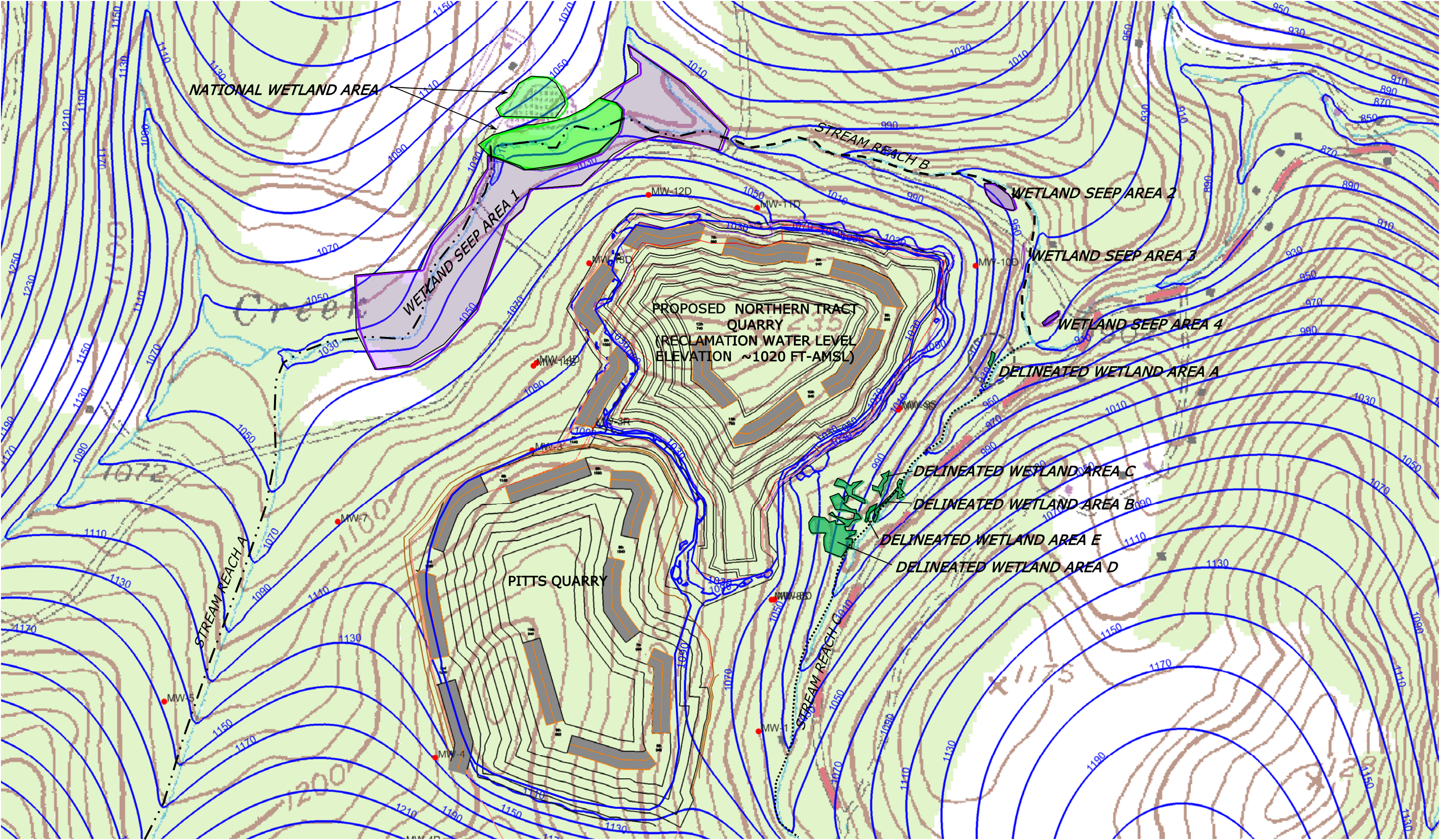
PROJECT LOCATION
SGI CHARMIAN FACILITY
PROPOSED NORTHERN TRACT QUARRY
BLUE RIDGE SUMMIT, PENNSYLVANIA

DRAWN BY VFB DATE 12-12-17

FIGURE NUMBER

32





NOTES

- 1. BASE MAP FROM USGS TOPOGRAPHIC QUADRANGLE.
- 2. NORTHERN TRACT QUARRY AND PITTS QUARRY NOT PUMPING – STATIC CONDITIONS AFTER QUARRY OPERATIONS END AND GROUNDWATER RECOVERS.
- 3. NORTHERN TRACT QUARRY CONFIGURATION DATA PROVIDED BY SKELLY AND LOY, INC.
- 4. FT-AMSL – FEET ABOVE MEAN SEA LEVEL
- 5. GROUNDWATER ELEVATION CONTOURS NEAR THE EDGE OF THE RECLAIMED (FILLED) QUARRY ARE CLOSE TOGETHER AND DIFFICULT TO READ. THE LOWEST ELEVATION CONTOUR THAT IS VISIBLE IS 1030. THE CONTOUR INTERVAL IS 20 FEET AND THE ELEVATION OF THE STATIC (RECLAIMED) WATER LEVEL IN THE NORTHERN TRACT QUARRY IS 1020 FT-AMSL.

EXPLANATION

● MONITORING WELL LOCATION

1050 SIMULATED POTENTIOMETRIC SURFACE (FT. MSL)



APPROXIMATE SCALE (FEET)



ATTACHMENT E

PITTS QUARRY GROUNDWATER INFILTRATION CALCULATION

By: AMR Date: 11/06/17 Subject: Water Balance Analysis Sheet No.: 1 of 5
Chkd. By: DBB Date: 11/15/17 Northern Tract Quarry Proj. No.: 152596A
Revised By: MDW Date: 12/21/2017

W:\2015\152596 A - SGI - Northern Tract Surface Mine Permit\Field Data\Pitts Quarry Pumping Data\[Pump_Data-Dapp revised.xlsx]Summary

**PITTS QUARRY WATER BALANCE ANALYSIS
NORTHERN TRACT QUARRY
CHARMIAN SITE, SPECIALTY GRANULES, LLC.
ADAMS COUNTY, PENNSYLVANIA**

PURPOSE

The purpose of these calculations is to evaluate the overall water balance in the existing Pitts Quarry as a way to roughly confirm the calculated groundwater infiltration rate determined by the groundwater model developed for the adjacent, proposed Northern Tract Quarry. SGI currently maintains the pool level in the bottom of Pitts Quarry by using a pump intermittently to remove any accumulated water. SGI installed an automated monitoring system to tabulate the pumping rates and durations for a time period from June 6, 2017 to August 29, 2017. Additionally, SGI routinely collected daily precipitation depths at two rain gauges on site, located at the Lower Mill Pond System and the Pitts Pond. This calculation will compare the incoming precipitation and groundwater infiltration to the pumping and evaporation as a way to evaluate the overall water balance in the quarry and confirm estimated groundwater infiltration rates. It is assumed that the groundwater infiltration rate estimated for the Pitts Quarry will be comparable to the proposed Northern Tract given their proximity.

MASS BALANCE CALCULATIONS

The following sections will determine the various evaporation, groundwater infiltration, precipitation, and pumping rates for comparison in evaluating the water mass balance in the Pitts Quarry.

*Evaporation***Evaporation Rates (inches)**

The evaporation rates for the area were obtained from References 1, 2, and 3. The average evaporation rate is a weighted average based on the distance of the observation point to the project site.

Month	Beltsville, MD		Sterling, VA	
	Evap. (IN)	Dist. (MI)	Evap. (IN)	Dist. (MI)
June	6.46	59.10	6.57	50.40
July	7.14		6.82	
August	6.19		6.23	

Month	Shaver Creek, PA		Landisville, PA		Raystown Lake, PA	
	Evap. (IN)	Dist. (MI)	Evap. (IN)	Dist. (MI)	Evap. (IN)	Dist. (MI)
June	4.89	66.20	6.61	60.3	6.05	53.8
July	5.56		7.17		6.24	
August	4.81		5.91		5.73	

