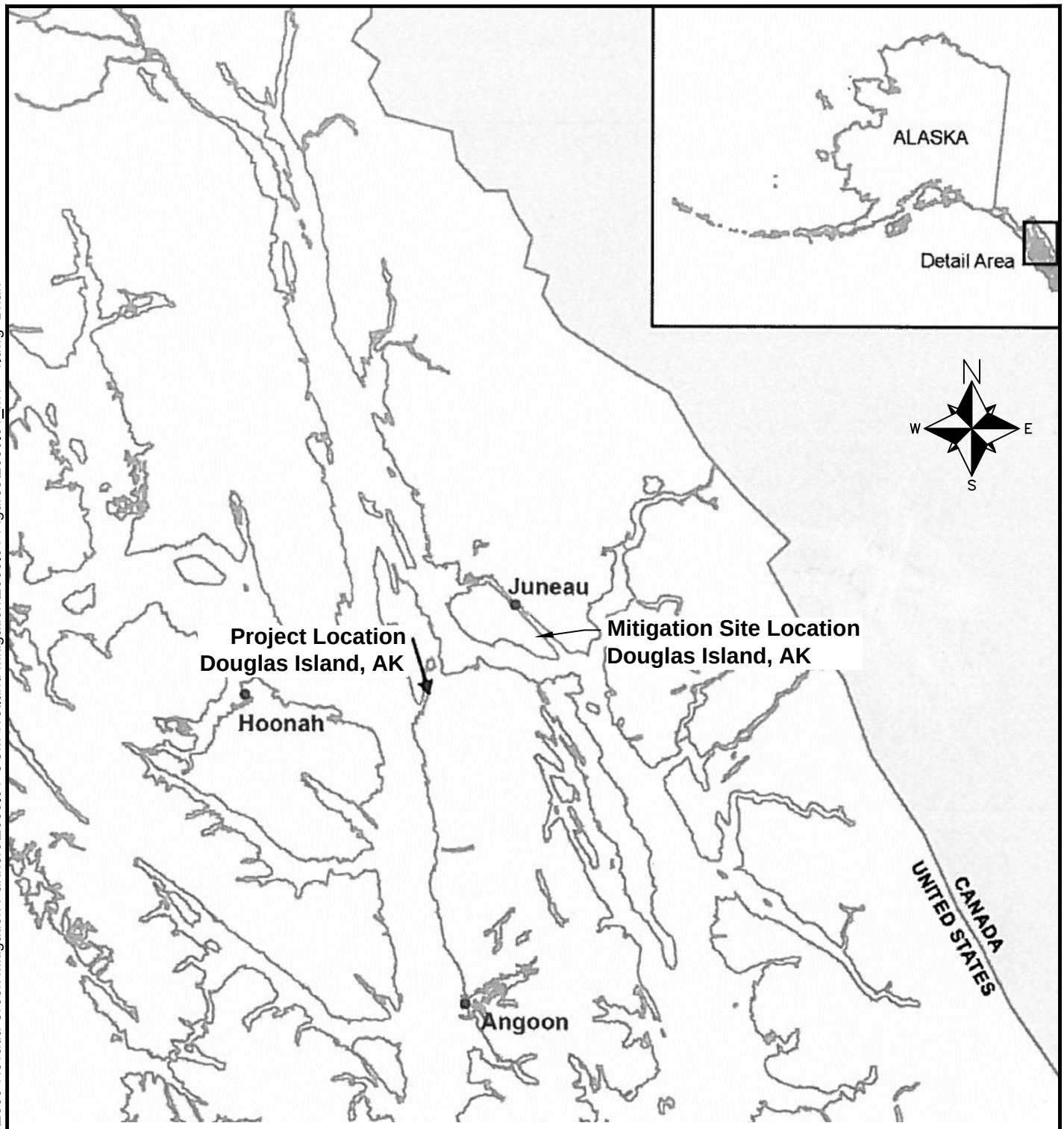
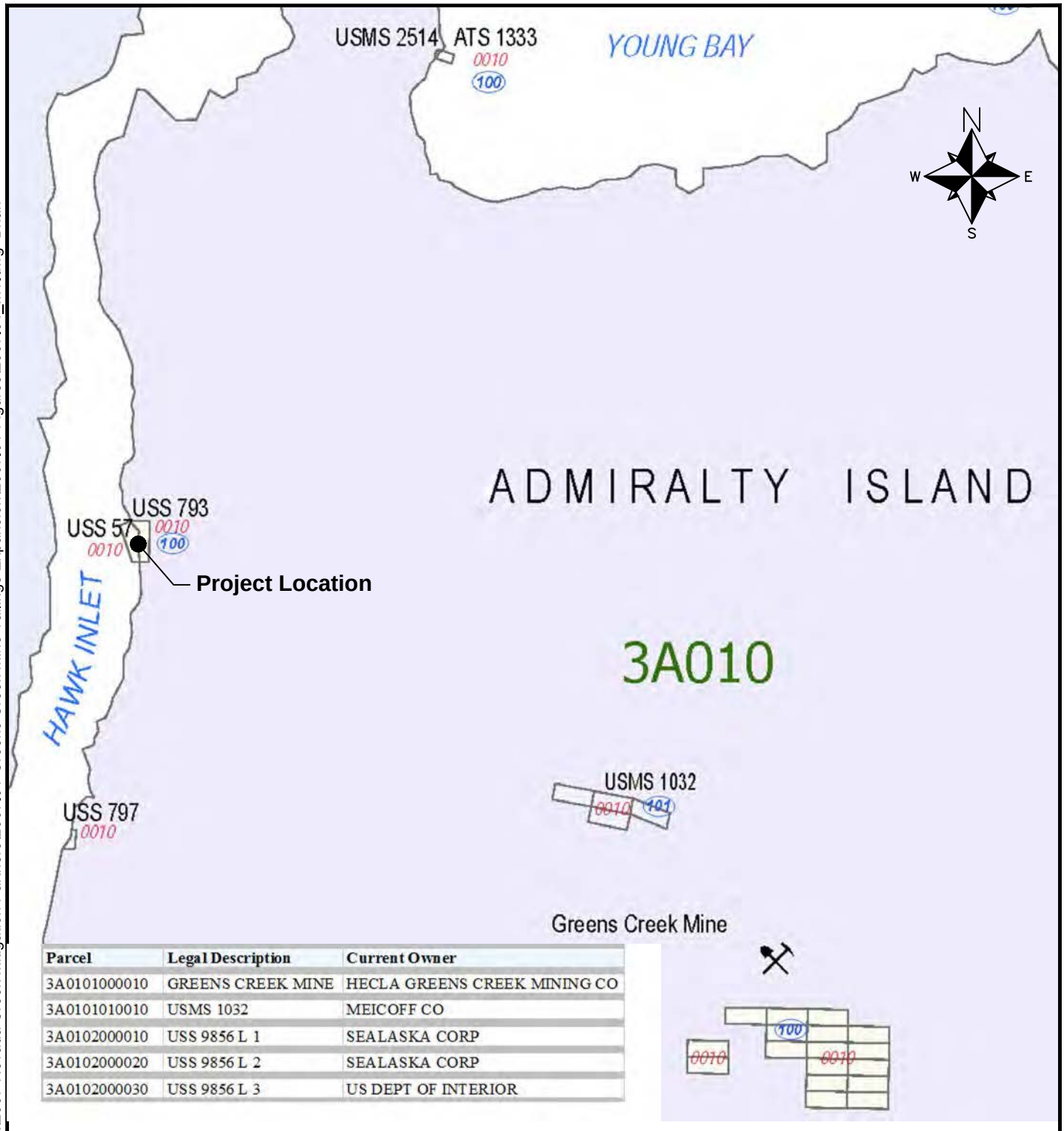


PROJECT & MITIGATION SITE LOCATION

CITY: Juneau **BOROUGH:** Juneau **STATE:** Alaska
WATERWAY: Nevada Creek Watershed
PROPOSED ACTIVITY: Stage 3 Expansion
DIRECTIONS TO SITE:
The Greens Creek Mine project site is located on northern Admirality Island. The Nevada Creek mitigation site is located on southern Douglas Island. Both sites are accessed by boat, helicopter or float plane.

APPLICANT: Hecla Greens Creek Mining Company
FILE #: POA-1988-0269-2
PROJECT: **S.** 26 **T.** 43S **R.** 65E **M.** C.R.M.
LAT.: 58.1172 °N **LONG.:** -134.7466 °W
MITIGATION: **S.** 3,4,9,10 **T.** 66S **R.** 65E **M.** C.R.M.
LAT.: 58.2277 °N **LONG.:** -134.3133 °W
SHEET 1 **OF** 17 **DATE:** 3/25/14

3/25/2014 2:49 PM S:\Juneau-AK\2039-Nevada Creek Mitigation Partners\2039.01-GCM Wetland Mitigation\2039.01-Figures\2039.01_MT - 4.dwg Brian



Parcel	Legal Description	Current Owner
3A0101000010	GREENS CREEK MINE	HECLA GREENS CREEK MINING CO
3A0101010010	USMS 1032	MEICOFF CO
3A0102000010	USS 9856 L 1	SEALASKA CORP
3A0102000020	USS 9856 L 2	SEALASKA CORP
3A0102000030	USS 9856 L 3	US DEPT OF INTERIOR

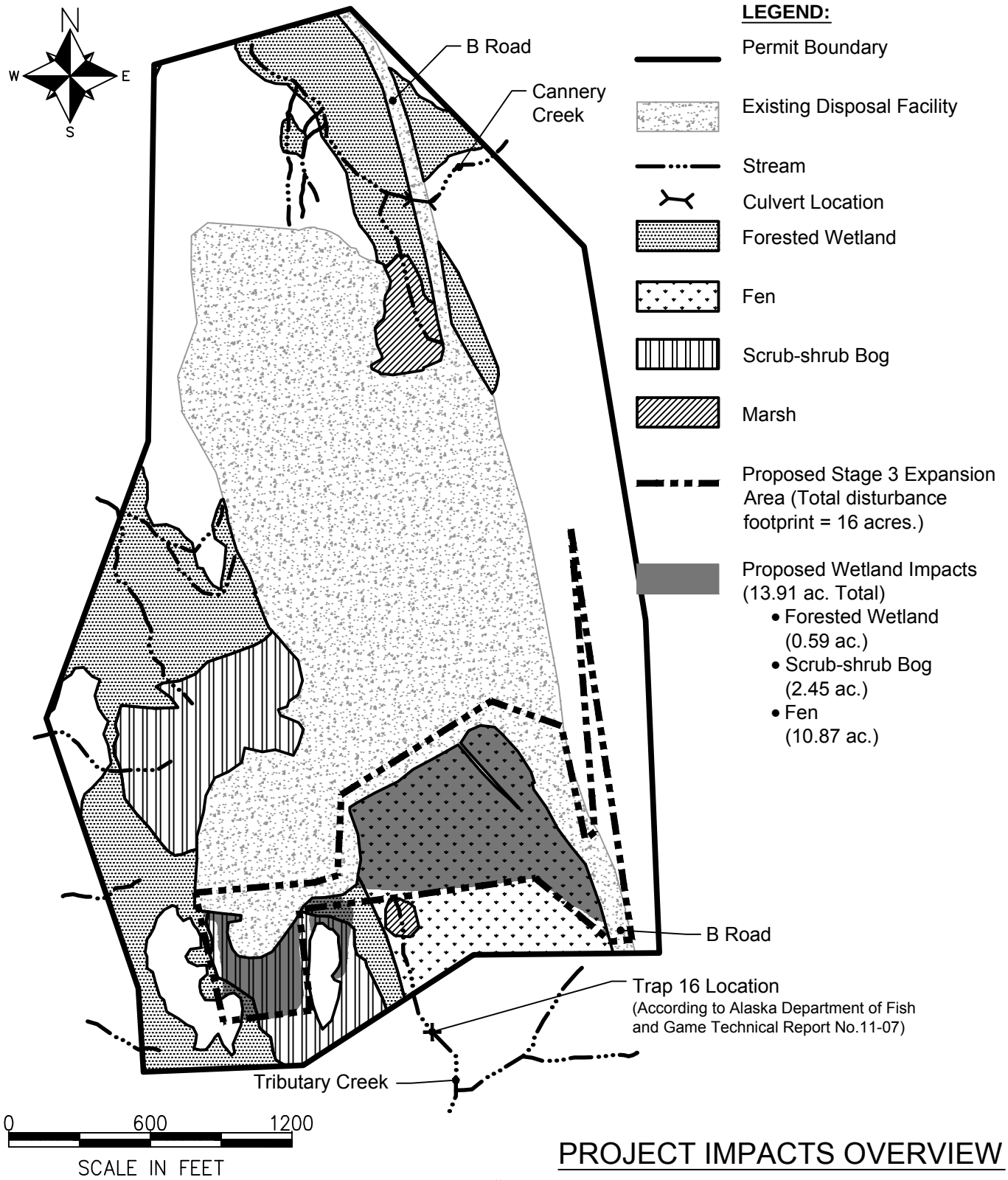
0 1 2

SCALE IN MILES

PROJECT SITE OWNERSHIP MAP

CITY: Juneau **BOROUGH:** Juneau **STATE:** Alaska
WATERWAY: Nevada Creek Watershed
PROPOSED ACTIVITY: Stage 3 Expansion
DIRECTIONS TO SITE:
The Greens Creek Mine project site is located on northern Admiralty Island. The Nevada Creek mitigation site is located on southern Douglas Island. Both sites are accessed by boat, helicopter or float plane.

