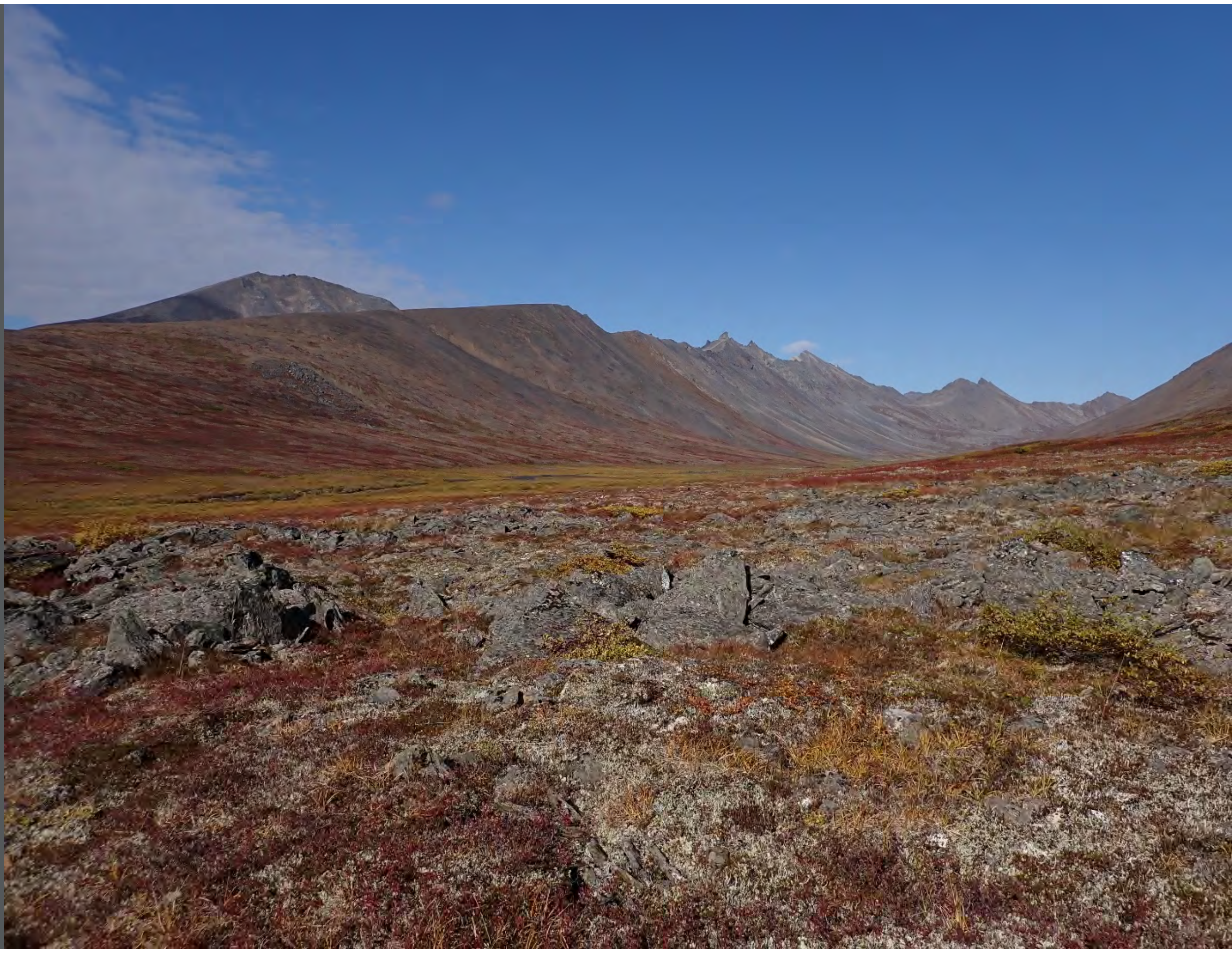

Graphite Creek Project

Project Description to Support DA Permit Application POA-2018-00210

Graphite One (Alaska), Inc.
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August 2025

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Abbreviations

ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
APDES	Alaska Pollutant Discharge Elimination System
APMA	Application for Permits to Mine in Alaska
Approx.	approximately
AS	Alaska Statute
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BOP	beginning of Project
CFR	Code of Federal Regulations
CSG	Coated Spherical Graphite
CWA	Clean Water Act
CY	cubic yard(s)
DoI	U.S. Department of Interior
EFH	Essential Fish Habitat
EOP	end of Project
EPA	U.S. Environmental Protection Agency
ft	foot/feet
Graphite One	Graphite One (Alaska), Inc.
H:V	horizontal to vertical
HDPE	high-density polyethylene
HUC10	10-digit hydrologic unit code
ID	Identifier
Jurisd	Jurisdictional
lf	linear foot/feet
MOP	midpoint of Project
MW	megawatt
NMFS	National Marine Fisheries Service
NWI	National Wetland Inventory
OHW	ordinary high water
Project	Graphite Creek Project
SHPO	State Historic Preservation Office
TSF	tailings storage facility
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMF	Waste Management Facility
WTP	water treatment plant
WOTUS	Waters of the United States

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1 Introduction

Graphite One (Alaska), Inc. (Graphite One) is seeking to develop the Graphite Creek Project (Project) located approximately 37 miles north of Nome, Alaska, on the northern side of the Kigluaik Mountains. The Project consists of an open pit mine, ore processing facilities, a waste management facility, water treatment facilities, and a proposed new 17.3-mile gravel access road connecting to the existing Seward Peninsula public road system. The graphite concentrate would be transported out of Alaska for further processing and manufacturing of Coated Spherical Graphite (CSG). The CSG is primarily intended to supply the electric-vehicle lithium-ion-battery and energy-storage markets, as well as other high-grade graphite products.

The Project has been designed to avoid impacts on waters of the United States (WOTUS), including both jurisdictional wetlands and waters, to the maximum extent practicable. However, unavoidable impacts on WOTUS would result from Project activities. Project components that involve the discharge of fill material into WOTUS are subject to U.S. Army Corps of Engineers (USACE) jurisdiction under the authority of Section 404 of the Clean Water Act of 1972 (as amended; CWA), with oversight from the U.S. Environmental Protection Agency (EPA).

This document provides an overview of the proposed action, describes Project components, summarizes proposed construction methods, identifies design criteria requirements and considerations, summarizes anticipated impacts on WOTUS, and describes mitigation measures to avoid and minimize those impacts. This document also identifies other environmental permits and authorizations that would be required prior to construction.

2 Purpose and Need

Graphite One intends to develop the Project to produce high-grade CSG and other value-added products produced from Graphite Creek, north of Nome, Alaska.

2.1 Purpose

Graphite One’s purpose is to mine graphite from their mineral leases on State of Alaska land and to process the graphite into commercially viable ore concentrate for transport to the Port of Nome via a proposed new 17.3-mile gravel access road and existing Seward Peninsula public road system.

2.2 Need

At present, the United States is 100 percent import-dependent for natural graphite. Natural graphite appears on the Department of Energy’s Critical Materials List as both a critical mineral and a critical material for energy (88 *Federal Register* 51792). High-grade graphite in its advanced CSG form is essential to electric-vehicle batteries as well as energy storage systems (ESS). The U.S. Department of Interior (DoI) found that graphite is one of nine critical minerals that meets all six of the industrial/defense sector criticality indicators identified by the DoI. The World Bank's Climate-Smart Mining Initiative includes graphite among its clean-tech, green-tech materials, projecting global graphite demand to rise 383 percent between 2020 and 2050 (Arrobas et al. 2017).

According to the U.S. Geological Survey (USGS; Fortier et al. 2018):

> *Graphite's use in rechargeable batteries, as well as technologies under development (such as large-scale fuel-cell applications), could consume as much graphite as all other uses combined.*

As a result, the Project would provide essential supply-chain infrastructure for the United States' renewable energy sector and storage systems, as well as advanced graphite materials for industrial and Defense Industrial Base applications.

Development of the Project would require a 17.3-mile access road to provide dependable, year-round transportation between the mine site and the existing Seward Peninsula public road system in order to facilitate construction the mine facilities, operation of the Project, transportation of graphite concentrate, and closure of the mine.

3 Project Overview

The Project consists of an open pit mine, mine site roads, ore processing facilities, a tailings and waste rock management facility, water treatment facilities, and a 17.3-mile access road to connect to the existing Seward Peninsula public road system in order to transport processed graphite concentrate to the Port of Nome. The proposed access road also includes rock and gravel borrow sites along its corridor. Other mine infrastructure includes site electrical power generation and distribution, fuel storage and dispensing, explosives and emulsion storage, and a helipad. Enclosed buildings are provided for administration offices, warehousing, a metallurgical lab, a crusher, mills, tailings filtration and thickening, concentrate loading, a truck shop, parts storage, and emergency response. Crushed ore feeding the mill would also be stored in a covered stockpile. Accommodation facilities during Project construction would be developed at the mine site. The permanent workforce during Project operation would be housed in Nome on existing developed land.