Watershed Area 2,915,200 SF
Quarry Pool Area 55,105 SF

D'APPOLONIA

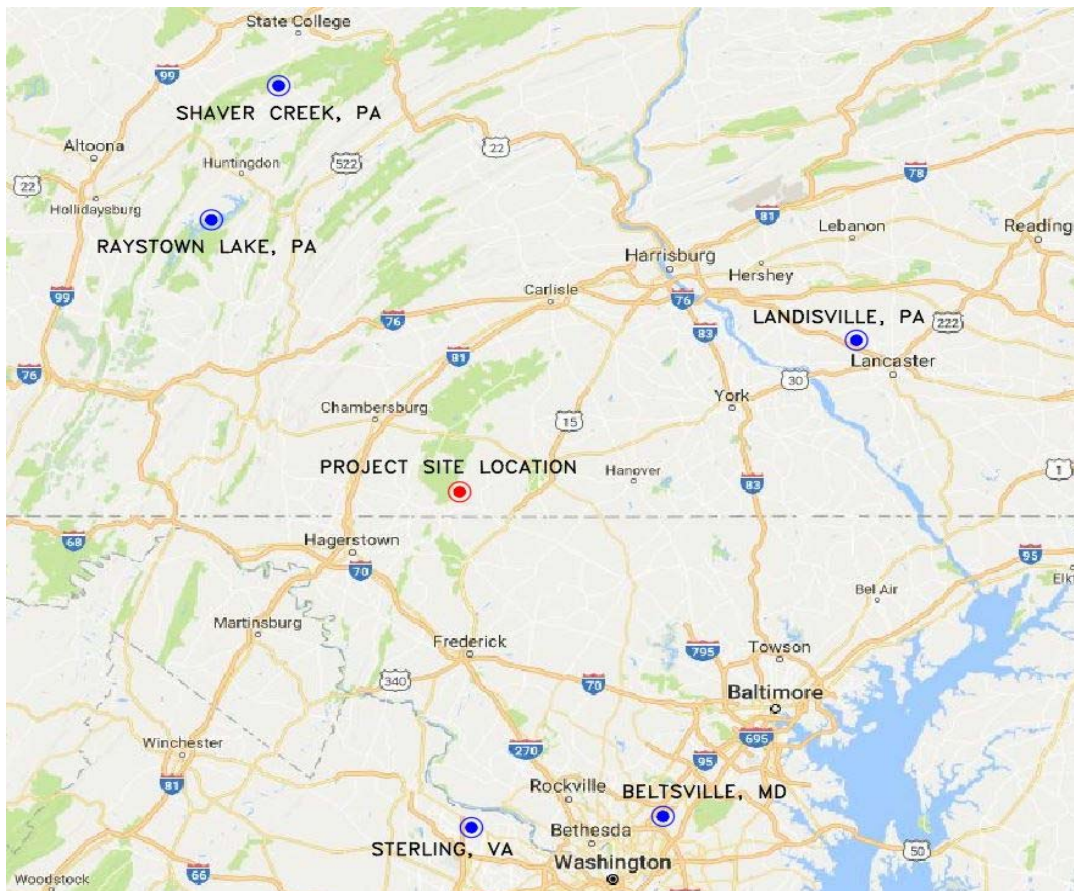
By: AMR Date: 11/06/17 Subject: Water Balance Analysis Sheet No.: 2 of 5
 Chkd. By: DBB Date: 11/15/17 Northern Tract Quarry Proj. No.: 152596A
 Revised By: MDW Date: 12/21/2017

W:\2015\152596 A - SGI - Northern Track Surface Mine Permit\Field Data\Pitts Quarry Pumping Data\[Pump_Data-Dapp revised.xlsx]Summary

Average Evaporation	
June	6.15
July	6.61
August	5.81

Evaporation Duration (Days)	
June	25
July	31
August	28
Total Duration	84

Evaporation Volume (CF)	
June	23,162
July	30,228
August	24,494
Total Volume	77,885



Precipitation

Precipitation Depths (IN)	Rain Gauge No. 1	Rain Gauge No. 2
June	2.33	1.89
July	6.13	6.78
August	5.60	4.81
Total Precipitation	14.06	13.48

Precipitation Volume (CF)	Rain Gauge No. 1	Rain Gauge No. 2
June	10,700	8,680
July	28,150	31,135
August	25,716	22,088
Total Precipitation	64,566	61,903

D'APPOLONIA

By: AMR Date: 11/06/17 Subject: Water Balance Analysis Sheet No.: 3 of 5
 Chkd. By: DBB Date: 11/15/17 Northern Tract Quarry Proj. No.: 152596A
 Revised By: MDW Date: 12/21/2017

W:\2015\152596 A - SGI - Northern Track Surface Mine Permit\Field Data\Pitts Quarry Pumping Data\[Pump_Data-Dapp revised.xlsx]Summary

Pumping

Average Pump Rate 640 GPM

	Time Pumping (MIN)	Volume (Gallons)	Volume (CF)
June	8,699.00	5,567,360.00	744,248.00
July	8,639.00	5,528,960.00	739,115.00
August	12,954.00	8,290,560.00	1,108,287.00
Total	30,292.00	19,386,880.00	2,591,650.00

The average pumping rate presented above was calculated using flow data obtained from the Pitts Quarry provided by SGI. A flow meter is established at the pump location to passively monitor flow rates when the pump is activated. The pump is located near the bottom of Pitts Quarry and is connected to a high density polyethylene (HDPE) pipe which travels overland to the top of the quarry. The raw flow monitoring data was adjusted to remove outlier points which were not representative of the pumping system. For instance, larger flows observed during the beginning of a pumping event were eliminated from the dataset as these flow rates are associated with initial filling of the piping system and prior to the pumping system reaching equilibrium.

Infiltration and Runoff

Map Unit	Unit Name	Area (AC)	Percent Area	Hyd. Soil Group	Curve No.
HKB	Highfield, Catoctin, and Myersville soils	14.0	18.02	B	72
HMF	Highfield and Catoctin channery silt loams	11.1	14.29	B	60
RcD	Ravenrock-Highfield-Rock Outcrop	52.6	67.70	B	86
Composite CN					79.76

Potential Maximum Retention 2.54 IN Ref. No. 4, Eq. 2-4
 Initial Abstraction 0.51 IN Ref. No. 4, Eq. 2-2
 Total Volume of Water Due to Surface Infiltration 120,940 CF

Gauge 1 Gauge 2
 Surface Runoff 11.42 10.85 Ref. No. 4, Eq. 2-1
 Surface Runoff Volume 2,720,793 2,586,121

D'APPOLONIA

By: AMR Date: 11/06/17 Subject: Water Balance Analysis Sheet No.: 4 of 5
Chkd. By: DBB Date: 11/15/17 Northern Tract Quarry Proj. No.: 152596A
Revised By: MDW Date: 12/21/2017

W:\2015\152596 A - SGI - Northern Track Surface Mine Permit\Field Data\Pitts Quarry Pumping Data\[Pump_Data-Dapp revised.xlsx]Summary

Quarry Water Management

	Minimum	Maximum
Surface Runoff (CF)	2,720,793	2,586,121
Rainfall (CF)	64,566	61,903
Surface Infiltration (CF)	120,940	120,940
Evaporation (CF)	77,885	77,885
Pumping (CF)	2,591,650	2,591,650
Groundwater Infiltration (CF)	5,116	142,451

The minimum and maximum values above vary by using the two different rain gauge values, Gauge 1 and Gauge 2, respectively.

Groundwater Infiltration Rate

	Minimum	Maximum
Volume of Groundwater	5,116	142,451
Groundwater Infiltration Rate	61	1,694
	1	9

CF
CF/Day
GPM

D'APPOLONIA

By: AMR Date: 11/06/17 Subject: Water Balance Analysis Sheet No.: 5 of 5
Chkd. By: DBB Date: 11/15/17 Northern Tract Quarry Proj. No.: 152596A
Revised By: MDW Date: 12/21/2017

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REFERENCES

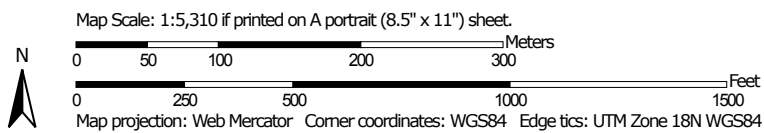
1. Technical Paper No. 13 - Mean Monthly and Annual Evaporation From Free Water Surface for the United States, Alaska, Hawaii, and West Indies, Hydrologic Branch Division of Climatological and Hydrologic Services, U.S. Department of Commerce, 1950.
2. Technical Report NWS 34 - Mean Monthly, Seasonal, and Annual Pan Evaporation for the United States, Office of Hydrology, National Weather Service, U.S. Department of Commerce, 1982.
3. Raystown Evaporation, Retrieved November 06, 2017, from The Pennsylvania State Climatologist:
<http://climate.psu.edu/features/evap/rayevap.php>
4. TR-55 - Urban Hydrology for Small Watersheds, Conservation Engineering Division, Natural Resources Conservation Service, United States Department of Agriculture, 1986

SOIL SURVEY DATA

Soil Map—Adams County, Pennsylvania



Soil Map may not be valid at this scale.




