Public

Site-Specific Waterbody Crossing Plans

November 8, 2019

AKLNG-4000-REG-GRD-DOC-00031

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REVISION HISTORY

Rev	Date	Description	Originator	Reviewer	Approver
0	April 17, 2017	For Use	exp	AGDC	F. Richards
1	Nov. 8, 2019	For Use	M. Holley (exp); R. Smrha (AGDC)	L. Haas	F. Richards
Approver Signature*					

*This signature approves the most recent version of this document.

MODIFICATION HISTORY

Rev	Section	Modification
1		Updated to current AGDC Template, Resource Report No. 2 Appendix I Site-Specific Construction Drawings: Site-Specific Waterbody Crossing Plans
1		Update text on pg. 20-30: 20.99' (MHHW) changed to 19.9 (MHW) Add OHW labels and leaders to pages 13, 18, 19 Removed pages 31-34 (were PTTL crossings that changed to aerial spans, no fill in the water)

List of Crossing Plans

- MIDDLE FORK KOYUKUK RIVER DMT CROSSING PLAN & PROFILE (USAP-WP-XDPLX-00-000026-000)
- MIDDLE FORK KOYUKUK RIVER DMT DRAG SECTION SITE GEOTECH MAP (USAP-WP-XDPLX-00-000026-001)
- YUKON RIVER DMT CROSSING PLAN & PROFILE (USAP-WP-XDPLX-00-000062-000)
- YUKON RIVER DMT DRAG SECTION SITE GEOTECH MAP (USAP-WP-XDPLX-00-000062-001)
- TANANA RIVER DMT CROSSING PLAN & PROFILE (USAP-WP-XDPLX-00-000029-000)
- TANANA RIVER DMT DRAG SECTION SITE GEOTECH MAP (USAP-WP-XDPLX-00-000029-001)
- NENANA RIVER #1 CROSSING PLAN & PROFILE (USAP-WP-XDPLX-00-000054-000)
- NENANA RIVER (At Moody) Alternate 6 Upstream 3-Span Steel Bridge (USAP-WP-YDLPX-00-000034-012)
- NENANA RIVER #4 CROSSING PLAN & PROFILE (USAP-WP-YDPLX-00-0000630-000)
- CHULITNA RIVER DMT CROSSING PLAN & PROFILE (USAP-WP-YDPLX-00-000030-000)
- CHULITNA RIVER DMT DRAG SECTION SITE GEOTECH MAP (USAP-WP-YDPLX-00-000030-001)
- DESHKA RIVER DMT CROSSING PLAN & PROFILE (USAP-WP-YDPLX-00-000065-000)
- DESHKA RIVER DMT DRAG SECTION SITE GEOTECH MAP (USAP-WP-YDPLX-00-000065-001)
- YENTNA RIVER CROSSING PLAN & PROFILE (USAP-WP-XDPLX-00-000057-000)
- BELUGA RIVER CROSSING PLAN & PROFILE (USAP-WP-XDPLX-00-000067-000)
- BELUGA LANDING SOUTH SHORE APPROACH CROSSING PLAN & PROFILE (SHEET 1 OF 4) (USAP-WP-YDPLX-00-000069-001)
- BELUGA LANDING SOUTH SHORE APPROACH (SHEET 2 OF 4) (USAP-WP-YDPLX-00-000069-002)
- BELUGA LANDING SOUTH SHORE APPROACH (SHEET 3 OF 4) (USAP-WP-YDPLX-00-000069-003)
- BELUGA LANDING SOUTH SHORE APPROACH (SHEET 4 OF 4) (USAP-WP-YDPLX-00-000069-004)
- SUNEVA LAKE SHORE APPROACH CROSSING PLAN & PROFILE (SHEET 1 OF 7) (USAP-WP-YDPLX-00-000070-001)
- SUNEVA LAKE SHORE APPROACH (SHEET 2 OF 7) (USAP-WP-YDPLX-00-000070-002)
- SUNEVA LAKE SHORE APPROACH (SHEET 3 OF 7) (USAP-WP-YDPLX-00-000070-003)
- SUNEVA LAKE SHORE APPROACH (SHEET 4 OF 7) (USAP-WP-YDPLX-00-000070-004)

- SUNEVA LAKE SHORE APPROACH (SHEET 5 OF 7) (USAP-WP-YDPLX-00-000070-005)
- SUNEVA LAKE SHORE APPROACH (SHEET 6 OF 7) (USAP-WP-YDPLX-00-000070-006)
- SUNEVA LAKE SHORE APPROACH (SHEET 7 OF 7) (USAP-WP-YDPLX-00-000070-007)

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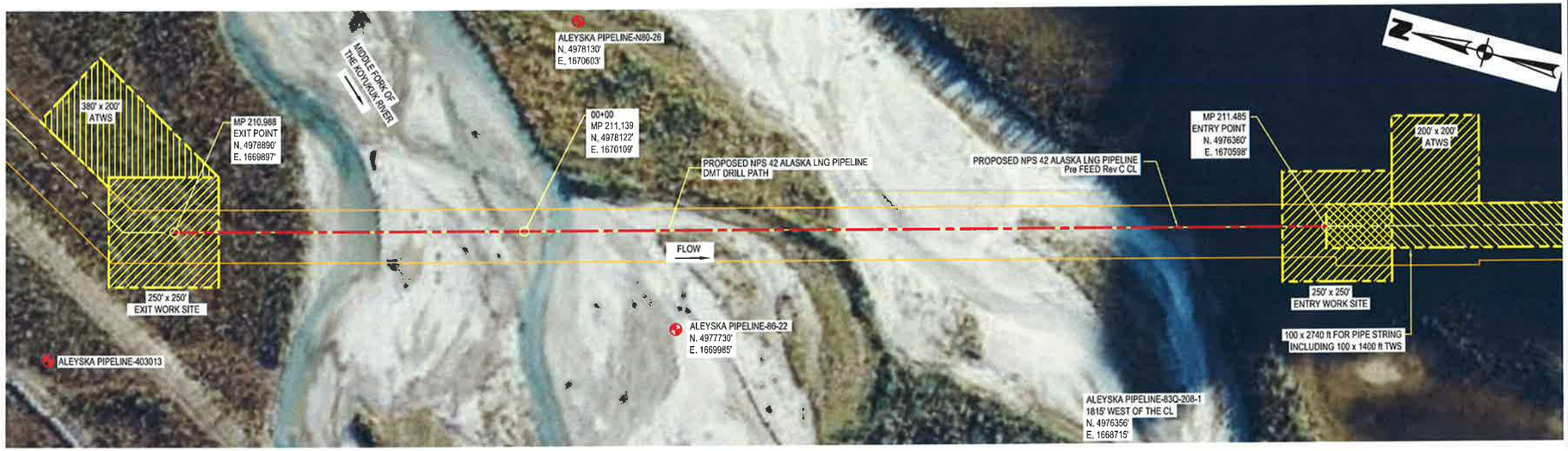
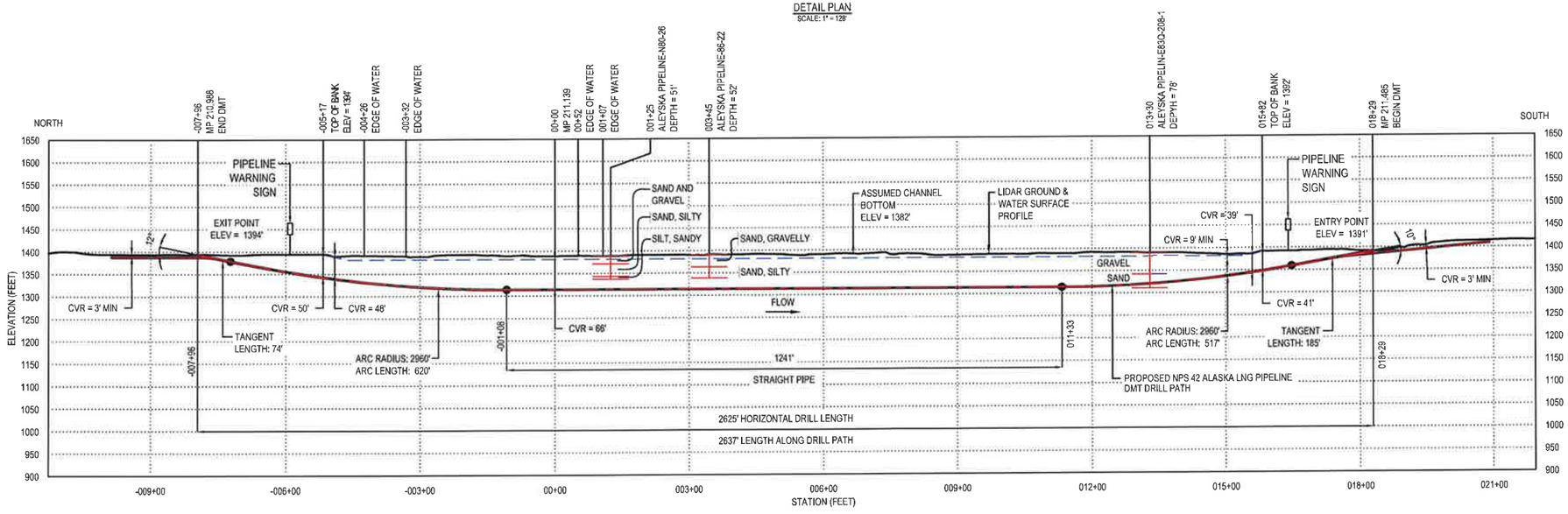


DETAIL PLAN
SCALE: 1" = 128'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 128'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP psig	DESIGN PRESSURE psig	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	0.677	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES
HEAVY WALL	NPS 42	42	1.24	API 5L Grade X70M PSL2	2075	2075	3 LPE	YES

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASKA ZONE 4
CROSSING COORDINATES @ MP 211.139 N. 4978122' E. 1670109'		

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. LIMITED SUBSOIL INFORMATION IS AVAILABLE.
3. THE GROUND PROFILE IS BASED ON LIDAR OBTAINED IN 2014. ELEVATIONS ARE GEODETIC.
4. THE CROSSING DESIGN IS CONCEPTUAL AND IS TO BE CONFIRMED DURING DETAILED ENGINEERING.
5. THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED DURING SUMMER.
6. THE EXPECTED SOIL CONDITIONS, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF FLOODPLAIN RIVERBED DEPOSITS OF GRAVEL AND SAND WITH FREQUENT COBBLES AND BOULDERS OVER GLACIOFLUVIAL GRAVEL AND SAND WITH FREQUENT COBBLES AND BOULDERS OVER LACUSTRINE SILT AND CLAY. THE SOIL IS GENERALLY FROZEN OUTSIDE THE CHANNEL WITH UP TO 20% ICE. FURTHER INVESTIGATION IS REQUIRED TO CONFIRM THE EXPECTED CONDITIONS.
7. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000.

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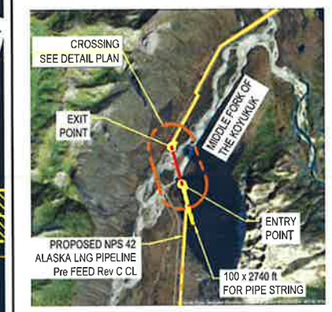

LOCATION PLAN
NTS

REFERENCE DRAWINGS

ABBREVIATIONS & ACRONYMS

API - AMERICAN PETROLEUM INSTITUTE
ATWS - ADDITIONAL TEMPORARY WORK SPACE
CVR - COVER
DMT - DIRECTIONAL MICROTUNNELLING
HDD - HORIZONTAL DIRECTIONAL DRILLING
LIDAR - LIGHT DETECTION AND RANGING
MIN. - MINIMUM
MP - MILE POST
MOP - MAXIMUM OPERATING PRESSURE
MSL - MEAN SEA LEVEL
NAD - NORTH AMERICAN DATUM
NAVD88 - NORTH AMERICAN VERTICAL DATUM OF 1988
NSRS 2007 - NATIONAL SPATIAL REFERENCE SYSTEM 2007
psig - POUNDS PER SQUARE INCH GAUGE
3LPE - THREE LAYER POLYETHYLENE

LEGEND:

- BOREHOLE

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DS MZ
DS JB

ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REVR/ ENG'R	RESP. CODE	APP'D
2	20160629	LW / JM	RE-ISSUED FOR USE	-	-	JT
1	20160602	LW / JM	RE-ISSUED FOR USE	-	-	JT
0	20151103	LW / JM	ISSUED FOR USE	-	-	JT

WorleyParsons resources & energy

ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

ALASKA LNG PIPELINE PROJECT
MIDDLE FORK OF THE KOYUKUK RIVER @ MP 211.139
WPC 127
DMT CROSSING PLAN & PROFILE

DRAWN BY	DATE	SCALE	CHK'D / APP'D
LW	20150303	AS SHOWN	JT / -

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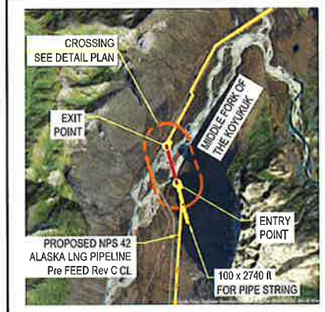

LOCATION PLAN
NTS

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0	20151217	LW / JM	ISSUED FOR USE	-	-	JT

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ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG TM

ALASKA LNG PIPELINE PROJECT
MIDDLE FORK OF THE KOYUKUK RIVER @ MP 211.139
WPC 127
DMT DRAG SECTION SITE GEOTECH MAP

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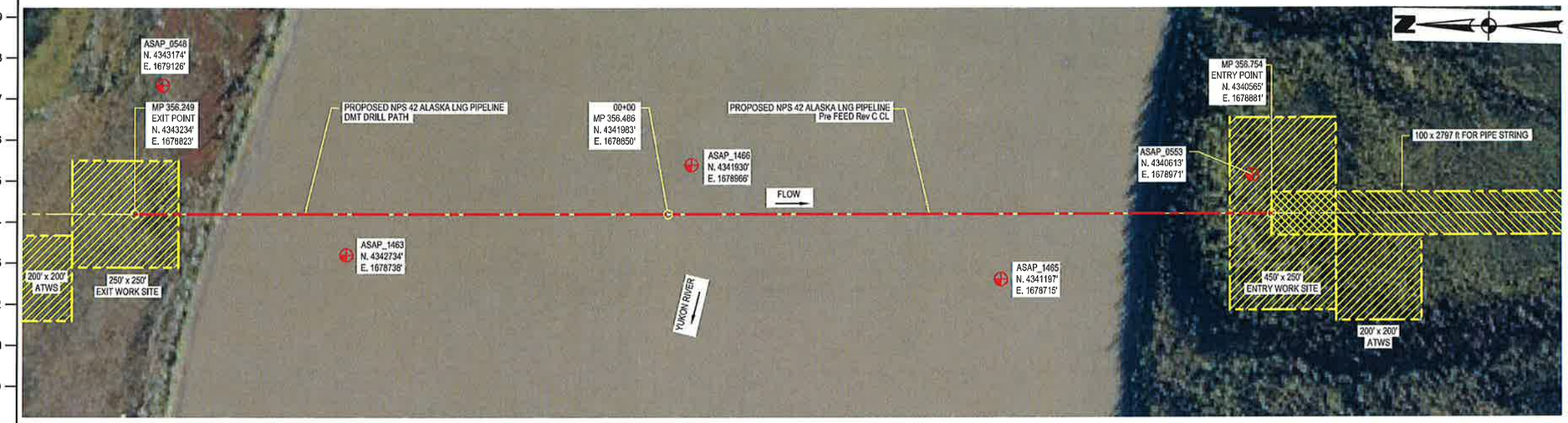
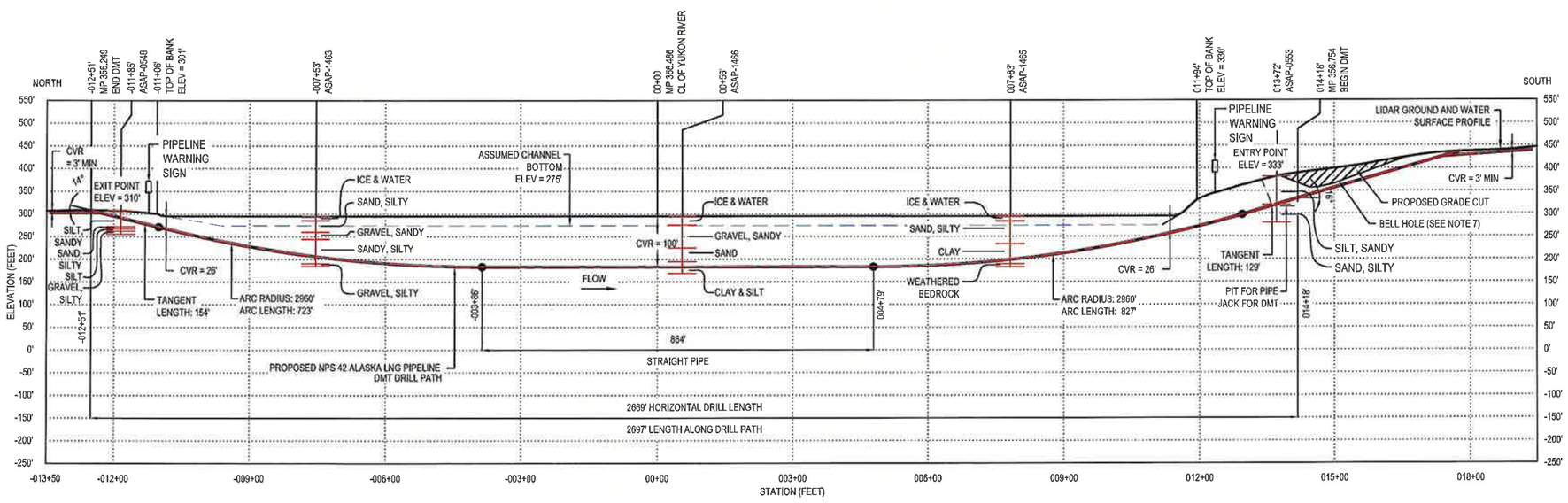


DETAIL PLAN
SCALE: 1" = 128'



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COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASKA ZONE 4
CROSSING COORDINATES @ MP 356.486 N. 4341983' E. 1678850'		

NOTES:

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6. THE EXPECTED SOIL CONDITIONS, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF RIVERBED DEPOSITS OF GRAVEL AND SAND WITH FREQUENT COBBLES AND BOULDERS OVER WEATHERED IGNEOUS AND SEDIMENTARY BEDROCK. A THAW BULB IS EXPECTED BELOW THE YUKON RIVER THAT MAY EXTEND INTO THE NORTH FLOODPLAIN. THE SOUTH BANK CONSISTS OF SILTS WITH INTERMITTENT GRAVEL LAYERS WITH SIGNIFICANT SUBSURFACE ICE .
7. CURRENT TECHNOLOGY LIMITS THE DMT TO MAXIMUM LENGTH OF APPROXIMATELY 2700 ft. HENCE, A BELL HOLE AND SLOPE GRADING ARE REQUIRED. FUTURE TECHNOLOGY MAY REDUCE THE REQUIRED BELL HOLE LENGTH.
8. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000.

