NORTHERN DYNASTY MINES INC.
PEBBLE PROJECT

Application for Water Right

Upper Talarik Creek

INSTRUCTION #5 – *Attach sketch, photos, plans of water system, or project description (if applicable).*

BRIEF PROJECT DESCRIPTION

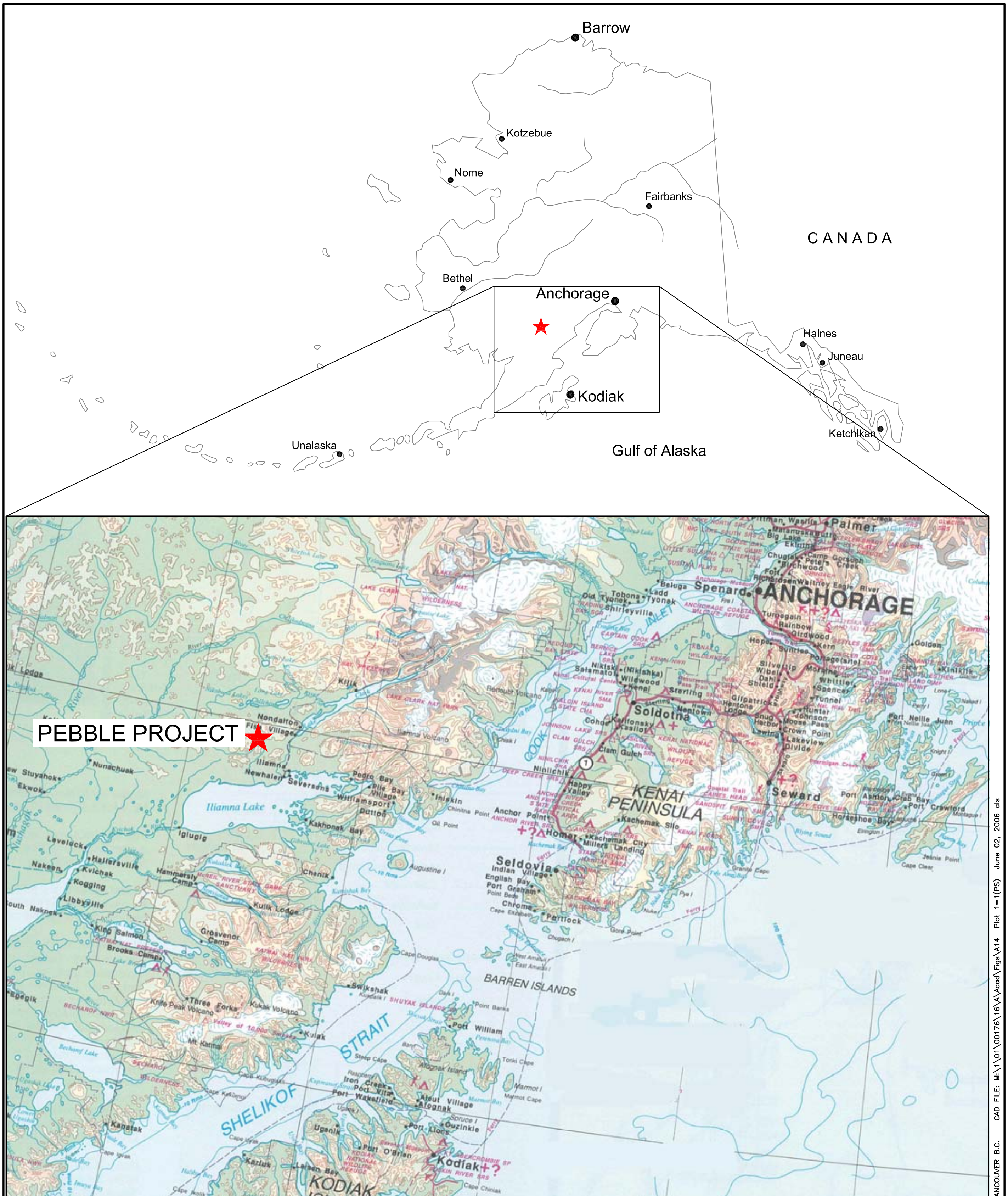
The Pebble Project will be a large open pit mine located 17 miles northwest of the community of Iliamna, on the north side of Lake Iliamna (Figure 1.1). Primary mine area facilities will consist of the open pit, ore conveyor, ore stockpile, a mill site (with associated offices, workshops, equipment repair and storage areas), tailing storage facilities, and a worker camp. Transportation facilities will include a mine area road network, and an approximately 100-mile road to a port facility on Cook Inlet. The primary port site facilities will include metal concentrates storage, fuel storage, a ship loading structure, barge landing, offices and worker housing.