**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

11/7/2017
Page 1 of 3


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Adams County, Pennsylvania

Survey Area Data: Version 13, Oct 3, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 14, 2011—Nov 6, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HKB	Highfield, Catoctin, and Myersville soils, 0 to 8 percent slopes, very stony	14.0	18.1%
HMF	Highfield and Catoctin channery silt loams, 25 to 70 percent slopes, very stony	11.1	14.3%
RcD	Ravenrock-Highfield-Rock outcrop complex, 15 to 25 percent slopes	52.6	67.7%
Totals for Area of Interest		77.7	100.0%

Adams County, Pennsylvania

HKB—Highfield, Catoctin, and Myersville soils, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 19qq

Elevation: 200 to 2,800 feet

Mean annual precipitation: 35 to 50 inches

Mean annual air temperature: 45 to 59 degrees F

Frost-free period: 120 to 220 days

Farmland classification: Not prime farmland

Map Unit Composition

Highfield, very stony, and similar soils: 40 percent

Catoctin, very stony, and similar soils: 25 percent

Myersville, very stony, and similar soils: 15 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Highfield, Very Stony

Setting

Landform: Mountainsides

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Upper third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from greenstone

Typical profile

H1 - 0 to 9 inches: channery silt loam

H2 - 9 to 24 inches: channery silt loam

H3 - 24 to 42 inches: very channery silt loam

H4 - 42 to 52 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent

Percent of area covered with surface fragments: 1.6 percent

Depth to restrictive feature: 40 to 60 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.06 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Catoctin, Very Stony

Setting

Landform: Mountainsides

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Upper third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from greenstone

Typical profile

H1 - 0 to 9 inches: channery silt loam

H2 - 9 to 16 inches: very channery silt loam

H3 - 16 to 24 inches: extremely channery silt loam

H4 - 24 to 34 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent

Percent of area covered with surface fragments: 1.6 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.06 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Myersville, Very Stony

Setting

Landform: Mountainsides

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Upper third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from greenstone

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 14 inches: silty clay loam
H3 - 14 to 27 inches: channery silty clay loam
H4 - 27 to 38 inches: channery silt loam
H5 - 38 to 48 inches: channery loam
H6 - 48 to 60 inches: bedrock
H7 - 60 to 70 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock;
60 to 80 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very
low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Glenville

Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: No

Baile

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Buchanan

Percent of map unit: 4 percent
Landform: Mountainsides
Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: No

Edgemont, channery

Percent of map unit: 4 percent

Landform: Mountainsides

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Upper third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Neshaminy, extremely bouldery

Percent of map unit: 4 percent

Landform: Hillsides

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Data Source Information

Soil Survey Area: Adams County, Pennsylvania

Survey Area Data: Version 13, Oct 3, 2017

Adams County, Pennsylvania

HMF—Highfield and Catoctin channery silt loams, 25 to 70 percent slopes, very stony

Map Unit Setting

National map unit symbol: 19qs

Elevation: 500 to 2,800 feet

Mean annual precipitation: 35 to 48 inches

Mean annual air temperature: 46 to 59 degrees F

Frost-free period: 135 to 210 days

Farmland classification: Not prime farmland

Map Unit Composition

Highfield, very stony, and similar soils: 45 percent

Catoctin, very stony, and similar soils: 35 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Highfield, Very Stony

Setting

Landform: Mountainsides

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from greenstone

Typical profile

H1 - 0 to 9 inches: channery silt loam

H2 - 9 to 24 inches: channery silt loam

H3 - 24 to 42 inches: very channery silt loam

H4 - 42 to 52 inches: bedrock

Properties and qualities

Slope: 25 to 70 percent

Percent of area covered with surface fragments: 1.6 percent

Depth to restrictive feature: 40 to 60 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.06 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Catoctin, Very Stony

Setting

Landform: Mountainsides

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from greenstone

Typical profile

H1 - 0 to 9 inches: channery silt loam

H2 - 9 to 16 inches: very channery silt loam

H3 - 16 to 24 inches: extremely channery silt loam

H4 - 24 to 34 inches: bedrock

Properties and qualities

Slope: 25 to 35 percent

Percent of area covered with surface fragments: 1.6 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.06 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Hydric soil rating: No

Minor Components

Myersville, silt loam

Percent of map unit: 9 percent

Landform: Mountainsides

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Buchanan

Percent of map unit: 6 percent

Landform: Mountainsides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Edgemont, very stony

Percent of map unit: 5 percent
Landform: Mountainsides
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Center third of mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Adams County, Pennsylvania
Survey Area Data: Version 13, Oct 3, 2017

Adams County, Pennsylvania

RcD—Ravenrock-Highfield-Rock outcrop complex, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 19s9
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 150 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Ravenrock, extremely stony, and similar soils: 40 percent
Highfield, extremely stony, and similar soils: 40 percent
Rock outcrop: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ravenrock, Extremely Stony

Setting

Landform: Mountainsides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Center third of mountainflank
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Colluvium derived from greenstone over residuum weathered from greenstone

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 7 inches: gravelly silt loam
H3 - 7 to 16 inches: gravelly silt loam
H4 - 16 to 43 inches: gravelly loam
H5 - 43 to 57 inches: gravelly silty clay
H6 - 57 to 65 inches: gravelly clay loam
H7 - 65 to 80 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 60 to 80 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Highfield, Extremely Stony

Setting

Landform: Mountainsides

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from greenstone

Typical profile

H1 - 0 to 3 inches: channery silt loam

H2 - 3 to 21 inches: channery silt loam

H3 - 21 to 64 inches: very channery silt loam

H4 - 64 to 70 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent

Percent of area covered with surface fragments: 9.0 percent

Depth to restrictive feature: 40 to 80 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to high (0.06 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Valley sides

Landform position (two-dimensional): Shoulder, backslope

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Bedrock exposures

Typical profile

H1 - 0 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to high (0.06 to 6.00 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: No

Data Source Information

Soil Survey Area: Adams County, Pennsylvania

Survey Area Data: Version 13, Oct 3, 2017

MODULE 13

REPLACE THE EXISTING MODULE 13 WITH THE DOCUMENT PROVIDED HEREIN

MODULE 13

Module 13: Impoundments/Treatment Facilities

[§§77.457/77.461/77.526/77.531/Chapter 105]

13.1 Treatment

Provide a plan for the treatment of surface and groundwater drainage from the areas disturbed by the mining activities. Include a construction and treatment narrative, flow diagram, design criteria, and design calculations (which include the proposed capacity) of the treatment facilities. Identify treatment chemicals to be used. Do not include any facilities included in Module 12.

Construction and Treatment Narrative:

The initial site development of the Northern Tract Quarry consists of 3 phases. For Phase 1, collection ditches CD-1 and CD-2 will be constructed to allow for initial development and overburden soil removal of the Northern Tract Quarry. Collection Ditch CD-1 collects stormwater runoff from roughly an 11 acre area and Collection Ditch CD-2 collects stormwater runoff from roughly a 33 acre area, of which approximately 3 acres consists of the adjacent access road and approximately 41 acres consists of area available for overburden soil removal. These ditches convey the runoff to the existing Pitts Quarry. The accumulated water in the Pitts Quarry will then be incrementally pumped to the Lower Mill Pond system. Refer to Module 12 for design criteria and calculations related to these ditches.

NT Pond No. 1 and the associated collection ditches CD-3 and CD-4 will be constructed to begin Phase 2 of development. NT Pond No. 1 will collect stormwater runoff from roughly 18 acres of area downstream of Collection Ditch CD-1, of which approximately 3 acres consists of the adjacent access road and approximately 15 acres consists of area available for overburden soil removal. Collected stormwater runoff detained by NT Pond No. 1 will be incrementally pumped to the Pitts Quarry (if needed) and ultimately to the Lower Mill Pond (LMP) system over a period of 2 to 7 days after the occurrence of the storm. Once NT Pond No. 1 and the associated collection ditches are established, overburden removal and development of the Northern Tract Quarry in the Phase 2 area may advance.

NT Pond No. 2 and associated collection ditches CD-5 and CD-6 will be constructed to begin Phase 3 development. The area of overburden removal in Phases 1 and 2 will be maintained to drain towards Pitts Quarry, or into the Northern Tract Quarry. NT Pond No. 2 will collect stormwater runoff from roughly 28 acres of area downstream of collection CD-2 and CD-4, of which approximately 4 acres consists of the adjacent access road and approximately 24 acres consists of area available for overburden removal. Collected stormwater runoff detained by NT Pond No. 2 will be pumped to the Pitts Quarry (if needed) and ultimately to the LMP system over a period of 2 to 7 days after the occurrence of the storm. Once NT Pond No. 2 and the associated collection ditches are established, overburden removal and development of the Northern Tract Quarry in the Phase 3 area may advance.