APPLICANT: Hecla Greens Creek Mining Company
FILE #: POA-1988-0269-2
PROJECT: **S.** 26 **T.** 43S **R.** 65E **M.** C.R.M.
LAT.: 58.1172 °N **LONG.:** -134.7466 °W
MITIGATION: **S.** 3,4,9,10 **T.** 66S **R.** 65E **M.** C.R.M.
LAT.: 58.2277 °N **LONG.:** -134.3133 °W
SHEET 2 **OF** 17 **DATE:** 3/25/14

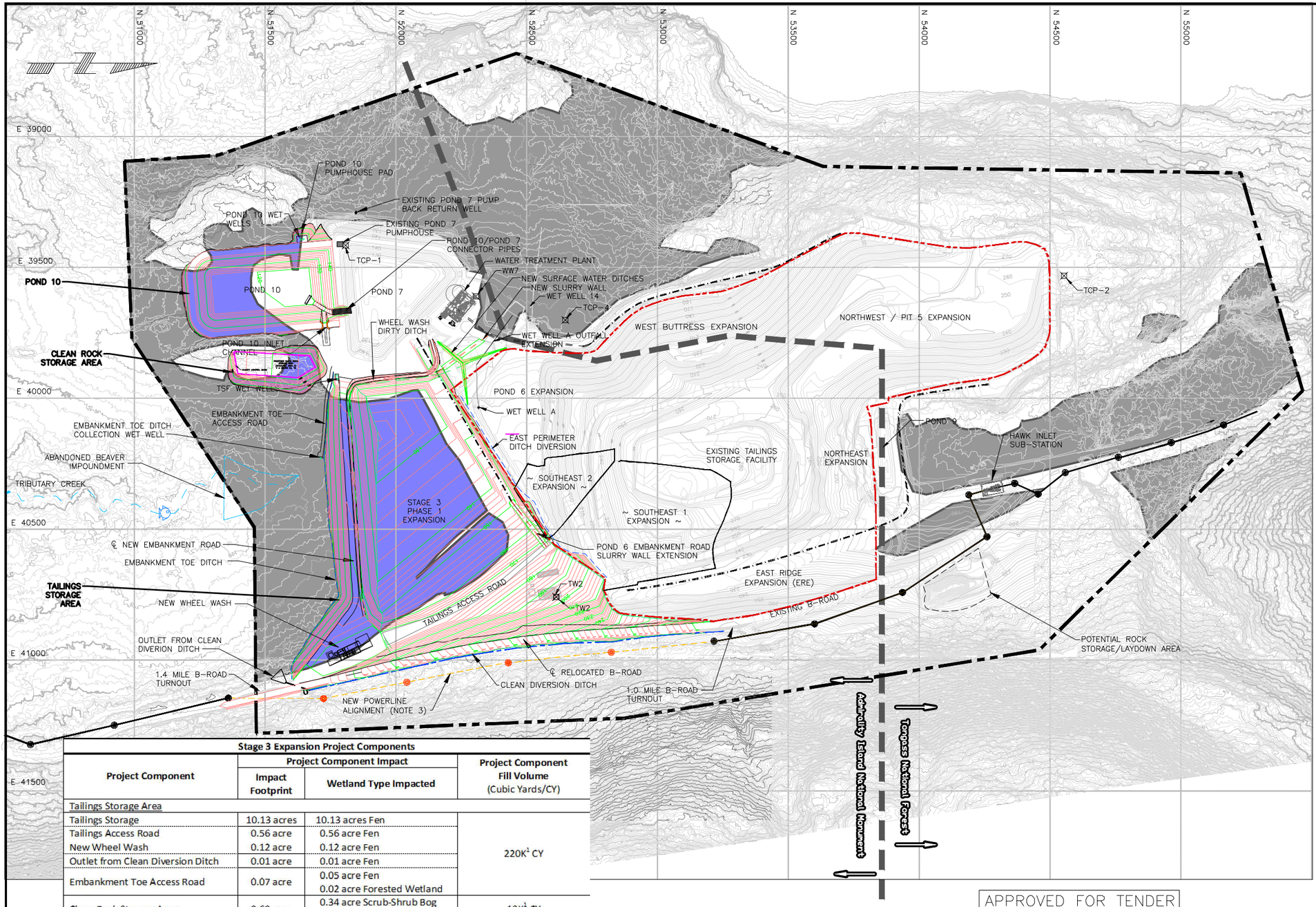


PROJECT IMPACTS OVERVIEW

CITY: Juneau **BOROUGH:** Juneau **STATE:** Alaska
WATERWAY: Nevada Creek Watershed
PROPOSED ACTIVITY: Stage 3 Expansion
DIRECTIONS TO SITE:
The Greens Creek Mine project site is located on northern Admirality Island. The Nevada Creek mitigation site is located on southern Douglas Island. Both sites are accessed by boat, helicopter or float plane.

APPLICANT: Hecla Greens Creek Mining Company
FILE #: POA-1988-0269-2
PROJECT: **S.** 26 **T.** 43S **R.** 65E **M.** C.R.M.
LAT.: 58.1172 °N **LONG.:** -134.7466 °W
MITIGATION: **S.** 3,4,9,10 **T.** 66S **R.** 65E **M.** C.R.M.
LAT.: 58.2277 °N **LONG.:** -134.3133 °W
SHEET 3 **OF** 17 **DATE:** 3/25/14

3/25/2014 2:48 PM S:\Juneau-AK\2067-Nevada Creek Mitigation Partners\2067.01-Greens Creek Mine Tailings Expansion\2067.01-Figures\2067.01_MT.dwg Brian



⊠SURVEY CONTROL POINTS (ft)			
#	NAME	NORTHING	EASTING
1	TCP-1	51808	39415
2	WW7	52306	39610
3	TCP-4	52648	39701
4	TCP-2	54554	39531
5	TW2	52613	40758

ALL CONTROL POINTS ARE GPS COMPATIBLE. CONTROL POINT TW2 WILL BE LOST DURING DEMOLITION OF EXISTING TRUCK WASH.

LEGEND

- EXISTING TAILINGS PLACEMENT BOUNDARY
- PROPOSED STAGE 3 PHASE 1 TAILINGS BOUNDARY
- STAGE 3 LEASE BOUNDARY
- EXISTING SLURRY WALLS
- PROPOSED SLURRY WALLS
- EXISTING POWERLINE AND POLES
- NEW POWERLINE AND POLES
- SURVEY CONTROL POINTS
- POWER POLE
- FISH TRAP
- WETLAND (NO IMPACT)
- WETLAND IMPACT (13.91 ACRES)

GENERAL NOTES

1. BASE TOPOGRAPHY AND ROAD PROVIDED BY HGCMC (MARCH 2013).
2. LOCATIONS AND ELEVATIONS ARE IN FEET AND ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO MINE DATUM UNLESS OTHERWISE NOTED.
3. POWERLINE RELOCATION BY OTHERS.
4. EXISTING DITCH ALIGNMENTS NOT SHOWN.
5. EXISTING ROCK STORAGE/LAYDOWN AREA, WHEEL WASH AREA, AND POND 7 LAYDOWN AREA ARE ALL POTENTIAL TEMPORARY CONTRACTOR LAYDOWN OR ROCK STORAGE AREAS.

Stage 3 Expansion Project Components

Project Component	Project Component Impact		Project Component Fill Volume (Cubic Yards/CY)
	Impact Footprint	Wetland Type Impacted	
Tailings Storage Area			
Tailings Storage	10.13 acres	10.13 acres Fen	220K[1] CY
Tailings Access Road	0.56 acre	0.56 acre Fen	
New Wheel Wash	0.12 acre	0.12 acre Fen	
Outlet from Clean Diversion Ditch	0.01 acre	0.01 acre Fen	
Embankment Toe Access Road	0.07 acre	0.05 acre Fen 0.02 acre Forested Wetland	
Clean Rock Storage Area	0.69 acre	0.34 acre Scrub-Shrub Bog 0.35 acre Forested Wetland	13K[1] CY
Pond 10	2.33 acres	2.11 acres Scrub-Shrub Bog 0.22 acre Forested Wetland	20K[1] CY
Total	*13.91 acres*	*10.87 acres Fen* *2.45 acres Scrub-Shrub Bog* *0.59 acre Forested Wetland*	*253K[2] CY*

[1]K = abbreviation for thousand.

Latitude: 58.1172° N
Longitude: -134.7466° W

APPROVED FOR TENDER

SCALE A 200 0 200 FT

REVISION	DESCRIPTION OF REVISION	DATE (YYYY-MM-DD)	DRAWN	DESIGNED	CHECKED	APPROVED
0	APPROVED FOR TENDER	2013-12-19	CW	BO	LC	LM

CLIENT: HECLA GREENS CREEK MINING COMPANY

Klohn Crippen Berger

PROJECT: TAILINGS STORAGE FACILITY STAGE 3 – PHASE 1 EXPANSION

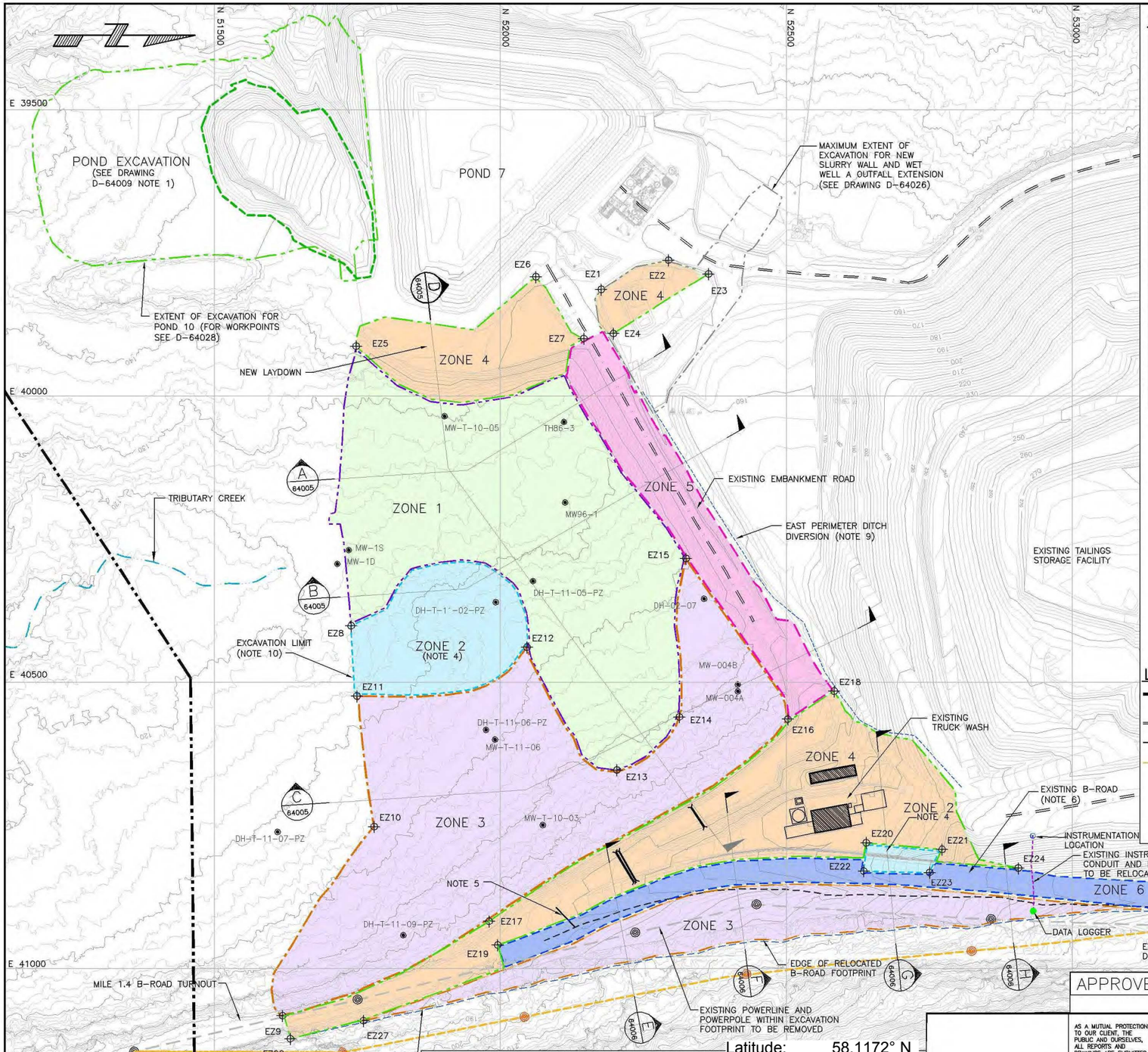
TITLE: TAILINGS STORAGE AREA GENERAL ARRANGEMENT