DESCRIPTION OF IMPOUNDMENT FACILITIES

11 AAC 93.040(c)(8) requires:

> "a description of any impoundment, diversion, or withdrawal structures, including dimensions, construction materials, plans and specifications, and operation plans, and an application to construct or modify a dam, as defined in AS 46.17.900, if 11 AAC 93.171 requires an application;"

There would be no impoundment structures within the Upper Talarik Drainage, and therefore no application to construct or modify a dam is required. Following is a report describing the withdrawal structures and diversions that would be constructed and operated within the Upper Talarik Drainage.



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REV.	DATE	DESCRIPTION
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NORTHERN DYNASTY MINES INC.

PEBBLE PROJECT

PROJECT LOCATION

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-176/16	5

FIGURE 1.1 REV. 0

NORTHERN DYNASTY MINES INC.
PEBBLE PROJECT

FACILITIES DESCRIPTION IN SUPPORT OF A WATER RIGHTS APPLICATION

Upper Talarik Creek

(REF. NO. VA101-00176/16-5)

TABLE OF CONTENTS

PAGE

FIGURES

SECTION 1.0 - INTRODUCTION

1.1 GENERAL

The Pebble Project is a proposed mining development of a large copper-gold-molybdenum deposit located in the Bristol Bay region of Southwestern Alaska. The Pebble Project property is centered at latitude 59° 53’ 54” and longitude 155°17’44”, approximately 238 mi southwest of

Anchorage and 17 mi northwest of the Village of Iliamna. The project location is shown on Figure 1.1.

The deposit is situated on a drainage divide, with the Upper Talarik River draining to the east and south, and the North Fork and South Fork Koktuli rivers draining to the west and southwest, respectively. The mining of the ore deposit would result in an open pit mine located at the headwaters of the South Fork Koktuli Watershed; ongoing development of the open mine would extend the open pit into the headwaters of the Upper Talarik Watershed. The mine waste (tailings and waste rock) would be stored in two Tailings Storage Facilities (TSF) located in the South Fork Koktuli Watershed (TSF at Site A) and the North Fork Koktuli Watershed (TSF at Site G). A regional site plan of the watersheds for the respective water use facilities is shown on Figure 1.2.

1.2 SCOPE OF REPORT

The scope of this report is to provide information in support of the Water Rights Application process for the Upper Talarik Creek Watershed. Open pit development will impact the local hydrogeological regime and the surface water flow rates for the Upper Talarik Creek.

The open pit will act as a groundwater discharge zone. Hydrogeological field tests and piezometer monitoring suggest that the baseline groundwater table varies between 0 and 50 ft (15 m) below the ground surface. Ongoing development of the mine would cause a gradual lowering of the groundwater table in the vicinity of the excavation. The resulting increase in groundwater gradient with respect to the pit floor will increase groundwater flows towards the pit. Groundwater depressurization measures will be implemented in the pit walls, in addition to the water inflow control measures.