Design Criteria:

Both NT Pond No. 1 and No. 2 are designed to detain, without discharging, the stormwater runoff from a storm less than or equal to a Soil Conservation Service (SCS) Type II, 24-hour duration, 100-year recurrence interval storm event. Typically, when mining is proposed within a sensitive watershed such as a High Quality (HQ) watershed as designated in 25 Pa. Code Chapter 93, the sedimentation impoundment is required to have the capacity to contain the runoff from a 10-year, 24-hour precipitation event, per the PADEP Engineering Manual for Mining Operations. This requires an impoundment constructed with a minimum total capacity of approximately 8,600 cubic feet per drainage acre. The ponds proposed for the Northern Tract Quarry permit area can store the runoff from the 100-year storm, without the use of any spillway or conveyance structure, and provide 1.5 feet of freeboard. Therefore, the proposed ponds are conservatively sized to provide storm storage capacity that greatly exceeds the minimum requirement.

SCS curve number methodology was used to calculate the stormwater runoff volume for each pond, considering a curve number of 86 (assuming disturbed conditions and hydrologic soil group B) for the runoff area and a rainfall depth of 8.03 inches. Both of the ponds are designed to have 2,000 cubic-feet per drainage acre for sediment storage, consistent with PADEP requirements. Since the ponds are design to detain the 100-year storm event runoff, NT Pond Nos. 1 and 2 have approximately 27,000 cubic-feet per acre and 30,000 cubic-feet per acre of settling volume, respectively. This settling volume is significantly larger than the typical settling volume required by the PADEP of 5,000 cubic feet per acre, minus applicable reductions.

Although not activated for the 100-yr storm event, both ponds are provided with an emergency spillway. The spillways are configured with a riprap lining to preclude uncontrolled erosion in the event of being activated. However, these spillways are not anticipated to be activated except during rare or extreme storm events that exceed a 24-hour duration, 100-year storm event. The ponds are configured to provide sufficient volume to store the volume of the 24-hour, 100-year storm event without the need for any type of dewatering (e.g. via spillway or pumping) during the storm. Thus, the ponds can passively control the 100-year design storm without discharge and be dewatered at a later time after cessation of the storm. Electric turbine pumps are proposed in each pond to facilitate dewatering of the ponds in 2 to 7

days, and to maintain the ponds' normal pool elevations.

13.2 Quarry/Pit Sump

Provide a description of the sump including size, location, depth, method of pumping, etc. (Key location to Exhibits 6.2 and 9).

The location and size of the quarry sump will vary as mining progresses to the final configuration depicted on Exhibit 9 – Operations Map. Electric turbine pumps with diesel backup capabilities will be maintained in the quarry to transfer water collected in NT Ponds 1 and 2 into the LMP system. Alternately, water collected in NT Ponds 1 and 2 may be pumped directly to the LMP System.

13.3 Dams and Impoundments (General) Do not include any facilities included in Module 12

- a) Proposed use. **Collection and Sediment Removal**
- b) Map and location (key to maps). **Refer to Exhibit 13 drawings for plans, cross-sections, and details of NT Pond Nos. 1 and 2.**
- c) Provide a design report and construction plans and specifications to include detailed cross-sections and plan view scale drawings of the proposed structure which show: principal spillway, dewatering devices, embankment details (including maximum height, top width, and cutoff trench), crest of emergency spillway and existing ground.

Refer to Exhibit 13 drawings for plans, cross-sections, and details of NT Pond Nos. 1 and 2. Additionally, design calculations for each pond, demonstrating how the proposed configurations meet PADEP criteria, are attached to this module.

As discussed in Module 13.1, accumulated water in NT Pond Nos. 1 and 2 will be pumped to the Pitts Quarry (if needed) and ultimately to the LMP system for ultimate discharge into Miney Branch through NPDES Outfall 001 (NPDES Permit PA0009059). The existing LMP system has adequate capacity to accommodate this additional water as discussed in the following section.

Per the NT Pond Calculations provided with this permit application, the anticipated pumping rate at NT Pond No. 1 will range from 400 gallons per minute (gpm) to 1,000 gpm, considering a dewatering time of 7 days to 2 days, respectively, per PADEP requirements. Similarly, NT Pond No. 2 will have a pumping rate ranging from approximately 650 gpm to 1,800 gpm (7 day to 2 day dewatering time). Thus, the total pumping rate tributary to the LMP from the NT Ponds will range from 1,050 gpm to 2,800 gpm, depending on the chosen pump capacities.

The NT Ponds are designed to detain the runoff from a 100-year, 24-hour storm event without discharging. Therefore, the NT Ponds have excess available storage volume that, during normal operations, will allow for temporarily detaining accumulated water in the NT Ponds to accommodate mining operations. Thus, after a storm event, the accumulated water in the NT Ponds could be allowed to remain in the pond for two to five days. Then, the NT ponds could be dewatered in the following two to five days (within seven days total), depending on the chosen pump capacities. This will allow for a staged dewatering process at the LMP system where the runoff that is passively conveyed to the LMP system (the runoff from its tributary watershed) will be discharged from the pond in the short term through the perforated riser spillways, and the accumulated runoff from the NT Ponds and other sources can be pumped to the LMP system at a later time for subsequent release. Once the Northern Tract Quarry is developed such that it will detain water in the bottom of the pit, the ability to complete a staged dewatering process will be improved since the water can be detained in the quarry pit for an even longer duration. Therefore, the discharge rate at NPDES Outfall 001 will be unchanged considering the addition of the pumped water from the proposed NT Ponds.

An evaluation of the LMP system was provided to the PADEP on October 26, 2017 in report titled NPDES Permit No. PA0009059 Application Final Addendum Report. This submission was made in response to comments provided by the PADEP regarding the associated NPDES permit renewal. Per the NPDES report, the total spillway capacity of the LMP system is 775.7 cubic feet per second (cfs), while providing 2 feet of freeboard. The anticipated pumping rate from the proposed NT Ponds is anticipated to be no greater than 2,800 gpm (1,000 gpm

from NT Pond No. 1 and 1,800 gpm from NT Pond No. 2) or 6.2 cfs. As previously mentioned, the NT Ponds are configured so that the water conveyed from these ponds as part of dewatering will be discharged to the LMP system after the storm event has ceased in most cases. However, even if dewatering of the NT Ponds occurred during a storm event at the LMP system, the additional 6.2 cfs of flow is negligible considering the overall discharge capacity of the LMP system.

- d) If the impoundment is located outside of the area covered by the geology and hydrology description contained in Modules 7 and 8, include a preliminary geology and hydrology report.

Not Applicable

- e) Describe the potential effect on the structure from subsidence from underground mining when applicable.

Not Applicable

- f) If the detailed design plans are not included with the initial submittal of this application, identify when the detailed design plans will be submitted. (**Note:** The detailed design plans must be approved by the Department before construction of the structure begins.) **Not Applicable. All detailed design plans are included with this submittal.**

13.4 Class C Dams

A separate permit is required for impoundments that meet one or more of the following:

- 1) a contributory drainage area exceeding 100 acres;
- 2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 ft;
- 3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet.

(**Note:** A permit processing fee of \$1500 should be included for structures that meet the above criteria. Permits for impoundments that meet the above mentioned criteria and are to be left in place after mining will be submitted to the Division of Dams Safety, Bureau of Waterways Engineering for their review and approval.)

The proposed NT Pond Nos. 1 and 2 have contributory areas of less than 100 acres, do not include dams that exceed 15 feet in height, and do not impound more than 50 acre-feet at the maximum storage elevation. Therefore, a separate dam permit is not applicable.

13.5 Operation and Maintenance Requirements

Describe the operation and maintenance requirements for the structure, including dewatering of the impoundments following storm events.

The dewatering of NT Pond Nos. 1 and No. 2 is to be maintained by pumping. The ponds will be inspected after every storm event or on a minimum weekly basis. The inspection will entail a visual inspection of the impounded water level and clarity; measurement of the sediment storage level to ascertain its level relative to the maximum permitted sediment cleanout level; observation of the conditions of the emergency spillway, embankment crest, and pond interior and exterior slopes; and observation of other pertinent features of the pond and adjoining areas (such as contributing ditches). The ponds will be dewatered by pumping within 2 to 7 days following a storm event. Physical markers within the pond will provide reference points for identifying when the pond is approaching sediment capacity and requires cleaning. An access road is provided in each pond to facilitate sediment cleanout operations. Sediment will be removed from the ponds as necessary to maintain accumulated sediment levels at or below the prescribed sediment cleanout elevation. The removed sediment will be disposed in approved areas at the Charmian Site.

13.6 Removal

Describe the timetable and plans for removal of the impoundment and reclamation of the area.

Once the Northern Tract Quarry is developed and the contributory areas to the ponds are encompassed within the quarry, and the depth of the quarry can detain the runoff volume from storm events without impacting mining operations, NT Pond No. 1 and NT Pond No. 2 may be removed. The operator will submit a revised E & S plan for approval to the Department prior to removing NT Pond No. 1 and/or NT Pond No. 2. The E & S plan will show that no storm water from the mining area will be directed to Tom's Creek or unnamed tributary to Tom's Creek, located next to Iron Springs Road.