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LOCATION PLAN
NTS

REFERENCE DRAWINGS

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LEGEND:

- BOREHOLE

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ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG

ALASKA LNG PIPELINE PROJECT
YUKON RIVER @ MP 356.486
WPC 217
DMT CROSSING PLAN & PROFILE

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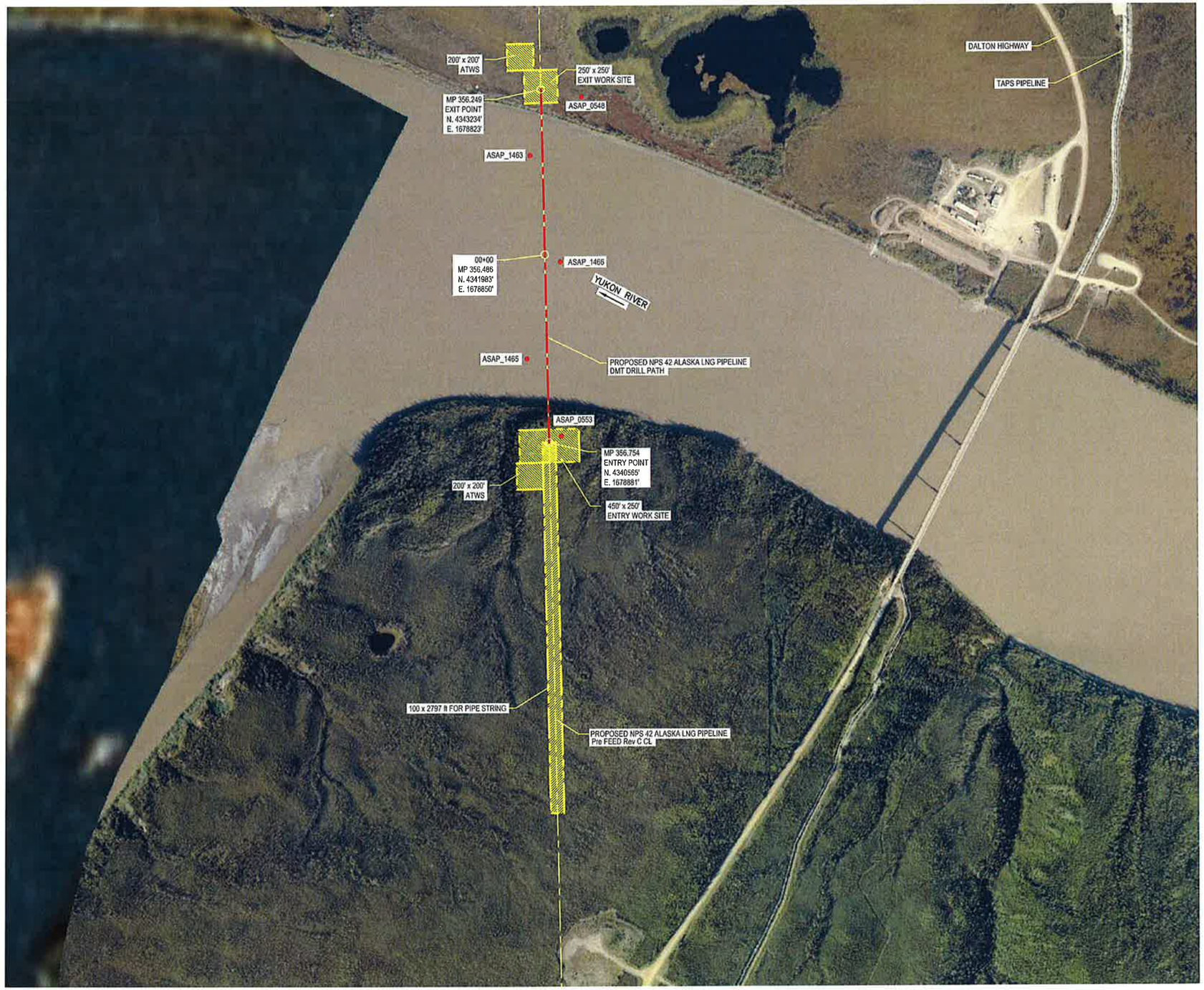

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Alaska LNG

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YUKON RIVER @ MP 356.486
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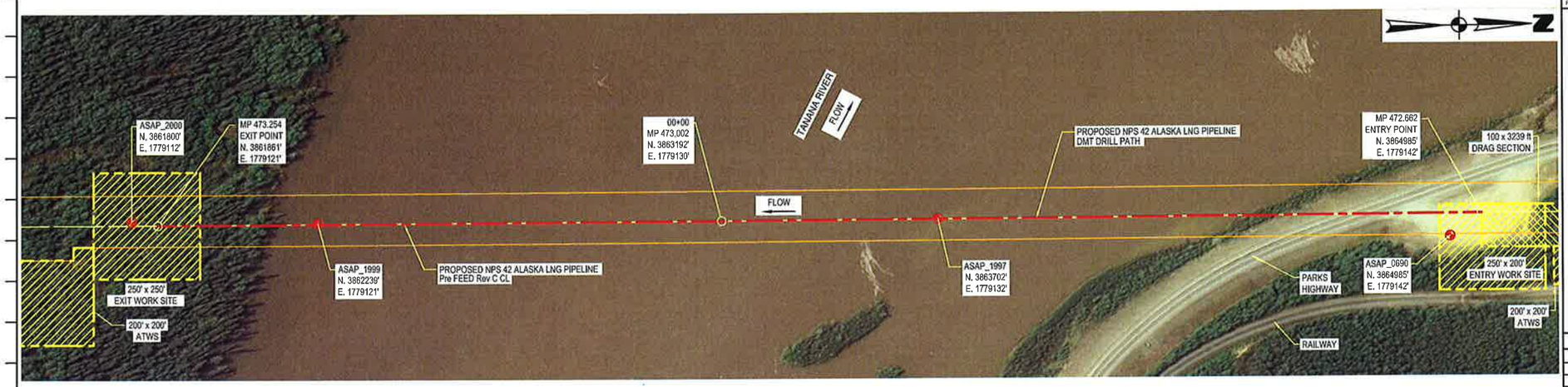
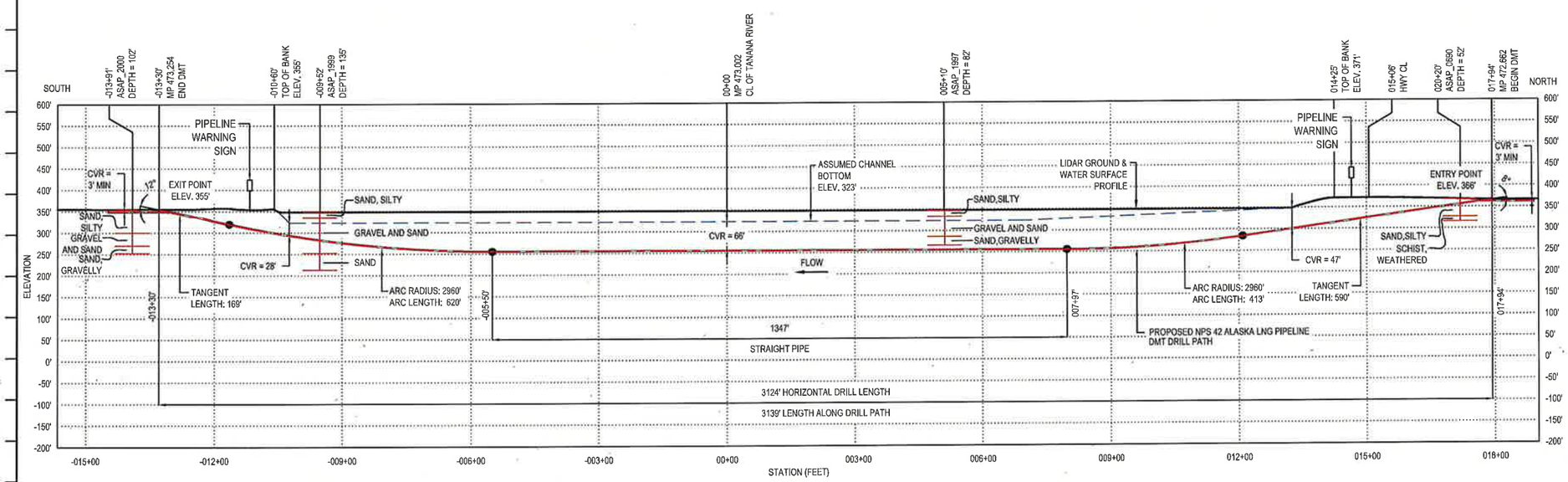


DETAIL PLAN
SCALE: 1" = 128'



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COORDINATES TABLE

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CROSSING COORDINATES @ MP 473.002 N. 3863192' E. 1779130'		

NOTES:

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6. THE EXPECTED SOIL CONDITIONS, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF SAND, SILT AND FINE TO COARSE, SUB-ANGULAR GRAVEL OVERLYING HIGHLY WEATHERED SCHIST. SOILS ARE GENERALLY UNFROZEN.
7. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000.

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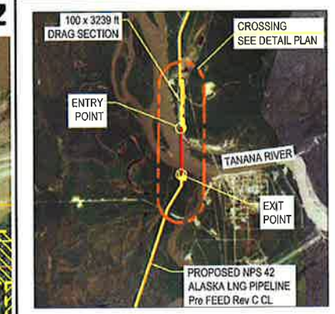

LOCATION PLAN
NTS

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Nikiski, Alaska

Alaska LNG™

ALASKA LNG PIPELINE PROJECT
TANANA RIVER @ MP 473.002
WPC 276 - B
DMT CROSSING PLAN & PROFILE

DRAWN BY	DATE	SCALE	CHK'D / APPVD
LW	20150303	AS SHOWN	JT / -

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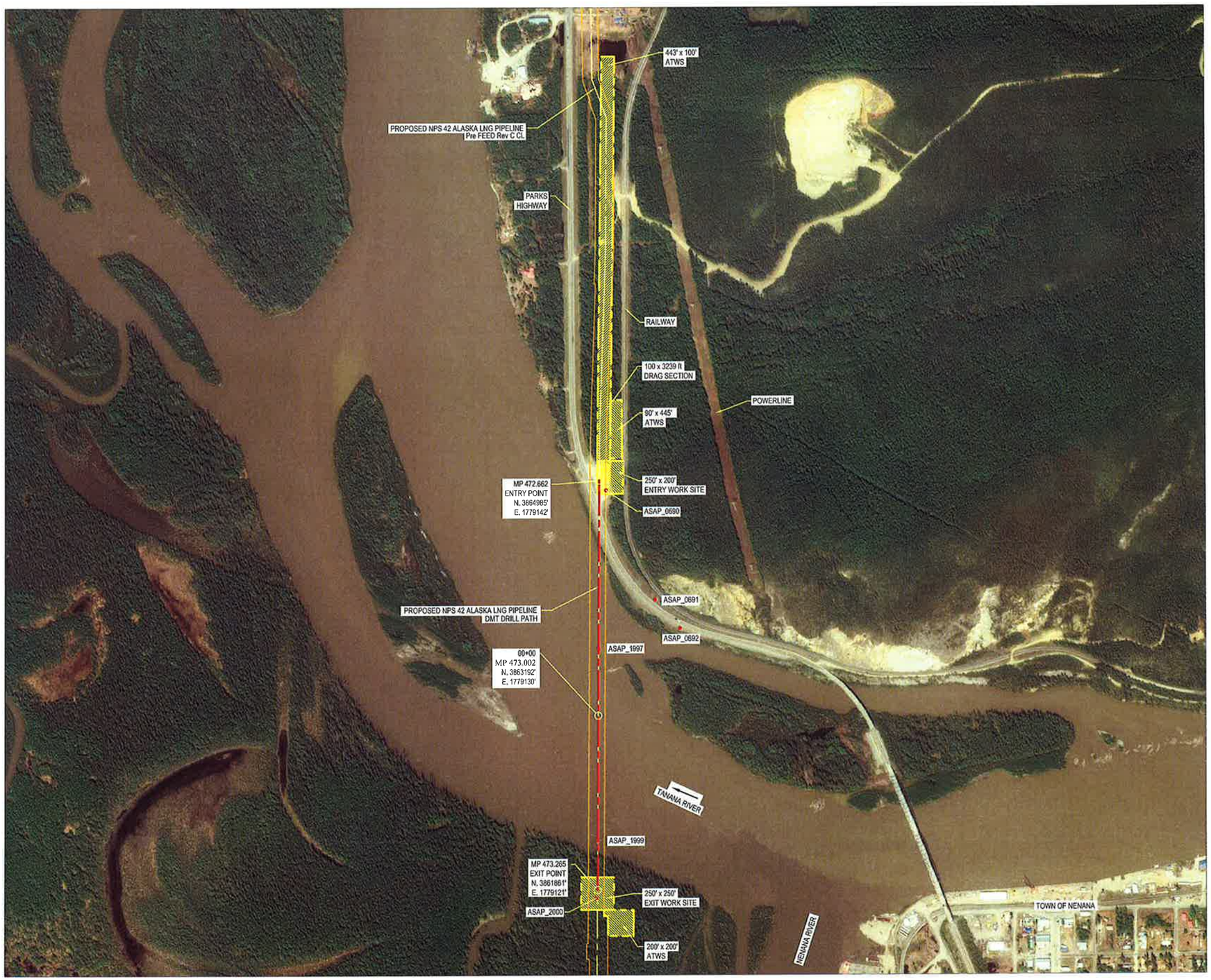

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LOCATION PLAN
NTS

REFERENCE DRAWINGS

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
ATWS	-	ADDITIONAL TEMPORARY WORK SPACE
CVR	-	COVER
DMT	-	DIRECTIONAL MICROTUNNELLING
HDD	-	HORIZONTAL DIRECTIONAL DRILLING
LIDAR	-	LIGHT DETECTION AND RANGING
MIN.	-	MINIMUM
MP	-	MILE POST
MOP	-	MAXIMUM OPERATING PRESSURE
MSL	-	MEAN SEA LEVEL
NAD	-	NORTH AMERICAN DATUM
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NSRS 2007	-	NATIONAL SPATIAL REFERENCE SYSTEM 2007
psig	-	POUNDS PER SQUARE INCH GAUGE
3LPE	-	THREE LAYER POLYETHYLENE

LEGEND:

- BOREHOLE

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0	20160708	LW JM	ISSUED FOR USE	-	-	JT

DS MJ DS TJB

WorleyParsons resources & energy

ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG TM

ALASKA LNG PIPELINE PROJECT
TANANA RIVER @ MP 473.002
WPC 276 - B
DMT DRAG SECTION SITE GEOTECH MAP

DRAWN BY	DATE	SCALE	CHK'D / APP'VD
LW	20150303	AS SHOWN	JT / -

DRAWING NO. USAP-WP-YDPLX-00-000029-001 ISSUE NO. 0

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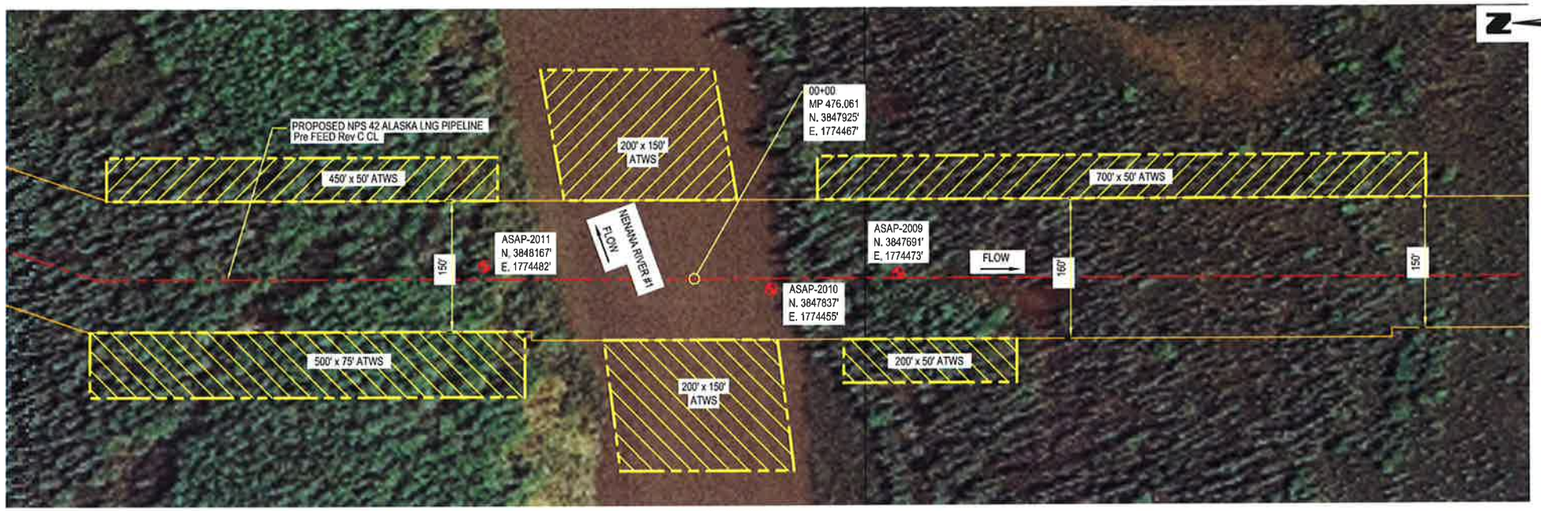
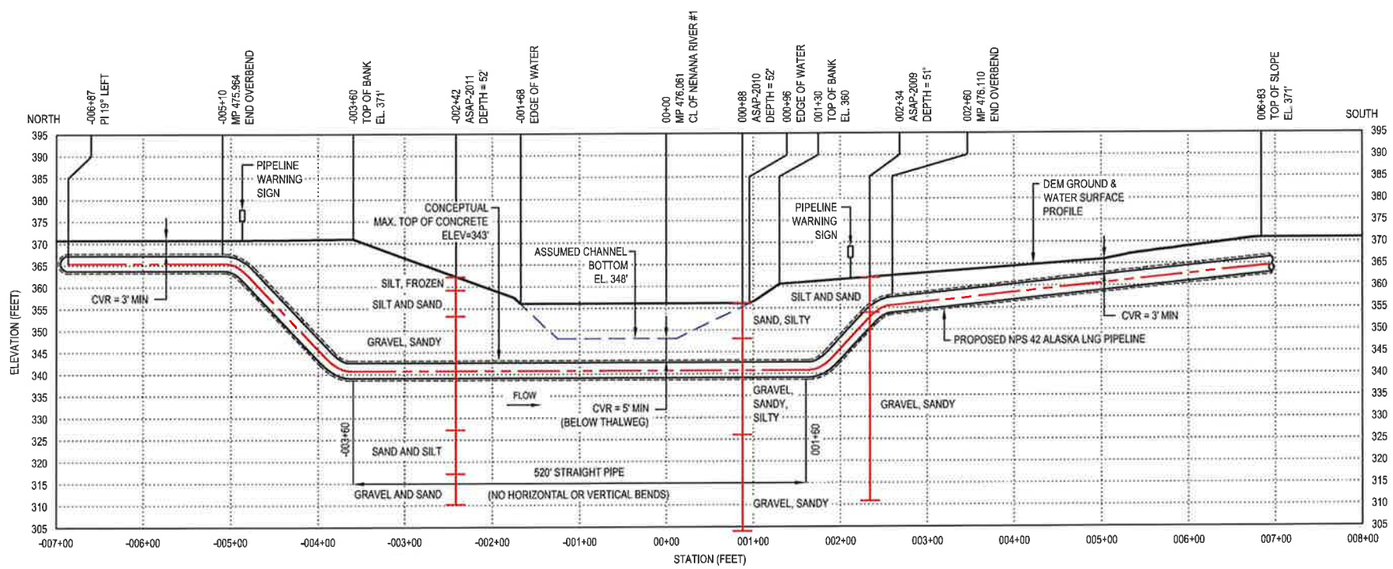


DETAIL PLAN
SCALE: 1" = 75'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 75'
VERTICAL SCALE 1" = 15'

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASKA ZONE 4
CROSSING COORDINATES @ MP 476.061 N. 3847925' E. 1774467'		

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP psig	DESIGN PRESSURE psig	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	0.677	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES
HEAVY WALL	NPS 42	42	0.752	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES

NOTES:

GENERAL:
1. THE CENTRELINE IS BASED ON PRE-FEED ROUTE REV. C.
2. THE CROSSING DESIGN IS CONCEPTUAL AND IS TO BE CONFIRMED DURING DETAILED ENGINEERING.
3. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
4. THE CROSSING SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH APPROPRIATE ASME, FERC AND LOCAL REGULATIONS IN EFFECT AT THE TIME OF CONSTRUCTION.
5. THE GROUND PROFILE IS BASED ON A DIGITAL ELEVATION MODEL ADJUSTED TO MATCH IMAGERY. ELEVATIONS ARE GEODETIC.