The Project access road would begin at Milepost 30 of Kougarok Road, north of Nome, and traverse through Mosquito Pass to the mine site. The access road would be 28 feet wide to accommodate two-way traffic, with side slopes that range from 2 horizontal (H):1 vertical (V) to

3H:1V. The road would be a private industrial mining road and would not be open for public use. A security gate would be located at the junction with Kougarok Road to prevent unauthorized use.

In addition to the two-lane access road, the Project would include construction of culverts and bridges at river/stream crossing locations as well as material sites. Table 3-1 provides a summary of the major Project components to be included in construction of the mine and access road. Temporary construction components for the Project would include an access ramp to the construction staging pad, temporary river/stream crossings, temporary stream diversions, and approach roads to temporary bridges during construction.

Table 3-1. Summary of Major Permanent Project Components

Project Component	Description	Latitude, Longitude	Quantity	Typical Size/ Dimensions	Maximum Size/ Dimensions
Mine Pit	Open pit	65.03795, -165.54258	1	—	337 acres
Waste Management Facility (WMF)	Dried and wet tailings and waste rock storage	65.04803, -165.56467	1	—	659.8 acres
Contact Water Sumps	Collects WMF runoff and directs to Water Treatment Facility	Varies	3	0.56 acre each	—
Processing Facilities Pad	Ore processing facilities pad	65.04538, -165.54137	1	—	63 acres
Water Treatment Facility	Treatment facility and lined treatment ponds	65.04765, -165.59278	1	—	58.3 acres
Non-Contact Water Diversion Channels	Directs streams around pit and WMF	Varies	3	Varies	Varies
Mine Site Haul and Access Roads	Haul and site facility roads	Varies	2	98-ft-wide surface for haul roads 16-ft-wide surface for other site roads 135-ft-wide average footprint width	98-ft-wide surface 250-ft-wide maximum footprint width
Powder Magazine Pad	Explosives storage	65.03789, -165.56035	1	—	0.4 acre

Project Component	Description	Latitude, Longitude	Quantity	Typical Size/ Dimensions	Maximum Size/ Dimensions
Construction Staging Pad	Gravel staging pad during Project construction and temporary ramp	65.07043, -165.61092	1	—	5.0 acres
Access Road	Two-lane road	BOP: 64.86944, -165.26224 MOP: 64.95778, -165.47994 EOP: 65.04527, -165.52871	17.3 miles	28-ft-wide surface 50–60-ft-wide average footprint width	150-ft-wide maximum footprint width
Bridges	Single-lane for waterbody crossings greater than 40 ft	Varies	6 total bridges: 5 single-span 1 double-span at Cobblestone River	16 ft wide by varied lengths	16 ft wide by 160 ft long
Culverts	Water crossings with or without fish present	Varies	46	Varies[a]	Up to 55 ft wide by varied lengths
Material Sites	Borrow and quarry locations	Varies	13	Varies	65.0 acres

Notes: Approx. = approximately; BOP = beginning of Project; EOP = end of Project; ft = foot/feet; MOP = midpoint of Project

[a] Total quantity of drainage and fish passage culverts will be determined during final design.

The Project would discharge approximately 16,400 cubic yards (CY) of fill material to construct the mine facilities, access road embankment, and other Project components into 2.21 acres of WOTUS.

The entire mine footprint and access road are located on State of Alaska-owned land managed by the Alaska Department of Natural Resources (ADNR).

4 Location

The Project is located on the Seward Peninsula, approximately 37 miles north of Nome, Alaska (Figure V-001 in Appendix A Figures) and is found within the townships, ranges, and sections listed in Table 4-1.

The Project property consists of 176 active State of Alaska mining claims. The northern edge of the Project property borders the Imuruk Basin, a shallow tidal body of water that flows through the Tuksuk Channel out to Grantly Harbor, then to Port Clarence and the Bering Sea. The Project is located entirely on State of Alaska lands.

Table 4-1. Townships, Ranges, and Sections for the Project

Township	Range	Section(s)[a]
5 South	34 West	15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 35, 36
6 South	34 West	1, 2, 11, 12, 13, 14, 23, 24, 25, 36
7 South	33 West	6, 7, 14, 15, 16, 17, 18, 23, 24
7 South	34 West	1

[a] Kateel River Meridian

Table 4-2 lists the USGS 10-digit hydrologic unit code (HUC10) watersheds that the Project crosses and acreage of the Project footprint in each watershed.

Table 4-2. Project Footprint in Watersheds Crossed by the Project

Watershed[a]	HUC10	Total Watershed Area (acres)	Project Footprint (acres)[b]
Nome River	1905010416	102,359.7	61.1
Sinuk River	1905010419	190,571.6	168.4
Cobblestone River	1905010510	48,812.3	622.8
Imuruk Basin	1905010515	241,152.8	1,695.0

[a] USGS 2025
[b] Total acreage presented may not reflect the sum of the individual cells due to rounding.

5 Project Components and Design Criteria

This section describes the proposed Project work and components, design criteria, and anticipated impacts associated with these components.

5.1 Proposed Work

The Project includes construction of a new access road from the existing Kougarok Road to the mine site, development of the mine site and associated facilities, and construction of support facilities in Nome (Figure V-001 in Appendix A Figures). Construction of the mine facilities and access road would involve the discharge of fill material into wetlands and waterbodies that are considered jurisdictional under the CWA. Mine facilities requiring fill in wetlands and waterbodies include the waste management facility (WMF), the primary site building pad that includes the ore processing facility and other buildings, water treatment ponds and storage areas, sediment basins, mine roadways, and stream diversion structures.

5.1.1 Access Road

The Project would involve constructing a new gravel surface access road to the Graphite Creek Mine site. The new gravel access road would be 17.3 miles long and begin at Kougarok Road, north of Nome, and traverse through Mosquito Pass to the mine site. The access road would be 28 feet wide to accommodate two-way traffic, with side slopes that range from 2:1 to 3:1. The road would be a private industrial mining road and would not be open for public use. The access road would be used to transport graphite concentrate to the existing road system in custom, polymer-lined, 20-foot shipping containers with a net capacity of 21 tons. A single truck would haul two graphite concentrate containers at a time.

The road would be constructed entirely of locally sourced material extracted from material sites along the route. The road will typically use fill construction over native soils, with side cut-to-fill construction limited to a few on-side slope sections where subgrade conditions allow.

The following design criteria were used for design of the access road:

- Design life: 50 years
- Construction phase vehicle: 40-ton articulating truck
- Typical transport design vehicle: WB-62, typical tractor-trailer used on resource roads
- Design speed: 45 miles per hour
- Embankment fill: minimum of 3 to 6 feet, depending on the quality of the subgrade
- Road grades: 7 percent preferred, 8 percent maximum
- Cut slope: 0.25H:1V to 4H:1V, depending on rock or soil type
- Fill slope: 2H:1V to 3H:1V, depending on rock or soil type
- Horizontal curve: 426 feet minimum, 800 feet preferred
- Vertical curve: American Association of State of Highway Traffic Officials standard for design speed or specialized carrier requirements for oversized loads (K=20 typical and K=15 minimum)

The designed structural section for the road is shown in Figure RX-001 and plan views are shown in Figures P-001 through P-020 (see Appendix A Figures). Table 5-1 provides a general description of the road materials that would be used over permafrost and wetlands.

In locations with soft spots or poor underlying material, additional road prism borrow or geo-fabric may be required. A dust palliative such as calcium chloride may be mixed in with the crushed aggregate surface course material to control dust.

Table 5-1. Road Material Descriptions

Material Designation	Description
Crushed Aggregate Surface Course	12 inches consisting of 3-inch minus, well-graded, durable, granular material with 6% to 10% passing the No. 200 sieve
Structural Section – Road Prism Borrow	60 inches of coarse rock fill
Select Material – Embankment Borrow	Depth as required of coarse rock fill

5.1.1.1 Stream Crossings

The proposed access road crosses numerous creeks, streams, and rivers, collectively referred to as “stream(s)” in this document. Table 5-2 provides details on the total number of streams crossed, widths, fish presence, and streams under USACE jurisdiction. Crossings would be accomplished with culverts or bridges, depending upon the ordinary high water (OHW) stream widths, stream characteristics, and various topographic considerations.

Table 5-2. Stream Crossings

Stream Width (feet)	Stream Crossings – Culvert	Stream Crossings – Bridges	Total Stream Crossings	Anadromous Fish Stream Crossings	Resident and Anadromous Fish Stream Crossings	Jurisdictional Stream Crossings
0–1	11	0	9	0	0	5
>1–5	26	0	23	2	2	19
>5–10	3	0	3	1	2	3
>10–15	2	0	2	1	2	2
>15–25	3	0	3	1	2	3
>25	1	6	7	5	6	7
Total	**46**	**6**	**47**	**10**	**14**	**39**

Prior to 2018, relatively few prior aquatic surveys had taken place near the Project area. Since 2018, Owl Ridge Natural Resource Consultants, Inc. has been contracted to complete desktop research and field-based fish abundance and distribution surveys, including for adult Pacific salmon, in Project area drainages (Owl Ridge 2025). Stream surveys to detect fish presence were conducted along the proposed mine access road alignment in locations where the road would cross a stream. All streams potentially crossed by roads proposed by the Project were visually surveyed to determine fish use potential and passage requirements during design and construction. Streams already listed in the Alaska Department of Fish and Game's (ADF&G's) *Anadromous Waters Catalog* were not sampled, as fish passage design was assumed and incorporated into the road design at these crossings (ADF&G 2024).