SCALE	PROJECT NO.	DWG. NO.	REV.
AS SHOWN	M07802A64	D-64002	0

CANCEL PRINTS BEARING PREVIOUS REVISION

KCB-TWC-n-I

PROJECT SITE MAP



EXISTING INSTRUMENTATION

INSTRUMENT	LOCATION (ft.)		TYPE*	COMMENTS
	NORTHING	EASTING		
MW-T-10-05	51902	40035	SP	INSTALL VIBRATING WIRE PIEZOMETER WITH TIP AT 20 FT. BELOW GROUND SURFACE; GROUT TO SURFACE; AND EXTEND CABLES AS SHOWN IN D-64019.
MW96-1	52113	40186	SP	INSTALL VIBRATING WIRE PIEZOMETER WITH TIP AT 20 FT. BELOW GROUND SURFACE; GROUT TO SURFACE; AND EXTEND CABLES AS SHOWN IN D-64019.
MW-1S	51735	40269	SP	GROUT TO SURFACE USING PROPER WELL ABANDONMENT TECHNIQUES
MW-1D	51715	40293	SP	GROUT TO SURFACE USING PROPER WELL ABANDONMENT TECHNIQUES
DH-T-11-05-PZ	52057	40323	VWP	EXTEND EXISTING INSTRUMENT CABLES AS SHOWN IN D-64019.
DH-T-11-02-PZ	51992	40360	VWP	EXTEND EXISTING INSTRUMENT CABLES AS SHOWN IN D-64019.
DH-T-11-06-PZ	51975	40583	VWP	EXTEND EXISTING INSTRUMENT CABLES AS SHOWN IN D-64019.
MW-T-11-06	51991	40600	SP	GROUT TO SURFACE USING PROPER WELL ABANDONMENT TECHNIQUES
DH-02-07	52356	40354	SP	GROUT TO SURFACE USING PROPER WELL ABANDONMENT TECHNIQUES
MW-004A	52415	40516	SP	INSTALL VIBRATING WIRE PIEZOMETER. EXTEND INSTRUMENTATION CABLES AS SHOWN IN D-64019.
MW-004B	52415	40504	SP	GROUT TO SURFACE USING PROPER WELL ABANDONMENT TECHNIQUES
MW-T-10-03	52074	40749	SP	GROUT TO SURFACE USING PROPER WELL ABANDONMENT TECHNIQUES
DH-T-11-09-PZ	51830	40942	VWP	EXTEND EXISTING INSTRUMENTATION CABLES AS SHOWN IN D-64012.
TH86-3	52111	40045	UNKNOWN	GROUT TO SURFACE USING PROPER WELL ABANDONMENT TECHNIQUES
DH-T-11-07-PZ	51611	40761	VWP	DO NOT DISTURB

* VWP VIBRATING WIRE PIEZOMETER
SP STANDPIPE

WORK POINTS (FT)			
WP#	NORTHING	EASTING	EL.
EZ1	52176	39814	148.0
EZ2	52294	39762	150.0
EZ3	52364	39786	150.0
EZ4	52197	39891	148.0
EZ5	51748	39913	142.0
EZ6	52062	39791	147.0
EZ7	52146	39899	152.0
EZ8	51739	40401	124.0
EZ9	51620	41082	172.0
EZ10	51779	40752	137.0
EZ11	51749	40524	128.0
EZ12	52046	40438	138.0
EZ13	52203	40653	152.0
EZ14	52313	40561	150.0
EZ15	52324	40284	139.0
EZ16	52502	40565	165.0
EZ17	51980	40917	165.0
EZ18	52583	40515	172.0
EZ19	51996	40959	174.0
EZ20	52640	40780	202.0
EZ21	52772	40792	218.0
EZ22	52635	40829	228.0
EZ23	52750	40832	240.0
EZ24	52905	40824	250.0
EZ25	53199	40853	278.0
EZ26	53209	40901	280.0
EZ27	51761	41091	172.0
EZ28	51633	41122	172.0

EXCAVATION ZONES

EXCAVATION ZONE	MATERIAL TO BE EXCAVATED	EXPECTED BASE UNIT(S) OF EXCAVATION	ESTIMATED EXCAVATION DEPTH (ft) (NOTE 3)	DISPOSAL LOCATION
1	PEAT AND/OR TOPSOIL	CLAY	2 – 15	TSF
2	PEAT, TOPSOIL, CLAY, SILTY SAND AND GRAVEL, AND/OR ROCKFILL	BEDROCK	4 – 15	TSF
3	PEAT AND/OR TOPSOIL	SILTY SAND AND GRAVEL AND/OR BEDROCK	1 – 3	TSF
4	UNSUITABLE ROCKFILL	NATIVE GROUND OR AS DIRECTED BY QA FIELD ENGINEER	4 – 20	TSF
5	UNSUITABLE ROCKFILL	TOP OF SLURRY WALL	2 – 14	TSF
6	UNSUITABLE ROCKFILL (NOTE 11)	CLEAN ROCKFILL	VARIES	TSF

LEGEND

- PROPOSED STAGE 3 LEASE BOUNDARY
- EXISTING SLURRY WALLS
- EXISTING POWERLINE AND POLES
- NEW POWERLINE AND POLES (NOTE 8)
- DRILL HOLE WITH INSTRUMENTATION (NOTE 7)

NOTES:

1. FOR GENERAL NOTES SEE D-64002.
2. FINAL EXTENT OF EXCAVATION ZONES AS DIRECTED BY FIELD QA ENGINEER.
3. ZONE BOUNDARIES AND EXCAVATION DEPTH HAVE BEEN ESTIMATED FROM AVAILABLE SITE INVESTIGATIONS, ACTUAL CONDITIONS WILL VARY. EXCAVATION ACTIVITIES TO BE COMPLETED IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.
4. EXCAVATE TO EXISTING BEDROCK AND CAP BEDROCK WITH TYPE 4 FILL (FILL TYPES DEFINED ON D-64013).
5. EXISTING CULVERTS AND EROSION PROTECTION TO BE REMOVED.
6. EXISTING B-ROAD SHALL STAY OPERATIONAL UNTIL RELOCATED B-ROAD IS COMPLETED.
7. THE CONTRACTOR SHALL PROTECT ALL EXISTING INSTRUMENTATION.
8. NEW POWER POLE LOCATIONS WILL REQUIRE ADDITIONAL CLEARING FOR EQUIPMENT ACCESS
9. RE-ROUTE EXISTING PERIMETER DITCH AS SHOWN PRIOR TO EXCAVATION. DITCH TO BE RELOCATED AS REQUIRED TO MAINTAIN FLOW TO POND 7.
10. DISTURBANCE SHALL BE LIMITED TO WITHIN 15 FT OF EXCAVATION LINES.
11. TOP 4 FT OF ZONE 6 EXCAVATED MATERIAL TO BE STORED IN CONTAINMENT. REMAINING MATERIAL MAY BE USABLE AS GENERAL FILL WITH APPROVAL OF ENGINEER.
12. MINIMUM 3 FOOT THICK LIFT OF COMPACTED TYPE 1 FILL TO BE PROGRESSIVELY PLACED OVER EXPOSED CLAY DURING EXCAVATION OF ZONE 1. FILL TYPES DEFINED ON D-64013.

SCALE A 100 0 100 FT

APPROVED FOR TENDER

Latitude: 58.1172° N
Longitude: -134.7466° W

Sheet 5 of 17

TAILINGS STORAGE AREA DETAIL

REVISION	DESCRIPTION OF REVISION	DATE (YYYY-MM-DD)	DRAWN	DESIGNED	CHECKED	APPROVED
0	APPROVED FOR TENDER	2013-12-19	CW	BO	LC	LM

CLIENT
HECLA GREENS CREEK MINING COMPANY

Klohn Crippen Berger

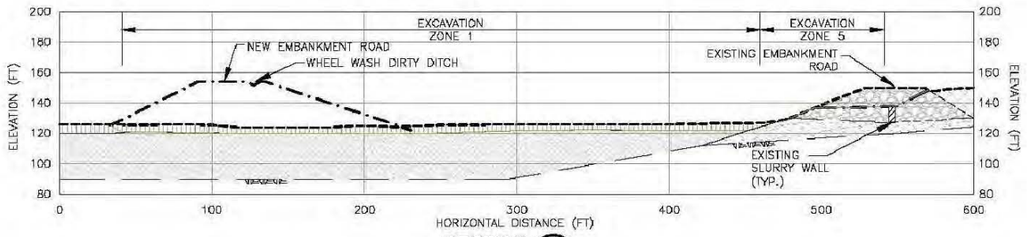
PROJECT
TAILINGS STORAGE FACILITY
STAGE 3 – PHASE 1 EXPANSION

TITLE
TAILINGS STORAGE AREA
EXCAVATION AND EXISTING INSTRUMENTATION PLAN

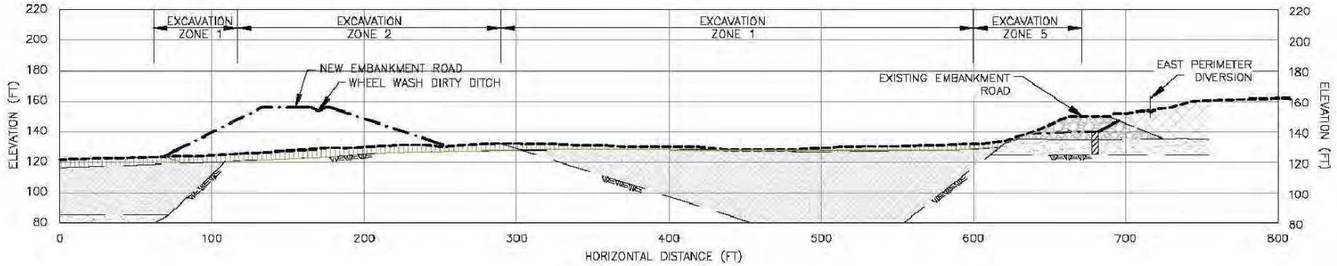
SCALE	PROJECT NO.	DWG. NO.	REV.
AS SHOWN	M07802A64	D-64004	0

KCB-DWG-D-L

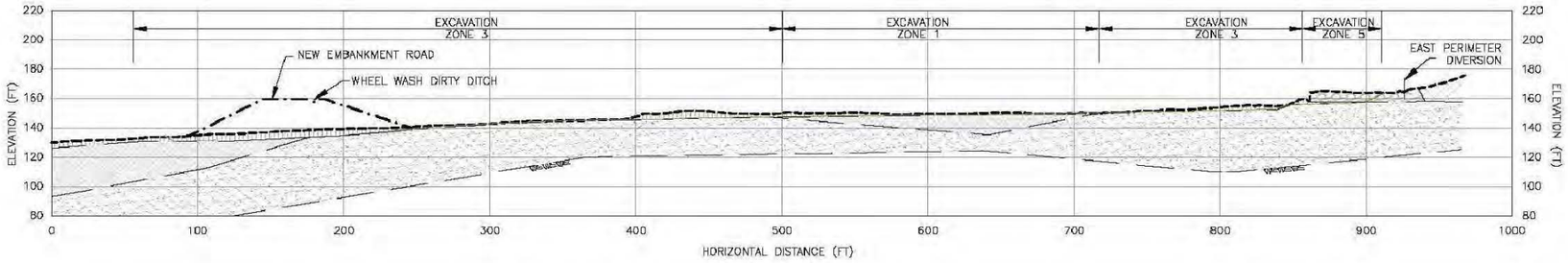
Date: 12/19/2013
Scale: 1:2(PS)
Drawing File: Z:\M\VCR\M07802\A64-2012 S3P1 Design\400 Drawings\IssuesForConstruction\D-64004-Rev0.dwg (cwong)
Xref File(s): extracted eg contour
mage File(s):



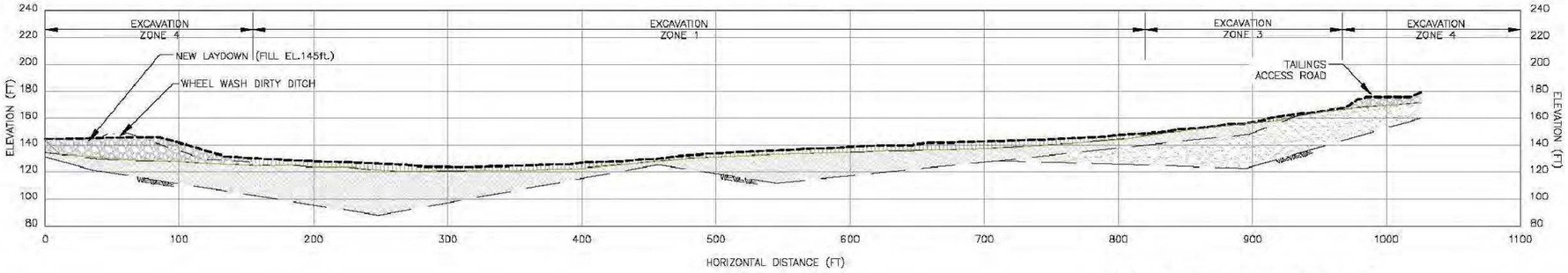
SECTION A (B4004)



SECTION B (B4004)



SECTION C (B4004)



SECTION D (B4004)

LEGEND

- EXISTING SURFACE
- PROPOSED STAGE 3 PHASE 1 SURFACE
- INFERRED UNIT BOUNDARY
- EXCAVATION SURFACE (APPROXIMATE)
- TAILINGS
- EXISTING FILL
- PEAT
- CLAY OR SILT
- SILTY SAND & GRAVEL
- BEDROCK

NOTES:

1. FOR GENERAL NOTES (SEE DRAWING D-64002).
2. SUBSURFACE CONDITIONS ESTIMATED FROM DRILL HOLES (SEE DRAWING D-64003).
3. WATER TABLE IS EXPECTED TO BE AT THE TOP OF PEAT OR AT TOP OF SILTY SAND & GRAVEL LAYER.
4. UNIT BOUNDARY IS INFERRED FROM LIMITED GEOLOGICAL DATA EXTRAPOLATED OVER CONSTRUCTION AREA. ACTUAL CONDITIONS MAY VARY.