CROSSING INSTALLATION METHOD:
6. THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED DURING WINTER.
7. THE CROSSING IS CURRENTLY PROPOSED TO BE INSTALLED USING AN OPEN-CUT METHOD. FINAL CROSSING METHODOLOGY WILL BE DETERMINED DURING DETAILED ENGINEERING.
8. THE PRIMARY VEHICLE CROSSING METHOD IS AN ICE BRIDGE.

CROSSING BURIAL DESIGN:
9. THE PIPELINE IS, AT A MINIMUM, TO BE INSTALLED/PLACED BELOW THE 1 IN 100 YEAR SCOUR DEPTH.
10. CCC WILL BE ADDED FOR BUOYANCY CONTROL.

MITIGATIVE MEASURES:
11. REFER TO THE AK LNG PROJECT WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES DOCUMENT FOR MITIGATION AND REHABILITATION MEASURES.

SOIL CONDITIONS:
12. THE EXPECTED SOIL CONDITIONS, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF SILTS OVER GRAVELLY SANDS AND SANDY GRAVELS. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000. FURTHER INVESTIGATION IS REQUIRED TO CONFIRM THE EXPECTED CONDITIONS.

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LOCATION PLAN
NTS

REFERENCE DRAWINGS

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
ASME	-	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ATWS	-	ADDITIONAL TEMPORARY WORK SPACE
CVR	-	COVER
CCC	-	CONTINUOUS CONCRETE COATING
FERC	-	FEDERAL ENERGY REGULATORY COMMISSION
LIDAR	-	LIGHT DETECTION AND RANGING
MIN	-	MINIMUM
MOP	-	MAXIMUM OPERATING PRESSURE
MP	-	MILE POST
MSL	-	MEAN SEA LEVEL
NAD	-	NORTH AMERICAN DATUM 1983
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NSRS 2007	-	NATIONAL SPATIAL REFERENCE SYSTEM 2007
psig	-	POUNDS PER SQUARE INCH GAUGE
3LPE	-	THREE LAYER POLYETHYLENE

LEGEND:
- BOREHOLE

PRELIMINARY ONLY NOT FOR CONSTRUCTION

ISSUE	DATE	BY	CHK'D	DESCRIPTION	REV'R/ ENG'R	RESP. CODE	APP'D
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1	20160602	LW	RS	RE-ISSUED FOR USE	-	-	JT
0	20151103	LW	RS	ISSUED FOR USE	-	-	JT

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ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

ALASKA LNG PIPELINE PROJECT
NENANA RIVER #1 @ MP 476.061
WPC 279-B
OPEN CUT CROSSING PLAN & PROFILE

DRAWN BY	DATE	SCALE	CHK'D / APP'D
LW	20150728	AS SHOWN	- / -

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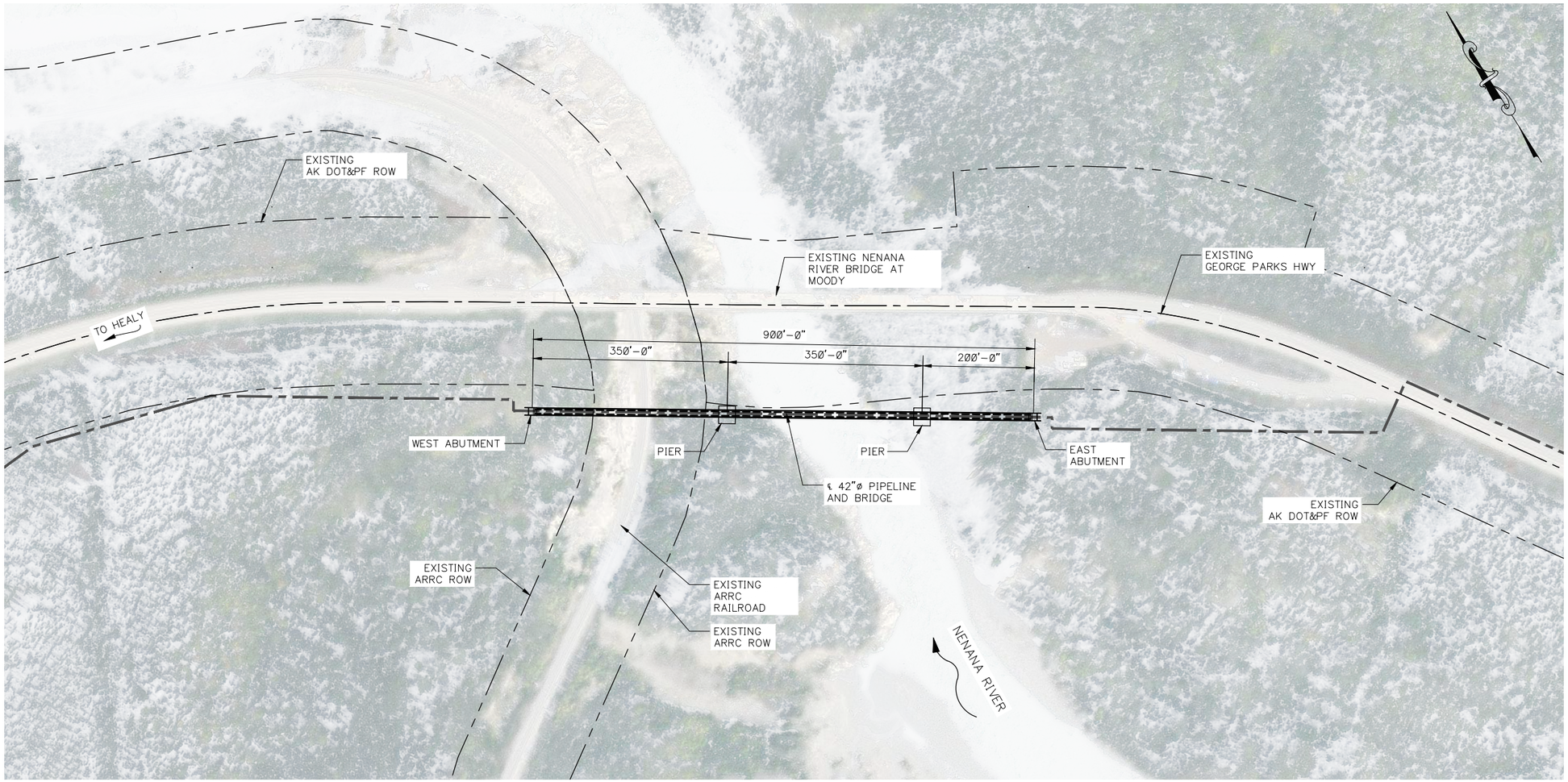

PLAN

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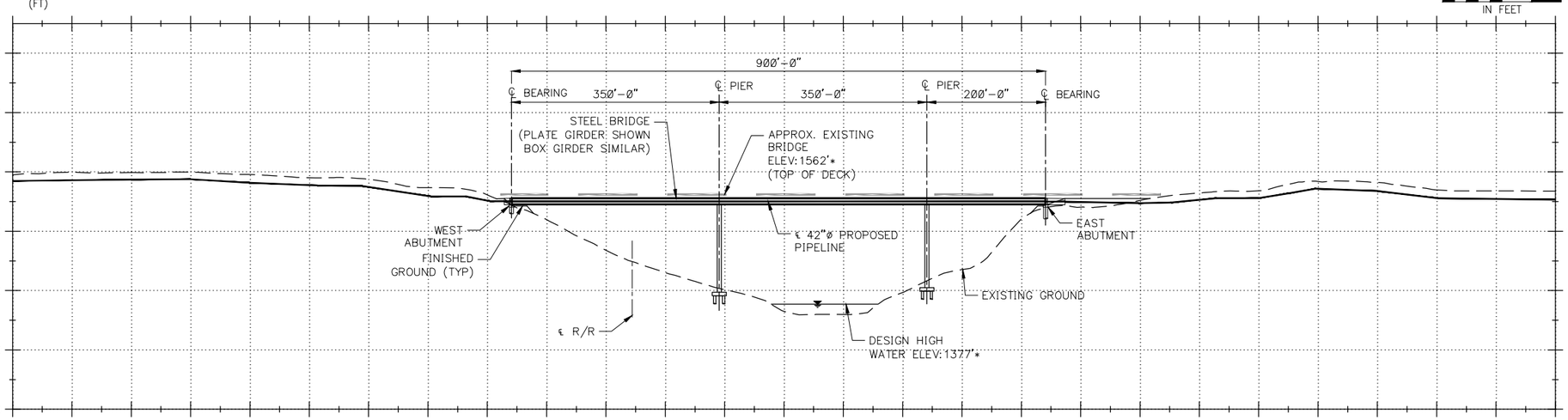
IN FEET



PROFILE

* ELEVATIONS BASED ON INFORMATION SHOWN IN
EXISTING NENANA RIVER BRIDGE AT MOODY AS-BUILTS DATED 1972

Pre-FEED INFORMATION - CONFIDENTIAL

Pre-FEED Information - Confidential (subject to the terms and conditions of the Alaska LNG Project AKLNG-WP-US-002 under A2 29 985 7 Agreement, dated 24 July 2014)

PIPELINE COMPONENT

NOTES:

LOCATION CLASS:	CLASS 1
PIPELINE OUTSIDE DIAMETER (NOMINAL) :	42"
MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP):	2075psig
PIPE WALL THICKNESS:	1.034 IN; 452 LBS/FT
DESIGN FACTOR:	0.60
BRIDGE DESIGN TEMP:	100°F MAX;-65° MIN
COEFFICIENT OF THERMAL EXPANSION:	0.0000065 FT/FT-F

PREFERRED ALTERNATE

ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REV'R/ END'R	RESP. CODE	APP'D
1	5/20/15	A.S.N.	ISSUED FOR USE			

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Michael Baker INTERNATIONAL

ALASKA LNG

NENANA RIVER CROSSING
DRAWING PACKAGE (AT MOODY)
ALTERNATE 6
UPSTREAM 3-SPAN STEEL BRIDGE

DRAWN BY	DATE	SCALE	CHKD / APPVD
J. NUNEZ	5/20/2015	1"=100'	A. NAVARRO / J. CAROTA

DRAWING NO. USAP-WP-YDPLX-00-000034-012 | ISSUE NO. 1

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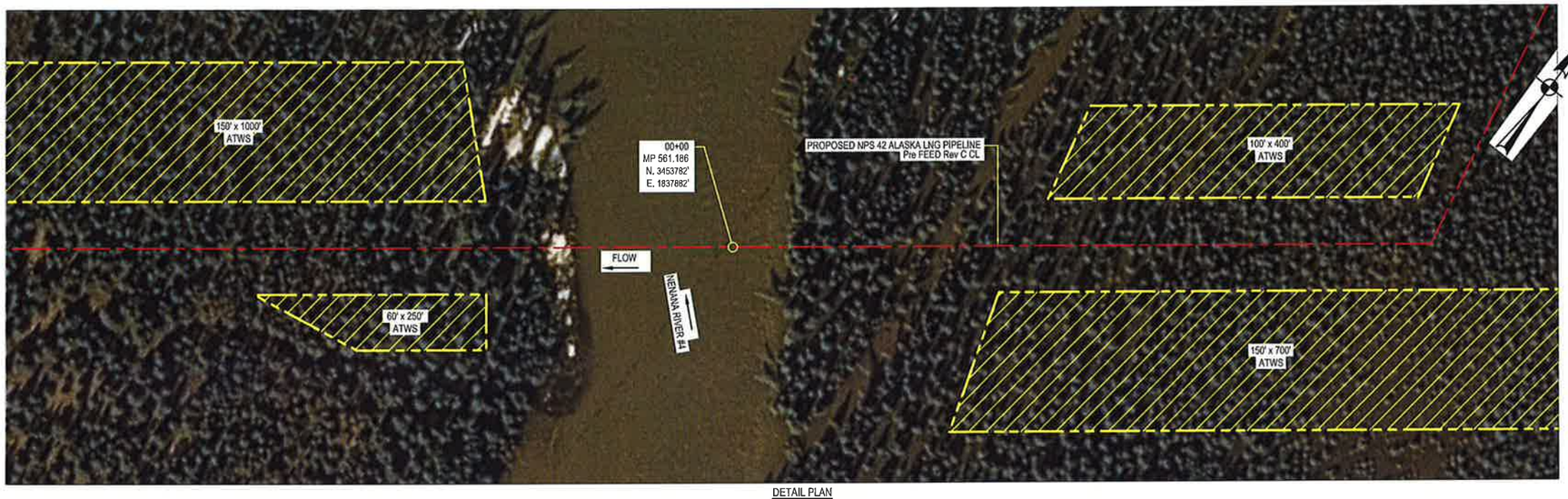
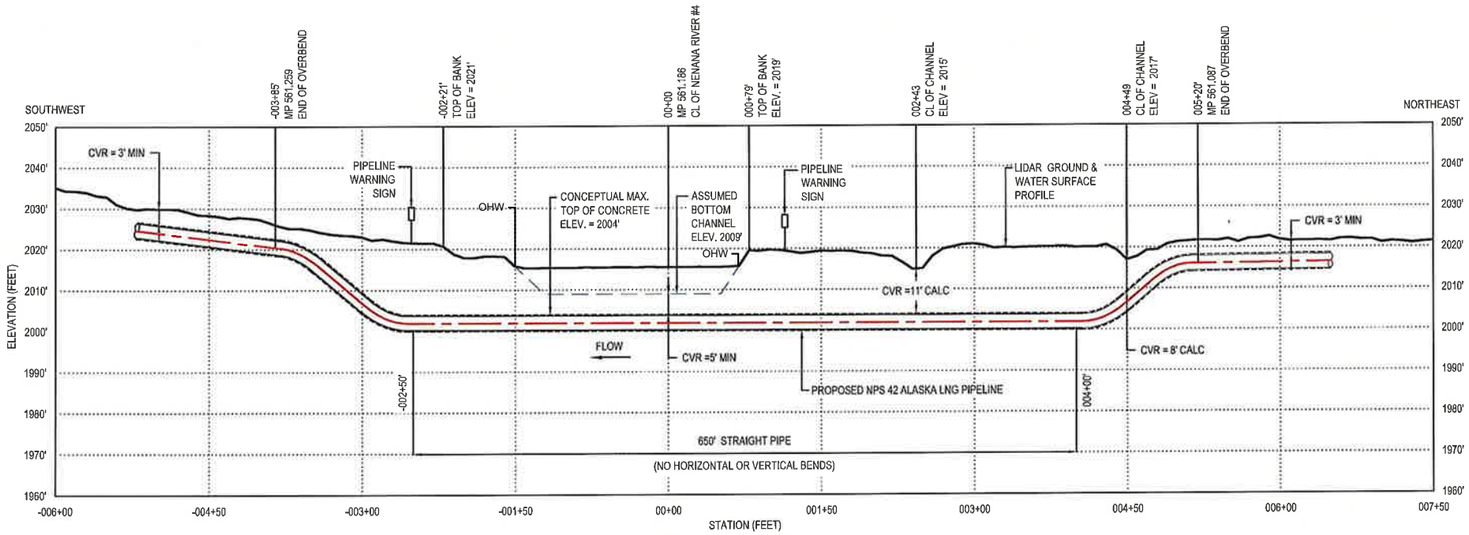


DETAIL PLAN
SCALE: 1" = 64'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 64'
VERTICAL SCALE 1" = 16'

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASKA ZONE 4
CROSSING COORDINATES @ MP 561.186 N. 3453782' E. 1837882'		

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psig	DESIGN PRESSURE Psig	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	0.677	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES
HEAVY WALL	NPS 42	42	0.752	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES

NOTES:

GENERAL:
1. THE CENTRELINE IS BASED ON PRE-FEED ROUTE REV. C.
2. THE CROSSING DESIGN IS CONCEPTUAL AND IS TO BE CONFIRMED DURING DETAILED ENGINEERING.
3. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
4. THE CROSSING SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH APPROPRIATE ASME, FERC AND LOCAL REGULATIONS IN EFFECT AT THE TIME OF CONSTRUCTION.
5. THE GROUND PROFILE IS BASED ON LIDAR OBTAINED IN 2014. ELEVATIONS ARE GEODETIC.

CROSSING INSTALLATION METHOD:
6. THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED FOR SUMMER.
7. THE CROSSING IS CURRENTLY PROPOSED TO BE INSTALLED USING AN OPEN-CUT METHOD. FINAL CROSSING METHODOLOGY WILL BE DETERMINED DURING DETAILED ENGINEERING.
8. THE PRIMARY VEHICLE CROSSING METHOD IS THE EXISTING HIGHWAY BRIDGE.

CROSSING BURIAL DESIGN:
9. THE PIPELINE IS, AT A MINIMUM, TO BE INSTALLED/PLACED BELOW THE 1 IN 100 YEAR SCOUR DEPTH.
10. CCC WILL BE ADDED FOR BUOYANCY CONTROL.

MITIGATIVE MEASURES:
11. REFER TO THE AK LNG PROJECT WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES DOCUMENT FOR MITIGATION AND REHABILITATION MEASURES.

SOIL CONDITIONS:
12. THE EXPECTED SOIL CONDITIONS, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF SAND AND GRAVEL WITH POSSIBLE COBBLES AND BOULDERS. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000. FURTHER INVESTIGATION IS REQUIRED TO CONFIRM THE EXPECTED CONDITIONS.