Bridges

Table 5-3 describes the stream crossings that would be constructed as bridges. Waterways that are determined to be navigable require a Rivers and Harbors Act Section 9 permit from the U.S. Coast Guard (USCG; USCG 2012). None of the waterways crossed are currently listed as navigable by the USCG (2012) or USACE (2025a). No streams within the Project area are subject to the ebb and flow of the tide.

All bridges would be designed as steel plate girder bridges with concrete deck. The bridges would be designed for 80-ton capacity and overall width of 16 feet.

Table 5-3. Bridge Crossings

Stream Name	Plan and Profile Figure Number[a]	Milepost	Approximate Length (feet)	Number of Spans
Nome River	BX-001	0.1	80	1
Buffalo Creek	BX-002	0.8	95	1
Sinuk River	BX-003	4.3	80	1
Windy Creek	BX-004	6.7	131	1
Osborn Creek	BX-005	13.7	90	1
Cobblestone River	BX-006	16.5	160	2

[a] Included in Appendix A Figures

Bridge lengths were determined by ground truthing and examining aerial photography and topography to identify approximate bankfull width of waterways. End slopes are proposed to be 2H:1V. During final design, bridge lengths will be refined with more detailed topographic survey, hydrology and hydraulic analysis, and structural/geometric optimization. The minimum vertical clearance below bridges (OHW elevation to the lowest bridge superstructure member) is 10.6 feet. Vertical clearance requirements will also be refined based on site-specific hydrology and hydraulics during final design. The Figure Index in Appendix A (Figures) shows the location of each bridge crossing, and Figures BX-001 through BX-06 show the typical plan and profile of each bridge crossing.

Culverts

The proposed action would involve constructing culverts from 3 feet up to 55 feet wide at stream crossing locations along the route and mine roads. As part of the design effort, culvert crossings were categorized based on stream width and fish presence, as shown in Table 5-4.

Categorization of streams and the design of stream crossings could change based on additional field survey, including hydrologic and hydraulic modeling.

Table 5-4. Culvert Crossing Categories

Culvert Category #	Crossing Type and Size	Mapped Stream Width at OHW	Figure Number	Design Passage for Fish?
1	Circular culvert 3-foot diameter	Installed as needed during road construction for cross drainage; not for mapped streams	CX-001	No
2	Circular culvert 4-foot diameter	Up to 2 feet	CX-002	No
3	Circular culvert 9-foot diameter	>2 to 6 feet	CX-003	Yes
4	Circular culvert 9-foot diameter	Up to 6 feet	CX-004	No
5[a]	Pipe arch 15 feet wide	>6 to 10 feet	CX-005	No
6	Pipe arch 15 feet wide	>6 to 10 feet	CX-006	Yes
7	Site-specific pipe arch up to 20 feet wide	>10 to 17 feet	CX-007	No
8	Site-specific pipe arch up to 50 feet wide	>13 to 55 feet	CX-008	Yes

[a] Although no Category 5 culverts are currently included within the design, the culvert types is included because it may be necessary with additional data collection.

Access road culvert design for the Project has been divided into two broad categories: drainage culverts (Categories 1, 2, 4, 5 and 7) and fish passage culverts (Categories 3, 6, and 8). Table 5-5 provides details on the numbers of culverts in each category. Appendix B (Culvert Impact Table) lists each culvert identifier, the location of each culvert, characteristics of each stream crossing, fish presence, and the proposed culvert type. Typical culvert details are shown on Figures CX-001 through CX-009 in Appendix A Figures.

Table 5-5. Culvert Counts by Category

Culvert Category #	Drainage or Fish Passage	Count
1	Drainage	Determined in final design
2	Drainage	29
3	Fish Passage	7
4	Drainage	3
5	Drainage	0
6	Fish Passage	1

Culvert Category #	Drainage or Fish Passage	Count
7	Drainage	2
8	Fish Passage	4
Total Drainage Culverts	—	**34**
Total Fish Passage Culverts	—	**12**
Total Culverts	—	**46**

Drainage culverts (Categories 1, 2, 4, 5, and 7) were designed to meet the criteria provided in the *Alaska Highway Preconstruction Manual* (DOT&PF 2025) and *Alaska Highway Drainage Manual* (DOT&PF 2006). These manuals require drainage culverts to pass a specified design flood event without major impacts. The *Alaska Highway Preconstruction Manual* (DOT&PF 2025) requires a minimum drainage culvert of 2 feet in diameter. However, the minimum size proposed for this Project is 3 feet in diameter to minimize ponding potential, improve constructability, and allow for break-up flow capacity if ice forms in the culverts. Category 1 culverts equalize water levels in uplands and wetlands in locations where no defined channels are present. Minimum spacing requirements and exact locations for Category 1 culverts in upland and wetlands will be defined during final design.

Fish passage culverts (Categories 3, 6, and 8) will be designed in general accordance with the U.S. Fish and Wildlife Service (USFWS) *Culvert Design Guidelines for Ecological Function, Alaska Fish Passage Program* (USFWS 2024). Fish passage culvert planning and design will use the following stream simulation design criteria:

- Culvert width will not be less than 1.5 times bankfull width (it is assumed that OHW width equals bankfull width at this preliminary engineering stage).
- Slope will be within 25 percent of the bankfull channel slope.
- Culvert invert burial will be 0.4 times culvert diameter for circular culverts or 0.2 times culvert height for pipe arches; burial is measured at the channel bottom.
- Substrate located in culverts will remain stable up to and including the 50-year discharge.
- Culverts will span the entire roadway toe-of-fill width plus one-half of the culvert height beyond the toe of fill.
- Inlet and outlet protection will extend 2 times the culvert diameter from culvert ends.

5.1.1.2 Material Sites

Eleven material sites have been identified along the access road to provide construction material for the access road (shown in Figures P-001 through P-020 in Appendix A Figures). These sites would provide the sand, gravel, aggregates, and riprap needed for construction and maintenance of the road. Material sites are divided into two types: borrow sites provide gravel and sand, while quarry sites provide rock that can be processed into riprap or smaller aggregates. Materials would be transported from the material site to the access road corridor by truck. Two of the material sites (MS06 and MS11) would require short, spur, access roads off the main Project access road.

The material sites are located in uplands and do not intersect any jurisdictional wetlands or other WOTUS. Table 5-6 summarizes the location, type, and size of each proposed material site boundary.

Table 5-6. Access Road Material Sites

Material Site ID	Material Type	Milepost	Size (acres)	Length of Spur Road (feet)
MS02	Gravel/Sand		16.35	—
MS06	Gravel/Sand		36.69	1,600
MS07	Quarry		22.65	—
MS08	Quarry		48.50	—
MS10	Quarry/Gravel/Sand		22.94	—
MS11	Gravel/Sand		29.39	650
MS12	Gravel		51.69	—
MS22	Gravel/Sand		29.26	—
MS33	Quarry		18.36	—
MS34	Quarry		40.54	—
MS35	Quarry		64.94	—
		Total	**381.31**	**2,250**

Note: ID = Identifier

5.1.2 Mine Site

The mine site would include roads, electrical power generation and distribution, fuel storage and dispensing, explosive and emulsion storage, a mine waste management facility, a water treatment facility, and a helipad. Additionally, it would include administration offices, warehousing, a metallurgical lab, a crusher, a mill, tailing filtration and thickening, concentrate loading, a truck shop, parts storage, a wastewater (sewage) treatment plant, a drinking water well, emergency accommodations for employees, concentrate container storage, and emergency response. The mine will operate 365 days per year, 24 hours per day.

A plan view of the mine site facilities at full mine build out are shown in Figure GC-001 in Appendix A Figures.

5.1.2.1 Mine Pit

The mining method would be open pit mining using conventional drill, blast, load, and haul to deliver ore to a crusher where the ore process begins. The mine is designed to deliver up to 11,000 tons of ore daily. With a life-of-mine strip ratio of 3.2:1, on average, an additional 35,400 tons of waste would be handled daily. Waste rock would be co-mingled with drystack tailings for disposal.

The overall size and design of the pit was based on open pit economic optimization and geotechnical considerations. These major considerations resulted in the following design criteria, which may change throughout the life of the mine:

- Bench face angle of slopes in rock: 57.5 degrees
- Rock slope bench height: 105 feet (overall bench)
- Catch bench width for slopes in rock: 36 feet
- Inter-ramp angle for slopes in rock: 45.6 degrees
- Bench face angle of slopes in overburden soils above the Kigluaik Fault: 45 degrees
- Geotechnical bench width: 98 feet wide at 938 feet above mean sea level on southern highwall (Graphite Creek diversion)
- Haul road width: 98 feet wide at elevations ranging from 197 to 427 feet on southern highwall
- Overall slope angle: 42.4 degrees or flatter

Plan and profile views of the mine pit at full mine build out are shown in Figures GC-001 and GX-001 in Appendix A Figures.