APPROVED FOR TENDER

50 0 50 FT

Sheet 6 of 17

TAILINGS STORAGE AREA CROSS SECTIONS A-D

Latitude: 58.1172° N
Longitude: -134.7466° W

REVISION	DESCRIPTION OF REVISION	DATE (YYYY-MM-DD)	DRAWN	DESIGNED	CHECKED	APPROVED
0	APPROVED FOR TENDER	2013-12-19	CW	BD	LC	LM

CLIENT: HECLA GREENS CREEK MINING COMPANY

Klohn Crippen Berger

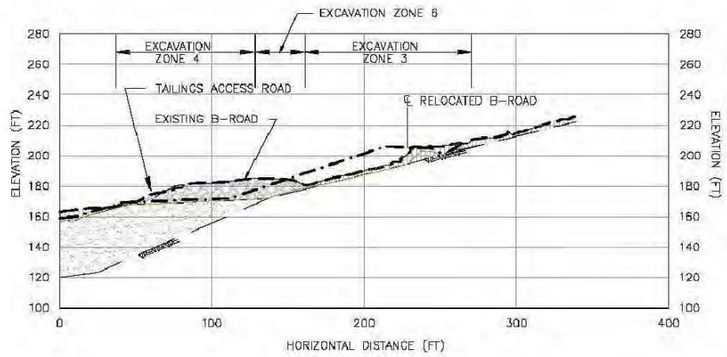
PROJECT: TAILINGS STORAGE FACILITY STAGE 3 – PHASE 1 EXPANSION

TITLE: TAILINGS STORAGE AREA GEOLOGICAL SECTIONS 1 OF 2

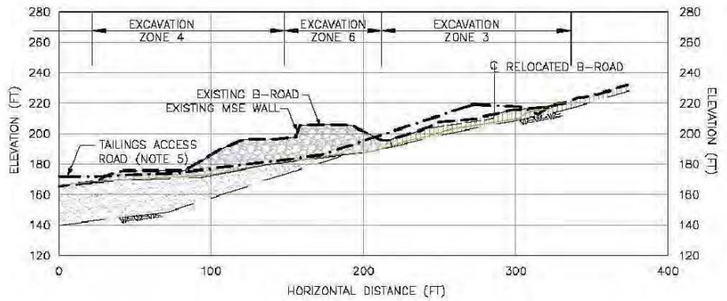
SCALE	PROJECT NO.	DWG. NO.	REV.
AS SHOWN	M07802A64	D-64005	0

CANCEL PRINTS BEARING PREVIOUS REVISION

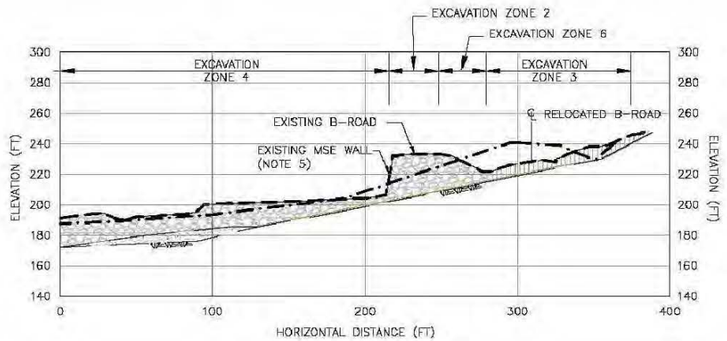
Time: 10:01:13
Date: 12/19/2013
Scale: 1:2(FS)
Drawing File: Z:\M\VCR\M07802\A64-2012 S3P1 Design\400 Drawings\IssuesForConstruction\D-64005, 6-Rev0.dwg (cwong)



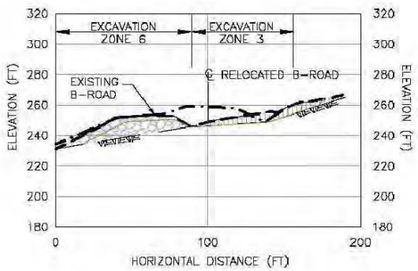
SECTION E 64004



SECTION F 64004



SECTION G 64004



SECTION H 64004

LEGEND

- EXISTING SURFACE
- PROPOSED STAGE 3 PHASE 1 SURFACE
- INFERRED UNIT BOUNDARY
- EXCAVATION SURFACE (APPROXIMATE)
- TAILINGS
- EXISTING FILL
- PEAT
- CLAY OR SILT
- SILTY SAND & GRAVEL
- BEDROCK

NOTES:

1. FOR GENERAL NOTES SEE DRAWING (D-64002).
2. SUBSURFACE CONDITIONS ESTIMATED FROM DRILL HOLES (SEE DRAWING D-64003).
3. WATER TABLE IS EXPECTED TO BE AT THE TOP OF PEAT, OR TOP OF SILTY SAND AND GRAVEL UNIT.
4. UNIT BOUNDARY IS INFERRED FROM LIMITED GEOLOGICAL DATA EXTRAPOLATED OVER CONSTRUCTION AREA. ACTUAL CONDITIONS MAY VARY.
5. TOP 4 FT OF ZONE 6 EXCAVATED MATERIAL TO BE STORED IN CONTAINMENT. REMAINING MATERIAL MAY BE USABLE AS GENERAL FILL WITH APPROVAL OF ENGINEER.
6. ALL MANUFACTURED MATERIAL TO BE DISPOSED OF PER TECHNICAL SPECIFICATIONS.

APPROVED FOR TENDER

50 0 50 FT

Sheet 7 of 17

TAILINGS STORAGE AREA CROSS SECTIONS E-H

Latitude: 58.1172° N
Longitude: -134.7466° W

REVISION	DESCRIPTION OF REVISION	DATE (YYYY-MM-DD)	DRAWN	DESIGNED	CHECKED	APPROVED
0	APPROVED FOR TENDER	2013-12-19	CW	BO	LC	LM

CLIENT: HECLA GREENS CREEK MINING COMPANY

Klohn Crippen Berger

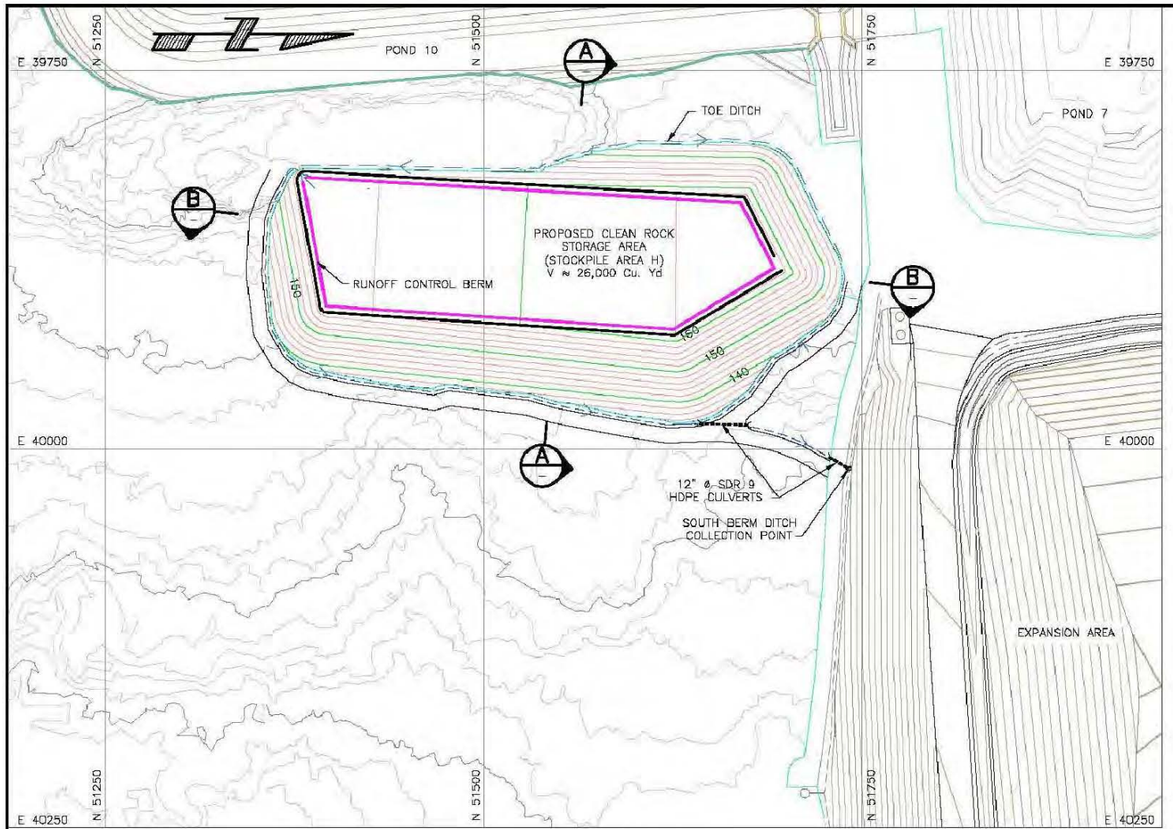
PROJECT: TAILINGS STORAGE FACILITY STAGE 3 – PHASE 1 EXPANSION

TITLE: TAILINGS STORAGE AREA GEOLOGICAL SECTIONS 2 OF 2

SCALE	PROJECT NO.	DWG. NO.	REV.
AS SHOWN	M07802A64	D-64006	0

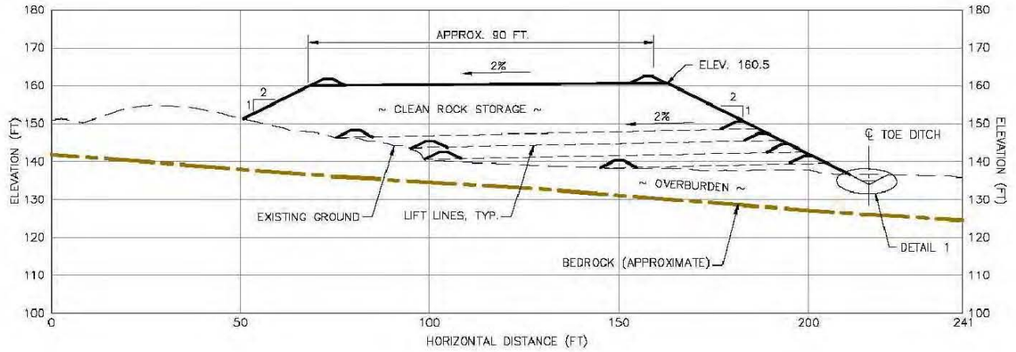
CANCEL PRINTS BEARING PREVIOUS REVISION

Time: 10:01:13
Date: 12/19/2013
Scale: 1:2(PS)
Drawing File: Z:\M\VCR\M07802\A64-2012 S3P1 Design\400 Drawings\IssuesForConstruction\D-64005, 6-Rev0.dwg (cwong)



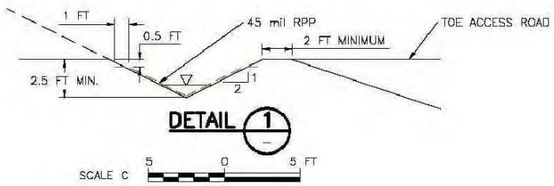
PLAN

50 0 50 FT



SECTION A

20 0 20 FT



DETAIL 1

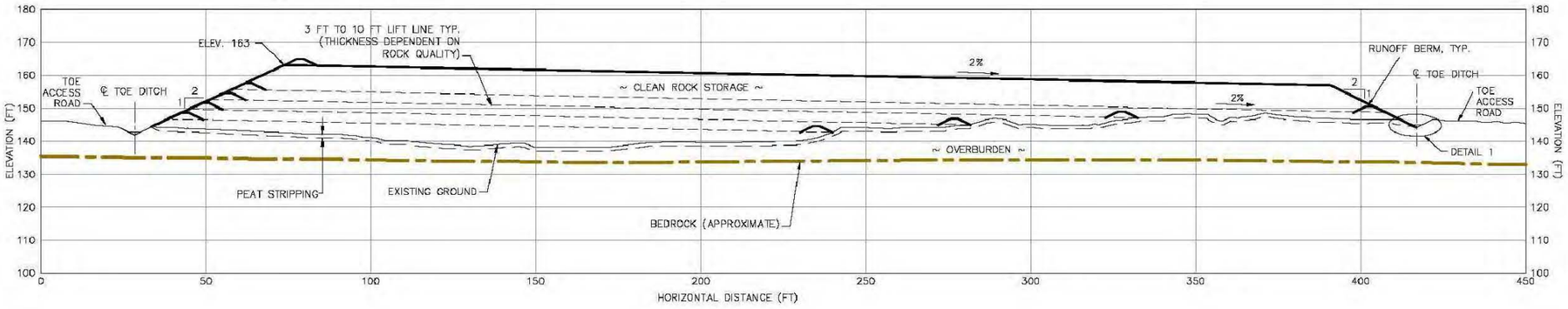
SCALE C 5 0 5 FT

LEGEND

- ROCKFILL MAJOR CONTOUR
- ROCKFILL MINOR CONTOUR
- RUNOFF BERM
- RPP — REINFORCED POLYPROPYLENE

NOTES:

1. OVERBURDEN CONSISTS OF APPROXIMATELY 5FT–10FT OF PEAT & ORGANICS UNDERLAIN BY GRAVEL/SAND/SILT. PEAT TO BE REMOVED BEFORE CLEAN ROCK IS PLACED.
2. CLEAN ROCK ONLY. NO PEAT/ORGANICS PLACEMENT IN THIS AREA.