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LOCATION PLAN
NTS

REFERENCE DRAWINGS

-	-

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
ASME	-	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
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CVR	-	COVER
CCC	-	CONTINUOUS CONCRETE COATING
FERC	-	FEDERAL ENERGY REGULATORY COMMISSION
LIDAR	-	LIGHT DETECTION AND RANGING
MIN	-	MINIMUM
MOP	-	MAXIMUM OPERATING PRESSURE
MP	-	MILE POST
MSL	-	MEAN SEA LEVEL
NAD	-	NORTH AMERICAN DATUM 1983
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NSRS 2007	-	NATIONAL SPATIAL REFERENCE SYSTEM 2007
psig	-	POUNDS PER SQUARE INCH GAUGE
3LPE	-	THREE LAYER POLYETHYLENE

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ALASKA LNG PIPELINE PROJECT
NENANA RIVER #4 @ MP 561.186
WPC 320-C
OPEN CUT CROSSING PLAN & PROFILE

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LW	20160425	AS SHOWN	JT / -

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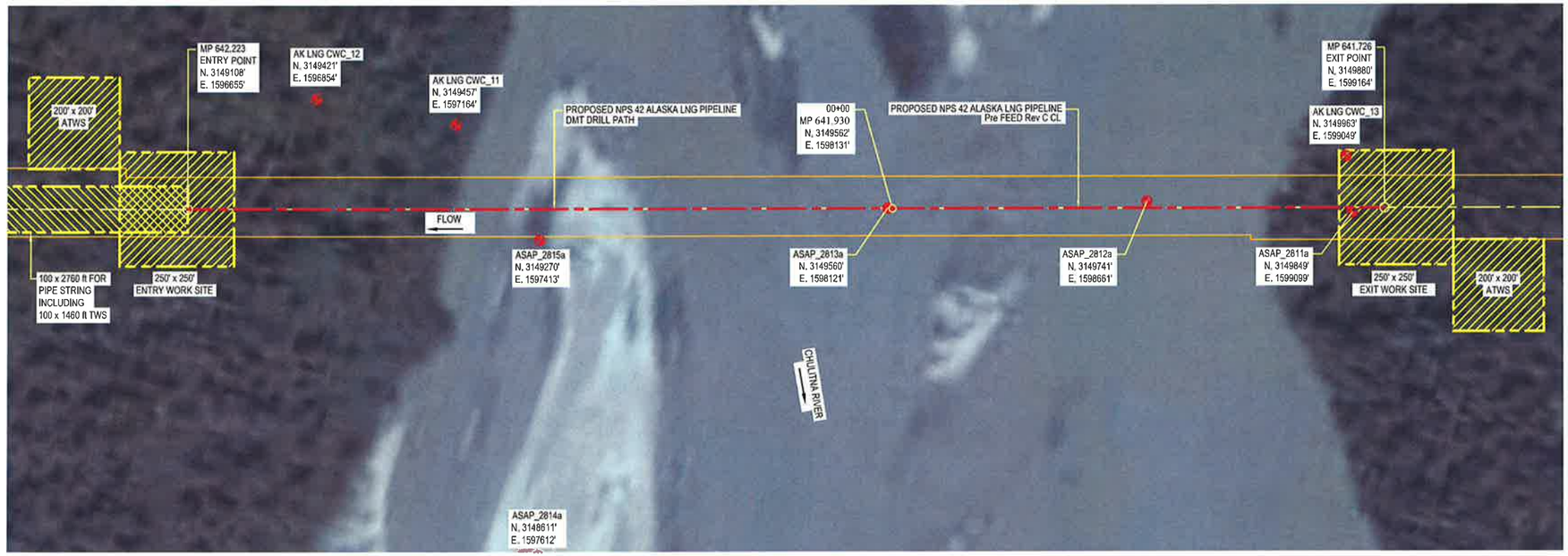
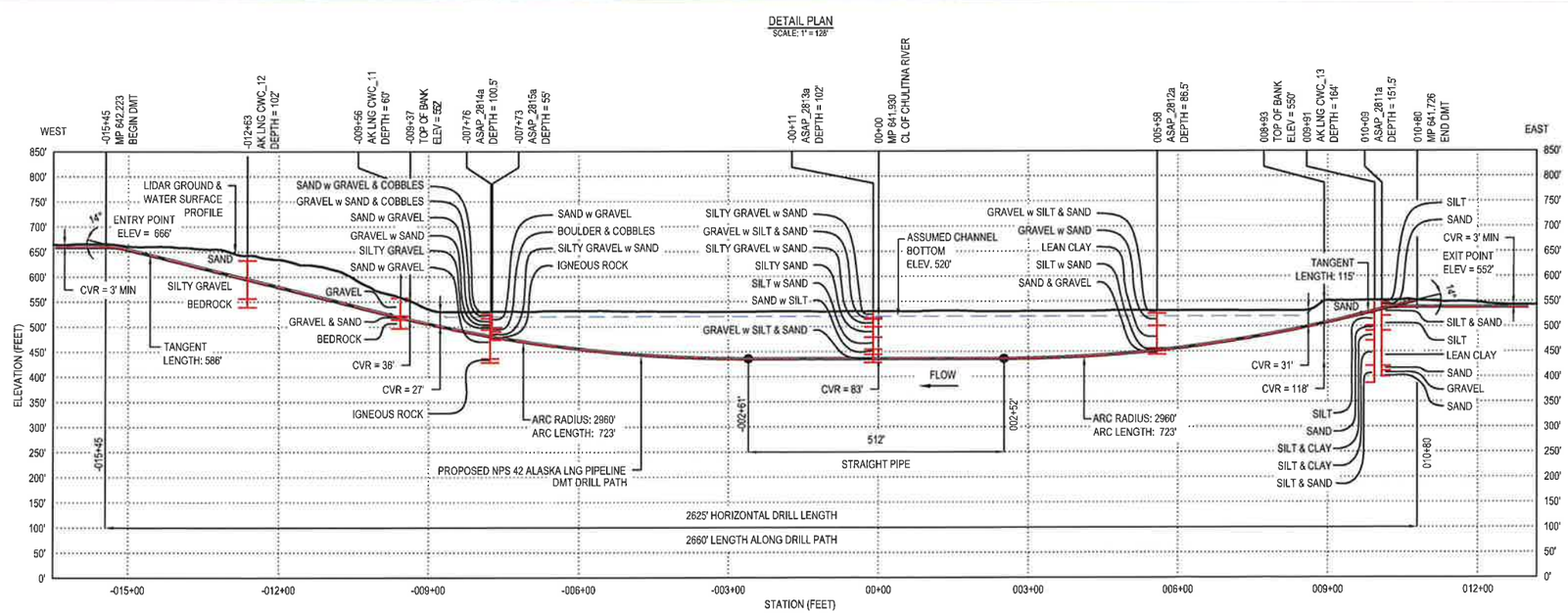


DETAIL PLAN
SCALE: 1" = 128'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 128'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP psig	DESIGN PRESSURE psig	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	0.677	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES
HEAVY WALL	NPS 42	42	1.24	API 5L Grade X70M PSL2	2075	2075	3 LPE	YES

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASKA ZONE 4
CROSSING COORDINATES @ MP 641.930 N. 3149562' E. 1598131'		

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. SUBSOIL INFORMATION IS AVAILABLE.
3. THE GROUND PROFILE IS BASED ON LIDAR OBTAINED IN 2014. ELEVATIONS ARE GEODETIC.
4. THE CROSSING DESIGN IS CONCEPTUAL AND IS TO BE CONFIRMED DURING DETAILED ENGINEERING.
5. THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED DURING SUMMER.
6. THE EXPECTED SOIL CONDITIONS WITHIN THE CHANNEL, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF SILT AND SAND OVERLYING SILTY CLAY. IGNEOUS ROCK IS EXPECTED AT DEPTH NEAR THE WEST BANK. FURTHER INVESTIGATION IS REQUIRED TO CONFIRM THE EXPECTED CONDITIONS.
7. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000.

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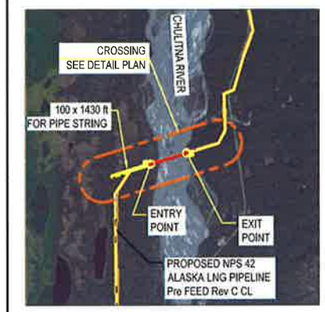

LOCATION PLAN
NTS

REFERENCE DRAWINGS

-	-

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
ATWS	-	ADDITIONAL TEMPORARY WORK SPACE
CVR	-	COVER
DMT	-	DIRECTIONAL MICROTUNNELLING
HDD	-	HORIZONTAL DIRECTIONAL DRILLING
LIDAR	-	LIGHT DETECTION AND RANGING
MIN.	-	MINIMUM
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psig	-	POUNDS PER SQUARE INCH GAUGE
3LPE	-	THREE LAYER POLYETHYLENE

LEGEND:

- BOREHOLE

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ISSUE	DATE	BY/CHK'D	DESCRIPTION	REVR/END'R	RESP. CODE	APP'D
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1	20160602	LW / JM	RE-ISSUED FOR USE	- / -	-	JT
0	20160114	LW / JM	ISSUED FOR USE	- / -	-	JT

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Nikiski, Alaska

Alaska LNG™

ALASKA LNG PIPELINE PROJECT
CHULITNA RIVER @ MP 641.930
WPC 350
DMT CROSSING PLAN & PROFILE

DRAWN BY	DATE	SCALE	CHKD / APP'D
LW	20150908	AS SHOWN	JT / -

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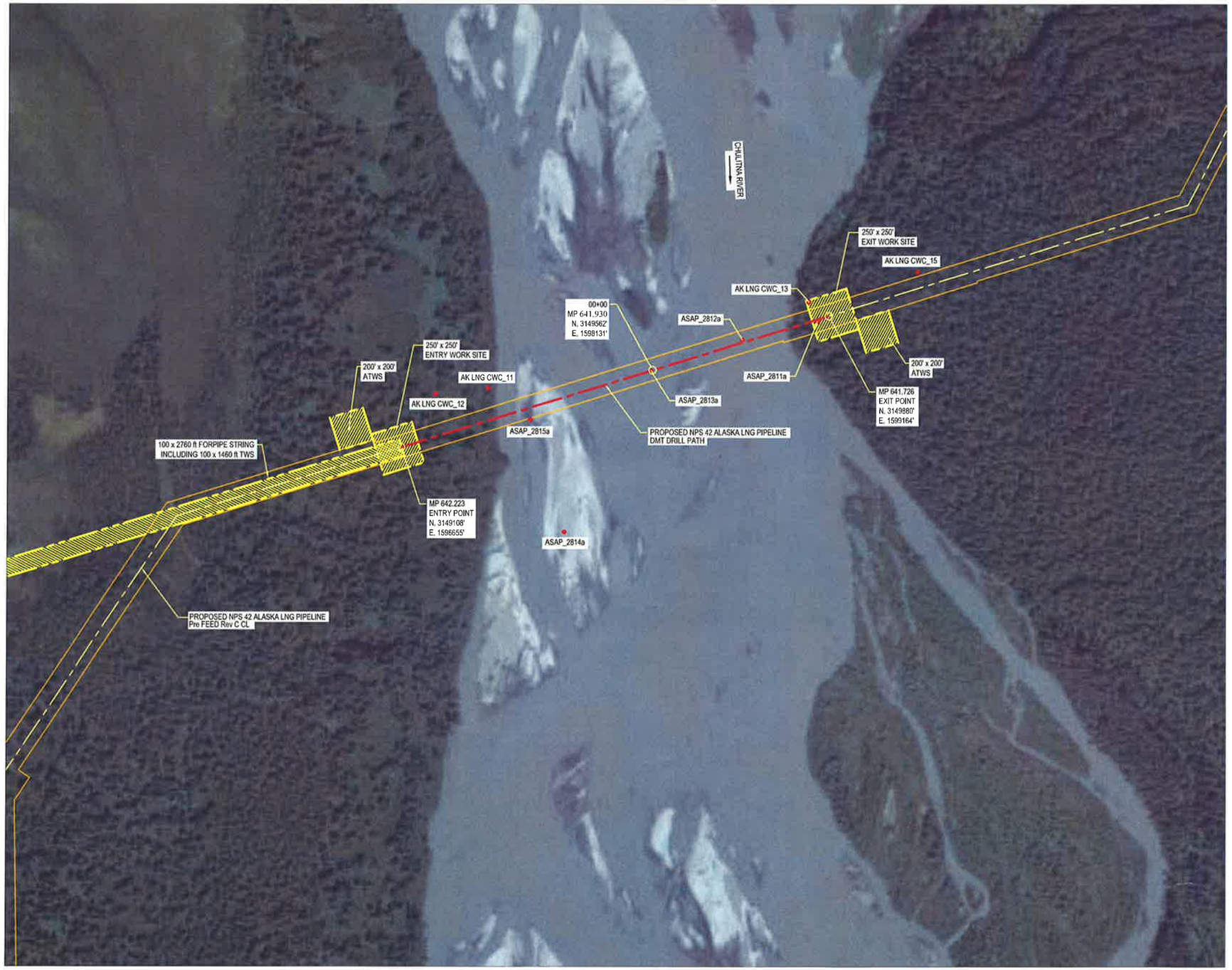

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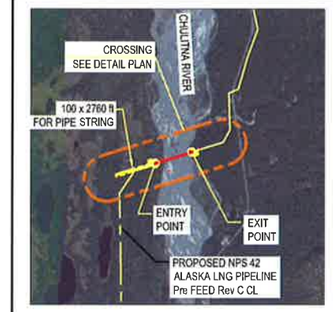

LOCATION PLAN
NTS

REFERENCE DRAWINGS

-	-

ABBREVIATIONS & ACRONYMS

API - AMERICAN PETROLEUM INSTITUTE
ATWS - ADDITIONAL TEMPORARY WORK SPACE
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LIDAR - LIGHT DETECTION AND RANGING
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NSRS 2007 - NATIONAL SPATIAL REFERENCE SYSTEM 2007
psig - POUNDS PER SQUARE INCH GAUGE
3LPE - THREE LAYER POLYETHYLENE

LEGEND:

- BOREHOLE

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ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

ALASKA LNG PIPELINE PROJECT
CHULITNA RIVER @ MP 641.930
WPC 350
DMT DRAG SECTION SITE GEOTECH MAP

DRAWN BY	DATE	SCALE	CHK'D / APP'D
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DRAWING NO. USAP-WP-YDPLX-00-000030-001 ISSUE NO. 0

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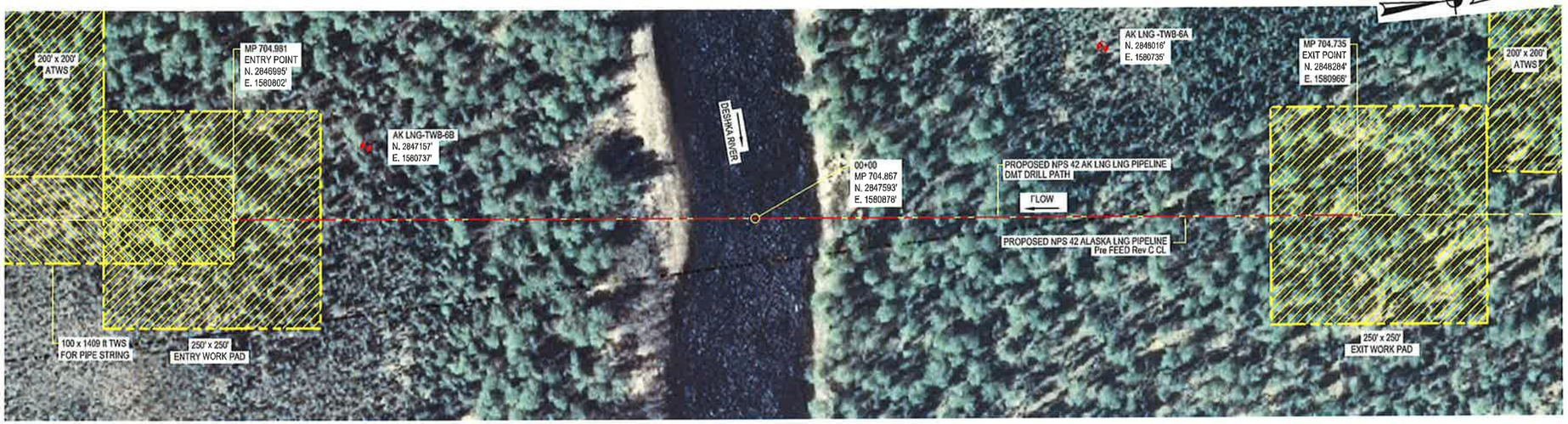
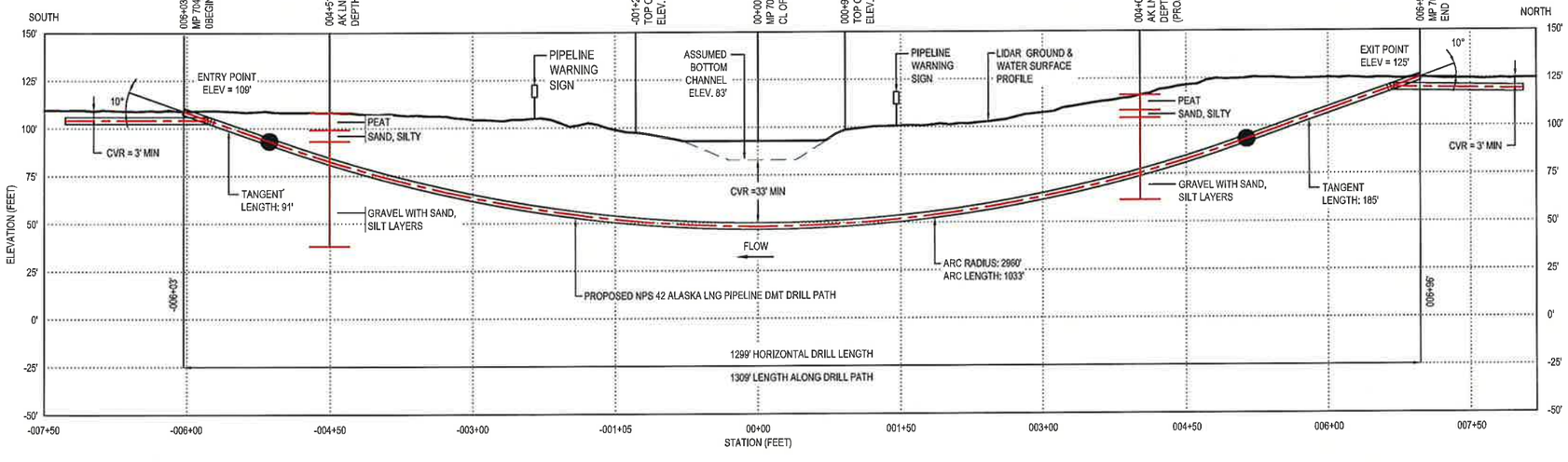


DETAIL PLAN
SCALE: 1" = 64'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 64'
VERTICAL SCALE 1" = 32'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP psig	DESIGN PRESSURE psig	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	0.677	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES
HEAVY WALL	NPS 42	42	1.24	API 5L Grade X70M PSL2	2075	2075	3 LPE	YES

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASKA ZONE 4
CROSSING COORDINATES @ MP 704.867 N. 2847593' E. 1580878'		

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. SUBSOIL INFORMATION IS LIMITED.
3. THE GROUND PROFILE IS BASED ON LIDAR OBTAINED IN 2014. ELEVATIONS ARE GEODETIC.
4. THE CROSSING DESIGN IS CONCEPTUAL AND IS TO BE CONFIRMED DURING DETAILED ENGINEERING.
5. THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED DURING SUMMER.
6. THE EXPECTED SOIL CONDITIONS, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF SAND OVERLYING SILTY SAND AND GRAVEL. FURTHER INVESTIGATION IS REQUIRED TO CONFIRM THE EXPECTED CONDITIONS.
7. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000.