5.1.2.2 Processing Facilities

Processing of mined ore would occur on the processing facilities pad. The processing facilities pad contains the processing plant, ore stockpiles, a process water pond, a truck shop, an administrative office, a power station, fuel storage, and a helicopter pad. The processing plant would use crushing, grinding, and flotation processes. A jaw crusher would reduce ore, which would then be conveyed to a covered stockpile. The crushed ore would then be conveyed to a semi-autogenous grinding mill. Ground ore would pass through seven stages of flotation and three stages of regrinding, producing a 95 percent pure graphite concentrate. The concentrate would be dewatered and dried before being placed in fully enclosed shipping containers for truck transport to Nome.

A process water pond would support operational needs at the mill and capture runoff from the mill area. Sediment basins would be constructed to settle out sediments in the runoff from the mill area before it enters the process water pond. The process water pond would be hydraulically linked with the water treatment ponds to maintain the balance between reuse and treatment.

Structural cross section views of the processing facilities pad are shown in Figure GX-002 in Appendix A Figures.

5.1.2.3 Waste Management Facility

The WMF for Graphite Creek would store both waste rock material (non-ore) from the pit and tailings (coarse and fine) produced from the milling operation. The fine, wet tailings would be stored in a conventional tailings pond (referred to as the tailings storage facility [TSF]) that would be constructed in the northeastern portion of the WMF. The dam for the TSF would be built in stages using compacted waste rock material.

The dry, coarse tailings would be co-mingled with waste rock and placed into the WMF. The waste material and coarse tailings would be hauled in and placed by large, end-dump, mining trucks. Co-mingling and compaction would occur in the WMF using heavy equipment, such as dozers, roller compactors, and graders. The objective of the co-mingling strategy is to create blended, compacted, low-permeability material. Placement of co-mingled material over the life of the operation would result in a very large stabilizing buttress adjacent to the tailings dam. The WMF would be constructed in multiple stages, and contemporaneous closure activities would be used wherever practical.

The TSF would be constructed during the initial stage of WMF development. The elevation of the dam would be raised over time, as operations progress and more tailings storage is required. Wet tailings would be pumped from the processing pad to the tailings pond by a pipeline. Approximately 25 to 30 percent of the milled material is expected to be diverted to the wet tailings pond for disposal.

A high-density polyethylene (HDPE) or clay basin liner would be installed under the WMF prior to material placement. Additionally, the inside slope of the tailings dam would be lined. An underdrain system would be installed with the WMF. This system would assist in transporting water that drains through the comingled material to collection sumps where it would be sent to the water management ponds. Water from the collection pond would either be recycled for use at the mill or treated for discharge. Collection sumps would be placed in well-drained areas. Figure GC-001 and Figures GX-001 through GX-006 (Appendix A Figures) illustrate the overall WMF, TSF, and liner placement.

The overall design geometry for the WMF, including the tailings dam (e.g., height, slopes) was developed from a two-dimensional slope stability analysis to evaluate long-term stability conditions under the ultimate WMF geometry. The geometry uses an exterior slope of 2.5H:1V and an average height of 280 feet, with a maximum height of approximately 345 feet. The WMF design uses a waste rock perimeter embankment surrounding the co-mingled tailings and waste material.

Excavation and structural sections of the WMF are shown in Figures GX-003 and GX-006 in Appendix A Figures.

5.1.2.4 Water Management Facilities

Water management facilities would include water management ponds, a water treatment plant (WTP), diversion ditches, contact water ditches, stormwater settling structures, and a diversion structure for Graphite Creek above the mine pit.

Water management ponds would be used to store contact water and settle sediments prior to recycling or treatment. The WTP would treat all contact water to State of Alaska standards prior to discharging to Glacier Canyon Creek. The WTP would use precipitation, flocculation, settling, filtration, and reverse osmosis processes prior to discharge. Excavation and structural sections of the water management facility are shown in Figure GX-004 in Appendix A Figures.

Diversion ditches would route surface runoff away from site facilities so that surface water remains unaffected by Project activities. Graphite Creek would require diversion in Year 1 of mine operations to allow for the tailings pond construction and once again in Year 5 when the pit footprint encroaches on this non-fish bearing stream. A diversion structure would be constructed uphill from the pit to contain water in a pipeline that would then discharge the flow into Glacier Canyon Creek west of the pit footprint. Glacier Canyon Creek is also non-fish bearing and is the natural ultimate discharge point of Graphite Creek. The Graphite Creek diversion structure and other stream diversions are detailed in Section 5.1.2.7.

5.1.2.5 Power Generation Facilities

Due to lack of other power sources within the region, diesel powered generators would be used to provide electrical power at the mine site. Two 7.5-megawatt (MW) generators would operate to supply the 12.5 MW of nominal electrical operating load. A third 7.4-MW generator would be installed as a standby spare for a total 22.5 MW of generating power installed. These generators would be located on the same pad as the processing plant.

Fuel for power generation, concentrate drying, and mobile equipment would be trucked from a bulk fuel tank farm in Nome. Two weeks of fuel storage would be located at the Project site in a double-walled, 850,000-gallon, steel tank. The fuel tank would be located within a containment structure adjacent to the power generation facility. A fueling station and 4,000-gallon gasoline tank for light vehicles would be co-located in the containment.

5.1.2.6 Powder Magazine Pad

High- and low-explosive materials would be stored on a gravel pad along the main mine haul road connecting the pit with the WMF on pads built specifically for this purpose. The magazines would be situated a sufficient distance from occupied facilities to meet regulatory safety requirements. The two magazines would be adequately barricaded by berms, isolated from mine traffic, and properly located away from one another to provide the required physical separation distance. The powder magazine pad is not located within jurisdictional WOTUS.

5.1.2.7 Stream Diversions

The water management plan for the mine facility is designed to manage water resources throughout the life of the mine, ensuring maximum reuse and minimal environmental impact. The plan segregates mine contact water from non-contact water and uses diversions of streams and surface runoff around mine operations.

After the mine pit extends to Graphite Creek, an upstream diversion structure would be constructed to mitigate pit infiltration and reduce dewatering needs. This diversion would redirect creek flows around the pit and all operational areas into Glacier Canyon Creek to the west. North of the pit, Lower Graphite and Ruby Creeks would be conveyed in a diversion that would flow south and west around the WMF. Glacier Canyon Creek would flow into this diversion with Lower Graphite and Ruby Creeks, then flow northward into the original Glacier Canyon Creek channel north of the mine facilities. All infrastructure would be removed at closure, and active water management would cease. The Graphite Creek diversion structure would remain in perpetuity and require intermittent maintenance. Cross sections of the Graphite Creek diversion structure are shown in Figure GX-005. The locations of all mine site stream diversions are shown in Figure GC-001, and typical cross sections of the diversions adjacent to roads are shown in Figure GX-006 (see Appendix A Figures).

5.1.2.8 Site Roads

The main site roads would serve the mill, truck shop, and remaining support buildings within these areas. The site road would continue westward beyond the mill toward the pit, water treatment ponds, WTP, and WMF. The site would also have designated haul roads to facilitate material movement (ore and waste) from the open pit to the primary crusher at the mill and WMF. Where required, various temporary construction roads would be made or modified from existing roads for temporary construction laydown facilities, staged WMF construction, and general construction access.

Mine site roads and designated haul roads would incorporate culvert crossings over five streams that intersect the mine site, including Graphite Creek and Glacier Canyon Creek. Culverts would follow the same design criteria as the access road, described in Section 5.1.1.1. Appendix B (Culvert Impact Table) lists each culvert identifier, the location of each culvert, characteristics of each stream crossing, fish presence, and the proposed culvert type associated with mine site roads.

Typical sections of the site roads are shown in Figure GX-006 in Appendix A Figures.

5.1.2.9 Other Mine Site Facilities

Other minor infrastructure facilities would be located on gravel pads developed for the main facilities described above, and include:

- Drinking water well
- Potable water treatment plant
- Mine mobile equipment shop
- Construction camp facilities
- Waste water (sewage) treatment plant
- Offices
- Warehouses
- Emergency response equipment and facilities
- Metallurgical/assay lab
- Explosive storage facilities
- Concentrate container storage
- Emergency accommodations for employees when weather conditions prohibit safe travel
- Access road guard gate

5.1.3 Construction Staging Pad

A 5-acre gravel staging pad and temporary access ramp would be constructed near Imuruk Basin (Figure GC-001 in Appendix A Figures) to support mine site construction, mine facility staging and transport, access road construction, and bulk ore sample shipment. This staging pad and temporary ramp would be developed in coordination with the landowner, Bering Straits Native Corporation, who would lease the site to Graphite One for use during the Project construction phase.