SECTION B

20 0 20 FT

APPROVED FOR TENDER

Sheet 8 of 17

CLEAN ROCK STORAGE AREA DETAIL & CROSS SECTIONS

Latitude: 58.1172° N
Longitude: -134.7466° W

REVISION	DESCRIPTION OF REVISION	DATE (YYYY-MM-DD)	DRAWN	DESIGNED	CHECKED	APPROVED
0	APPROVED FOR TENDER	2013-12-19	CW	BO	LC	LM

CLIENT: HECLA GREENS CREEK MINING COMPANY

Klohn Crippen Berger

PROJECT: TAILINGS STOREAGE FACILITY STAGE 3 – PHASE 1 EXPANSION

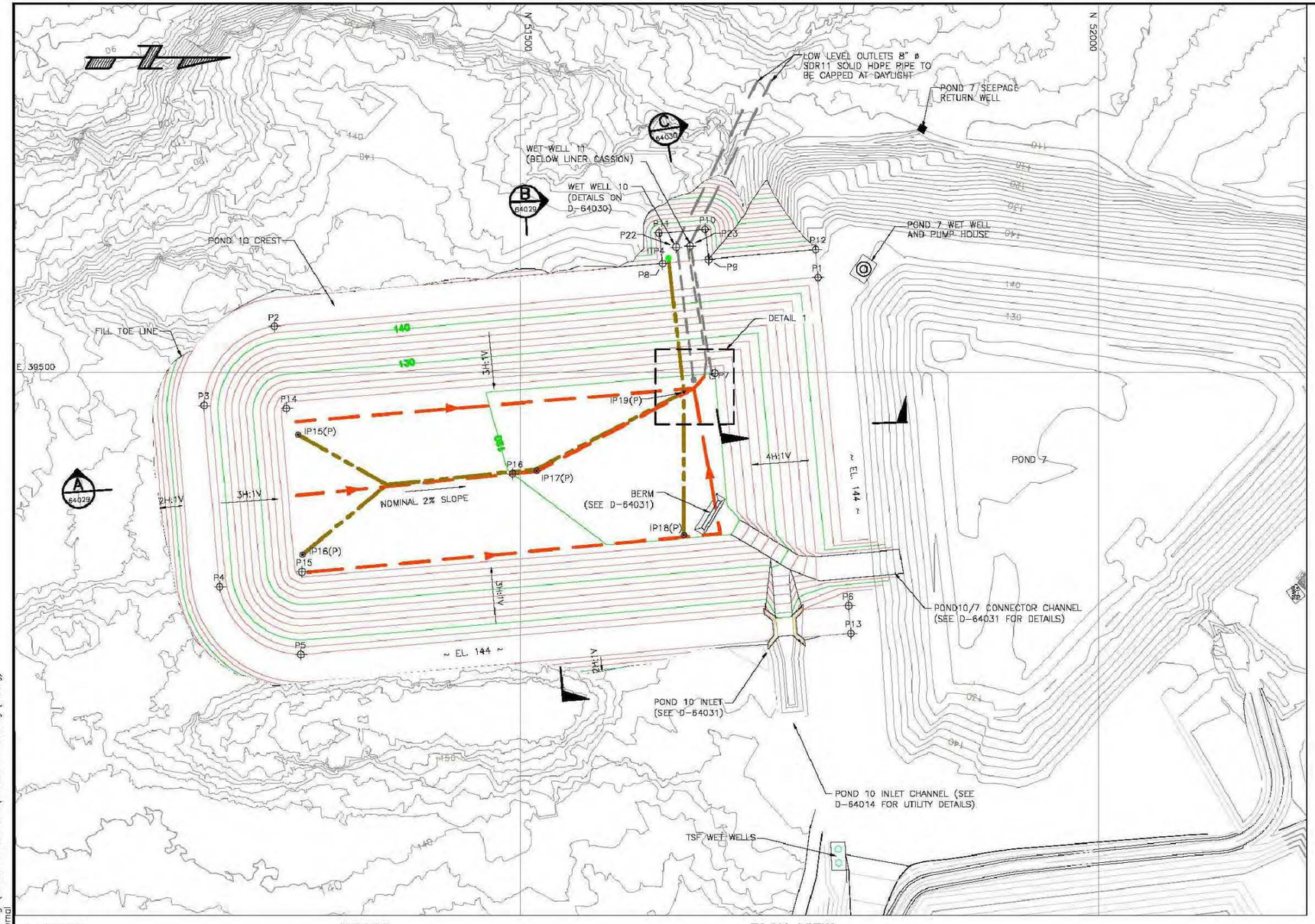
TITLE: TAILINGS STORAGE AREA PROPOSED CLEAN ROCK STORAGE AREA STOCKPILE AREA H

SCALE	PROJECT NO.	DWG. NO.	REV.
AS SHOWN	M07802A64	D-64011	0

CANCEL PRINTS BEARING PREVIOUS REVISION

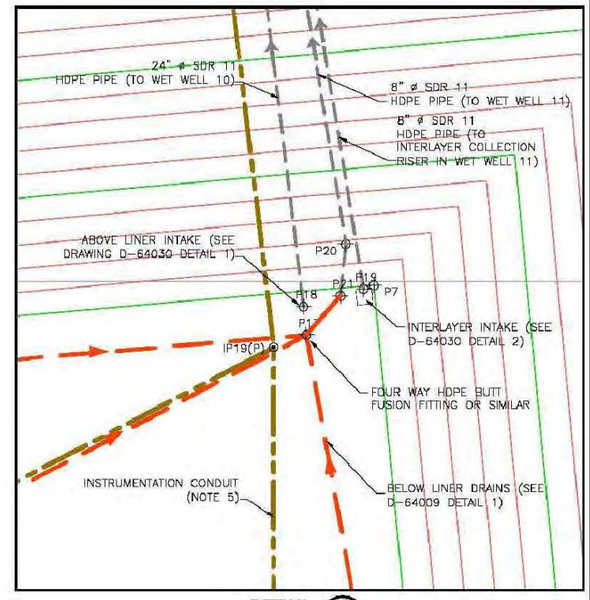
KCB-DWG-D-L

Time: 10:40:38
Date: 12/19/2013
Scale: 1:2(PS)
Drawing File: Z:\W\VCR\W07802\A64-2012 S3P1 Design\400 Drawings\IssuesForConstruction\D-64011-Rev0.dwg (cwong)
Xref File(s): srf-contours; acad-master.dwg
Image File(s):



INSTRUMENTATION POINTS (FT) (ALL INSTRUMENTATION POINTS ARE VIBRATING WIRE PIEZOMETER LOCATIONS ONLY)			
IP# ⊙	NORTHING	EASTING	TARGET STRATA
IP15	51642	39517	LINER BEDDING LAYER
IP16	51312	39658	
IP17	51515	39585	
IP18	51642	39641	
IP19	51653	39504	

WORK POINTS (FT)				
WP# ⊕	NORTHING	EASTING	EL.	COMMENTS
P1	51757	39418	144	POND CREST TIE-IN WITH POND 7
P2	51287	39461	144	RADIUS = 72 (POND CREST)
P3	51227	39529	144	
P4	51240	39685	144	RADIUS = 72 (POND CREST)
P5	51310	39744	144	
P6	51784	39702	144	POND CREST
P7	51668	39501	120	POND LINER SURFACE
P8	51623	39406	144	POND PUMP HOUSE PAD
P9	51663	39403	144	POND PUMP HOUSE PAD
P10	51660	39377	144	POND PUMP HOUSE PAD
P11	51620	39380	144	POND PUMP HOUSE PAD
P12	51755	39394	144	POND CREST
P13	51786	39726	144	POND CREST
P14	51298	39532	122	POND LINER SURFACE
P15	51311	39673	122	POND LINER SURFACE
P16	51493	39588	120	POND LINER SURFACE
P17	51650	39514	118.7	BELOW LINER DRAIN INVERT (DETAIL 1, D-64019)
P18	51650	39507	117.5	ABOVE LINER INTAKE INVERT (DETAIL 1, D-64030)
P19	51666	39502	119	INTERLAYER INTAKE INVERT (DETAIL 2, D-64030)
P20	51661	39490	117.4	BELOW LINER DRAIN INVERT
P21	51659	39504	118.6	BELOW LINER DRAIN (NOTE 6)
P22	51635	39392	108	WET WELL 10 CENTER
P23	51647	39391	108	WET WELL 11 CENTER



DETAIL 1

20 0 20 FT

LEGEND

- BELOW LINER DRAINS (SEE DRAWING D-64019, DETAIL 1)
- IP7(P) — INSTRUMENTATION CONDUIT (NOTE 3)
- ⊙ ITP1 — INSTRUMENTATION POINT (PIEZOMETER ONLY)
- INSTRUMENTATION TERMINATION POINT
- ⊕ P1 — WORK POINT

NOTES:

1. FOR GENERAL NOTES SEE DRAWING D-64002.
2. HGCMC WILL COORDINATE AND MANAGE INSTRUMENTATION INSTALLATION. CONTRACTOR TO PROVIDE SUPPORT AS NEEDED WHICH INCLUDES PROVIDING AND INSTALLING CONDUIT TO ALLOW ROUTING OF INSTRUMENT WIRES TO TERMINATION POINTS AS DIRECTED BY THE OWNER.
3. DATALOGGER CONDUITS TO BE EXTENDED AS DIRECTED BY OWNER. FOR DETAIL SEE DRAWING D-64019, DETAIL 2.
4. LINER TO EXTEND UNDER THE INLET CHANNEL BERM.
5. INSTRUMENTATION CONDUIT TO PASS OVER TOP OF BELOW LINER DRAINS THROUGH THE LINER BEDDING LAYER. SEE D-64019 DETAIL 2 FOR CONDUIT DETAILS.
6. TRANSITION FROM BELOW LINER DRAIN WITH SLOTTED PIPE TO SOLID HDPE, SEE D-64030 DETAIL 4.

PLAN VIEW

50 0 50 FT

Latitude: 58.1172° N
Longitude: -134.7466° W

APPROVED FOR TENDER

REVISION	DESCRIPTION OF REVISION	DATE (YYYY-MM-DD)	DRAWN	DESIGNED	CHECKED	APPROVED
0	APPROVED FOR TENDER	2013-12-19	CW	RW	LC	LM