Commonwealth of Pennsylvania
Department of Environmental Protection
Bureau of Mining Programs

POND CERTIFICATION

Permittee Specialty Granules, LLC
Permit No. Pending
Pond NT Pond No. 1
Township Hamiltonban Township
County Adams County, Pennsylvania
Engineer/Land Surveyor D'Appolonia Engineering Division of GTI
Date _____

Instructions: Complete first page and submit with permit application. Use both pages to certify completed impoundment.

Sedimentation ponds and other impoundments must be constructed in accordance with the approved permit before any disturbance of the area to be drained into the pond. Impoundment requiring a Chapter 105 permit or is equal to or greater than 20 acre-feet storage capacity must be inspected during construction under the supervision of, and certified to the Department upon completion of construction by a registered professional engineer. If impoundment does not require a Chapter 105 permit or is less than 20 acre-feet storage capacity, it must be inspected during construction, and certified by a registered professional engineer or a registered professional land surveyor.

Any enlargement, reduction in size, reconstruction, or other modification, that may affect the stability or operation must be approved by the Department. Pond must be certified and approved prior to the start of any other mining activities.

Unless otherwise specified in your permit, use this form for the sedimentation pond and other impoundment certification. Submit 1 original and 2 copies to the appropriate District Mining Office. All information must be provided, otherwise it will be returned for completion.

U.S.G.S. Quadrangle: Iron Springs, Pennsylvania Location (point of discharge): Latitude 39° 46' 9.2"; Longitude 77° 26' 37.9" or

Location from **Bottom Right** corner of U.S.G.S. Quadrangle: - _____ inches North; - _____ inches West

HYDROLOGY: Drainage Area 18.37 acres Design Storm 100-yr Average Watershed Slope 0.25 ft/ft

Land Use Unmanaged Forestland Soil Type HSG B Curve Number 86 (Disturbed) Peak Discharge 178 cfs (100-yr storm)

		<i>Permit Application</i>	<i>As Constructed</i>
Embankment	Top Width (Minimum)	<u>12 ft</u>	
	Outside Slope (Maximum) (_H: _ V)	<u>2H:1V</u>	
	Inside Slope (Maximum)	<u>2H:1V</u>	
	Top Elevation	<u>1060.0</u>	
	Bottom Elevation	<u>1045.0</u>	
	Upstream Toe Elevation	<u>1058.5</u>	
	Downstream Toe Elevation	<u>1048.5</u>	
	Type of Cover	<u>Vegetated/Coarse Aggregate</u>	
	Incised Slope (if any)	<u>Yes</u>	
	Inside Slope (Maximum) (_H: _ V)	<u>2H:1V</u>	
Principal Spillway	Top Elevation	<u>1060</u>	
	Bottom Elevation	<u>1045.0</u>	
	Type	<u>See Dewatering Device</u>	
	Conduit Diameter (if barrel/riser give both)	<u>N/A</u>	
	Inlet Elevation	<u>N/A</u>	
Dewatering Device	Outlet Protection	<u>N/A</u>	
	Spillway Capacity	<u>N/A</u>	
	Type/Size	<u>Pumping System</u>	
	Inlet Elevation	<u>1047.0</u>	
	Discharge Regulation (ie., self draining or valved)	<u>-</u>	
Emergency Spillway	Discharge Capacity (cubic feet/second)	<u>0.89 to 2.23 cfs (400 to 1000 gpm)</u>	
	Time to Dewater Full Pond	<u>2 to 7 days</u>	
	Type	<u>Open Channel Spillway</u>	
	Width	<u>8 ft</u>	
	Depth (with 2 feet of freeboard)	<u>1.5 ft</u>	
Storage Capacity	Length	<u>24 ft</u>	
	Sideslopes	<u>10H:1V</u>	
	Crest Elevation	<u>1058.5</u>	
	Slope	<u>0.0 ft/ft</u>	
	Type of Lining/Protection	<u>R-3 Riprap/AASHTO No. 57</u>	
	Spillway Capacity (provide design calculations)	<u>21 cfs at EI 1059.5</u>	
	Length @ Bottom	<u>802 ft</u>	
	Width @ Bottom	<u>12 ft to 33 ft</u>	
	Length @ Crest of Emergency Spillway	<u>862 ft</u>	
	Width @ Crest of Emergency Spillway	<u>65.5 ft to 87 ft</u>	
	Volume @ Crest of Emergency Spillway	<u>537,159 cf (12.33 ac-ft)</u>	

Permittee _____
 Permit No. _____
 Pond _____
 Township _____
 County _____

TO BE COMPLETED AFTER CONSTRUCTION

1. Has the facility been constructed at the location shown in the approved permit? ☐ Yes ☐ No
2. Is the emergency spillway constructed at the location shown in the approved plan? ☐ Yes ☐ No
3. Is the principal spillway constructed at the location shown in the approved plan? ☐ Yes ☐ No
4. Are the collection channel inlets constructed with adequate inlet protection and at the location shown in the approved plan? ☐ Yes ☐ No
5. Identify any conditions or deficiencies in the facility that need to be corrected.

Construction Inspection

Stage of Construction

(specify stage e.g. layout, impoundment/embankment construction, spillway/piping installation)

Date of Inspection

Inspected By

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Supervising Professional Engineer/Registered Professional Land Surveyor _____

Address _____

Telephone Number _____

I certify in accordance with 25 Pa Code Section 77.531 that the above-mentioned structure is complete and has been constructed.

Signature of Registered Professional Engineer/Registered Professional Land Surveyor _____

Date _____

SEAL

Registration Number and Expiration Date _____

Signature of Permittee or Responsible Official _____

Date _____

Title _____

**Commonwealth of Pennsylvania
Department of Environmental Protection
Bureau of Mining Programs**

POND CERTIFICATION

Permittee Specialty Granules, LLC
 Permit No. Pending
 Pond NT Pond No. 2
 Township Hamiltonban Township
 County Adams County, Pennsylvania
 Engineer/Land Surveyor D'Appolonia Engineering Division of GTI
 Date _____

Instructions: Complete first page and submit with permit application. Use both pages to certify completed impoundment.

Sedimentation ponds and other impoundments must be constructed in accordance with the approved permit before any disturbance of the area to be drained into the pond. Impoundment requiring a Chapter 105 permit or is equal to or greater than 20 acre-feet storage capacity must be inspected during construction under the supervision of, and certified to the Department upon completion of construction by a registered professional engineer. If impoundment does not require a Chapter 105 permit or is less than 20 acre-feet storage capacity, it must be inspected during construction, and certified by a registered professional engineer or a registered professional land surveyor.

Any enlargement, reduction in size, reconstruction, or other modification, that may affect the stability or operation must be approved by the Department. Pond must be certified and approved prior to the start of any other mining activities.

Unless otherwise specified in your permit, use this form for the sedimentation pond and other impoundment certification. Submit 1 original and 2 copies to the appropriate District Mining Office. All information must be provided, otherwise it will be returned for completion.

U.S.G.S. Quadrangle: Iron Springs, Pennsylvania Location (point of discharge): Latitude 39° 46' 4.8"; Longitude 77° 26' 9.2" or
 Location from **Bottom Right** corner of U.S.G.S. Quadrangle: - _____ inches North; - _____ inches West
 HYDROLOGY: Drainage Area 28.19 acres Design Storm 100-yr Average Watershed Slope 0.25 ft/ft
 Land Use Unmanaged Forestland Soil Type HSG B Curve Number 86 (Disturbed) Peak Discharge 272 cfs (100-yr storm)

	<i>Permit Application</i>	<i>As Constructed</i>
Embankment	Top Width (Minimum) <u>12 ft</u> Outside Slope (Maximum) (_H: _ V) <u>2H:1V</u> Inside Slope (Maximum) <u>2H:1V</u> Top Elevation <u>1010.0</u> Bottom Elevation <u>995.0</u> Upstream Toe Elevation <u>1004.5</u> Downstream Toe Elevation <u>998.5</u> Type of Cover <u>Vegetated/Coarse Aggregate</u> Incised Slope (if any) <u>Yes</u> Inside Slope (Maximum) (_H: _ V) <u>2H:1V</u> Top Elevation <u>1075.0</u> Bottom Elevation <u>995.0</u>	
Principal Spillway	Type <u>See Dewatering Device</u> Conduit Diameter (if barrel/riser give both) <u>N/A</u> Inlet Elevation <u>N/A</u> Outlet Protection <u>N/A</u> Spillway Capacity <u>N/A</u>	
Dewatering Device	Type/Size <u>Pumping System</u> Inlet Elevation <u>997.0</u> Discharge Regulation (ie., self draining or valved) <u>-</u> Discharge Capacity (cubic feet/second) <u>1.45 to 4.01 cfs (650 to 1,800 gpm)</u> Time to Dewater Full Pond <u>2 to 7 days</u>	
Emergency Spillway	Type <u>Open Channel Spillway</u> Width <u>8 ft</u> Depth (with 2 feet of freeboard) <u>1.5 ft</u> Length <u>18 ft</u> Sideslopes <u>10H:1V</u> Crest Elevation <u>1008.5</u> Slope <u>0.0 ft/ft</u> Type of Lining/Protection <u>R-3 Riprap/AASHTO No. 57</u> Spillway Capacity (provide design calculations) <u>21 cfs at EI 1008.5</u>	
Storage Capacity	Length @ Bottom <u>1286 ft</u> Width @ Bottom <u>13 ft to 23 ft</u> Length @ Crest of Emergency Spillway <u>1346 ft</u> Width @ Crest of Emergency Spillway <u>62 ft to 97 ft</u> Volume @ Crest of Emergency Spillway <u>910,367 cf (20.90 ac-ft)</u>	