The gravel fill to construct the staging pad would likely be sourced from Brevig Mission and brought to the site by barge. The temporary ramp would be constructed using mats and clean gravel to allow vehicles equipped with low-pressure tires to transport the construction equipment and modules to the staging pad. Once the construction equipment and mine facility modules are transported to the mine, the temporary ramp would be removed. The area within the temporary ramp would be re-contoured to preconstruction conditions.

Graphite One would use a shallow-draft barge or landing craft, which can be moored on the shoreline of Imuruk Basin, to offload and store construction equipment and modularized mine facilities during the open-water season. Equipment and facility modules would be staged on the gravel pad until winter, when an approximately 4-mile ice and snow road can be constructed to transport these materials to the mine. The staging pad would also be used to store a bulk ore sample from the mine until the following open water season for barging to the Port of Nome.

Development of the gravel staging pad and transport of materials between the pad and landing craft would not require permanent fill within jurisdictional WOTUS.

5.1.4 Nome Support Facilities

New support facilities in Nome would include a concentrate storage pad (approximately 26 acres), additional fuel storage capacity, employee housing, and upgrades to existing roads. The concentrate storage pad, fuel storage, and employee housing would be constructed by a third party on existing gravel pads.

Improvements to the existing roads would include widening, curve straightening, and capping to accommodate the transport trucks and would be completed by the Alaska Department of Transportation and Public Facilities.

5.1.4.1 Bulk Fuel Storage

Due to sea ice formation on the Bering Sea and Norton Sound, shipping of fuel, concentrates, and other bulk commodities can only occur between approximately June and October. In order to support year-round mine operations, the Project would require 8 million gallons of fuel to be stockpiled in Nome by October 1 each year. Graphite One has assumed that it would use excess capacity in existing bulk storage owned by the Bering Straits Native Corporation, but an additional 4 million gallons of diesel fuel storage would be required. Graphite One intends to negotiate the construction and operation of that storage with local businesses, who would also deliver the fuel to Graphite Creek. Two 14,000-gallon truck/trailer loads would be required daily.

5.1.4.2 Concentrate Storage

Graphite concentrate would only ship during the ice-free season; therefore, Graphite One would need to stage the 20-foot shipping containers at a facility near the Port of Nome. The containers would be stacked three to four high in rows until container ships are able to access the port during ice-free months. Graphite One has assumed that the Port of Nome expansion project would have progressed sufficiently to allow self-loading container ships to load containers dockside. The design-basis ship for this portion of the Project is assumed to have a 37-foot draft. If the Port of Nome expansion does not proceed, Graphite One would examine options to lighter concentrate containers to a vessel anchored in deeper water.

It is assumed that the concentrate container storage area would be on land owned and already developed by the Bering Straits Native Corporation, and no further disturbance would be required.

5.1.4.3 Employee Housing

Graphite One has assumed that the Project's construction housing requirements would be fulfilled by a construction camp installed to support the Port of Nome expansion, and no new facilities would be required. If the Port of Nome expansion is further delayed, a construction camp would be built on existing, prepared land in Nome or at the mine site.

It is Graphite One's intention to maximize a local work force in Nome through a combination of local hire and relocation. Graphite One recognizes Nome's housing shortage and intends to provide long-term housing by constructing a subdivision with single- and multi-family housing as well as apartments for Nome-based employees. Graphite One would construct camp-style accommodations for residents of outlying villages for their use while on rotation. Location of these facilities requires planning with the City of Nome and private landowners, but it is expected that all construction would occur on previously developed land.

5.2 Mine Closure and Reclamation

After mining operations conclude, the site would transition into final reclamation and closure activities. Due to the site's remote location, all reclamation activities would be self-performed using the equipment fleet that supported the mining operation. Given the relatively small size of the operation and concurrent reclamation activities of the WMF throughout the life of the mine, it is assumed that the demolition and most reclamation activities would be completed in approximately 1 year.

The mill, all facilities, and foundations would be demolished and removed. The debris would be disposed in the final pit and covered in accordance with Alaska mining regulations. The haul roads, access roads, and facility pads would be dismantled and regraded to approximate original contours. Topsoil material that was salvaged during operations would be spread on the regraded areas where suitable and reseeded according to permit requirements. The last phase of the WMF would also be regraded and closed at that time.

6 Project Construction

6.1 Access Road Construction

Construction of the Project access road would include field staking the alignment, site clearing and grubbing, staging equipment and materials, excavating, creating embankment, grading, final stabilizing, and cleaning up the site.

Typical road construction methods would be used to construct road segments in wetlands. Construction would consist of clearing, grubbing, and placing fill; blasting existing rock, in some cases; and/or excavating existing material to reach the proposed design grade.

The proposed road design incorporates 3H:1V embankment side slopes, which are recommended for slope stability and traffic safety. The overall embankment width would generally vary from 50 to 80 feet. The cut-and-fill limits of the proposed road are shown on the permit figures (Appendix A Figures).

The construction limits would include a 20-foot buffer on either side of the toe of slope to account for temporary activities during construction, such as vegetation clearing and/or equipment operating. With the construction limits, the overall disturbance footprint generally ranges between 100 to 120 feet. No grubbing would occur within the temporary disturbance limits, and vegetation would be cleared above the ground surface. All activities within the 20-foot buffer would not be ground-disturbing. The limits of the temporary impact area are the minimum necessary to conduct this work. Measures to avoid and minimize unavoidable impacts on wetlands and waters during the design process are provided in Section 10 Mitigation Statement.

6.2 Mine Construction

Mine facilities would be shipped as modularized units to the Port of Nome for transport to the mine. The facility modules and mine construction equipment would be brought to the mine either via the new access road or barged to the construction staging pad.

The buildout of the mine site would occur in three distinct development phases. These phases are closely linked to the water management strategy and are intended to minimize contact water generation throughout the life of the mine. The largest infrastructure element, and the one driving all others, would be the WMF. The first phase of the WMF, mill facility construction and initial pit development, would involve the most land disturbance. Graphite Creek would initially be diverted downslope of the mine pit during the establishment of the first phase of the WMF, adjacent to the mill. The surface diversion would take the flow from Graphite Creek to the Glacier Canyon Creek channel west of the WMF final footprint. Additionally, some culvert crossings would be established for mine site access and haul roads.

6.2.1 Mine Site Construction and Phase 1 of the WMF (Years 1–5)

The initial development phase would include mill site construction; haul road construction; and general water management infrastructure, including stormwater collection and contact water ponds. Initial mining and pit development, primarily west of Graphite Creek, would also occur within this first development phase. Access to the western reaches of the pit would entail the crossing of, but not interference with, Graphite Creek. After establishing the WMF and process water pond, the land clearing, foundation development, and liner installation for the first phase of the WMF would begin. This first phase of the WMF would cover approximately 30 percent of the final WMF footprint, including the establishment of the initial lift of a lined conventional tailings impoundment. This initial lift would be within the larger footprint of the lined waste rock and dry tailings WMF. The initial tailings dam would be constructed from pre-stripping material from the mine pit and would be enlarged with and buttressed by the mine waste and dried tailings produced from the mining operation.

The diversion of Graphite Creek, approximately 3,280 feet to the west, around the active development footprint of the WMF, would be established during the first phase of mine development. This initial lowland diversion would be managed within an open, rock-lined surface channel that carries the flow to the existing stream bed of Glacier Canyon Creek.

This first phase of site development would also include establishing all run-on stream diversion channels upstream of all land disturbances to limit additional contact water flowing into the pit, WMF, and mill pad and roads.

6.2.2 Phase 2 of the WMF Expansion and Diversion of Graphite Creek (Years 6–12)

This phase of development would expand the WMF footprint as well as the tailings dam and pond height and extent. All material not required for direct construction of the tailings dam would be placed within the lined footprint of the WMF, serving as a secondary buttress for the dam. The tailings dam would continue to be raised and lined at pace with the wet tailings production. Overall WMF expansion would result in increased land disturbance and a net increase in contact water generation. All contact water would be collected in the downstream water management pond prior to treatment. Completed sections of the WMF would be contemporaneously reclaimed, where practicable, as they reach final elevation to limit contact water generation. Some internal drain down is expected to continue after cover placement over closed areas. However, all drainage would be collected by the WMF base liner and conveyed through the subdrain piping for treatment with other contact water.

Roads and other mine site infrastructure would undergo minimal expansion during Phase 2.

Due to the expansion of the pit during Phase 2, the upstream diversion structures on Graphite Creek would be established to intercept flows upstream of all areas of pit development. The diversion structure and conveyance piping are designed to direct creek flow west of mine operations to join Glacier Canyon Creek, approximately 1 mile upstream of the current natural confluence with Graphite Creek. This upstream diversion would entail a permanent water diversion dam and inlet structure, as described in Section 5.1.2.7. Stream flows would be diverted along a road pit bench within two HDPE diversion pipes around downstream operations.

6.2.3 Phase 3 of the WMF Expansion and Full Pit Buildout (Years 13 – Closure)

The final phase of development would include the final lift of the tailings dam and expansion of the overall WMF facility to accommodate storage of all remaining scheduled waste and tailings until closure. Completed sections of the WMF would continue to be contemporaneously closed as much as practical to further limit atmospheric contribution to the mine-water balance.