CLIENT: HECLA GREENS CREEK MINING COMPANY

Klohn Crippen Berger

PROJECT: TAILINGS STORAGE FACILITY STAGE 3 – PHASE 1 EXPANSION

TITLE: POND 10 LINER FOUNDATION GRADING PLAN, DRAINAGE AND INSTRUMENTATION

SCALE	PROJECT NO.	DWG. NO.	REV.
AS SHOWN	M07802A64	D-64028	0

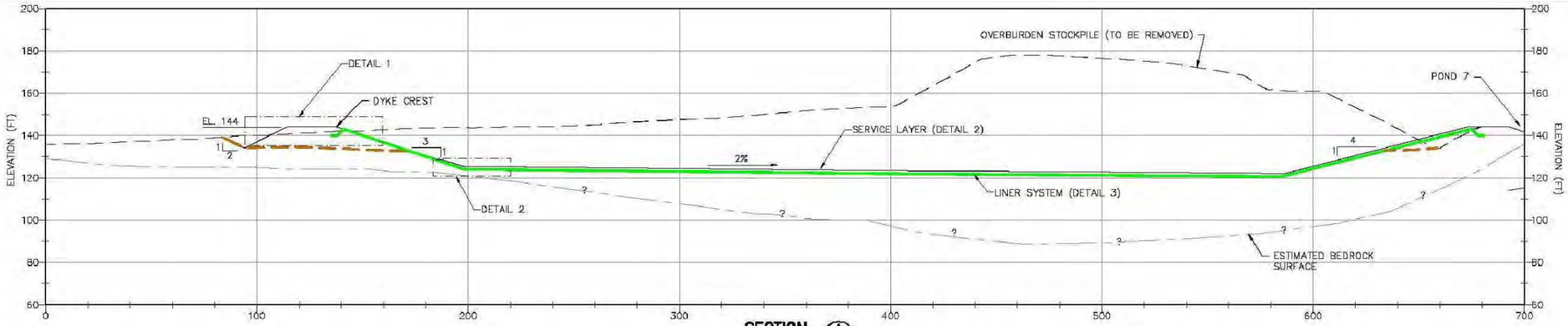
CANCEL PRINTS BEARING PREVIOUS REVISION

KCB-DWG-D-L

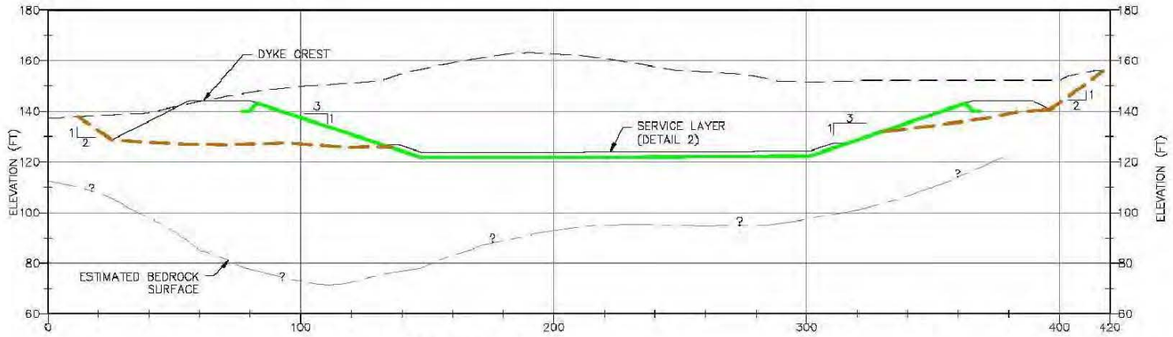
Sheet 9 of 17

POND 10 DETAIL

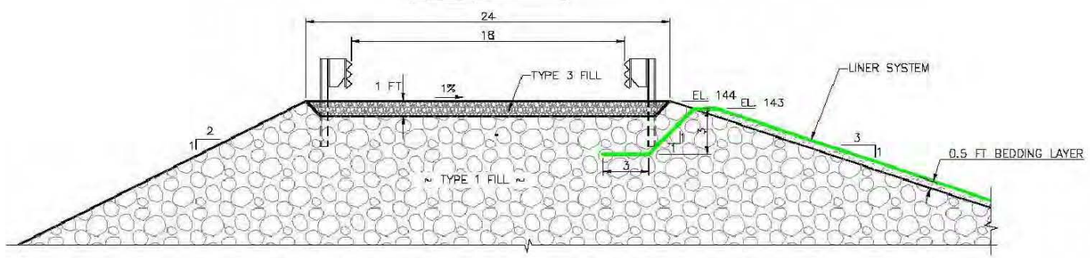
Time: 16:25:40
Date: 10/1/2012
Scale: 1=(FS)
Z:\WVDR\M07802\A64-2012 S3P1 Design\400 Drawings\IssuesForConstruction\D-64028-RevO.dwg (Owang)
Xrefs: NG-August-2012, acad-d-64002-gg for external



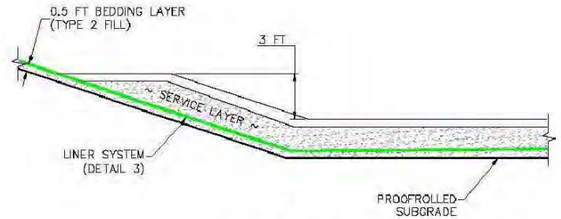
SECTION A (64028)
30 0 30 FT



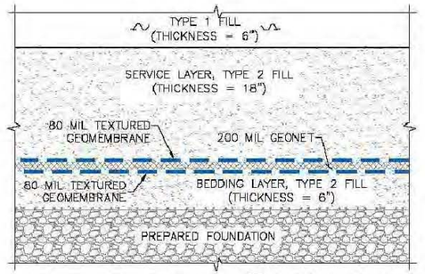
SECTION B (64028)
30 0 30 FT



DETAIL 1 POND CREST ROAD
5 0 5 FT



DETAIL 2 SERVICE LAYER
5 0 5 FT



DETAIL 3 LINER SYSTEM
1 0 1 FT

Sheet 10 of 17

POND 10 DETAILS & CROSS SECTIONS

LEGEND

- EXISTING SURFACE
- FOUNDATION PROFILE (NO LINER)
- LINER SYSTEM
- EXCAVATION SURFACE
- ESTIMATED BEDROCK SURFACE (NOTE 4)

NOTES:

1. FOR GENERAL NOTES SEE D-64002.
2. SERVICE LAYER AND TYPE 1 FILL EXTENDS UP ENTIRE 4H:1V SLOPE ON NORTH POND FACE AND EXTENDS 3 VERTICAL FEET UP ALL OTHER FACES AS SHOWN ON DETAIL 2.
3. ALL OVERBURDEN TO BE REMOVED TO APPROVED FOUNDATION LEVEL, APPROXIMATE LEVEL SHOWN ON SECTIONS.
4. BEDROCK ELEVATION IS ESTIMATED ONLY. VARIATIONS IN BEDROCK TOPOGRAPHY SHOULD BE EXPECTED.

FILL TYPES

TYPE 1 – GENERAL ROCK FILL
TYPE 2 – SAND
TYPE 3 – ROAD SURFACE ROCK
TYPE 4 – LOW PERMEABILITY FILL
TYPE 5 – DRAIN GRAVEL

REFER TO TECHNICAL SPECIFICATIONS FOR FURTHER DETAILS.

APPROVED FOR TENDER

Latitude: 58.1172° N
Longitude: -134.7466° W

REVISION	DESCRIPTION OF REVISION	DATE (YYY-MM-DD)	DRAWN	DESIGNED	CHECKED	APPROVED
0	APPROVED FOR TENDER	2013-12-19	CW	RW	LC	LM

CLIENT: HECLA GREENS CREEK MINING COMPANY

Klohn Crippen Berger

PROJECT: TAILINGS STORAGE FACILITY STAGE 3 – PHASE 1 EXPANSION

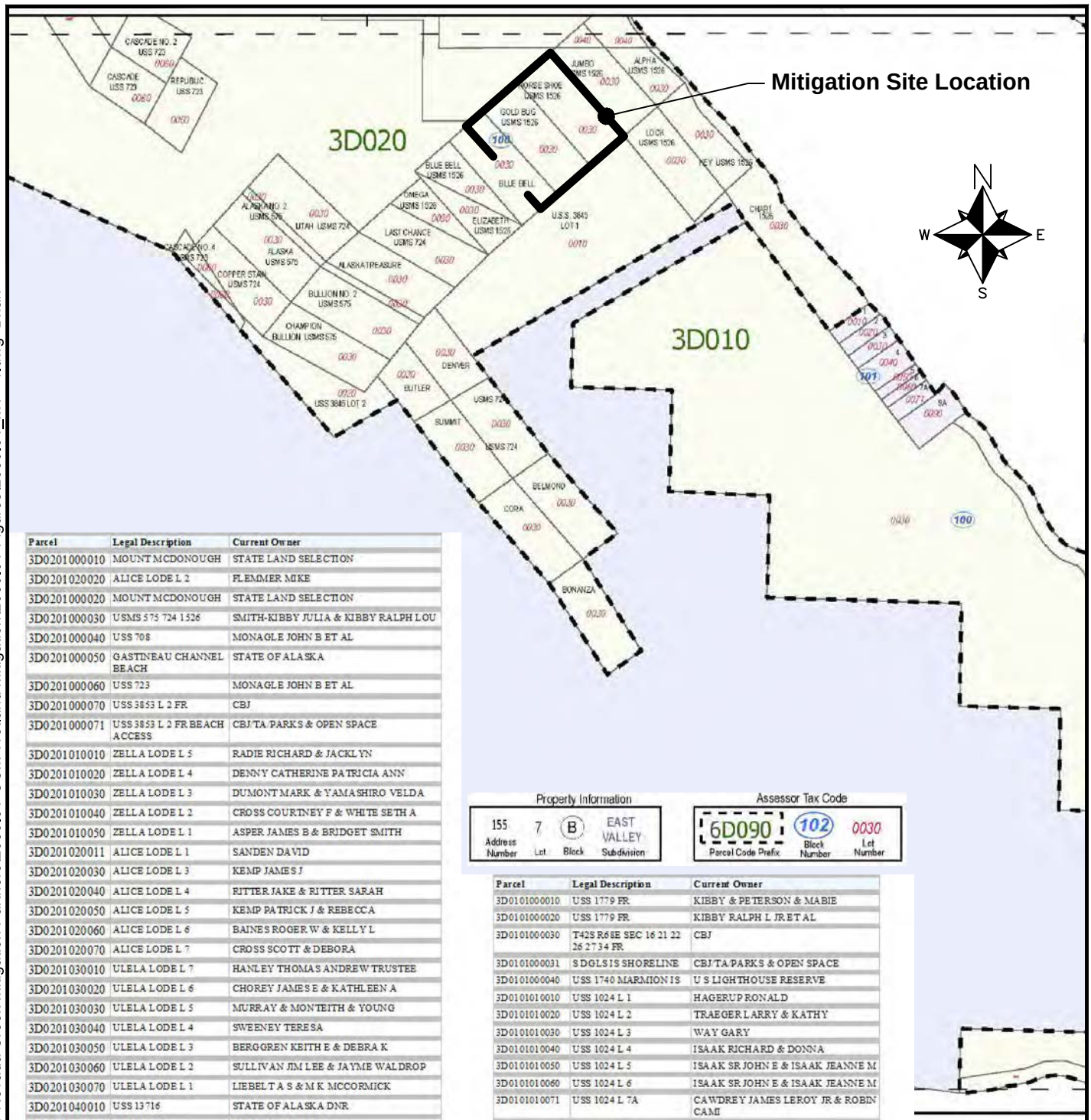
TITLE: POND 10 SECTIONS AND DETAILS

SCALE	PROJECT NO.	DWG. NO.	REV.
AS SHOWN	M07802A64	D-64029	0

CANCEL PRINTS BEARING PREVIOUS REVISION

KCB-DWG-D-L

Time: 15:07:21
Date: 12/18/2013
Scales: 1:2(PS)
Drawing File: Z:\M\VDR\M07802\A64-2012 S3P1 Design\400 Drawings\IssueForConstruction\D-64029-Rev0.dwg (cwong)



Parcel	Legal Description	Current Owner
3D0201000010	MOUNT MCDONOUGH	STATE LAND SELECTION
3D0201020020	ALICE LODE L 2	FLEMMER MIKE
3D0201000020	MOUNT MCDONOUGH	STATE LAND SELECTION
3D0201000030	USMS 575 724 1526	SMITH-KIBBY JULIA & KIBBY RALPH LOU
3D0201000040	USS 708	MONAGLE JOHN B ET AL
3D0201000050	GASTINEAU CHANNEL BEACH	STATE OF ALASKA
3D0201000060	USS 723	MONAGLE JOHN B ET AL
3D0201000070	USS 3853 L 2 FR	CBJ
3D0201000071	USS 3853 L 2 FR BEACH ACCESS	CBJ/TA/PARKS & OPEN SPACE
3D0201010010	ZELLA LODE L 5	RADIE RICHARD & JACKLYN
3D0201010020	ZELLA LODE L 4	DENNY CATHERINE PATRICIA ANN
3D0201010030	ZELLA LODE L 3	DUMONT MARK & YAMASHIRO VELDA
3D0201010040	ZELLA LODE L 2	CROSS COURTNEY F & WHITE SETH A
3D0201010050	ZELLA LODE L 1	ASPER JAMES B & BRIDGET SMITH
3D0201020011	ALICE LODE L 1	SANDEN DAVID
3D0201020030	ALICE LODE L 3	KEMP JAMES J
3D0201020040	ALICE LODE L 4	RITTER JAKE & RITTER SARAH
3D0201020050	ALICE LODE L 5	KEMP PATRICK J & REBECCA
3D0201020060	ALICE LODE L 6	BAINES ROGER W & KELLY L
3D0201020070	ALICE LODE L 7	CROSS SCOTT & DEBORA
3D0201030010	ULELA LODE L 7	HANLEY THOMAS ANDREW TRUSTEE
3D0201030020	ULELA LODE L 6	CHOREY JAMES E & KATHLEEN A
3D0201030030	ULELA LODE L 5	MURRAY & MONTEITH & YOUNG
3D0201030040	ULELA LODE L 4	SWEENEY TERESA
3D0201030050	ULELA LODE L 3	BERGGREN KEITH E & DEBRA K
3D0201030060	ULELA LODE L 2	SULLIVAN JIM LEE & JAYME WALDROP
3D0201030070	ULELA LODE L 1	LIEBELT A S & M K MCCORMICK
3D0201040010	USS 13716	STATE OF ALASKA DNR
5B210103D020	KODZOFF # D 2	JACOBSEN DUSTIN