The appropriated surface runoff from precipitation is estimated to be approximately 29 ft3/s (0.8 m3/s), based on the estimated annual discharge rate at the water extraction limit of the Upper Talarik Creek Watershed. The water extraction limit has been conservatively estimated to account for potential pit expansion.

The technical details in this report are preliminary. Ongoing exploration continues to expand the ore deposit and the understanding of the geological/ hydrogeological conditions of the deposit area. The open pit and water extraction limit for the Upper Talarik Creek Watershed are shown on Figure 1.3.

The appropriated groundwater and surface water collected within the water extraction limit will be used for the following mining processes and beneficial uses:

- To collect water prior to mill start-up to ensure that there is sufficient water available to support the mine and mill operations through the initial years of operations, including during the winter months when ice development reduces the free water volume in the tailings pond.
- To provide the water required for the mining process (mine haul road dust suppression, equipment cooling, mill process, tailings slurry transport, concentrate slurry transport, etc).
- To ensure that there is sufficient water available in the system to offset the water that is lost to evaporation and sublimation, and the water that is permanently retained in the tailings voids.

- To provide potable water for daily use of the mine workers.
- To ensure that annual and seasonal fluctuations in the tailings pond do not impact the mining process.
- To protect the downstream aquatic resources by:
    - Submerging the potentially reactive waste materials deposited in the TSF to prevent oxidation and the potential development of acid drainage.
    - Promoting the saturation and/or flooding of tailings solids to prevent dust generation.
    - Controlling sediment.
    - Capturing and re-using process water that comes into contact with mineralized rock to ensure that the quality of the water for downstream fish and aquatic habitat is not adversely impacted by the mining operations.

SECTION 2.0 - OPEN PIT

2.1 GENERAL

Pit inflows will come from runoff from precipitation and groundwater seepage from geological structures. Groundwater inflow through the bedrock is expected to be minimal due to the low hydraulic conductivity values that were measured in the field.

Preliminary pit drainage systems have been developed to provide for the controlled removal of both precipitation and groundwater runoff from the pit and wall rocks. The pit drainage systems will include:

- Vertical perimeter pumping wells on the northeast crest of the pit to intercept undisturbed groundwater flowing through the overburden towards the pit.
- Sub-horizontal wall drains installed in both interim and final pit walls.
- Diversion ditches to collect and channel surface runoff and snowmelt.
- A series of pumps and collection systems to remove water from the pit and place it in sediment control sumps prior to re-use in the mining process.

These dewatering techniques will be implemented in a staged approach to suit open pit mining and hydrogeological conditions. A schematic plan of the pit with the dewatering (depressurization) measures is shown on Figure 2.1.

2.2 VERTICAL PERIMETER PUMPING WELLS

Removal of undisturbed groundwater from the overburden will improve the stability of the pit slopes by reducing water pressure. The pumping wells will pass through the overburden materials and penetrate into competent bedrock.

The pumped water from the overburden and non-mineralized Tertiary sediments would not come in contact with mineralized rock and would be used in the mining process. It may be suitable for potable water uses if it meets water quality standards.

2.3 SUB-HORIZONTAL WALL DRAINS

Sub-horizontal drains will be installed in both interim and final pit walls. These horizontal drains will be installed to suit the actual conditions of the open pit. This observational approach will place drain holes based on a number of different sources of information, including: geological features identified by mapping, recorded locations of wet production blast holes, geological modeling, piezometric readings, and slope monitoring observations.

2.4 SURFACE WATER DIVERSION DITCHES

Diversion ditches will capture and channel the majority of the surface runoff and snow melt to settlement ponds above the pit. The captured water would be used in the mining process. It may be suitable for potable water uses if it meets water quality standards.

2.5 PIT PUMPING SYSTEM

The objective of the pit dewatering system is to remove water inflows resulting from precipitation runoff in and around the pit and from groundwater inflows. Groundwater inflows are expected to be largely from localized alluvial overburden materials and fractured rock that are exposed as the pit excavation is progressively developed.