Some drain-down moisture would continue to be collected after cover placement, but the water balance would significantly reduce contact water after the cover has been installed. During the final years of the tailing's impoundment, surface water would be drained down, and the basin would be backfilled with brines and mine waste up to final grade before covering and closure.

The pit would also expand to its full extent during this last development phase and can provide additional storage volume for tailings and waste (if necessary) as WMF closure activities are completed.

6.3 Mining Equipment

Mining activities would be self-performed using conventional mining techniques (drill, blast, load, haul). The mining fleet would consist of a hydraulic mining shovel, front-end loader, 155-ton haul trucks, and 6.75-inch diameter drills. Given the overall scale of operations and equipment requirements, the entire fleet would be diesel-powered. The mine would operate 365 days per year (allowing 13 non-operating days due to weather delays), and 24 hours per day, seven days per week. It would use four rotating crews, working two 12-hour shifts.

Blasting at this mine would primarily use gassed-emulsion explosives, which would be manufactured onsite. A contractor would produce and deliver explosives and blasting accessories. Loading the holes and blasting would be a joint effort between the mine employees and explosives contractor.

7 Construction Schedule

Construction of the mine (site access road, mill, support) facilities is expected to take approximately 30 months following approval of required permits and is expected to commence as soon as practicable following permit approvals. The mine requires 2 years of pre-strip operations, WMF pre-development, and water management facilities development before mine production can commence. The mine is currently anticipated to operate for 21 years.

The site access road would be constructed in two phases across 2 years of construction. The first phase would construct a development road with temporary bridges to transport mine and access road construction equipment to the mine site. All fish passage and drainage culverts would be constructed during the first phase. The second phase would use construction equipment staged at the mine site and from Kougarok Road to complete the road embankment from both ends and install the permanent bridges.

The milling facilities, WTP, and site infrastructure would be commissioned as each reaches substantial completion during construction. The WMF would be commissioned during the later stage of pre-development activities before commencing mine production.

8 Impacts on WOTUS

This section describes the anticipated impacts on WOTUS from Project activities. Construction of Project mine facilities and the access road would require excavation of soil and discharge of fill into jurisdictional wetlands and waters. A description of the wetlands and waters mapping, wetland delineation methods, and criteria used for determining WOTUS are provided in the *Jurisdictional Determination Report* (JDR; HDR 2025). Wetlands and waters mapping and impacts are shown on the permit figures (Appendix A Figures). Impacts on WOTUS by National Wetland Inventory (NWI) type are included in Table 8-9 (in Section 0 Summary of Discharges).

8.1 Access Road

Construction of the proposed road features would result in permanent impacts on WOTUS. Table 8-1 describes the impacts on WOTUS from road construction, as well as the volume of excavation and fill types discharged into WOTUS. Fill volumes by jurisdictional wetland crossing are shown on Figures D-001 through D-030 in Appendix A Figures.

Table 8-1. Permanent Impacts from Road Construction

Road Component	Upland and Non-Jurisdictional Impacts (acres)	Impact on Jurisdictional Waters (acres)	Impact on Jurisdictional Wetlands (acres)	Fill Type in WOTUS					Excavation in WOTUS (CY)
				Embankment Borrow (CY)	Road Prism Borrow (CY)	Surface Course (CY)	Rip Rap (CY)	Total Fill in WOTUS (CY)	
Road Footprint	185.01	1.27	0.20	4,268	10,669	533	920	16,390	400

8.1.1 Stream Crossings

8.1.1.1 Bridges

Bridges would be installed at six stream crossings. Permanent impacts on WOTUS, as defined in the JDR (HDR 2025), from bridge structures would occur at the Cobblestone River. Table 8-2 details the permanent impacts from the construction of the Cobblestone River bridge. The two-span Cobblestone River bridge would require installation of 16-inch structural steel pipe piles within the stream channel bottom. Riprap would be placed around all bridge abutments to protect the abutments and roadway from scour. All fill volumes associated with the road footprint, including abutments and rip rap volumes, are included within the roadway impacts (Table 8-1 in Section 8.1). Bridge plan and profile sheets are included in Figures BX-001 through BX-006 in Appendix A Figures.

Table 8-2. Permanent and Temporary Piles for Bridge Construction

Bridge Name	Permanent Piles				Temporary Piles			
	Diameter (feet)	Number in Uplands and Non-Jurisdictional Areas	Number in Jurisdictional Waters	Total Number Permanent Piles	Diameter (feet)	Number in Uplands and Non-Jurisdictional Areas	Number in Jurisdictional Waters	Total Number Temporary Piles
Cobblestone River	1.5	0	4	4	1.5	0	4	4
Total	**—**	**0**	**4**	**4**	**—**	**0**	**4**	**4**

Temporary access roads and bridges would be installed prior to construction to support workers, and equipment would be located adjacent to the permanent crossing location during construction. Temporary fill for access roads would be removed after construction is complete, and areas would be re-contoured to preconstruction conditions. The areas would be allowed to revegetate naturally. Table 8-3 provides a detailed breakdown of temporary impacts from bridge construction by bridge location.

Table 8-3. Temporary Impacts from Temporary Bridge Approach Construction

Bridge Name	Temporary Fill in Uplands and Non-Jurisdictional Areas (acres)	Temporary Fill in Waters – WOTUS (acres)	Temporary Fill in WOTUS (CY)
Nome River	0.28	0.03	177
Buffalo Creek	0.22	0	0
Sinuk River	0.31	<0.01	0

Bridge Name	Temporary Fill in Uplands and Non-Jurisdictional Areas (acres)	Temporary Fill in Waters – WOTUS (acres)	Temporary Fill in WOTUS (CY)
Windy Creek	0.29	0	0
Osborn Creek	0.24	0.08	610
Cobblestone River	0.15	0.16	1,268
Total	**1.49**	**0.27**	**2,055**

8.1.1.2 Culverts

The proposed mine access road crosses 41 streams that would be culverted. Of these 41 culverted stream crossings, 28 are WOTUS based on the analysis outlined in the JDR (HDR 2025). In addition to the access road stream crossings, there will also be stream crossings on the mine haul and interior mine access roads. These accounts for 5 additional stream crossings, all of which occur on jurisdictional streams. Appendix B (Culvert Impact Table) documents the location and characteristics of each proposed culvert crossing, including culvert category and fish presence. Table 8-4 summarizes the permanent impacts from culvert inlet/outlet protection installation. Impacts of the stream area covered by the road embankment are included within the road impacts (Table 8-1 in Section 8.1).

Table 8-4. Jurisdictional Impacts from Construction of Culverts Inlet/Outlet Protection

Culvert Category	Number of Culverts	Permanent Impact to Jurisdictional Waters (square feet)	Excavation in Jurisdictional Waters (CY)	Fill Volume in Jurisdictional Waters – Stream Bed Material (CY)
Category 1	—	—	—	—
Category 2	17	464	52	52
Category 3	6	900	100	100
Category 4	3	432	48	48
Category 5	—	—	—	—
Category 6	1	420	47	47
Category 7	2	1,728	192	192
Category 8	4	13,604	1,512	1,512
Total[a]	33	17,548	1,950	1,950

[a] Total acreage presented may not reflect the sum of the individual cells due to rounding.

Installation of the inlet/outlet protection would require excavating within the stream channel and adjacent areas. Unsuitable excavated material would be disposed at the nearest material site. The excavated area would then be backfilled with stream simulated bedding material to dissipate stream energy, allow fish passage, and protect the entrance/outlet of the culvert. The amount of excavation and stream bed material needed is outlined in Appendix B (Culvert Impact Table).

Heavy machinery would be used to install culverts and the inlet/outlet protection. Disturbance areas outside the permanent impact footprint, would be limited to non-jurisdictional areas. Temporary disturbance areas would be re-contoured to preconstruction contours after construction is complete. The small amount of native material repositioned during re-contouring is expected to be negligible.

8.1.2 Material Sites

Material sites and spur access roads would be constructed in uplands. No impacts on WOTUS would occur from material sites and the spur access roads to the material sites.

8.2 Mine Site

Construction of the mine site facilities, described in Section 5.1.2, would result in permanent impacts on WOTUS. Table 8-5 describes the impacts on WOTUS from mine site construction. All jurisdictional impacts are to streams and vegetated wetlands within stream channels. Water in these stream channels will be diverted from these stream channels to the Non-Contact Water Diversion Channels prior to the dry stream channels being impacted. Impacts to jurisdictional wetlands and other WOTUS are shown on Figure GC-001 in Appendix A Figures. Table 8-6 describes the temporary impacts on WOTUS from the construction staging area access ramp, as well as the volumes of temporary fill. No ground disturbing activities will occur within a 25-foot buffer around all jurisdictional WOTUS outside of the permanent impact area.