Property Information

155	7	B	EAST VALLEY
Address Number	Lot	Block	Subdivision

Assessor Tax Code

6D090	102	0030
Parcel Code Prefix	Block Number	Lot Number

Parcel	Legal Description	Current Owner
3D0101000010	USS 1779 FR	KIBBY & PETERSON & MABIE
3D0101000020	USS 1779 FR	KIBBY RALPH L JR ET AL
3D0101000030	T42S R68E SEC 16 21 22 26 27 34 FR	CBJ
3D0101000031	S DGLS IS SHORELINE	CBJ/TA/PARKS & OPEN SPACE
3D0101000040	USS 1740 MARMION IS	U S LIGHTHOUSE RESERVE
3D0101010010	USS 1024 L 1	HAGERUP RONALD
3D0101010020	USS 1024 L 2	TRAEGER LARRY & KATHY
3D0101010030	USS 1024 L 3	WAY GARY
3D0101010040	USS 1024 L 4	ISAAK RICHARD & DONNA
3D0101010050	USS 1024 L 5	ISAAK SR JOHN E & ISAAK JEANNE M
3D0101010060	USS 1024 L 6	ISAAK SR JOHN E & ISAAK JEANNE M
3D0101010071	USS 1024 L 7A	CAWDREY JAMES LEROY JR & ROBIN CAMI
3D0101010090	USS 1024 L 9A	KIBBY RALPH L JR & JULIA F

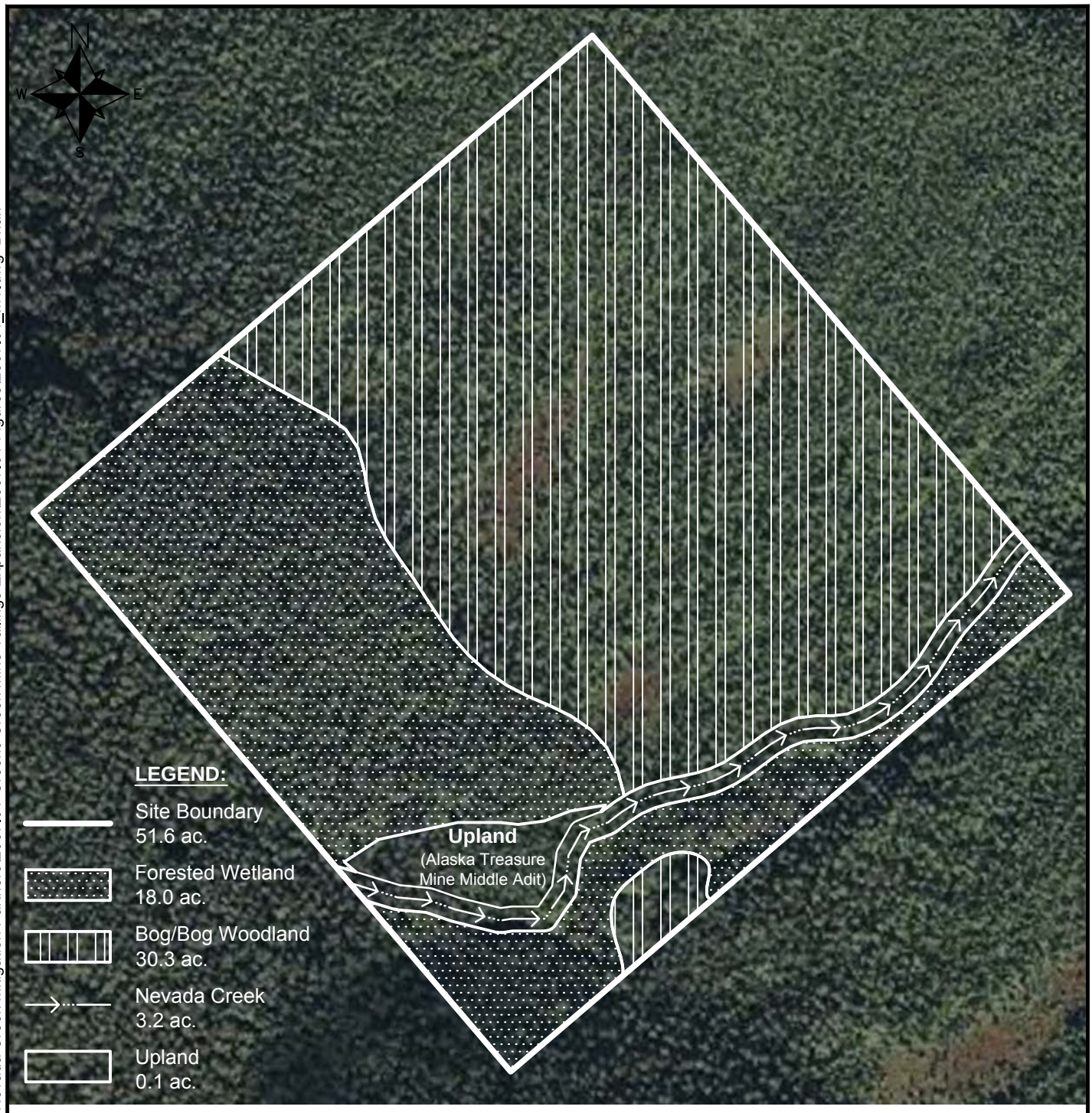
0 2000 4000

SCALE IN FEET

MITIGATION SITE OWNERSHIP MAP

CITY: Juneau **BOROUGH:** Juneau **STATE:** Alaska
WATERWAY: Nevada Creek Watershed
PROPOSED ACTIVITY: Stage 3 Expansion
DIRECTIONS TO SITE:
The Greens Creek Mine project site is located on northern Admiralty Island. The Nevada Creek mitigation site is located on southern Douglas Island. Both sites are accessed by boat, helicopter or float plane.

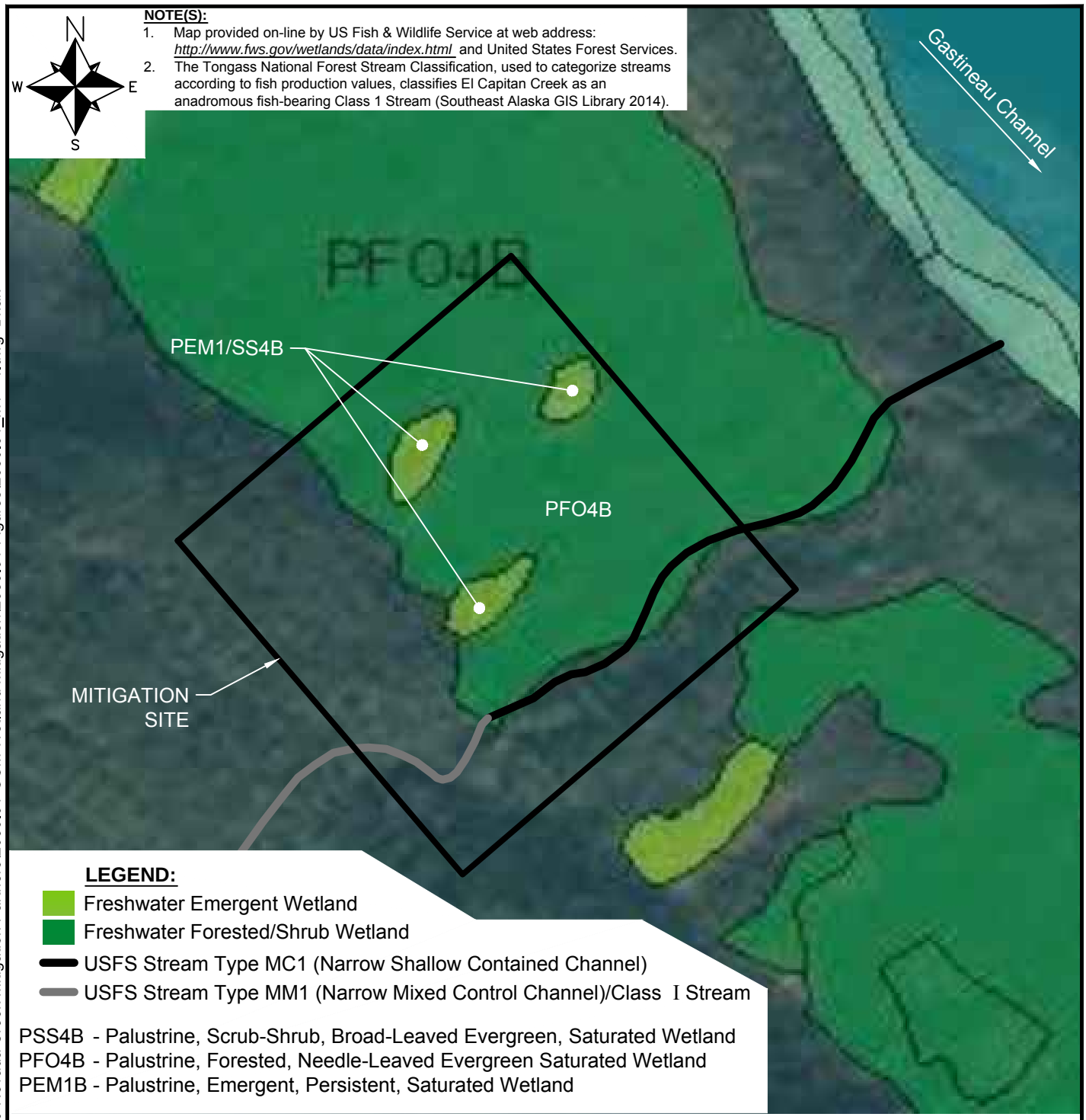
APPLICANT: Hecla Greens Creek Mining Company
FILE #: POA-1988-0269-2
PROJECT: **S.** 26 **T.** 43S **R.** 65E **M.** C.R.M.
LAT.: 58.1172 °N **LONG.:** -134.7466 °W
MITIGATION: **S.** 3,4,9,10 **T.** 66S **R.** 65E **M.** C.R.M.
LAT.: 58.2277 °N **LONG.:** -134.3133 °W
SHEET 11 **OF** 17 **DATE:** 3/25/14



MITIGATION SITE MAP

CITY: Juneau **BOROUGH:** Juneau **STATE:** Alaska
WATERWAY: Nevada Creek Watershed
PROPOSED ACTIVITY: Stage 3 Expansion
DIRECTIONS TO SITE:
The Greens Creek Mine project site is located on northern Admirality Island. The Nevada Creek mitigation site is located on southern Douglas Island. Both sites are accessed by boat, helicopter or float plane.

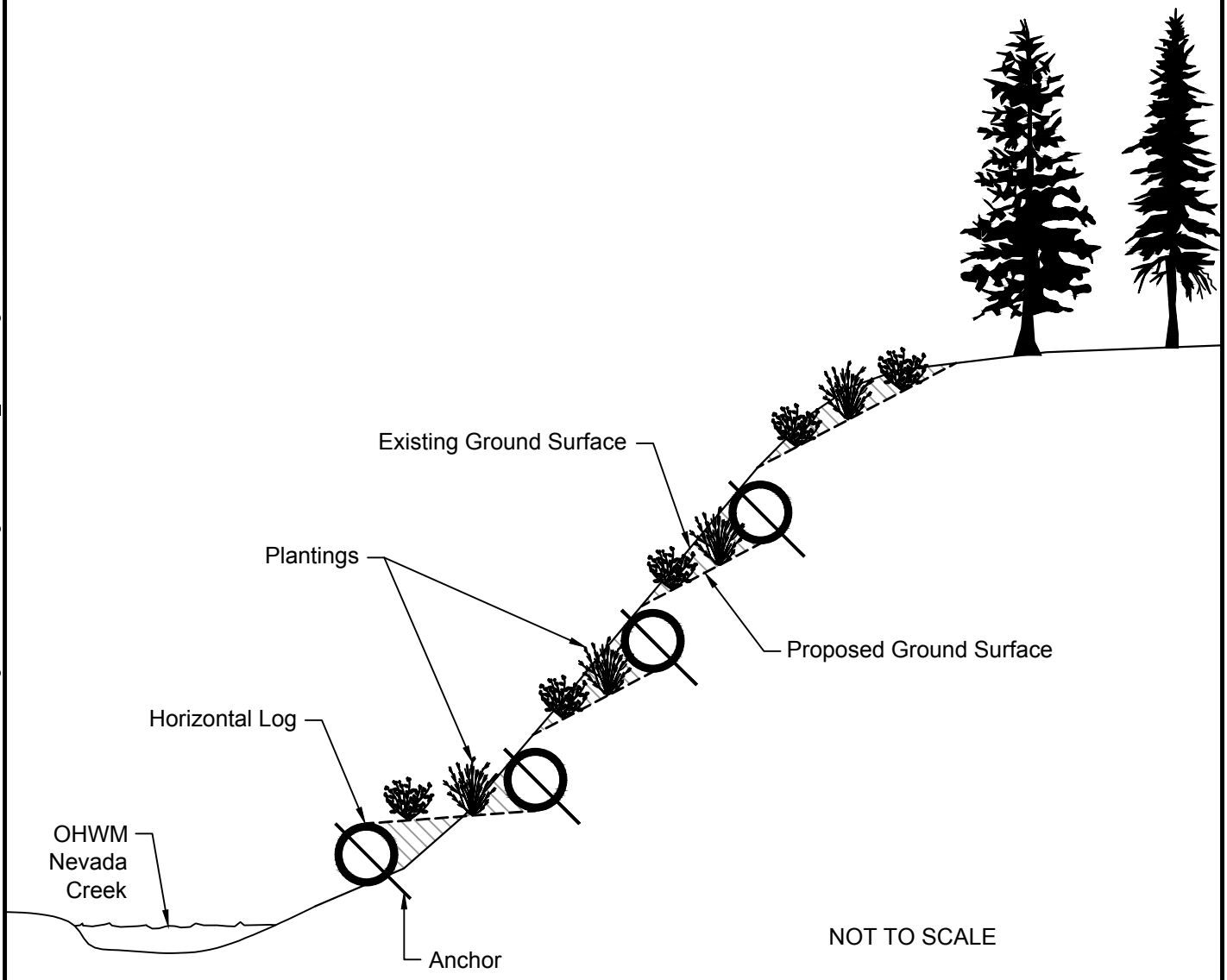
APPLICANT: Hecla Greens Creek Mining Company
FILE #: POA-1988-0269-2
PROJECT: **S.** 26 **T.** 43S **R.** 65E **M.** C.R.M.
LAT.: 58.1172 °N **LONG.:** -134.7466 °W
MITIGATION: **S.** 3,4,9,10 **T.** 66S **R.** 65E **M.** C.R.M.
LAT.: 58.2277 °N **LONG.:** -134.3133 °W
SHEET 12 **OF** 17 **DATE:** 3/25/14



MITIGATION SITE NWI & USFS STREAM TYPE MAP

CITY: Juneau **BOROUGH:** Juneau **STATE:** Alaska
WATERWAY: Nevada Creek Watershed
PROPOSED ACTIVITY: Stage 3 Expansion
DIRECTIONS TO SITE:
The Greens Creek Mine project site is located on northern Admirality Island. The Nevada Creek mitigation site is located on southern Douglas Island. Both sites are accessed by boat, helicopter or float plane.