In-pit sumps will be included in the pit floor; water reporting to these sumps will be pumped out to sediment control sumps on the west side of the open pit. Water collected in the sumps will be available for use in the mining process.

1 300 000 E
1 320 000 E
1 340 000 E
1 360 000 E
1 380 000 E
1 400 000 E
1 420 000 E
1 440 000 E
1 460 000 E

2 180 000 E
2 160 000 E
2 140 000 E
2 120 000 E
2 100 000 E
2 080 000 E
2 060 000 E

TSF SITE G
Mill Site
Pit
TSF SITE A
North Fork Koktuli Watershed
South Fork Koktuli Watershed
Upper Talarik Creek Watershed
Watershed Boundary (approx.)
Lake Iliamna

LEGEND

- Tailings Storage Facilities
- Open Pit
- Watershed Boundary

Scale 7500 0 7500 15000 22500 Feet

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NORTHERN DYNASTY MINES INC.

PEBBLE PROJECT

REGIONAL SITE PLAN

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PROJECT/ASSIGNMENT NO.	REF. NO.
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FIGURE 1.2 REV. A

2 180 000 N
2 160 000 N
2 140 000 N
2 120 000 N
2 100 000 N
1 320 000 E
1 340 000 E
1 360 000 E
1 380 000 E
1 400 000 E
1 420 000 E
1 440 000 E
1 460 000 E

NK100B
NK100C
NK119A
UT100E
DL-3
UT100D
ND
Mill Site
Pit
C
TSF SITE G
TSF SITE A
SK100G
SK100F
NK100A
SK100A
North Fork Koktuli River
South Fork Koktuli River
SK119A
SK100B.2
SK100C
SK100B
UT100B
UT119A
KC100A
Upper Talarik Creek

LEGEND

- DL-3 — Proposed Downstream Limit of Water Extraction for UTC
- SK119A — Hydrology Station Continuous Flow – NDM
- C — Cominco Meteorological Station
- ND — Northern Dynasty Meteorological Station
- Watershed Boundary
- USGS Station
- Area of Water Extraction for UTC (Option 1)
- Area of Water Extraction for UTC (Option 2)

NOTE: NAD83 datum, Alaska State Planes; Zone 5, US Foot.

Scale 5000 0 5000 10000 15000 Feet

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NORTHERN DYNASTY MINES INC.