Table 8-5. Permanent Impacts from Mine Components

Mine Component	Uplands and Non-Jurisdictional Impacts (acres)[a]	Impact on Jurisdictional Waters (acres)[a]	Impact on Jurisdictional Wetlands (acres)[a]	Jurisdictional Stream Diverted (lf)
Mine Pit	336.83	-	-	510
Processing Facilities Pad	62.96	-	-	153
Waste Management Facility	659.07	0.18	0.13	11,540
Water Management Facility	58.30	-	-	-
Powder Magazine Pad	0.36	-	-	-
Contact Water Sump	1.61	-	-	-
Mine Haul and Access Roads	31.81	0.03[b]	-	-
Non-Contact Water Diversion	19.80	-	-	237
Construction Staging Pad	4.96			
Total	**1,175.70**	**0.21**	**0.13**	**12,440**

Notes: lf = linear foot/feet

[a] Total acreage presented may not reflect the sum of the individual cells due to rounding.

[b] These impacts are at the five culvert stream crossings on mine haul and mine access roads. The culverts and the impacts to WOTUS from the inlet/outlet protection are included in Section 8.1.1.2.

Table 8-6. Temporary Impacts from Mine Components

Mine Component	Uplands and Non-Jurisdictional Impacts (acres)	Impact on Jurisdictional Waters (acres)	Impact on Jurisdictional Wetlands (acres)	Temporary Fill (CY)
Construction Staging Pad Access Ramp	0.05	—	0.12	580
Total	**1.49**	**0.27**	**—**	**2,055**

8.3 Summary of Discharges

The Project would result in the permanent discharge of fill material into WOTUS for the construction of the mine facilities; access road surface and embankment; and associated access road components, including culverts, bridges, and material sites. Temporary impacts on WOTUS would be limited to temporary fill for the access ramp to the construction staging pad, temporary fill for the temporary bridge access roads and for temporary piles for trestles during bridge construction. Temporary impacts on non-jurisdictional wetlands and waters would be associated with culvert construction, vegetation clearing, and temporary pile installation for trestles during bridge construction. Table 8-7 provides a summary of permanent impacts on WOTUS and fill volumes by Project component. Table 8-8 provides a summary of temporary impacts on WOTUS and temporary fill volumes by Project component. Table 8-9 summarizes impacts on WOTUS by wetland and waterbody type.

Table 8-7. Summary of Permanent Impacts by Project Component

Project Component	Impact on Uplands and Non-Jurisd. (acres)[a]	Impact on Jurisd. Waters (acres)[a]	Impact on Jurisd. Wetlands (acres)[a]	Impacts on WOTUS							
				Excavation (CY)	Embankment Borrow (CY)	Road Prism Borrow (CY)	Surface Course (CY)	Stream Bed Material (CY)	Rip Rap (CY)	Total Fill Volume (CY)	Stream diverted (lf)
Mine Facilities	1175.70	0.21	0.13	400	4,268	10,669	533	—	920	16,390	12,440
Access Road	185.01	1.27	0.20	—	—	—	—	—	—	—	—
Bridges[b]	—	—	—	—	—	—	—	—	—	—	—
Culverts[c]	—	0.40	—	1,950	—	—	—	1,950	—	—	—
Material Sites	381.31	—	—	—	—	—	—	—	—	—	—
Total	**1,742.02**	**1.88**	**0.33**	**2,350**	**4,268**	**10,669**	**533**	**1,950**	**920**	**16,390**	**12,440**

Notes: Jurisd. = Jurisdictional; lf = linear foot/feet

[a] Total acreage presented may not reflect the sum of the individual cells due to rounding.

[b] The Cobblestone Bridge requires 4 permanent 16-inch structural steel pipe piles.

[c] Includes 5 culverts on mine haul and mine access roads

Table 8-8. Summary of Temporary Impacts by Project Component

Project Component	Uplands and Non-Jurisdictional Impacts (acres)	Impact on Jurisdictional Waters (acres)	Impact on Jurisdictional Wetlands (acres)	Temporary Fill (CY) – Embankment Borrow
Temporary Bridge Approach Roads[a]	1.49	0.27	—	2,055
Construction Staging Pad Access Ramp	0.05	—	0.12	580
Total	**1.54**	**0.27**	**0.12**	**2,635**

[a] The temporary Cobblestone Bridge requires 4 temporary 16-inch structural steel pipe piles.

Table 8-9. Summary of Impacts to WOTUS by NWI Type

Wetland Type	NWI Code[a]	Permanent Impacts to WOTUS (acres)[b]	Temporary Impacts to WOTUS (acres)[b]
Scrub-Shrub	E2SS3P	—	0.12
Scrub-Shrub	PSS1/EM1F	0.13	—
Total Scrub-Shrub Wetlands	**—**	***0.13***	***0.12***
Emergent	PEM1F	0.20	0.02
Total Emergent Wetlands	**—**	***0.20***	***0.02***
Total Jurisdictional Wetlands	**—**	***0.33***	***0.14***
Fresh Waterbodies	PUBH	0.01	—
Total Fresh Waterbodies	**—**	***0.01***	**—**
Rivers and Streams	R2UBF	0.15	0.02
Rivers and Streams	R2UBH	<0.01	—
Rivers and Streams	R2USC	0.37	0.12
Rivers and Streams	R3UBF	0.01	—
Rivers and Streams	R3UBH	1.08	0.03
Rivers and Streams	R3USC	0.27	0.08
Total Rivers and Streams	**—**	***1.87***	***0.25***
Total Jurisdictional Waterbodies	**—**	***1.88***	***0.25***
Total WOTUS	**—**	***2.21***	***0.39***

[a] Cowardin et al. 1979. See JDR (HDR 2025) for descriptions of wetland types.
[b] Total acreage presented may not reflect the sum of the individual cells due to rounding.

9 Permits and Approvals

Table 9-1 details the current permits and authorizations that Graphite One holds related to the Project. Table 9-2 summarizes permits and authorizations that could be needed for the Project. Land ownership is shown on Figure O-001. The project occurs entirely on State of Alaska land; however, three landowners are within 1-mile of the proposed footprint.

Table 9-1. Current Permits and Authorizations

Permits and Authorizations	Agency	Description
Miscellaneous Land Use Permit No. APMA 2299	ADNR	Authorizes hard rock exploration activities on the Project site. Issued by ADNR Mining Section and valid until 12/31/2026

Permits and Authorizations	Agency	Description
Four Temporary Water Use Authorizations (No. F2022-077, 078, 079, and 080)	ADNR	Authorizes water removal from surface waterbodies for exploration activities. Issued by ADNR Water Section and valid until 12/31/2026
Land Use Permit No. LAS-34100	ADNR	Authorizes two staging areas along Kougarok Road
Land Use Permit No. LAS-34054	ADNR	Authorizes the placement of a communications repeater and meteorological station
APDES General Permit for Storm Water Discharges No. AKR06H00N	ADEC	Multi-Sector General Permit Activity
Title 16 Fish Habitat Permit No. FH22-III-0125	ADF&G	Authorizes activities in fish bearing waters, primarily for water withdrawal structures

Notes: ADEC = Alaska Department of Environmental Conservation; APDES = Alaska Pollutant Discharge Elimination System; APMA = Application for Permits to Mine in Alaska; No. = Number

Table 9-2. Summary of Permits and Authorizations

Permits and Authorizations	Agency	Description
CWA, Section 404/ Rivers and Harbors Act, Section 10	USACE with oversight by EPA	Required for placement of fill material within WOTUS, including wetlands (Section 404) and work in, over, and under a navigable WOTUS (Section 10)
Bald and Golden Eagle Protection Act	USFWS	Provides protection for bald and golden eagles; may permit “take” of bald eagle nests
Magnuson-Stevens Act Essential Fish Habitat Consultation	NMFS	Requires consultation conducted by lead federal agency when action may result in harm to designated EFH
National Historic Preservation Act Section 106 Consultation	SHPO	Requires consultation conducted by lead federal agency to consider effects on historic, prehistoric, or archaeological resources
CWA 401 Certification	ADEC	Requires State reviews of 404 permit applications and issues a Certificate of Reasonable Assurance that the Project is consistent with CWA provisions
Air Quality Permits	ADEC	Title I and/or Title V Operating Permits
Title 16 Fish Habitat Permit	ADF&G	Required for work, structures, or water withdrawal below OHW in waterbodies containing fish
Application for Permits to Mine in Alaska	ADNR	Authorizes hard rock exploration and mining activities on the Project site
Dam Safety Certification	ADNR	Required for tailings storage dam and a water supply dam

Permits and Authorizations	Agency	Description
Right-of-Way, Easement, Surface Use Agreement, and/or Temporary Land Use Permits	ADNR	Required for access or easements for alignment, including temporary and/or material source access
Material Sales (AS 38.05.550–565)	ADNR	Required for material site development on State lands
Miscellaneous Land Use Permit	ADNR	Required for hard rock exploration, winter cross-country travel
Tidelands Lease	ADNR	Lease of State tidelands for the barge landing during construction
Plan of Operations	ADNR	Provides design and operation plans of the mine
Reclamation Plan	ADNR	Requires reclamation of the mine to prevent degradation of land and water resources (AS 27.19.20). Includes a reclamation bond (AS 27.19.040)
Millsite Lease	ADNR	Authorizes mine facilities not located on the upland mining lease or claim
Mining Lease	ADNR	Consolidates mining claims into a single lease
Land Use Permit	ADNR	Authorizes staging areas, placement of communications repeater and meteorological station, and geotechnical drilling on State land to support the Project
Temporary Water Use Application	ADNR	Authorizes water withdrawal to support constructions and operations of the mine

Note: ADEC = Alaska Department of Environmental Conservation; AS = Alaska Statute; EFH = Essential Fish Habitat; NFMS = National Marine Fisheries Service; SHPO = State Historic Preservation Office. This table does not include construction-specific permitting requirements (e.g., temporary water use permits).