Permittee _____
 Permit No. _____
 Pond _____
 Township _____
 County _____

TO BE COMPLETED AFTER CONSTRUCTION

1. Has the facility been constructed at the location shown in the approved permit? ☐ Yes ☐ No
2. Is the emergency spillway constructed at the location shown in the approved plan? ☐ Yes ☐ No
3. Is the principal spillway constructed at the location shown in the approved plan? ☐ Yes ☐ No
4. Are the collection channel inlets constructed with adequate inlet protection and at the location shown in the approved plan? ☐ Yes ☐ No
5. Identify any conditions or deficiencies in the facility that need to be corrected.

Construction Inspection

Stage of Construction (specify stage e.g. layout, impoundment/embankment construction, spillway/piping installation)	Date of Inspection	Inspected By
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Supervising Professional Engineer/Registered Professional Land Surveyor _____

Address _____

Telephone Number _____

I certify in accordance with 25 Pa Code Section 77.531 that the above-mentioned structure is complete and has been constructed.

Signature of Registered Professional Engineer/Registered Professional Land Surveyor _____ Date _____

Registration Number and Expiration Date _____

SEAL

Signature of Permittee or Responsible Official _____ Date _____

_____ Title _____

MODULE 14

REPLACE THE EXISTING MODULE 14 WITH THE DOCUMENT PROVIDED HEREIN

MODULE 14

Module 14: Streams/Wetlands

[Chapter 105/§77.504/§77.523]

Note: The United States Army Corp 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. Projects will be sent to the Corps as a Category III activity for review. The Commonwealth has issued 401 Water Quality Certification for projects eligible under PASPGP-4.

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 and separate 401 Water Quality Certification.

Stream/Wetland encroachments may also require authorization from the US Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. If this project requires a federal permit, you may be eligible for either PASPGP-4 authorization or you must file a separate application with the Corps. If you require a permit and are not eligible under the PASPGP-4 you must request a Section 401 Water Quality Certification from the Department using module 14A "Request for Federal Clean Water Act (CWA) Section 401 Certification for Mining Activities."

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

If no, explain why not. **No discharge of dredged or fill materials, or the placement of temporary or permanent structures into Waters of the United States, including wetlands, is being proposed by the mining plan.**

14.1 Mining Activities Within 100 Feet of a Stream/Stream Relocation/Channel Change

If the mining activities are proposed within 100 feet of an intermittent or perennial stream, including haul road crossings, or the relocation or channel change of an intermittent or perennial stream provide the following information: (**Note:** Variance request for these and the expansion of pits must be included in the proof of publication. A separate Module 14.1 should generally be completed for each proposed encroachment.)

Not Applicable (N/A) - The proposed mining and support activities will avoid direct and indirect impacts to streams. All mineral extraction activities are planned to occur a minimum distance of approximately 300 feet from the nearest stream. Additionally, the planned drainage control features at the site are designed such that no discharges to Toms Creek and its adjacent tributaries will occur except for storms of greater magnitude or intensity than the 100-year storm. Additional detail regarding the drainage features is provided in Modules 12 and 13. Furthermore, the quarry development of the Northern Tract Quarry is not anticipated to affect the groundwater related base flow in Toms Creek or its adjacent tributaries, as discussed in Module 8.

- a) Name and location of the stream; and location, length, and acreage disturbed by the proposed activities (Identify the location of the proposed activities on Exhibits 9 and 18);
- b) A narrative giving a description and the purpose and justification of the proposed activities;
- c) A description of the character of the stream bed and banks, and a profile of the stream for a reasonable distance above and below the proposed site showing bed slopes, normal and flood water surfaces and a description of the riparian vegetation including 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 community. 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 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;
- e) A hydrologic and hydraulic analysis which shall include:
 1. data on size, shape and characteristics of the watershed;

2. the size and frequency of the design storm;
3. the hydraulic capacity of any structures or replacement channel;
4. the hydraulic capacity of the channel upstream and downstream of the structure or the relocation/channel change;

- f) Where a bridge, culvert or other water obstruction is proposed, provide the following information:

(Note: General Permit (BMR-GP-102) is available for construction of access roads.)

- 1) Plans and details showing the location, type, size, and height of the structure;
- 2) A narrative description of the construction methods and sequence including water handling during construction, and erosion and sedimentation controls;
- 3) Indicate if the structure will be temporary or permanent (include plans for removal of temporary structures).

- g) For a Channel Change or Stream Relocation: **N/A**

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;

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.

- h) A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code Chapter 93 Protected Water Use Classification.

14.2 Wetland Related Information

- a) Provide the name(s), address(es), telephone number(s) and qualifications of the person(s) who made the determination if wetlands exist within the proposed permit area.

Andrew Brookens
Skelly and Loy, Inc.
449 Eisenhower Blvd., Suite 300
Harrisburg, PA 17111
717-232-0593
B.S., Biology, 1993, Shippensburg University of Pennsylvania
USACE Baltimore District, Certified Wetland Delineator; USFWS Recognized Qualified Bog Turtle Surveyor

- b) Show the location of wetlands on Exhibits 6.2, 9 and 18. **Wetlands within the proposed permit area are shown on Exhibits 6.2, 9, and 18. All of these wetlands are located outside of the limit of disturbance (for both mining and support activities). No direct impacts to wetlands will occur.**

- c) What is the total wetland acreage (which will be affected) for the proposed permit area?

0 acres.

- d) Provide responses to the following for each wetland which will be affected by the proposed mining activities: **None of the wetlands will be directly affected by the proposed mining activities. Indirect impacts to Wetland D may occur as a result of the proposed project, as described in 14.3 below. An additional narrative regarding possible indirect wetland impacts is provided as Attachment No. 1 to the SEJ.**

Exceptional Value Wetland Characteristics

- 1) Does the wetland serve as habitat for flora and fauna listed as

“threatened” or “endangered” under the Endangered Species Act of 1973, Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code?

☐ yes ☒ no

- 2) Is the wetland hydrologically connected to or located within 1/2 mile of the wetlands identified in d)1) and does it maintain the habitat of the “threatened” or “endangered” species within the wetlands identified in d)1) above)?

☐ yes ☒ no

NOTE: If this wetland is located more than 1000 feet from the permit area, show its location (and the location of the wetland that is hydrologically connected to or located within ½ mile of) on the Exhibit 6.1 Map.

- 3) 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?

☐ yes ☒ no

- 4) Is the wetland located in or along the floodplain of a stream listed as exceptional value (under 25 Pa Code Chapter 93) or the floodplain of a tributary to an exceptional value stream?

☐ yes ☒ no

- 5) 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?

☐ yes ☒ no

- 6) 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?

☐ yes ☒ no

- 7) Is the wetland located in areas designated by the Department as “natural” or “wild” areas within state forest or park lands?

☐ yes ☒ no

- 8) Is the wetland located in areas designated as Federal wilderness areas under the Wilderness Act or the Federal Eastern Wilderness Act of 1975?

☐ yes ☒ no

- 9) Is the wetland located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935?

☐ yes ☒ no

NOTE: If a “yes” response is indicated for any question in d)1) through d)9), 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

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

☒ yes ☐ no

- 11) Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?

☐ yes ☒ no

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

☒ yes ☐ no

- 13) Does the wetland serve as storage areas for flood and storm waters, or does it shield other areas from erosion or storm damage?

☒ yes ☐ no

- 14) Does the wetland provide a groundwater recharge area that maintains minimum baseflows?

☒ yes ☐ no

- 15) Does the wetland serve as a prime natural recharge area where surface water and groundwater are directly connected?

☒ yes ☐ no

- 16) Does the wetland aid in the prevention of pollution?

☐ yes ☒ no

- 17) Is the wetland used for, or does it provide the opportunity to be

used for recreation?