PEBBLE PROJECT

OPEN PIT
UPPER TALARIK CREEK WATERSHED

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-176/16	5

FIGURE 1.3 REV. A

June 5, 2006 ALS
1"=10 000'
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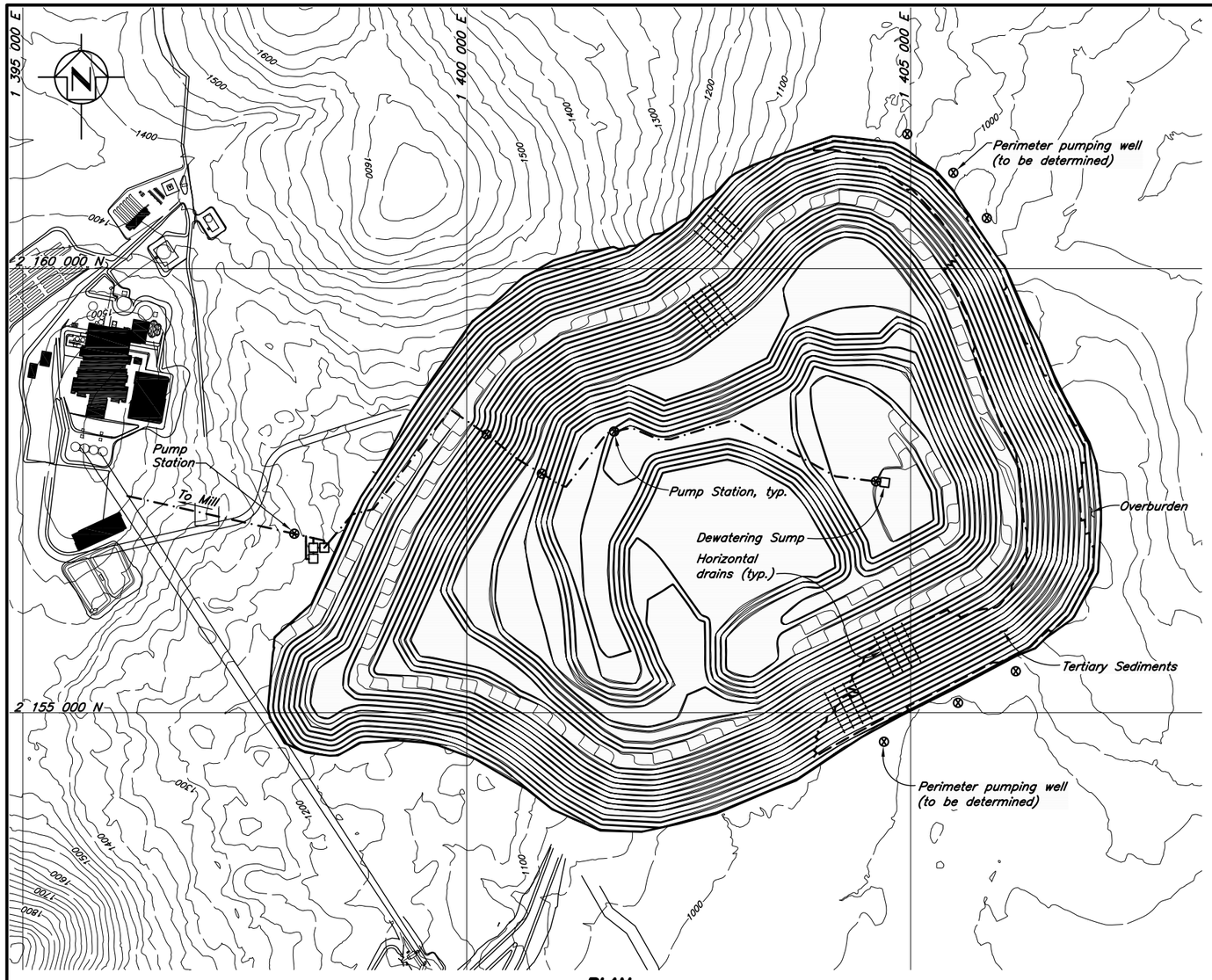
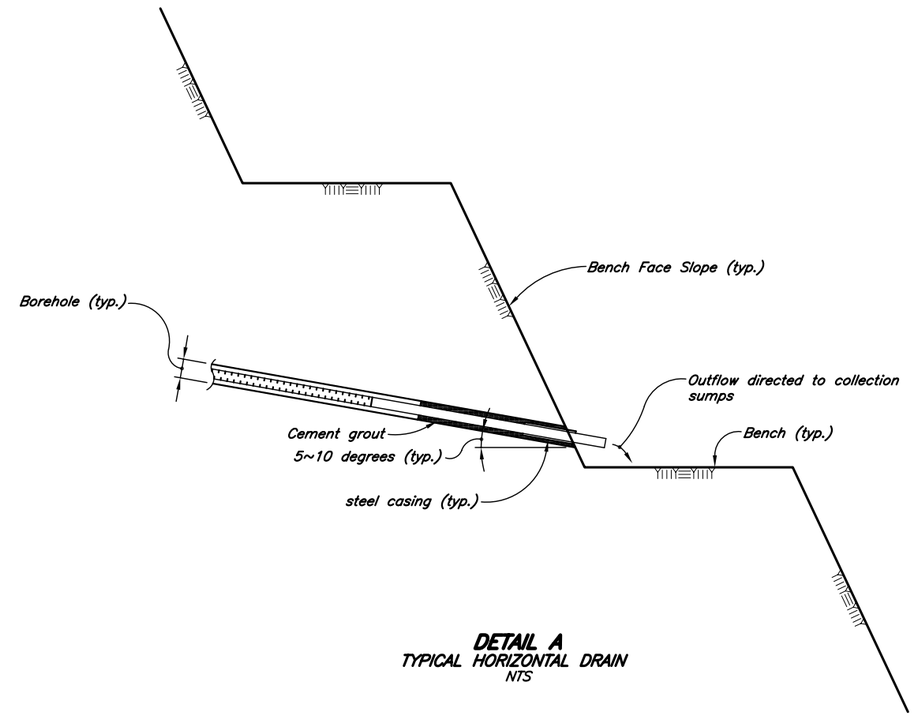