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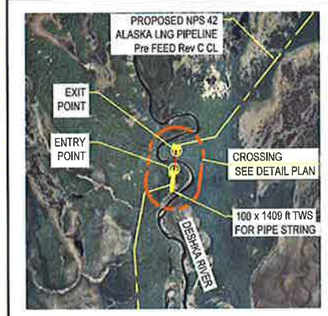

LOCATION PLAN
NTS

REFERENCE DRAWINGS

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
ATWS	-	ADDITIONAL TEMPORARY WORK SPACE
CVR	-	COVER
DEM	-	DIGITAL ELEVATION MODEL
DMT	-	DIRECTIONAL MICROTUNNELLING
HDD	-	HORIZONTAL DIRECTIONAL DRILLING
LIDAR	-	LIGHT DETECTION AND RANGING
MOP	-	MAXIMUM OPERATING PRESSURE
MSL	-	MEAN SEA LEVEL
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NDZ	-	NO DRILL ZONE
psig	-	POUNDS PER SQUARE INCH GAUGE
3LPE	-	THREE LAYER POLYETHYLENE
3LPP	-	THREE LAYER POLYPROPYLENE

LEGEND:

- 2016 BOREHOLE

PRELIMINARY ONLY NOT FOR CONSTRUCTION

ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REVR/ ENG'R	RESP. CODE	APP'D
0	20160628	LW / JM	ISSUED FOR USE	-	-	JT

WorleyParsons resources & energy

ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG

ALASKA LNG PIPELINE PROJECT
DESHKA RIVER @ MP 704.867
WPC 373-B
DMT CROSSING PLAN & PROFILE

DRAWN BY	DATE	SCALE	CHK'D / APP'D
LW	20160418	AS SHOWN	JT / -

DRAWING NO. USAP-WP-YDPLX-00-000065-000 ISSUE NO. 0

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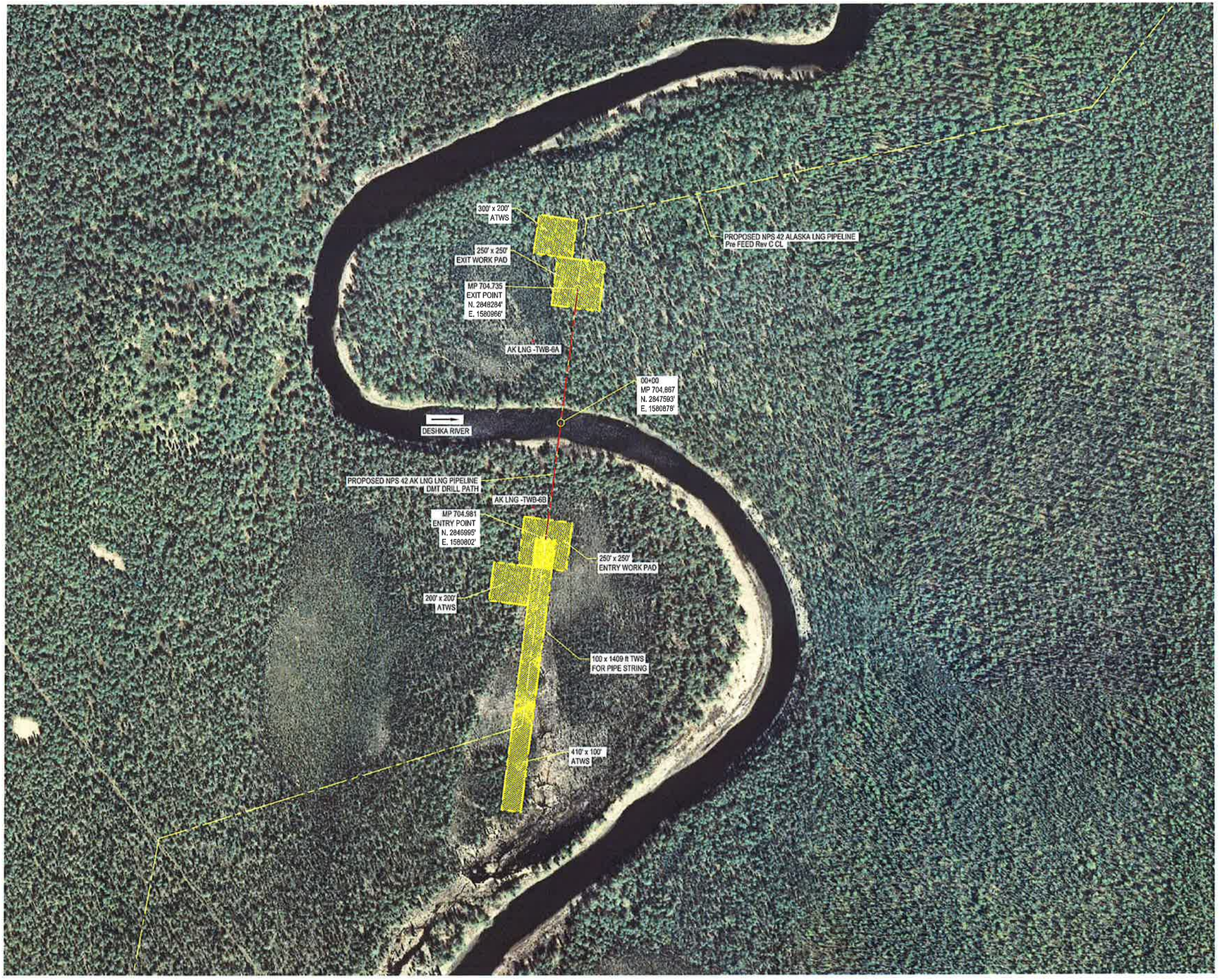

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LOCATION PLAN
NTS

REFERENCE DRAWINGS

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
ATWS	-	ADDITIONAL TEMPORARY WORK SPACE
CVR	-	COVER
DEM	-	DIGITAL ELEVATION MODEL
DMT	-	DIRECTIONAL MICROTUNNELLING
HDD	-	HORIZONTAL DIRECTIONAL DRILLING
LIDAR	-	LIGHT DETECTION AND RANGING
MOP	-	MAXIMUM OPERATING PRESSURE
MSL	-	MEAN SEA LEVEL
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NDZ	-	NO DRILL ZONE
psig	-	POUNDS PER SQUARE INCH GAUGE
3LPE	-	THREE LAYER POLYETHYLENE
3LPP	-	THREE LAYER POLYPROPYLENE

LEGEND:

- 2016 BOREHOLE

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ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REVR/ CHK'R	RESP. CODE	APP'D
0	20160708	LW / JM	ISSUED FOR USE	-	-	JT

WorleyParsons resources & energy

ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

ALASKA LNG PIPELINE PROJECT
DESHKA RIVER @ MP 704.867
WPC 373-B
DMT DRAG SECTION SITE GEOTECH MAP

DRAWN BY	DATE	SCALE	CHK'D / APP'D
LW	20160418	AS SHOWN	-

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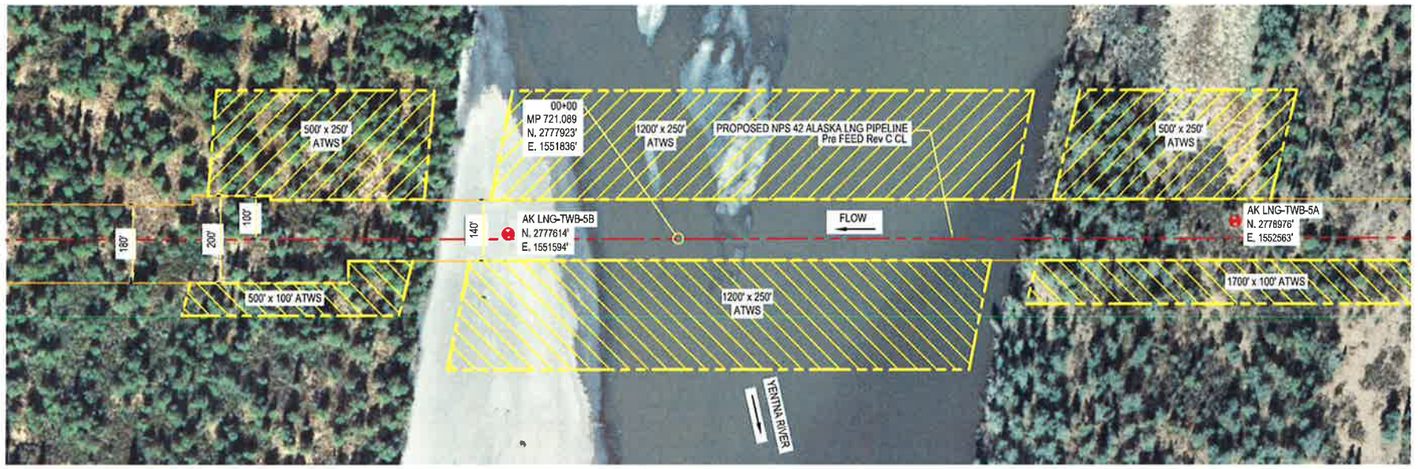
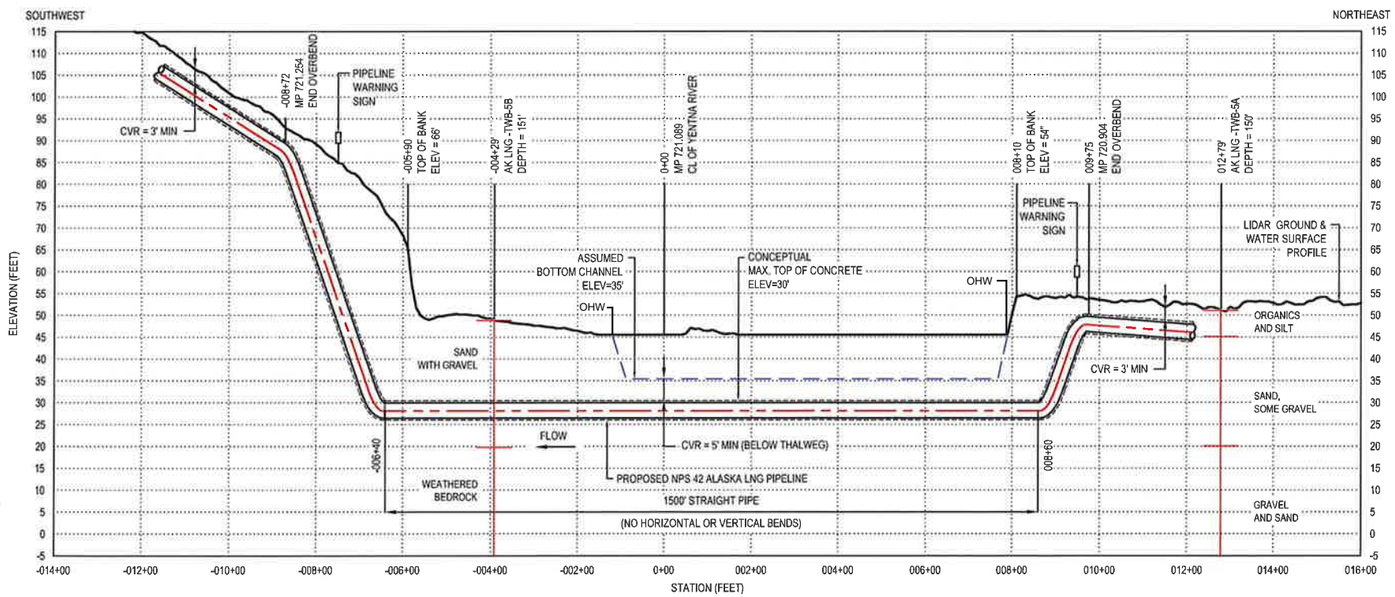


DETAIL PLAN
SCALE: 1" =150'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" =150'
VERTICAL SCALE 1" =15'

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASKA ZONE 4
CROSSING COORDINATES @ MP 721.089 N. 2777923' E. 1551836'		

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (Inch)	WT (Inch)	PIPE SPECIFICATION	MOP psig	DESIGN PRESSURE psig	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	0.677	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES
HEAVY WALL	NPS 42	42	0.752	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES

NOTES:

GENERAL:

1. THE CENTRELINE IS BASED ON PRE-FEED ROUTE REV. C.
2. THE CROSSING DESIGN IS CONCEPTUAL AND IS TO BE CONFIRMED DURING DETAILED ENGINEERING.
3. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
4. THE CROSSING SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH APPROPRIATE ASME, FERC AND LOCAL REGULATIONS IN EFFECT AT THE TIME OF CONSTRUCTION.
5. THE GROUND PROFILE IS BASED ON LIDAR OBTAINED IN 2014. ELEVATIONS ARE GEODETIC.

CROSSING INSTALLATION METHOD:

6. THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED DURING WINTER.
7. THE CROSSING IS CURRENTLY PROPOSED TO BE INSTALLED USING AN OPEN-CUT METHOD. FINAL CROSSING METHODOLOGY WILL BE DETERMINED DURING DETAILED ENGINEERING.
8. THE PRIMARY VEHICLE CROSSING METHOD IS AN ICE BRIDGE.

CROSSING BURIAL DESIGN:

9. THE PIPELINE IS, AT A MINIMUM, TO BE INSTALLED/PLACED BELOW THE 1 IN 100 YEAR SCOUR DEPTH.
10. CCC WILL BE ADDED FOR BUOYANCY CONTROL.

MITIGATIVE MEASURES:

11. REFER TO THE AK LNG PROJECT WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES DOCUMENT FOR MITIGATION AND REHABILITATION MEASURES.

SOIL CONDITIONS:

12. THE EXPECTED SOIL CONDITIONS, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF SANDY GRAVEL AND GRAVELLY SAND. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000. FURTHER INVESTIGATION IS REQUIRED TO CONFIRM THE EXPECTED CONDITIONS.

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LOCATION PLAN
NTS

REFERENCE DRAWINGS

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
ASME	-	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ATWS	-	ADDITIONAL TEMPORARY WORK SPACE
CVR	-	COVER
CCC	-	CONTINUOUS CONCRETE COATING
FERC	-	FEDERAL ENERGY REGULATORY COMMISSION
LIDAR	-	LIGHT DETECTION AND RANGING
MIN	-	MINIMUM
MOP	-	MAXIMUM OPERATING PRESSURE
MP	-	MILE POST
MSL	-	MEAN SEA LEVEL
NAD	-	NORTH AMERICAN DATUM 1983
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NSRS 2007	-	NATIONAL SPATIAL REFERENCE SYSTEM 2007
psig	-	POUNDS PER SQUARE INCH GAUGE
3LPE	-	THREE LAYER POLYETHYLENE

LEGEND:

- 2016 BOREHOLE

PRELIMINARY ONLY NOT FOR CONSTRUCTION

ISSUE	DATE	BY/CHK'D	DESCRIPTION	REV'R/ENG'R	RESP. CODE	APP'D
2	20160629	LW/RS	RE-ISSUED FOR USE	-	-	JT
1	20160602	LW/RS	RE-ISSUED FOR USE	-	-	JT
0	20151103	LW/RS	ISSUED FOR USE	-	-	JT

WorleyParsons resources & energy

ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

ALASKA LNG PIPELINE PROJECT
YENTNA RIVER @ MP 721.089
WPC 376
OPEN CUT CROSSING PLAN & PROFILE

DRAWN BY	DATE	SCALE	CHK'D / APPV'D
LW	20150821	AS SHOWN	-

DRAWING NO. USAP-WP-YDPLX-00-000057-000 ISSUE NO. 2

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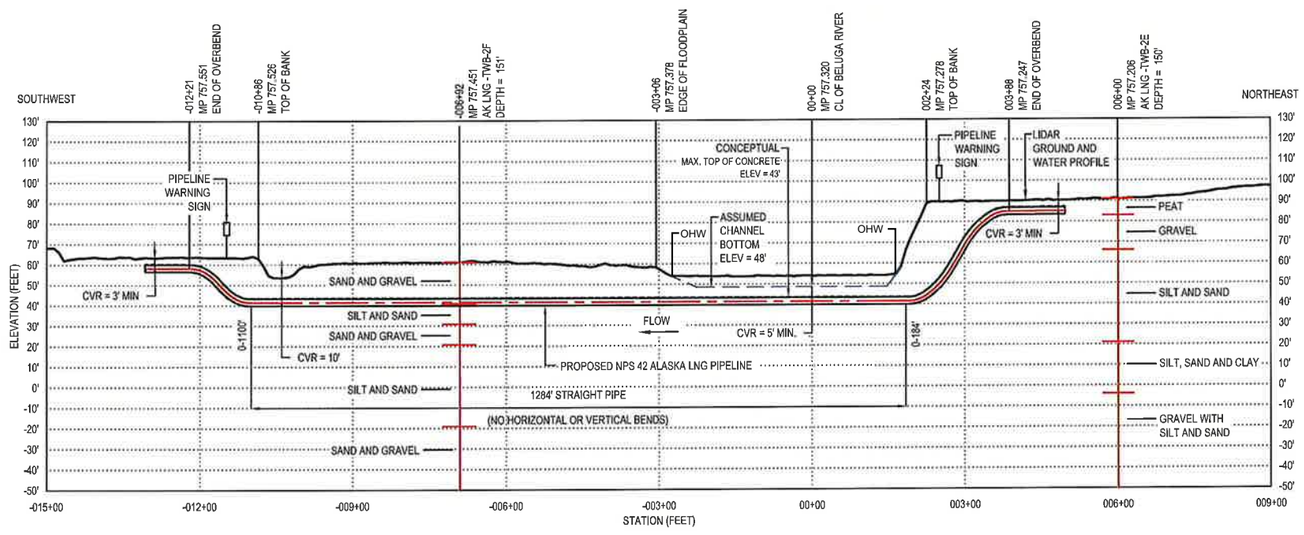
DETAIL PLAN
SCALE: 1" = 128'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 32'

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASKA ZONE 4
CROSSING COORDINATES @ MP 757.320 N. 2643287' E. 1441480'		

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (Inch)	WT (Inch)	PIPE SPECIFICATION	MOP Psig	DESIGN PRESSURE Psig	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	0.677	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES
HEAVY WALL	NPS 42	42	0.752	API 5L Grade X80M PSL2	2075	2075	3 LPE	YES

NOTES:

GENERAL:
1. THE CENTRELINE IS BASED ON PRE-FEED ROUTE REV. C.
2. THE CROSSING DESIGN IS CONCEPTUAL AND IS TO BE CONFIRMED DURING DETAILED ENGINEERING.
3. ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE NOTED.
4. THE CROSSING SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH APPROPRIATE ASME, FERC AND LOCAL REGULATIONS IN EFFECT AT THE TIME OF CONSTRUCTION.
5. THE GROUND PROFILE IS BASED ON LIDAR OBTAINED IN 2014. ELEVATIONS ARE GEODETIC.