☐ yes☒ no

- e) If a "yes" response is indicated for the question in d)1) or d)2), identify how the determination was made and indicate any contacts with state or federal agency personnel.

14.3 Wetland Impact Analysis/Assessment

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

The proposed mining and support activities will avoid direct impacts to wetlands, as all mineral extraction is planned to occur a minimum distance of 200 feet from the wetlands. All support activities (erosion and sediment control structures, access roads, stockpiles, etc.) will be located within the Operational Buffer which is located a minimum of 42 feet away from the nearest wetland (Wetland D). As discussed in detail in the SEJ that was submitted in support of this application, many alternatives were examined related to siting of the proposed mining operations. Siting of the Northern Tract Quarry permit area is constrained primarily by the location of the geologic formation planned for mineral extraction. The primary constraint is the presence of metabasalt rock which defines the location of the quarry operation. In turn, secondary constraints govern the location of some of the components of stormwater management features associated with those operations. Such secondary physical constraints include: property boundaries, required regulatory setbacks, utilities and infrastructure, and the conservation buffers mandated under the Conditional Use permit issued by Hamiltonban Township. The maximum operationally possible buffers/setbacks have been proposed and will be maintained separating wetland areas from mining and support activities.

Adequate erosion and sediment controls will be in-place and functional prior to earth disturbance activities in contributory areas, and no water will be discharged to the wetland areas. The only potential indirect impact to Wetland D would be related to the potential for water loss as a result of both the reduction in the run-off area (watershed) and the predicted decrease in elevation of the water table (especially in the western edge of Wetland D) adjacent Wetland D caused by the dewatering of the proposed quarry.

- b) Discuss whether any of the alternatives are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites which would not affect the wetlands.

N/A

- c) For any wetlands within the proposed permit area, provide the following:

- 1) Identify and delineate the wetland and the areal extent of the impact (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and delineation of wetlands – statement of policy).

Potential jurisdictional wetlands and watercourses were identified and delineated in the field by Skelly and Loy on December 16, 2015. The field investigation identified five potentially jurisdictional wetland habitats (Wetlands A through E, shown on the permit exhibits) within the Northern Tract Quarry; however, as stated previously, these wetlands are located outside of the proposed mining and support areas and no direct impacts are anticipated. A copy of the Jurisdictional Wetland-Watercourse Identification/Delineation And Phase I Bog Turtle Habitat Assessment Report is attached to this permit application with the PNDI correspondence located behind Module 1.

- 2) Submit a cross-sectional view showing the wetland and the proposed mining area.

See attached Exhibit 14.3 sheets.

- 3) Explain how the proposed mining activities will directly affect the wetlands.

N/A. Proposed mining activities will not directly affect the wetlands. Best Engineering/Management Practices will be employed for stormwater runoff control design and installation.

- aa) If the proposed mining activities will affect less than 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 of the wetland functions which will be impacted by the proposed mining activities. **Note:** If a "yes" response is indicated for any question in Module 14.2 d)1) through d)9), the wetlands would be exceptional value (as defined in Section 105.17).

N/A.

- bb) If the proposed mining activities will affect 1.0 or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions identified in Module 14.2 d)10) through d)17).

N/A

- d) If any wetlands within the proposed permit or adjacent area will be indirectly affected (e.g. altering the wetland hydrology), provide the following:

- 1) Identify and delineate the wetland and provide an estimate of the total wetland acreage affected (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and Delineation of Wetlands – statement of policy).

Wetland D has been identified and delineated and is depicted on the permit mapping. The acreage of Wetland D within the permit boundary is 1.2 acres, which is generally the portion delineated by Skelly and Loy; however the total acreage of Wetland D is approximately 4.1 acres, as some of it extends beyond the permit boundary and was delineated previously by others.

- 2) A description of how the proposed mining activities will indirectly affect the wetlands.

There is a potential for water loss as a result of both the reduction in the run-off area (watershed) and the predicted decrease in elevation of the water table (especially in the western edge of Wetland D) adjacent Wetland D caused by the dewatering of the proposed quarry. No indirect effects to Wetlands A, B, C, and E due to hydrologic alteration are anticipated from the development of the proposed Northern Tract Quarry. The hydrologic sources to these wetlands are primarily associated with the surface water and seasonal groundwater interflow contributed from the Unnamed Tributary to Toms Creek. Portions of Wetland C are associated with seepage along the lower hillside slope adjacent the floodplain of the Unnamed Tributary (UNT) to Toms Creek. In contrast to Wetland D, indirect impacts to the hillside groundwater seepage hydrology attributed to Wetland C are not anticipated due to the distance of the seepage at Wetland C from the proposed quarry pit, as well as the location of the Wetland C seepage at the toe of hillside slope rather than on the hillside like Wetland D. Also, the source of hydrology to Wetland C is

primarily from the unnamed tributary to Toms Creek, while the seepage is believed to be a limited component.

The groundwater model simulations suggest that impacts related to diminished baseflow (bedrock groundwater recharge) to existing wetlands and the UNT corridor as a result of lowering the regional potentiometric surface will be negligible during development of the Northern Tract Quarry. This conclusion is supported by the model simulation of the proposed ultimate pit floor elevation where the reduction in baseflow contribution (loss) to these resources compared to the total flow (runoff and baseflow) was calculated to be on the order of only 0.2% to 1.2%. The underlying metabasalt and metarhyolite geology within the area has a very low permeability and severely limits the movement of groundwater moving through these formations.

However, this analysis also suggests that these bedrock conditions most likely facilitate the movement of water over the ground surface. Thus, any appreciable loss of runoff area (watershed) and contributory overland flow could result in indirect hydrologic effects to receiving downslope aquatic resources. Approximately 65% of the existing contributory drainage area to two hillside-associated wetland habitats within the Northern Tract Quarry mine permit boundary, Wetland C and Wetland D, may be removed as a result of the ultimate quarry development.

Wetland D is an expansive habitat extending well beyond the proposed Northern Tract Quarry mine permit boundary. The sustenance of other sources of runoff area outside of the Northern Tract Quarry mine permit boundary are anticipated to ameliorate much of the effects of contributory drainage area loss within the Northern Tract. However, some amount of indirect effects due to the loss of contributory drainage area may occur to Wetland D.

Wetland C is substantially smaller in size, and is predominantly situated within the floodplain of the UNT to Toms Creek. The western extent of Wetland C is situated at an elevation approximately 55' lower and roughly 200' closer to the UNT to Toms Creek than the western extent of Wetland D. Due to a very limited amount of this habitat being situated on the hillside slope, the remaining upslope runoff area following development of the Northern Tract Quarry may continue providing sufficient hydrology to sustain this portion of the wetland. Given Wetland C's proximity to the UNT to Toms Creek, and the fact that the UNT to Toms Creek itself acts as a barrier to any indirect dewatering effects from proposed quarry development, the UNT to Toms Creek will continue to provide a sustaining source of flow/hydrology to this component of Wetland C. As supported by the groundwater modeling results, the hydrology associated with the UNT to Tom's Creek is not expected to be diminished by dewatering of the proposed Northern Tract Quarry or loss of contributory drainage area.

Although the existing Pitts Quarry is located further from Wetlands C and D than the proposed Northern Tract Quarry, it is important to note that there have been no reported impacts to the hydrology of Wetlands C and D related to the operation of the Pitts Quarry. Therefore, the effects of the proposed Northern Tract Quarry development on the wetlands and UNT corridor will likely be limited to the extent that surface runoff and shallow groundwater interflow in the upper soil horizons will be reduced to Wetland D by removing a portion of the wetland's natural upslope drainage area. The sustenance of other sources of runoff area to Wetland D outside of the Northern Tract Quarry mine permit boundary are anticipated to ameliorate much of these effects.

- e) Will the cumulative impact of the proposed and anticipated mining activities result in a major impairment of the wetland resource in the general area? ☐ yes ☒ no

Provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.

The proposed mining and support activities will avoid direct impacts to wetlands, as all mineral extraction is planned to occur a minimum distance of 200 feet from the wetlands. Due to Wetland D's limited hydrologic contribution to the Toms Creek drainage basin, any resulting impact to Wetland D from indirect hydrologic effects is expected to result in insignificant effects to the functions, values, and quality of the Toms Creek drainage basin.

14.4 Wetland Mitigation/Replacement

Note: If a total of one-half (.5) acres or less of wetlands will be affected, participation in Pennsylvania's Wetlands Replacement Project may be authorized by the Department in lieu of onsite replacement of the wetlands. **N/A**

a) If wetland mitigation measures or wetland replacement are proposed, address the following:

1) Identify the wetlands where mitigation measures will be employed.