APPLICANT: Hecla Greens Creek Mining Company
FILE #: POA-1988-0269-2
PROJECT: **S.** 26 **T.** 43S **R.** 65E **M.** C.R.M.
LAT.: 58.1172 °N **LONG.:** -134.7466 °W
MITIGATION: **S.** 3,4,9,10 **T.** 66S **R.** 65E **M.** C.R.M.
LAT.: 58.2277 °N **LONG.:** -134.3133 °W
SHEET 13 **OF** 17 **DATE:** 3/25/14



NOTE(S):

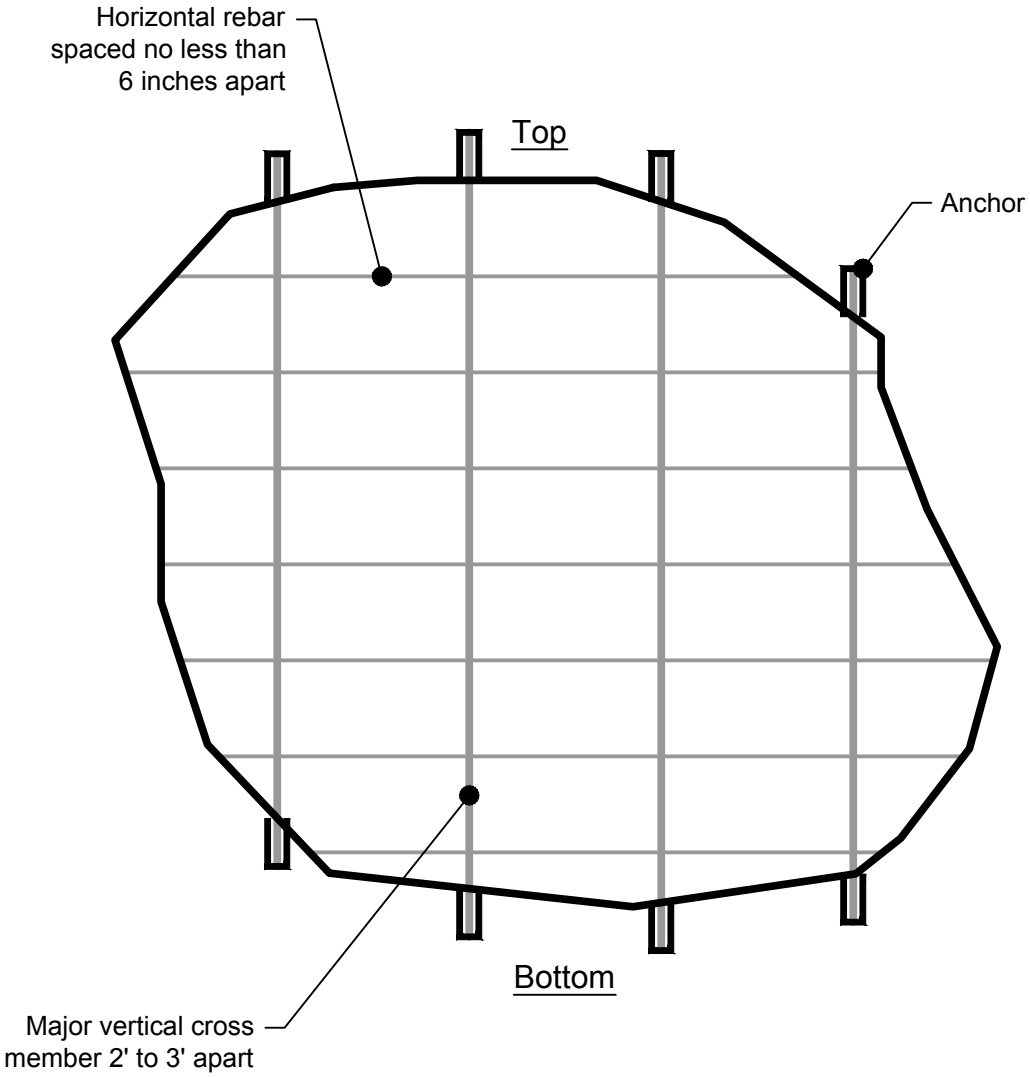
1. Proposed work associated with stabilization of the middle mine area eroding waste rock dump slopes involves the installation of either anchored waddles or (anchored) wood cribs/horizontal logs along the eroding slopes, and planting native trees behind the waddles or wood cribs/horizontal logs to provide additional stabilization and future soil formation; All work will take place above ordinary high water mark (OHWM) of Nevada Creek.

WASTE ROCK DUMP SIDE SLOPE STABILIZATION DETAIL

CITY: Juneau **BOROUGH:** Juneau **STATE:** Alaska
WATERWAY: Nevada Creek Watershed
PROPOSED ACTIVITY: Stage 3 Expansion
DIRECTIONS TO SITE:
The Greens Creek Mine project site is located on northern Admirality Island. The Nevada Creek mitigation site is located on southern Douglas Island. Both sites are accessed by boat, helicopter or float plane.

APPLICANT: Hecla Greens Creek Mining Company
FILE #: POA-1988-0269-2
PROJECT: **S.** 26 **T.** 43S **R.** 65E **M.** C.R.M.
LAT.: 58.1172 °N **LONG.:** -134.7466 °W
MITIGATION: **S.** 3,4,9,10 **T.** 66S **R.** 65E **M.** C.R.M.
LAT.: 58.2277 °N **LONG.:** -134.3133 °W
SHEET 14 **OF** 17 **DATE:** 3/25/14

3/25/2014 2:49 PM S:\Juneau-AK\2039-Nevada Creek Mitigation Partners\2039.01-GCM Wetland Mitigation\2039.01-Figures\2039.01_MT - 4.dwg Brian



NOT TO SCALE

ADIT CLOSURE GRATE DETAIL

CITY: Juneau **BOROUGH:** Juneau **STATE:** Alaska
WATERWAY: Nevada Creek Watershed
PROPOSED ACTIVITY: Stage 3 Expansion
DIRECTIONS TO SITE:
The Greens Creek Mine project site is located on northern Admirality Island. The Nevada Creek mitigation site is located on southern Douglas Island. Both sites are accessed by boat, helicopter or float plane.

APPLICANT: Hecla Greens Creek Mining Company
FILE #: POA-1988-0269-2
PROJECT: **S.** 26 **T.** 43S **R.** 65E **M.** C.R.M.
LAT.: 58.1172 °N **LONG.:** -134.7466 °W
MITIGATION: **S.** 3,4,9,10 **T.** 66S **R.** 65E **M.** C.R.M.
LAT.: 58.2277 °N **LONG.:** -134.3133 °W
SHEET 15 **OF** 17 **DATE:** 3/25/14

Non-tidal Wetlands of Southeast Alaska - Results for Assessment Area (AA):

Bog Wetlands of Nevada Creek Mitigation Site

Specific Functions or Values:	Function Score (wetland's relative effectiveness)	Qualitive Scores			Value Score (potential or actual)	Qualitive Scores		
		Regional Median (n= 32)	Qualitive Category			Regional Median (n=32)	Qualitive Category	
Surface Water Storage (WS)	6.60	3.52	High	3	0.00	2.50	Low	1
Stream Flow Support (SFS)	0.00	3.06	Low	1	0.00	0.91	Low	1
Streamwater Cooling (WC)	2.13	2.59	Moderate	2	0.00	1.15	Low	1
Streamwater Warming (WW)	4.25	5.67	Moderate	2	0.00	3.56	Low	1
Sediment & Toxicant Retention & Stabilization (SR)	10.00	3.32	High	3	1.18	3.30	Low	1
Phosphorus Retention (PR)	10.00	5.05	High	3	0.97	2.09	Low	1
Nitrate Removal & Retention (NR)	10.00	5.25	High	3	1.3	7.14	Low	1
Carbon Sequestration (CS)	6.72	5.17	High	3				
Organic Nutrient Export (OE)	0.00	4.56	Low	1				
Anadromous Fish Habitat (FA)	0.00	4.14	Low	1	0.00	5.00	Low	1
Resident & Other Fish Habitat (FR)	5.81	3.62	High	3	1.94	4.08	Low	1
Aquatic Invertebrate Habitat (INV)	6.41	4.80	High	3	6.94	6.25	High	3
Amphibian Habitat (AM)	6.65	5.29	High	3	5.39	5.00	High	3
Waterbird Feeding Habitat (WBF)	5.78	4.22	High	3	3.00	1.75	High	3
Waterbird Nesting Habitat (WBN)	0.00	2.69	Low	1	0.00	5.00	Low	1
Songbird, Raptor, & Mammal Habitat (SBM)	5.00	4.90	High	3	7.50	7.50	Moderate	2
Pollinator Habitat (POL)	4.08	3.85	High	3	5.00	5.00	High	3
Native Plant Habitat (PH)	5.05	4.90	High	3	4.77	5.76	Moderate	2
Public Use & Recognition (PU)					3.57	6.69	Low	1
Subsistence & Provisioning Services (Subsis)					0.00	5.28	Low	1
Wetland Sensitivity					3.39	3.06	High	3
Wetland Ecological Condition					7.08	5.10	High	3
Wetland Stressors (higher score means more)					1.10	1.18	Moderate	2

Non-tidal Wetlands of Southeast Alaska - Results for Assessment Area (AA):

Forested Wetlands of Nevada Creek Mitigation Site

Specific Functions or Values:	**Function Score** (wetland's relative effectiveness)	**Qualitive Scores**			**Value Score** (potential or actual)	**Qualitive Scores**		
		Regional **Median** (n=32)	***Qualitive Category***			Regional **Median** (n=32)	***Qualitive Category***	
Surface Water Storage (WS)	3.77	3.52	High	3	0.56	2.50	Low	1
Stream Flow Support (SFS)	4.83	3.06	High	3	2.87	0.91	High	3
Streamwater Cooling (WC)	5.00	2.59	High	3	3.13	1.15	High	3
Streamwater Warming (WW)	7.50	5.67	High	3	4.15	3.56	High	3
Sediment & Toxicant Retention & Stabilization (SR)	3.58	3.32	High	3	2.5	3.30	Low	1
Phosphorus Retention (PR)	2.90	5.05	Low	1	1.80	2.09	Moderate	2
Nitrate Removal & Retention (NR)	5.74	5.25	High	3	4.29	7.14	Low	1
Carbon Sequestration (CS)	4.81	5.12	Moderate	2				
Organic Nutrient Export (OE)	7.25	4.56	High	3				
Anadromous Fish Habitat (FA)	0.00	4.14	Low	1	0.00	5.00	Low	1
Resident & Other Fish Habitat (FR)	6.29	3.62	High	3	0.5	4.08	Low	1
Aquatic Invertebrate Habitat (INV)	5.17	4.80	High	3	1.53	6.25	Low	1
Amphibian Habitat (AM)	6.56	5.29	High	3	2.77	5.00	Low	1
Waterbird Feeding Habitat (WBF)	0.00	4.22	Low	1	0.00	1.75	Low	1
Waterbird Nesting Habitat (WBN)	0.00	2.63	Low	1	0.00	5.00	Low	1
Songbird, Raptor, & Mammal Habitat (SBM)	5.53	4.90	High	3	2.50	7.50	Low	1
Pollinator Habitat (POL)	7.40	3.85	High	3	0.00	5.00	Low	1
Native Plant Habitat (PH)	4.91	4.90	Moderate	2	3.23	5.76	Low	1
Public Use & Recognition (PU)					4.07	6.69	Low	1
Subsistence & Provisioning Services (Subsis)					0.00	5.28	Low	1
Wetland Sensitivity					3.10	3.06	High	3
Wetland Ecological Condition					3.33	5.10	Low	2
Wetland Stressors (higher score means more)					1.10	1.18	Moderate	2