CROSSING INSTALLATION METHOD:
6. THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED FOR LATE FALL OR WINTER.
7. THE CROSSING IS CURRENTLY PROPOSED TO BE INSTALLED USING AN OPEN-CUT METHOD. FINAL CROSSING METHODOLOGY WILL BE DETERMINED DURING DETAILED ENGINEERING.
8. THE PRIMARY VEHICLE CROSSING METHOD IS AN ICE BRIDGE.

CROSSING BURIAL DESIGN:
9. THE PIPELINE IS, AT A MINIMUM, TO BE INSTALLED/PLACED BELOW THE 1 IN 100 YEAR SCOUR DEPTH.
10. CCC WILL BE ADDED FOR BUOYANCY CONTROL.

MITIGATIVE MEASURES:
11. REFER TO THE AK LNG PROJECT WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES DOCUMENT FOR MITIGATION AND REHABILITATION MEASURES.

SOIL CONDITIONS:
12. THE EXPECTED SOIL CONDITIONS, BASED ON AVAILABLE SUBSURFACE DATA OR TERRAIN MAPPING, CONSIST OF SANDY GRAVEL AND GRAVELLY SAND WITH COBBLES AND BOULDERS. FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZZ-00-000054-000. FURTHER INVESTIGATION IS REQUIRED TO CONFIRM THE EXPECTED CONDITIONS.

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LOCATION PLAN
NTS

REFERENCE DRAWINGS

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
ASME	-	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ATWS	-	ADDITIONAL TEMPORARY WORK SPACE
CVR	-	COVER
CCC	-	CONTINUOUS CONCRETE COATING
FERC	-	FEDERAL ENERGY REGULATORY COMMISSION
LIDAR	-	LIGHT DETECTION AND RANGING
MIN	-	MINIMUM
MOP	-	MAXIMUM OPERATING PRESSURE
MP	-	MILE POST
MSL	-	MEAN SEA LEVEL
NAD	-	NORTH AMERICAN DATUM 1983
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NSRS 2007	-	NATIONAL SPATIAL REFERENCE SYSTEM 2007
psig	-	POUNDS PER SQUARE INCH GAUGE
3LPE	-	THREE LAYER POLYETHYLENE

LEGEND:
- 2016 BOREHOLE

PRELIMINARY ONLY NOT FOR CONSTRUCTION

ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REVIS/ ENG'R	RESP. CODE	APP'D
0	20160628	LW / RB	ISSUED FOR USE	-	-	JT

WorleyParsons resources & energy

ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG

ALASKA LNG PIPELINE PROJECT
BELUGA RIVER @ MP 757.320
WPC 389-C
OPEN CUT CROSSING PLAN & PROFILE

DRAWN BY	DATE	SCALE	CHK'D / APP'D
LW	20160422	AS SHOWN	-

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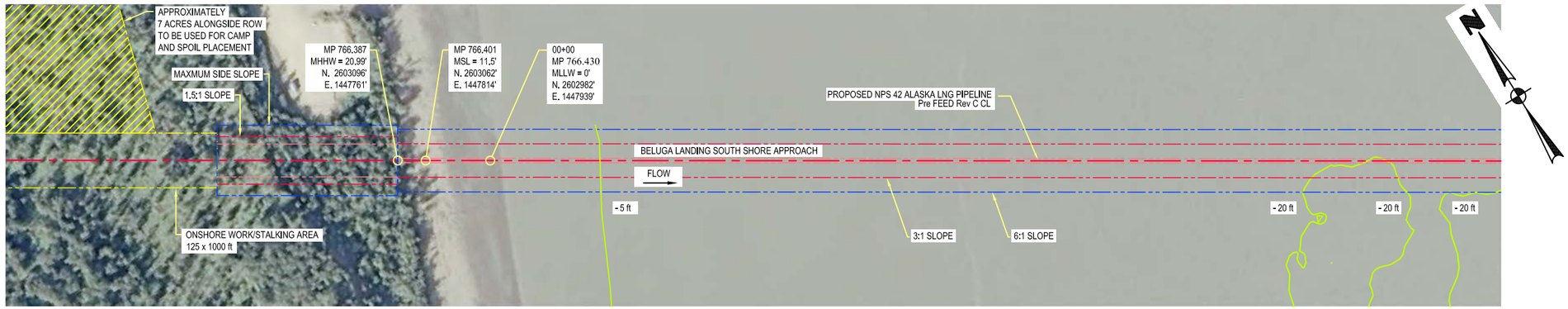
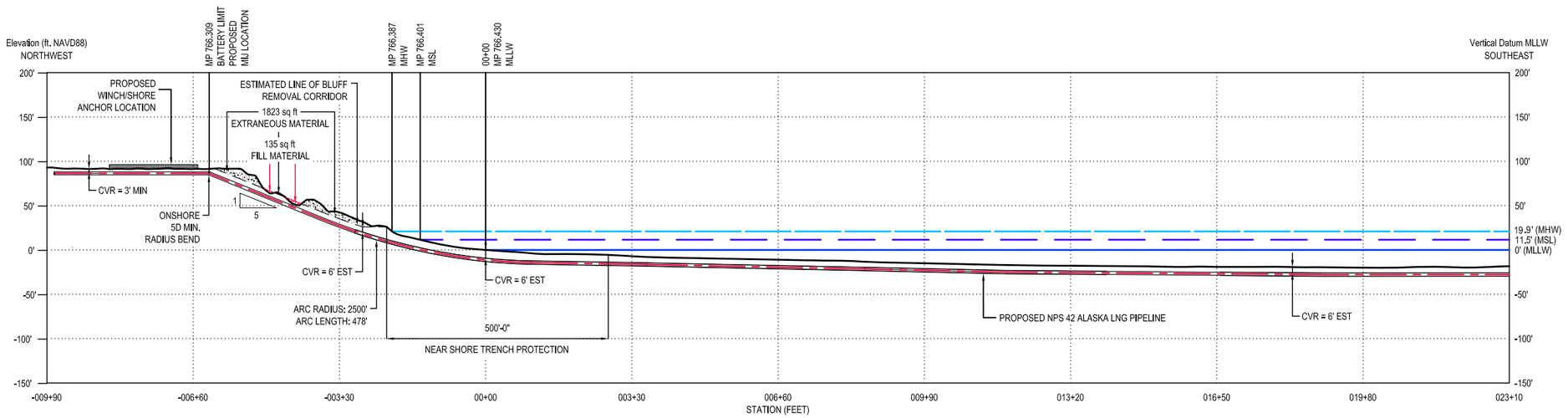


DETAIL PLAN
SCALE: 1" = 128'



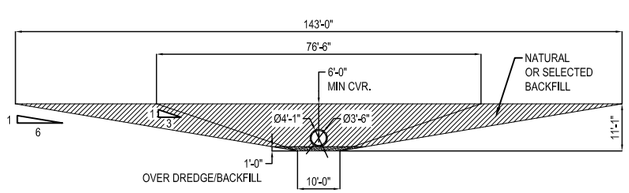
PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

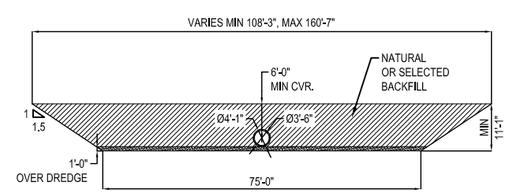
PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	1.25	API 5L Grade X65	1700	2075	3.5" CWC	SA

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASK ZONE 4
COORDINATES @ MP 766.430 N. 2602982' E. 1447939'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²



ON SHORE TRENCH
ABOVE MHHW
SCALE 1" = 16'
AREA 1.5:1 = 1016 ft²

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. FOR PRELIMINARY SUBSOIL INFORMATION REFER TO USAP-WP-GRZZZ-00-000035-000 (COOK INLET SHORELINE CROSSINGS – PRELIMINARY ENGINEERING GEOLOGY MODEL REPORT).
3. MINIMUM BEND RADIUS FOR PIPELINE BELOW MHHW IS 2500 ft, UNLESS OTHERWISE NOTED.
4. SHEET 1 OR 2 ARE USED INTERCHANGEABLY DEPENDING ON METHOD SELECTED.
5. ACTUAL TRENCH SLOPE PROFILE SUBJECT TO GEOTECH CONDITIONS, RANGE IS CONSIDERED POSSIBLE MIN/MAX.
6. TYPE AND EXTENT OF NEARSHORE TRENCH PROTECTION TBD.
7. the ESTIMATED EXCAVATION VOLUME IS 27800 CUBIC YARDS.

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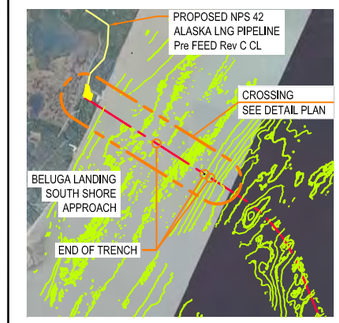

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDPAL-00-000002	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDMAP-00-000004-000	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
SHORTY CREEK MAP 01	PRELIMINARY GEOLOGY MODEL

ABBREVIATIONS & ACRONYMS

API - AMERICAN PETROLEUM INSTITUTE
BOP - BOTTOM OF PIPE
CVR - COVER
CWC - CONCRETE WEIGHT COATING
DEM - DIGITAL ELEVATION MODEL
DMT - DIRECTIONAL MICROTUNNELLING
EST - ESTIMATED
HDD - HORIZONTAL DIRECTIONAL DRILLING
LIDAR - LIGHT DETECTION AND RANGING
MHHW - MEAN HIGHER HIGH WATER
MIJ - MONOLITHIC ISOLATION JOINT
MLLW - MEAN LOWER LOW WATER
MOP - MAXIMUM OPERATING PRESSURE
MP - MILE POST
MSL - MEAN SEA LEVEL
NAVD88 - NORTH AMERICAN VERTICAL DATUM OF 1988
NDZ - NO DRILL ZONE
psi - POUNDS PER SQUARE INCH
SA - SACRIFICIAL ANODE
TOP - TOP OF PIPE
3LPE - THREE LAYER POLYETHYLENE
3LPP - THREE LAYER POLYPROPYLENE

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ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REV'R/ END'R	RESP. CODE	APP'D
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WorleyParsons resources & energy

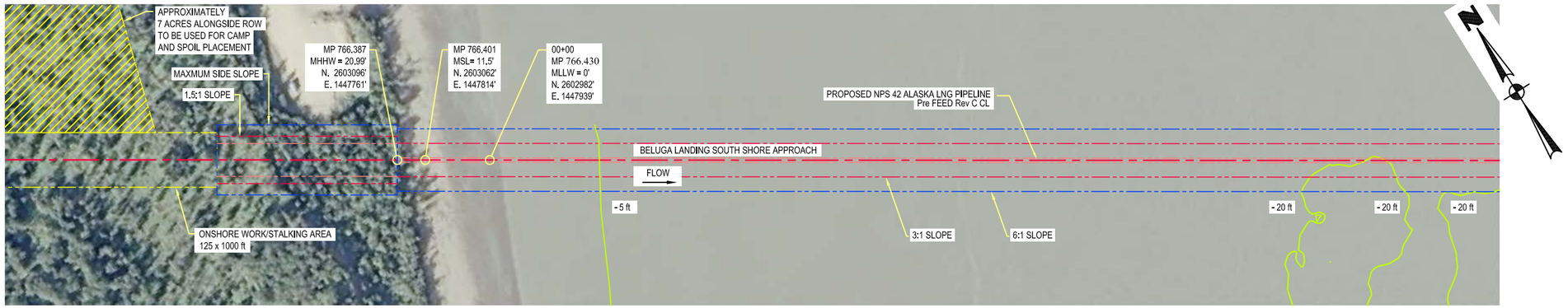
ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

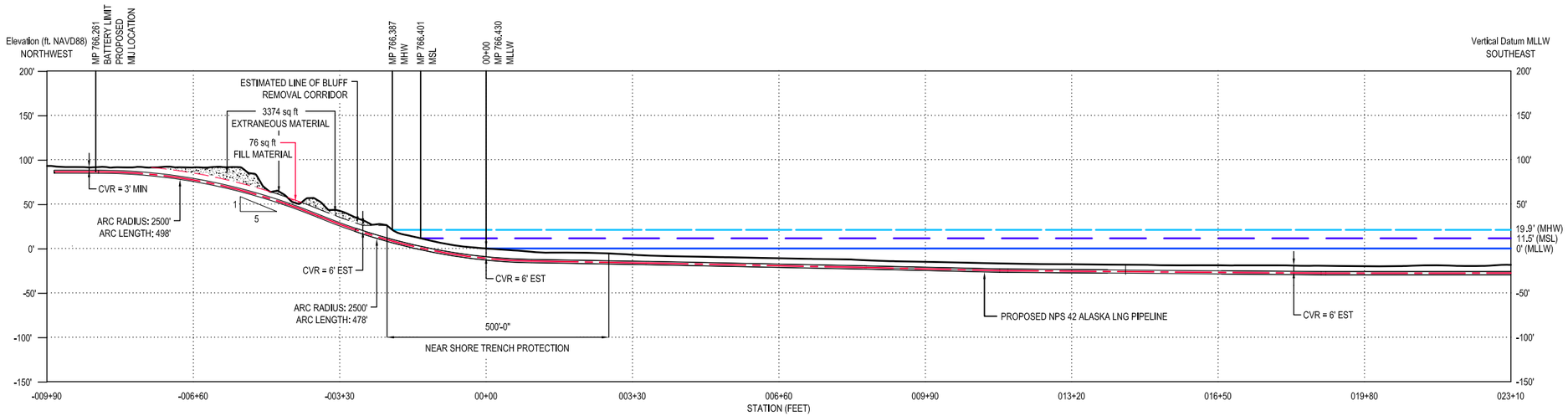
ALASKA LNG PIPELINE PROJECT
BELUGA LANDING SOUTH SHORE APPROACH @ MP 766.430
SHEET 1 OF 4
OPEN CUT CROSSING PLAN & PROFILE PULL FROM ONSHORE WINCH

DRAWN BY	DATE	SCALE	CHK'D / APPV'D
LW	20150501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000069-001 | ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



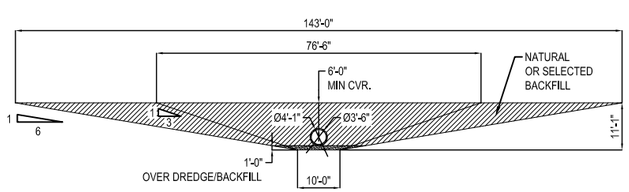
PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

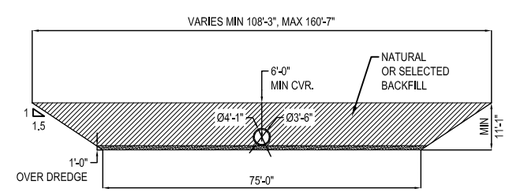
PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	1.25	API 5L Grade X65	1700	2075	3.5" CWC	SA

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASK ZONE 4
COORDINATES @ MP 766.430 N. 2602982' E. 1447939'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²



ON SHORE TRENCH
ABOVE MHHW
SCALE 1" = 16'
AREA 1.5:1 = 1016 ft²

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. FOR PRELIMINARY SUBSOIL INFORMATION REFER TO USAP-WP-GRZZZ-00-000035-000 (COOK INLET SHORELINE CROSSINGS – PRELIMINARY ENGINEERING GEOLOGY MODEL REPORT).
3. MINIMUM BEND RADIUS FOR PIPELINE BELOW MHHW IS 2500 ft, UNLESS OTHERWISE NOTED.
4. SHEET 1 OR 2 ARE USED INTERCHANGEABLY DEPENDING ON METHOD SELECTED.
5. ACTUAL TRENCH SLOPE PROFILE SUBJECT TO GEOTECH CONDITIONS, RANGE IS CONSIDERED POSSIBLE MIN/MAX.
6. TYPE AND EXTENT OF NEARSHORE TRENCH PROTECTION TBD.
7. TOTAL AREA OF ONSHORE CUT ABOVE MHHW IS 9083 sq ft.
8. THE ESTIMATED EXCAVATION VOLUME IS 55500 CUBIC YARDS.

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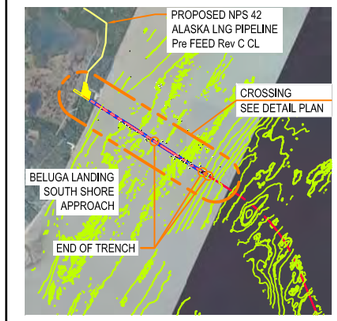

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDPAL-00-000002	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDMAP-00-000004-000	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
SHORTY CREEK MAP 01	PRELIMINARY GEOLOGY MODEL

ABBREVIATIONS & ACRONYMS

API - AMERICAN PETROLEUM INSTITUTE
BOP - BOTTOM OF PIPE
CVR - COVER
CWC - CONCRETE WEIGHT COATING
DEM - DIGITAL ELEVATION MODEL
DMT - DIRECTIONAL MICROTUNNELLING
EST - ESTIMATED
HDD - HORIZONTAL DIRECTIONAL DRILLING
LIDAR - LIGHT DETECTION AND RANGING
MHHW - MEAN HIGHER HIGH WATER
MIJ - MONOLITHIC ISOLATION JOINT
MLLW - MEAN LOWER LOW WATER
MOP - MAXIMUM OPERATING PRESSURE
MP - MILE POST
MSL - MEAN SEA LEVEL
NAVD88 - NORTH AMERICAN VERTICAL DATUM OF 1988
NDZ - NO DRILL ZONE
psi - POUNDS PER SQUARE INCH
SA - SACRIFICIAL ANODE
TOP - TOP OF PIPE
3LPE - THREE LAYER POLYETHYLENE
3LPP - THREE LAYER POLYPROPYLENE

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ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REV'R/ END'R	RESP. CODE	APP'D
0	20160616	LW / DN	ISSUED FOR USE	-	-	JT

WorleyParsons resources & energy

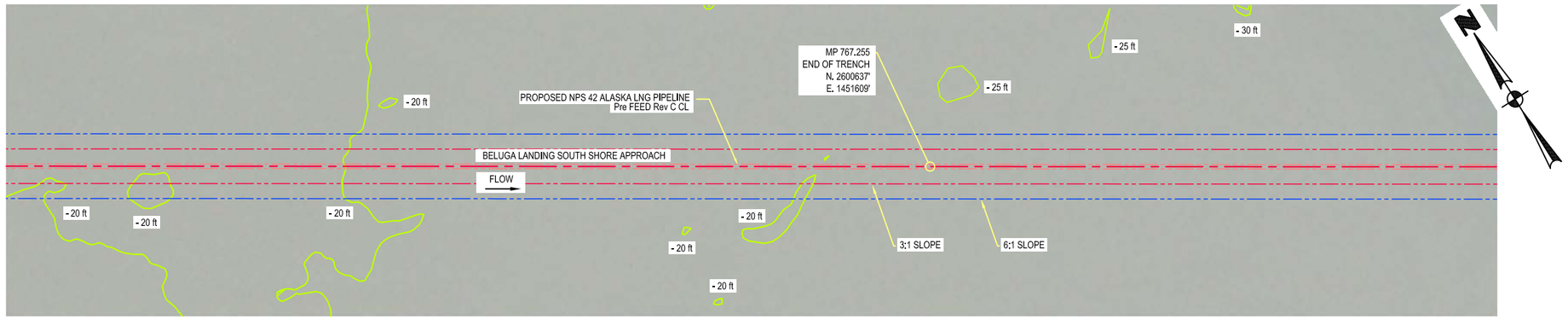
ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