10 Mitigation Statement

Regulations and guidelines associated with Section 404 of the CWA call for project proponents to take measures to avoid or reduce adverse impacts on jurisdictional wetlands and other resources. Avoidance and minimization measures have been incorporated into the design and construction of the Project to the maximum extent practicable. The purpose of the Mitigation Statement is to: (1) describe the proposed avoidance and minimization of impacts on jurisdictional wetlands and other resources within the Project area; and (2) identify the proposed compensatory mitigation for unavoidable impacts on WOTUS from construction of the Project.

10.1 Avoidance and Minimization

Given the purpose and size of the Project footprint and the length of the access road, complete avoidance of jurisdictional wetlands and waters is not possible. The Project has been designed to avoid and minimize impacts on WOTUS, non-jurisdictional wetlands, fish, Essential Fish Habitat (EFH), and other resources, wherever practicable, through avoidance and minimization measures such as route refinement, construction methods, selective siting of Project components, and appropriately sized conveyance structures. Regulations and guidelines associated with Section 404 of the CWA call for Project proponents to take measures to avoid or reduce adverse impacts on jurisdictional wetlands and other resources. The following avoidance and minimization measures have been incorporated into the design and construction of the Project.

10.1.1 Design Avoidance Measures

Design avoidance measures for the mine include:

- All mine facilities have been sited within the Graphite Creek and Glacier Canyon Creek drainages to avoid potential impacts to the Cobblestone River and other fish bearing streams.
- At the processing facilities pad, the crushed ore stockpile will be covered to eliminate effects from dust after the mined rock has been crushed.
- Most of the mine tailings will be drystacked and co-mingled with waste rock to reduce the size of the tailings pond.
- There would be no permanent facilities located on the shoreline of Imuruk Basin.

There would be no shipping activity through Port Clarence, Grantley Harbor, the Tuksuk Channel, or Imuruk Basin once construction of the mine facilities has completed. Design avoidance measures for the access road include:

- The proposed route has been designed to avoid and minimize impacts on WOTUS (including EFH) to the maximum extent practicable. Design engineers used field-verified digital wetland mapping to adjust the route throughout the length of the Project access road to avoid WOTUS, move road crossings perpendicular to stream channels, and cross wetlands at the narrowest possible point in consideration of topography and design criteria constraints.
- Access road material sites have been sited in uplands to the maximum extent practicable.
- The road dimensions will be the minimum required to meet the overall Project purpose.

10.1.2 Design Minimization Measures

Design minimization measures include:

- The proposed mine layout has been minimized to the greatest extent practicable given the Project purpose.
- The proposed road alignment is routed to minimize unavoidable impacts on sensitive areas such as WOTUS (including streams and EFH) to the extent practicable and in consideration of design criteria constraints.
- Existing drainage patterns will be maintained; properly sized and designed culverts will be used in appropriate locations to maintain the natural flow patterns and timing of surface water inflows to adjacent wetlands and waters.
- Culverts will be sized to reduce maintenance associated with debris clogging and icing, potential glaciation concerns, and sediment deposition. Culverts will be designed to minimize the potential for ponding and allow for break-up flow capacity if ice forms in the culverts.
- The proposed access road alignment will be routed so stream crossings are as close to perpendicular to the axis of the channel as engineering and routing conditions allow to minimize culvert and bridge length as well as reduce stream impacts.
- Properly sized and designed culverts will be installed to minimize impacts on fish in fish-bearing streams, and all anadromous fish stream crossings will be permitted according to ADF&G Title 16 guidelines.
- A 28-foot-wide, gravel road section with minimized use of roadside ditches will be used to promote sheet flow of runoff water from the road surface, increasing infiltration and vegetative filtration and thereby minimizing impacts on water quality resulting from concentrated runoff.
- Roadside ditches will be designed to accommodate maintenance demands and snow storage.

10.1.3 Construction Best Management Practices

Construction best management practices (BMPs) include:

- Stormwater pollution prevention control measures will be implemented during construction. A Storm Water Pollution Prevention Plan will be prepared prior to the start of construction.

- No vehicles or equipment will be fueled or serviced within 100 feet of wetlands or fish bearing streams. Fuel will be stored a minimum of 100 feet from any wetland or waterbody.
- Areas where grading and fill would occur will be stabilized using appropriate BMPs and revegetated with native seed mix within the first growing season following the work.
- Earthwork and pier construction will adhere to fish timing windows to avoid impacts on salmonids.
- Erosion control techniques will be used to prevent siltation and erosion during seasons of higher river levels.
- Appropriate measures, including working during low-flow and winter periods, will be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable.
- Sloping of site containment will be used to direct all spills and contaminated soil to gravity flow to a catchment pond.
- Coordination with USFWS will occur prior to construction to avoid and minimize impacts on nesting eagles in compliance with the Bald and Golden Eagle Protection Act (BGEPA).
- Timing windows will be implemented to avoid clearing, grubbing, and other site preparation and construction activities during critical life stages for migratory birds, in compliance with the Migratory Bird Treaty Act and BGEPA.
- ADF&G will determine timing windows during which in-water work will be authorized to minimize potential impacts on sensitive fish life stages such as spawning and/or migration periods. Timing windows for in-water work will be incorporated into the construction schedule.
- Construction activities will not result in a migration barrier for resident or anadromous fish. Fish passage will be maintained using temporary stream diversion channels, unless otherwise approved by the ADF&G Division of Habitat. Diversion techniques will likely involve creating a temporary diversion channel, plugging the natural channel upstream and downstream of the construction area, and temporarily rerouting flow into the diversion channel.

10.2 Compensatory Mitigation

The Project, in accordance with Section 404 of the CWA, has been designed to avoid impacts on wetlands and waterbodies wherever practicable, and to minimize impacts where impacts are not avoidable. Due to the number of streams within the Project area and the size of the Project, complete avoidance of WOTUS is not practical. The Project would impact 2.21 acres of WOTUS over four HUC10 watersheds (Table 10-1).

Table 10-1. Acreage of Watersheds Impacted by the Project

Watershed[a]	HUC10	Total Watershed Area (acres)	Impervious Surface[b] in Watershed (acres)[c]	Project Footprint (acres)[c]	Project Footprint in WOTUS (acres)[c]
Nome River	1905010416	102,359.7	771.9	61.1	0.19
Sinuk River	1905010419	190,571.6	116.5	168.4	0.2
Cobblestone River	1905010510	48,812.3	0	622.8	1.14
Imuruk Basin	1905010515	241,152.8	0	1,695.0	0.3
Total Area		**582,896.4**	**888.4**	**2,547.3**	**1.74**

Note: Table does not include permanent impacts from construction of inlet/outlet protection at culverts outside the road embankment.

[a] USGS 2025

[b] Dewitz and USGS 2021

[c] Total acreage presented may not reflect the sum of the individual cells due to rounding.

The 2008 *Final Rule on Compensatory Mitigation for Losses of Aquatic Resources* (2008 Final Rule; EPA and USACE 2008; found at 40 Code of Federal Regulations [CFR] 230.93(a)) provides that the District Engineer:

> *…must determine the compensatory mitigation to be required in a [Department of the Army] permit based on what is practicable and capable of compensating for the aquatic resources functions that will be lost as a result of the permitted activity.*

Additionally, it states that all compensatory mitigation (33 CFR 320.4(r)(2)):

> *…will be for significant resource losses which are specifically identifiable, reasonably likely to occur, and of importance to the human or aquatic environment. Also, all mitigation will be directly related to the impacts of the proposal, appropriate to the scope and degree of those impacts, and reasonably enforceable.*

In Alaska, implementation of regulations governing compensatory mitigation is further guided by a document titled *Compensatory Mitigation Considerations for the U.S. Army Corps of Engineers, Alaska District Regulatory* (CM Considerations; USACE 2025b).

Due to the Project's small impact on jurisdictional waters, the distribution of the minimal impacts over multiple watersheds (Table 10-1), and the extensive avoidance and minimization measures that Graphite One has already performed and committed to, Graphite One proposes no compensatory mitigation for the 2.21 acres of unavoidable permanent impacts of jurisdictional aquatic resource impacts. If USACE requires compensatory mitigation, Graphite One will work with USACE and mitigation providers in the region to develop a compensatory mitigation plan acceptable to USACE.

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