A botanist will conduct a comprehensive vegetation survey of Wetland D to document current baseline conditions, including a Prevalence Index and FAC Neutral Test score. These indices help characterize the vegetative condition of the wetland community with respect to the hydrophytic indicator status ranks for the existing vegetation. The prevalence index is a weighted-average of the wetland indicator status of all plant species in the wetland. The FAC-Neutral test is a summation of the number of dominant plants with a "Wet" indicator status versus those with a "Non-wet" indicator status. By establishing a baseline condition, future monitoring could provide a comparison to determine if a change in the wetland vegetative community has occurred. Biannual (twice per year) vegetative monitoring is proposed for Wetland D during mining activities. If there would be a change in the hydrologic condition to the subject wetland due to the proposed quarry project, it would be expected to be evinced in a change in the vegetative community (i.e. if drier hydrologic conditions develop, then drier uplands plants inhabit the area). If impacts to Wetland D are apparent, biannual vegetative monitoring will commence in Wetlands A and C. A mitigation strategy will be developed in coordination with the Department should impacts be realized.

2) Identify the wetlands that will be replaced and the location of the replacement wetland site. Provide the number of acres for each wetland to be replaced and the acreage of the replacement wetland.

As discussed in 14.4 a 1) above, a monitoring program is proposed. Should the results of this independent study reveal impacts to Wetland D, the applicant will compensate in coordination with the Department at a 1:1 ratio

3) Provide a plan for mitigation/replacement following the guidelines in the Department's technical guidance titled "Design Criteria - Wetlands Replacement Monitoring" document 363-0300-001. This guidance is available from the Division of Waterways, Wetlands and Erosion Control, Post Office Box 8854, Harrisburg, Pennsylvania 17105-8554 or through the Department's website.

If determined to be warranted, an appropriate compensatory wetland mitigation plan including the location of proposed compensatory activities will be coordinated with the Department. The compensatory wetland mitigation plan would be consistent with the Department's design criteria technical guidance.

Show the location of replacement wetland sites on the Operations Map (Exhibit 9) and the Land Use and Reclamation Map (Exhibit 18).

Note: At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres). 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.

14.5 United States Army Corp of Engineers Permits

a) If the United States Army Corp of Engineers (Corps) requires a Pennsylvania State Programmatic General Permit – 4 (PASPGP-4) for your proposed activity: **N/A**
Completed and attach the "PASPGP-4 Cumulative Impacts Project Screening Form (3150-PM-BWEW0050)" and supporting documents listed below.

1) the PASPGP-4 Cumulative Impact Project Screening Form (3150-PM-BWEW0050);

2) Exhibits (pdf format):

- a) U.S.G.S. Map 6.1 (site location map),
- b) Environmental Resources Map 6.2,
- c) Operations Map 9,
- d) Land Use and Reclamation Map 18, and
- e) a CD or DVD with any plans that are larger than 8 ½ by 11 inches.

- 3) Module 1: Large Noncoal (Industrial Minerals) Mine Permit Application
- 4) Module 14 and any detail drawings for stream / wetland encroachment activities (including Form 14A, Request for Federal Clean Water Act (CWA) Section 401 Certification For Mining / Coal Refuse Disposal Activities).
- 5) the Endangered Species Act /Pennsylvania Natural Diversity Inventory receipt,
- 6) the Pennsylvania Historical and Museum Commission correspondence (Section 106 coordination)

FORM 14A - Request for Federal Clean Water Act (CWA) Section 401 Certification For Mining / Coal Refuse Disposal Activities

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 _____	Application No. _____
Address _____	Operation Name _____

Telephone _____	Municipality _____
	County _____

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. _____

Section 2: Activity Description:

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

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 _____ and the date on which the application was filed _____.

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).**

Signature of Applicant or Responsible Official

Name (typed)

Title

MODULE 23

REPLACE THE EXISTING MODULE 23 WITH THE DOCUMENT PROVIDED HEREIN

MODULE 23

Module 23: Revegetation

[§77.456(5)]

23.1 Soil Test Plan

Provide a soil test plan for determining plant nutrients and soil amendments required to establish vegetation and achieve the approved postmining land use.

Example: Soil samples will be collected using a soil auger. A composite sample will be obtained from individual core samples from each type of existing land use. These samples will be analyzed by Blank Laboratory using "Soil Mailing Kits", or another accredited laboratory.

Overburden soil will be utilized for final reclamation and for establishing a growing medium for establishment of vegetative cover. Prior to redistribution of overburden soil or other material, the regraded land will be prepared to eliminate slippage surfaces and to promote root penetration. Overburden soils and other materials will be redistributed in a manner that achieves an approximate uniform, stable thickness consistent with the approved postmining land uses, contours and surface water drainage system, prevents excess compaction of the soil and other materials and protects the soil and other materials from wind and water erosion.

Overburden soils will be applied to the reclamation surface so that it supports the approved postmining land use and meets the revegetation requirements of 25 PA Code Chapter 77.611-77.618 (relating to revegetation). Results of a soil test will be submitted to the Department.

23.2 Temporary Cover. Provide the following information for each seed mixture to be used for temporary cover:

Example: Standard Seed Mixture

<u>Seed Mixture No.</u>	<u>Seed Mixture (Species)</u>	<u>Rate of Appl. 100% PLS* (lbs./acre)</u>	<u>Seeding Dates (Months)</u>
B	Annual Ryegrass	40	Early spring till Late fall
	<i>If storage areas are to be left longer than one growing season the following will be used: Perennial Ryegrass</i>	10	

a)

<u>Seed Mixture No.</u>	<u>Seed Mixture (Species)</u>	<u>Rate of Appl. 100% PLS* (lbs./acre)</u>	<u>Seeding Dates (Months)</u>
1TC	Annual Ryegrass Small Grain	20 50	March 1 June 15

* PLS means pure live seed. PLS is the product of the percentage of pure seed times percentage germination divided by 100.

b) Use.

Temporary stabilization of disturbed areas such as constructed embankments or stockpiles.

- c) Method(s) of seeding.

Hydroseeding or other standard accepted method

- d) How seedbed will be prepared for planting.

When practical and based on field conditions, soil will be loosened by disking, harrowing, or other standard accepted method.

- e) Type(s) of mulch to be used and rate(s) of application.
Example: Hay or straw at a rate of 2 ½ tons per acre.

Hydro mulch - 2,000lb/acre

23.3 Permanent Cover. [Insert standard seed mixture option(s)] Provide the following information for each seed mixture to be used for permanent cover: (Note: Key to Exhibit 18)

a)	Seed Mixture No.	Seed Mixture (Species)	Rate of Appl. 100% PLS* (lbs./acre)	Seeding Dates (Months)
	1PC	Perenniaal ryegrass	10	Feb-April
		Annual ryegrass	5	Feb-April
		Timothy	5	Feb-April
		White Clover	3	Feb-April
	2PC	Orchardgrass	5	Feb-April
		(steep slopes only)		
		Birdsfoot trefoil	5	Feb-April
		(steep slopes only)		

* PLS means pure live seed. PLS is the product of the percentage of pure seed times percentage germination divided by 100.

- b) Use.

- c) Method(s) of seeding.

Hydroseeding or other standard accepted methods.

- d) How seedbed will be prepared for planting.

When practical and based on field conditions, soil will be loosened by disking, harrowing, or other standard accepted methods.

- e) Type(s) of mulch to be used and rate(s) of application.
 Hay or straw at a rate of 2 ½ tons per acre.
 Any prime farmland soil areas will be mulched with 3 tons/acre of straw or hay.

Hydro mulch - 2,000lb/acre

23.4 Woody Plants. *[Insert standard stocking species option(s)]* For areas that will also be planted with woody plants, provide the following: (**Note:** Key to Exhibit 18)

a)	<u>Woody Plant Mixture No.</u>	<u>Woody Plant Species</u>	<u>No./ac.</u>
	1WP	Eastern White Pine (10%) Northern Red Oak(10%) Norway Spruce (10%) Yellow Poplar (10%) White Ash (10%) European Alder (10%) Black Cherry (8%) Sugar Maple (8%)	600 plants/acre (8'x9' grid)
	2WP	Red Bud (6%) Crab Apple (3%)	100/acre
	3WP	Black Locust (hydroseed) (15%)	0.5lb/acre

See 23.3 Permanent Cover – seed mixtures for grasses to be used with these woody plants.

b) Method of planting.

Black locust to be hydroseeded. Barefoot evergreens, hardwoods, and flowering trees will be planted by hand.

c) If the area is to be planted for wildlife habitat, identify the grouping and distribution of the plants.

Flowering trees will be interplanted with the timber species.

23.5 Cropland. For areas that will be planted to crops (agronomic or horticultural), identify the crops to be grown and the management plans to achieve the crop yield standards. (**Note:** Key to Exhibit 18: Land Use and Reclamation Map)

Not Applicable