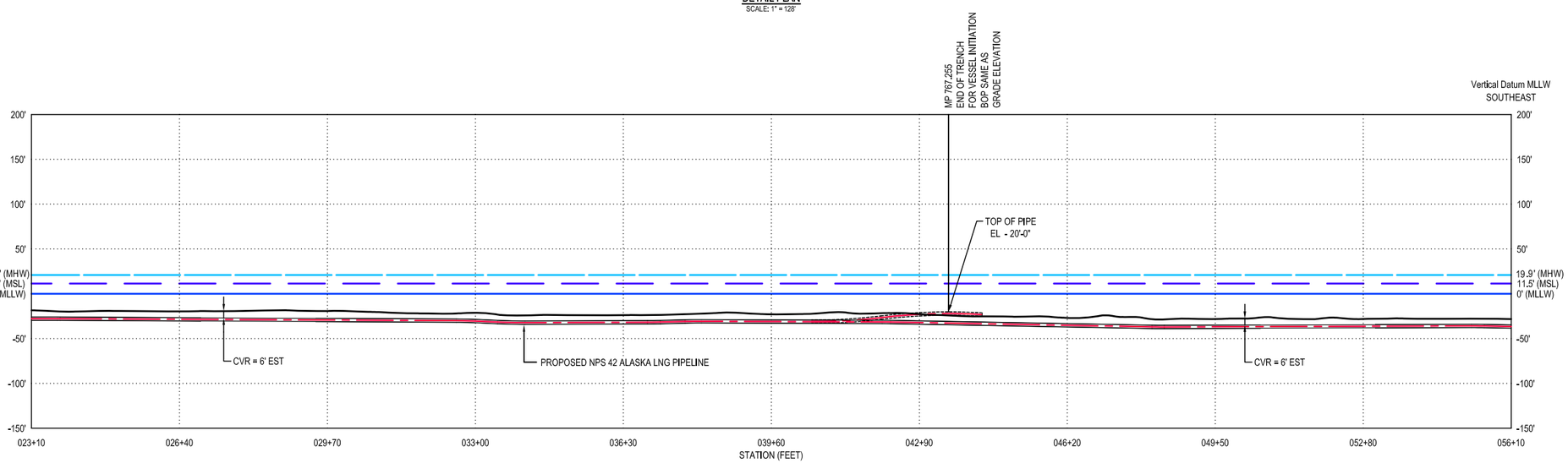
ALASKA LNG PIPELINE PROJECT
BELUGA LANDING SOUTH SHORE APPROACH @ MP 766.430
SHEET 2 OF 4
OPEN CUT CROSSING PLAN & PROFILE PULL FROM OFFSHORE WINCH

DRAWN BY	DATE	SCALE	CHK'D / APP'D
LW	20150501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000069-002 ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



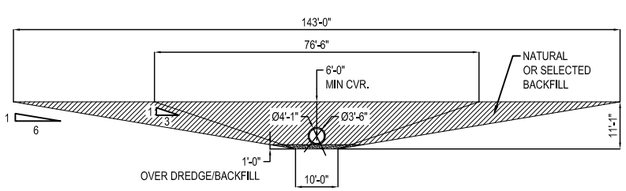
PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	1.25	API 5L Grade X65	1700	2075	3.5" CWC	SA

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASK ZONE 4
COORDINATES @ MP 766.430 N. 2602982' E. 1447939'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. FOR PRELIMINARY SUBSOIL INFORMATION REFER TO USAP-WP-GRZZZ-00-000035-000 (COOK INLET SHORELINE CROSSINGS – PRELIMINARY ENGINEERING GEOLOGY MODEL REPORT).
3. MINIMUM BEND RADIUS FOR PIPELINE BELOW MHHW IS 2500 ft, UNLESS OTHERWISE NOTED.
4. SHEET 3-4 ARE CONTINUATIONS FROM SHEET 1 OR 2.

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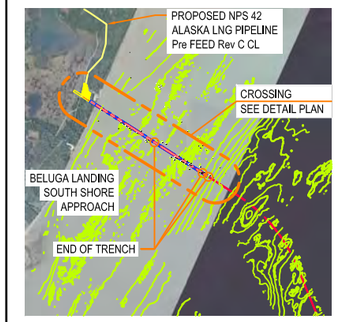

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDPAL-00-000002	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDMAP-00-000004-000	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
SHORTY CREEK MAP 01	PRELIMINARY GEOLOGY MODEL

ABBREVIATIONS & ACRONYMS

API - AMERICAN PETROLEUM INSTITUTE
BOP - BOTTOM OF PIPE
CVR - COVER
CWC - CONCRETE WEIGHT COATING
DEM - DIGITAL ELEVATION MODEL
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EST - ESTIMATED
HDD - HORIZONTAL DIRECTIONAL DRILLING
LIDAR - LIGHT DETECTION AND RANGING
MHHW - MEAN HIGHER HIGH WATER
MIJ - MONOLITHIC ISOLATION JOINT
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MOP - MAXIMUM OPERATING PRESSURE
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NAVD88 - NORTH AMERICAN VERTICAL DATUM OF 1988
NDZ - NO DRILL ZONE
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ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REV'R/ END'R	RESP. CODE	APP'D
0	20160616	LW / DN	ISSUED FOR USE	-	-	JT

WorleyParsons resources & energy

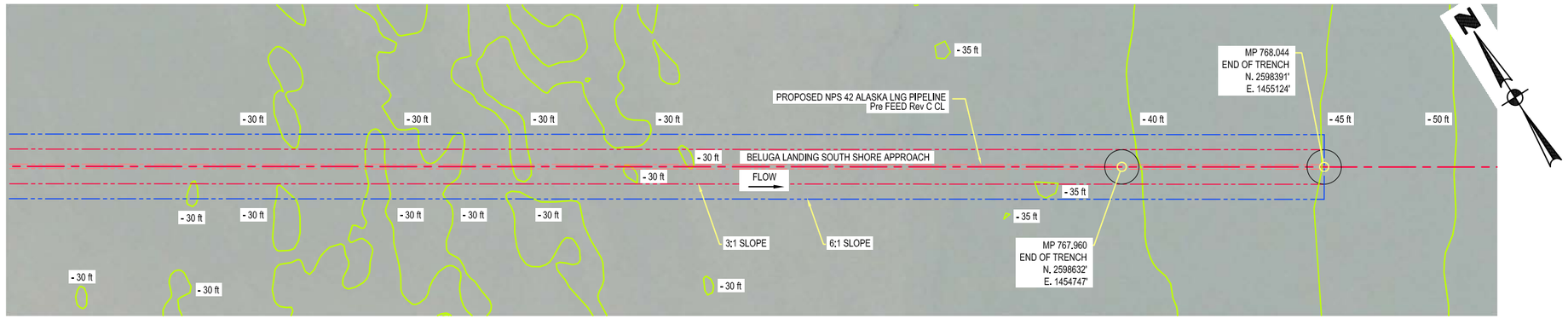
ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

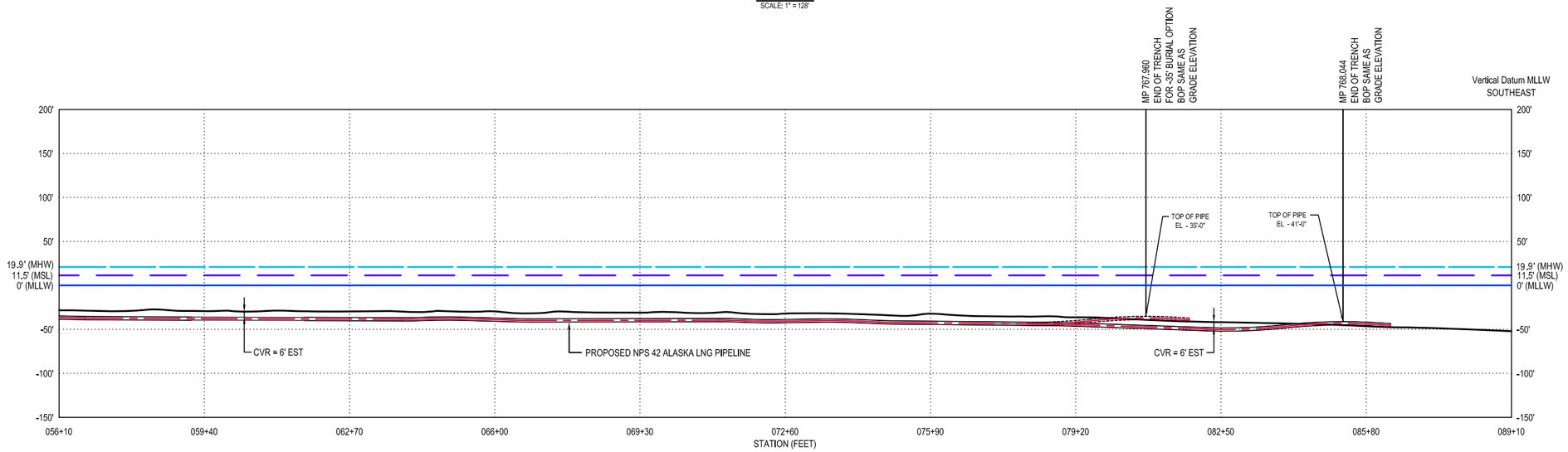
ALASKA LNG PIPELINE PROJECT
BELUGA LANDING SOUTH SHORE APPROACH @ MP 766.430
SHEET 3 OF 4
OPEN CUT CROSSING PLAN & PROFILE PULL FROM BEACH/VESSEL

DRAWN BY	DATE	SCALE	CHK'D / APP'D
LW	20160501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000069-003
ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



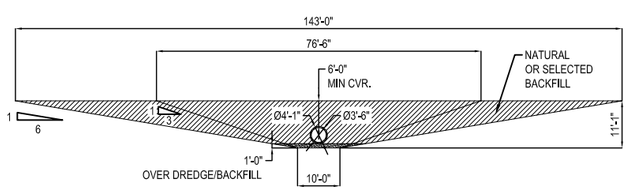
PROFILE ALONG PROPOSED NPS 42 ALASKA PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	1.25	API 5L Grade X65	1700	2075	3.5" CWC	SA

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASK ZONE 4
COORDINATES @ MP 766.430 N. 2602982' E. 1447939'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. FOR PRELIMINARY SUBSOIL INFORMATION REFER TO USAP-WP-GRZZZ-00-000035-000 (COOK INLET SHORELINE CROSSINGS – PRELIMINARY ENGINEERING GEOLOGY MODEL REPORT).
3. MINIMUM BEND RADIUS FOR PIPELINE BELOW MHHW IS 2500 ft, UNLESS OTHERWISE NOTED.

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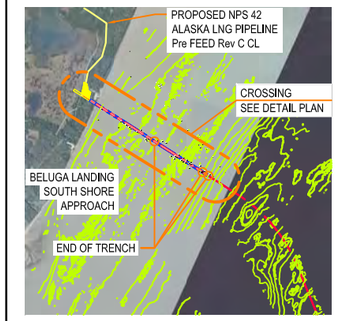

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDPAL-00-000002	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDMAP-00-000004-000	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
SHORTY CREEK MAP 01	PRELIMINARY GEOLOGY MODEL

ABBREVIATIONS & ACRONYMS

API - AMERICAN PETROLEUM INSTITUTE
BOP - BOTTOM OF PIPE
CVR - COVER
CWC - CONCRETE WEIGHT COATING
DEM - DIGITAL ELEVATION MODEL
DMT - DIRECTIONAL MICROTUNNELLING
EST - ESTIMATED
HDD - HORIZONTAL DIRECTIONAL DRILLING
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MHHW - MEAN HIGHER HIGH WATER
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MOP - MAXIMUM OPERATING PRESSURE
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NAVD88 - NORTH AMERICAN VERTICAL DATUM OF 1988
NDZ - NO DRILL ZONE
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TOP - TOP OF PIPE
3LPE - THREE LAYER POLYETHYLENE
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0	20160616	LW / DN	ISSUED FOR USE	-	-	JT

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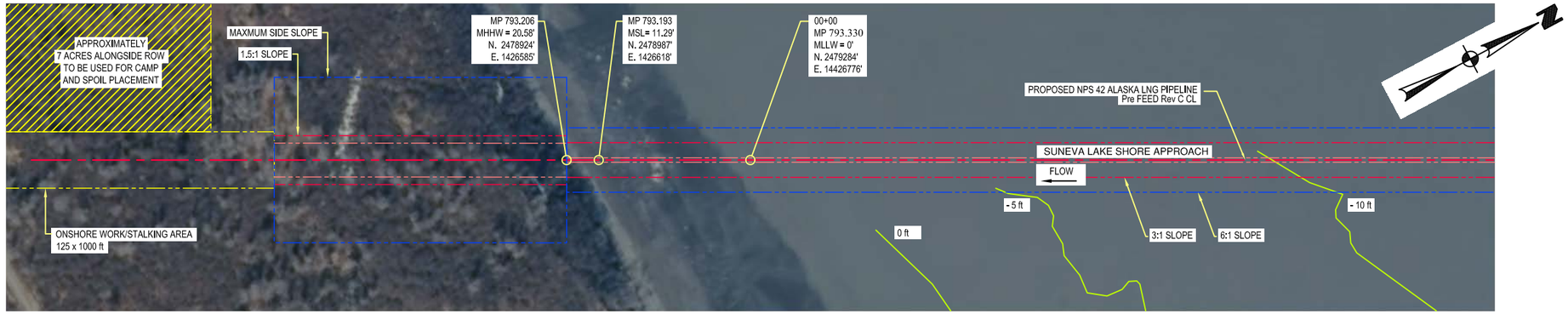
ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

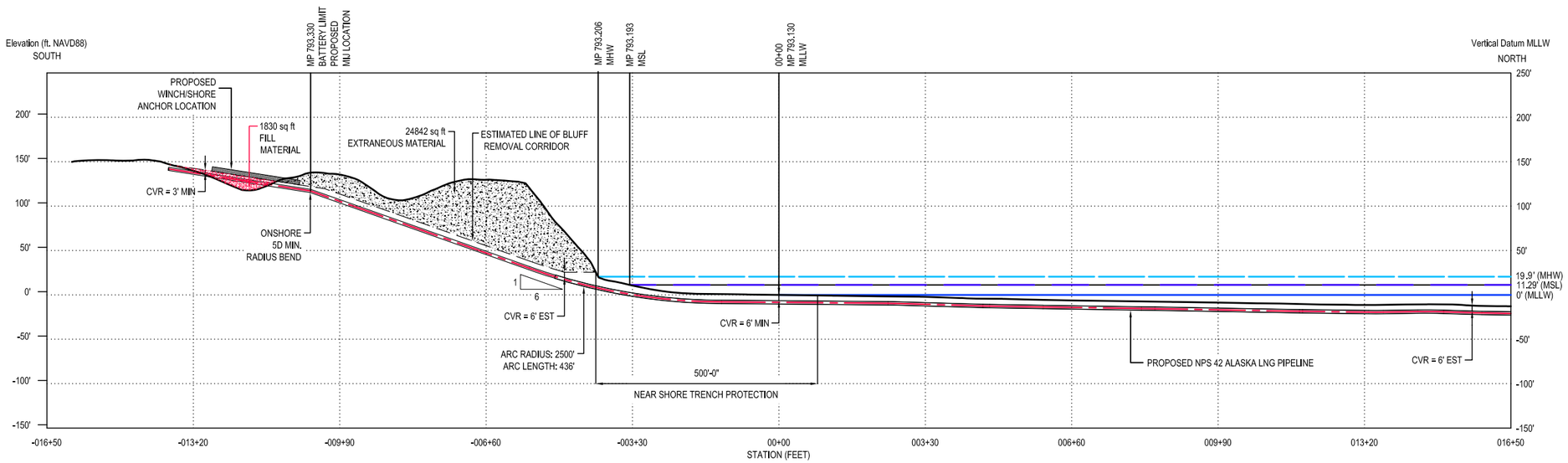
ALASKA LNG PIPELINE PROJECT
BELUGA LANDING SOUTH SHORE APPROACH @ MP 766.430
SHEET 4 OF 4
OPEN CUT CROSSING PLAN & PROFILE PULL FROM BEACH/VESSEL

DRAWN BY	DATE	SCALE	CHKD / APPVD
LW	20160501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000069-004
ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



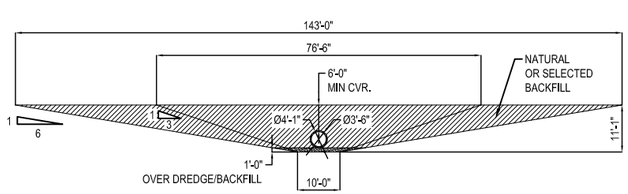
PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

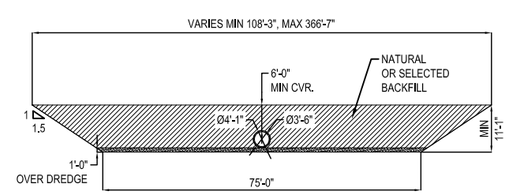
PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP (Psi)	DESIGN PRESSURE (Psi)	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	1.25	API 5L Grade X65	1700	2075	3.5" CWC	SA

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASK ZONE 4
COORDINATES @ MP 793.130 N. 2479284' E. 1426776'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²



ON SHORE TRENCH
ABOVE MHHW
SCALE 1" = 16'
AREA 1.5:1 = 1016 ft²

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. FOR PRELIMINARY SUBSOIL INFORMATION REFER TO USAP-WP-GRZZZ-00-000035-000 (COOK INLET SHORELINE CROSSINGS – PRELIMINARY ENGINEERING GEOLOGY MODEL REPORT).
3. MINIMUM BEND RADIUS FOR PIPELINE BELOW MHHW IS 2500 ft, UNLESS OTHERWISE NOTED.
4. SHEET 1 OR 2 ARE USED INTERCHANGEABLY DEPENDING ON METHOD SELECTED.
5. ACTUAL TRENCH SLOPE PROFILE SUBJECT TO GEOTECH CONDITIONS, RANGE IS CONSIDERED POSSIBLE MIN/MAX.
6. TYPE AND EXTENT OF NEARSHORE TRENCH PROTECTION TBD.
7. THE ESTIMATED EXCAVATION VOLUME IS 176800 CUBIC YARDS.