PLAN
OPEN PIT
Scale A



DETAIL A
TYPICAL HORIZONTAL DRAIN
NTS

A 500 0 500 1000 1500 Feet

NOTES

1. *Pit geometry provided by Northern Dynasty Mines Inc., October 2004.*
2. *Perimeter pumping wells and horizontal drains are for conceptual illustration only. Actual locations, depths, spacings will be determined during operation based on monitoring data.*
3. *Coordinate system is in NAD83 Alaska State Plane Zone 5 Foot.*

NORTHERN DYNASTY MINES INC.		
PEBBLE PROJECT		
PIT SLOPE DEPRESSURIZATION MEASURES		
Knight Piésold CONSULTING	PROJECT/ASSIGNMENT NO. VA101-176/16	REF. NO. 5
FIGURE 2.1		REV. A

REV.		
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NORTHERN DYNASTY MINES INC.
PEBBLE PROJECT
Application for Water Right

Upper Talarik Creek

MAP

INSTRUCTION #6 – *Attach legible map that includes meridian, township, range, and section lines such as a subdivision plat, USGS topographical quadrangle, or borough tax map. Indicate location of water withdrawal, route of water transmission, water use area boundary, points of water use within boundary, and point of water return flow (if applicable).*

The following map (Figure UT-1), originally introduced behind the Application Attachments tab, shows the township, range, and section lines for the location of water withdrawal, transmission of water, and the water use area boundary. The specific points of water use all will be within the boundary shown, primarily in the resource extraction area. Specific locations of water withdrawal points such as dewatering wells, and transmission routes, will be identified during the detailed design phase. At this time no return flow or discharge of water is anticipated.

2 180 000 N
2 160 000 N
2 140 000 N
2 120 000 N
2 100 000 E
1 320 000 E
1 340 000 E
1 360 000 E
1 380 000 E
1 400 000 E
1 420 000 E
1 440 000 E
1 460 000 E

NK100A
NK100B
NK100C
NK119A
SK100A
SK100B
SK100B.2
SK100C
SK100F
SK100G
SK119A
KC100A
UT100B
UT100D
UT119A
DL-3
ND
C

North Fork Koktuli River
South Fork Koktuli River
Koktuli River
Upper Talarik Creek

LEGEND

- DL-3 — Proposed Downstream Limit of Water Extraction
- SK119A — Hydrology Station Continuous Flow – NDM
- C — Cominco Meteorological Station
- ND — Northern Dynasty Meteorological Station
- Watershed Boundary
- USGS
- Area of Water Extraction

NOTE: NAD83 datum, Alaska State Planes; Zone 5, US Foot.

Scale 5000 0 5000 10000 15000 Feet

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NORTHERN DYNASTY MINES INC.

PEBBLE PROJECT

PROPOSED WATER EXTRACTION LIMITS
UPPER TALARIK CREEK

Knight Piésold CONSULTING

PROJECT/ASSIGNMENT NO. VA101-176/16 | REF. NO. – | REV. B

FIGURE UT-1

XREF FILE : Trimmed_50ft, Hydo_old_NAD83

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