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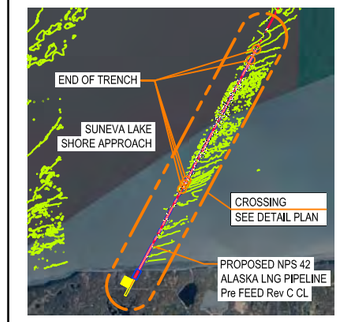

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDDPAL-00-000002-000	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDDET-00-000001-004	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
BOULDER POINT MAP 01	PRELIMINARY GEOLOGY MODEL

ABBREVIATIONS & ACRONYMS

API	- AMERICAN PETROLEUM INSTITUTE
BOP	- BOTTOM OF PIPE
CVR	- COVER
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0	20160616	LW / DN	ISSUED FOR USE	/	-	JT

WorleyParsons resources & energy

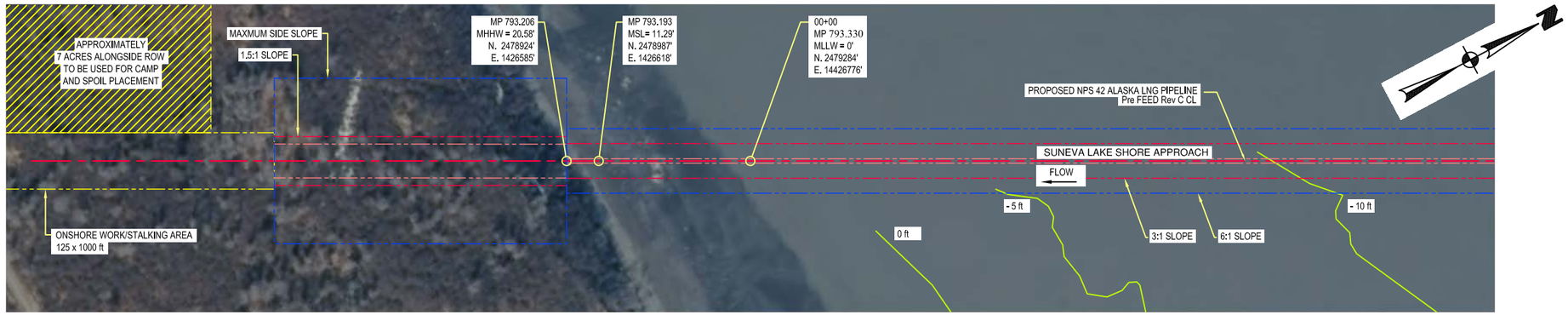
ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

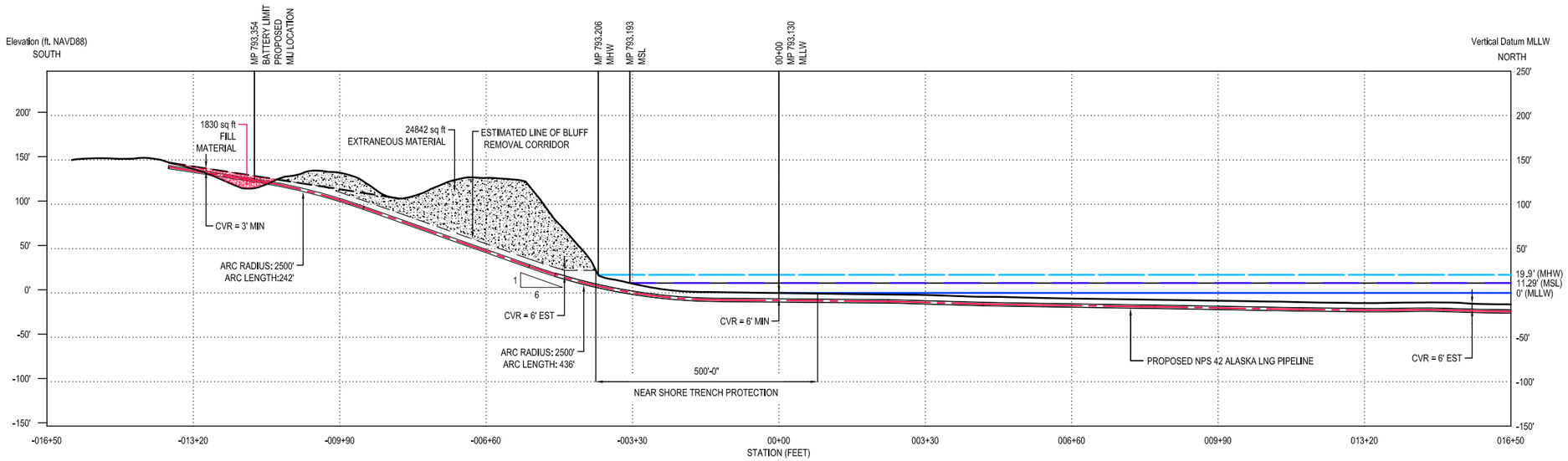
ALASKA LNG PIPELINE PROJECT
SUNEVA LAKE SHORE APPROACH @ MP 793.130
SHEET 1 OF 7
OPEN CUT CROSSING PLAN & PROFILE PULL FROM ONSHORE WINCH

DRAWN BY	DATE	SCALE	CHK'D / APPV'D
LW	20150501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000070-001 | ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
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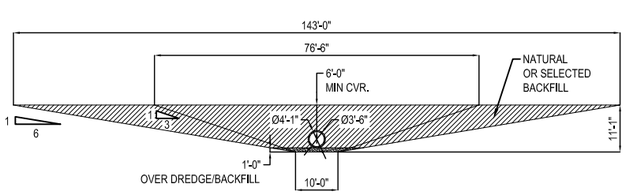
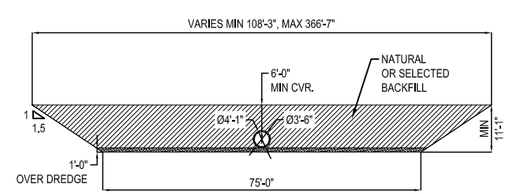
COORDINATES @ MP 793.130 N. 2479284' E. 1426776'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²



ON SHORE TRENCH
ABOVE MHHW
SCALE 1" = 16'
AREA 1.5:1 = 1016 ft²

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. FOR PRELIMINARY SUBSOIL INFORMATION REFER TO USAP-WP-GRZZZ-00-000035-000 (COOK INLET SHORELINE CROSSINGS – PRELIMINARY ENGINEERING GEOLOGY MODEL REPORT).
3. MINIMUM BEND RADIUS FOR PIPELINE BELOW MHHW IS 2500 ft, UNLESS OTHERWISE NOTED.
4. SHEET 1 OR 2 ARE USED INTERCHANGEABLY DEPENDING ON METHOD SELECTED.
5. ACTUAL TRENCH SLOPE PROFILE SUBJECT TO GEOTECH CONDITIONS, RANGE IS CONSIDERED POSSIBLE MIN/MAX.
6. TYPE AND EXTENT OF NEARSHORE TRENCH PROTECTION TBD.
7. TOTAL AREA OF ONSHORE CUT ABOVE MHHW IS 35420 sq ft.
8. THE ESTIMATED EXCAVATION VOLUME IS 216500 CUBIC YARDS.

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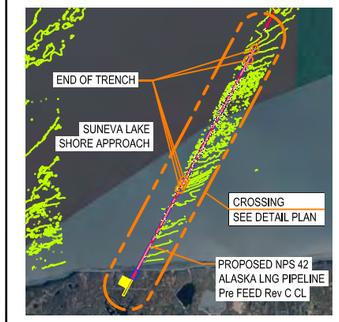


LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDDPAL-00-000002-000	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDDET-00-000001-004	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
BOULDER POINT MAP 01	PRELIMINARY GEOLOGY MODEL

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
BOP	-	BOTTOM OF PIPE
CVR	-	COVER
CWC	-	CONCRETE WEIGHT COATING
DEM	-	DIGITAL ELEVATION MODEL
DMT	-	DIRECTIONAL MICROTUNNELLING
HDD	-	HORIZONTAL DIRECTIONAL DRILLING
LIDAR	-	LIGHT DETECTION AND RANGING
MHHW	-	MEAN HIGHER HIGH WATER
MIJ	-	MONOLITHIC ISOLATION JOINT
MLLW	-	MEAN LOWER LOW WATER
MOP	-	MAXIMUM OPERATING PRESSURE
MP	-	MILE POST
MSL	-	MEAN SEA LEVEL
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NDZ	-	NO DRILL ZONE
psi	-	POUNDS PER SQUARE INCH
SA	-	SACRIFICIAL ANODE
TOP	-	TOP OF PIPE
3LPE	-	THREE LAYER POLYETHYLENE
3LPP	-	THREE LAYER POLYPROPYLENE

PRELIMINARY ONLY NOT FOR CONSTRUCTION

ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REV'R/ END'R	RESP. CODE	APP'D
0	20160616	LW / DN	ISSUED FOR USE	-	-	JT

WorleyParsons resources & energy

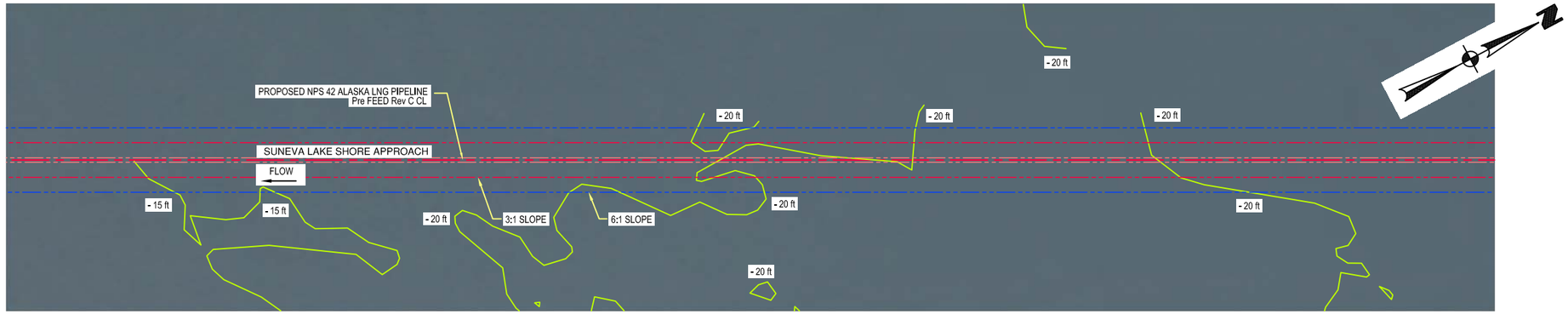
ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

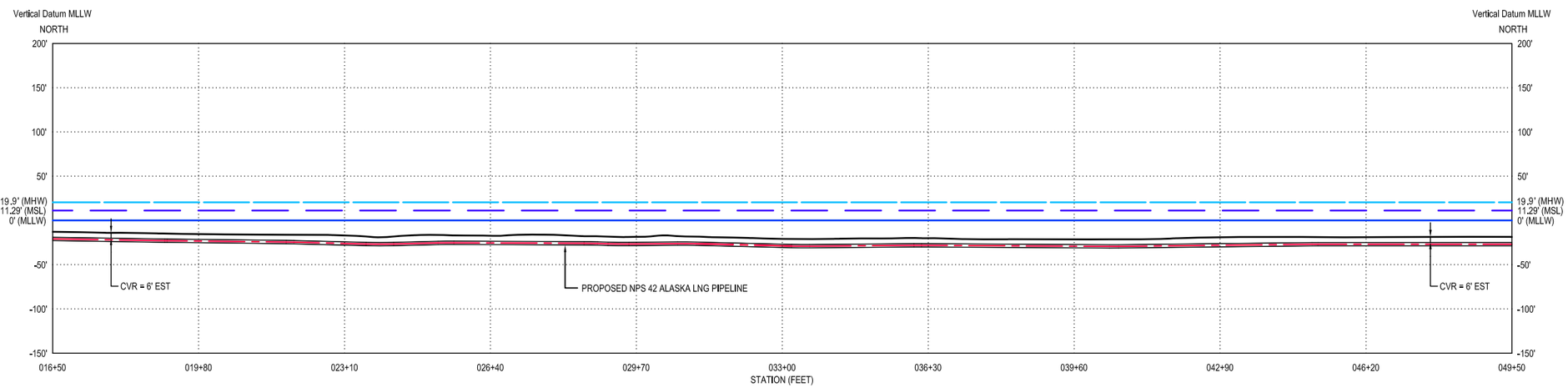
ALASKA LNG PIPELINE PROJECT
SUNEVA LAKE SHORE APPROACH @ MP 793.130
SHEET 2 OF 7
OPEN CUT CROSSING PLAN & PROFILE PULL FROM OFFSHORE WINCH

DRAWN BY	DATE	SCALE	CHK'D / APPV'D
LW	20150501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000070-002 ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



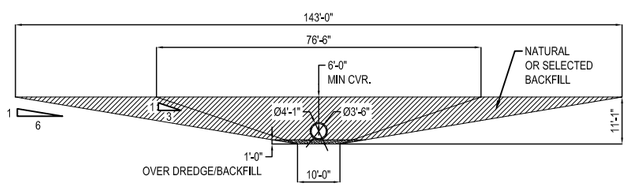
PROFILE ALONG PROPOSED NPS 42 ALASKA PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	1.25	API 5L Grade X65	1700	2075	3.5" CWC	SA

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASK ZONE 4
COORDINATES @ MP 793.130 N. 2479284' E. 1426776'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²

NOTES:

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4. SHEET 3-7 ARE CONTINUATIONS FROM SHEET 1 OR 2.

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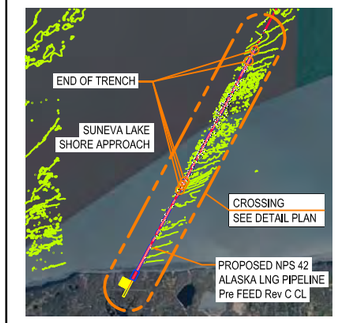

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDPAL-00-000002-000	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDDET-00-000004-000	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
BOULDER POINT MAP 01	PRELIMINARY GEOLOGY MODEL

ABBREVIATIONS & ACRONYMS

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BOP - BOTTOM OF PIPE
CVR - COVER
CWC - CONCRETE WEIGHT COATING
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EST - ESTIMATED
HDD - HORIZONTAL DIRECTIONAL DRILLING
LIDAR - LIGHT DETECTION AND RANGING
MHHW - MEAN HIGHER HIGH WATER
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MSL - MEAN SEA LEVEL
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0	20160616	LW / DN	ISSUED FOR USE	- / -	-	JT

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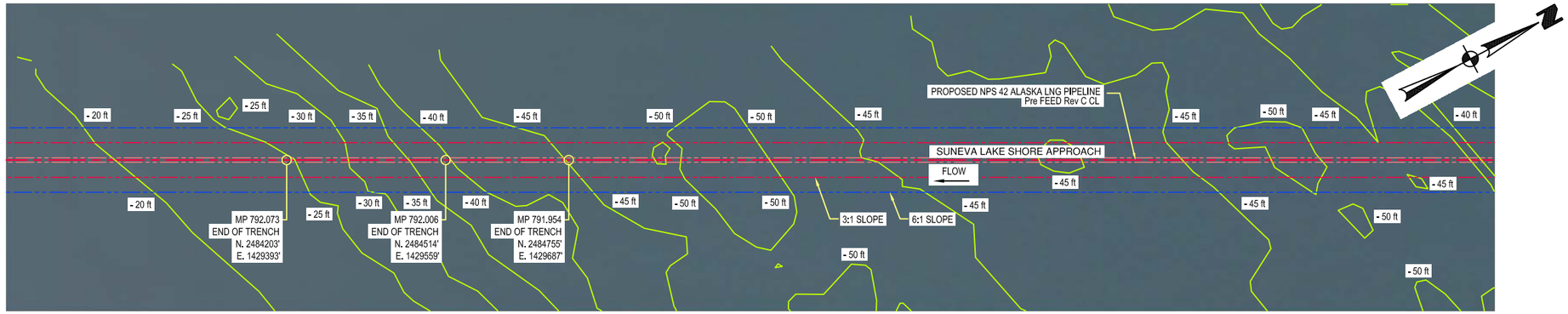
ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

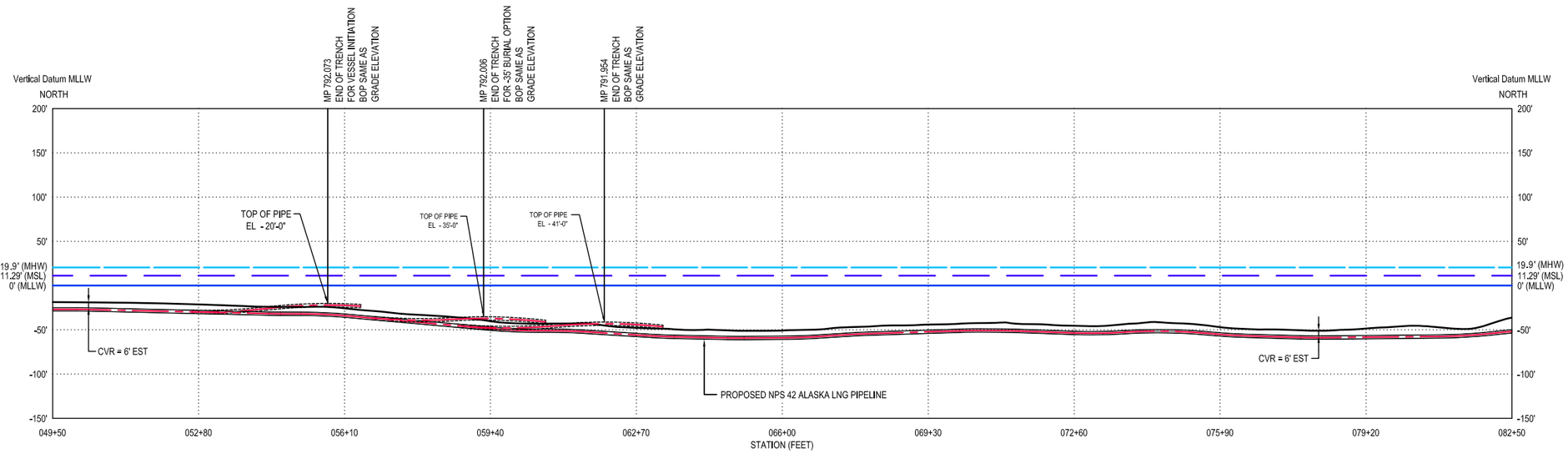
ALASKA LNG PIPELINE PROJECT
SUNEVA LAKE SHORE APPROACH @ MP 793.130
SHEET 3 OF 7
OPEN CUT CROSSING PLAN & PROFILE PULL FROM BEACH/VESSEL

DRAWN BY	DATE	SCALE	CHK'D / APP'D
LW	20160501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000070-003
ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



PROFILE ALONG PROPOSED NPS 42 ALASKA PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
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COORDINATES TABLE

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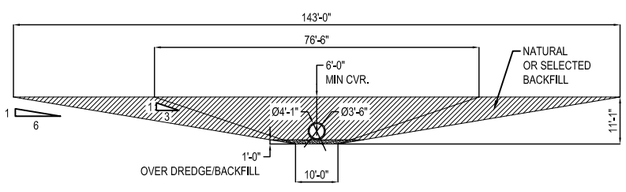
COORDINATES @ MP 793.130 N. 2479284' E. 1426776'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
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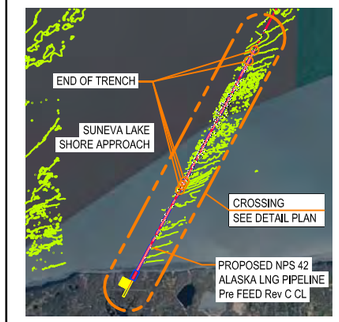

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDPAL-00-000002-000	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDDET-00-000004-000	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
BOULDER POINT MAP 01	PRELIMINARY GEOLOGY MODEL

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ISSUE	DATE	BY/ CHK'D	DESCRIPTION	REV'R/ END'R	RESP. CODE	APP'D
0	20160616	LW / DN	ISSUED FOR USE	-	-	JT

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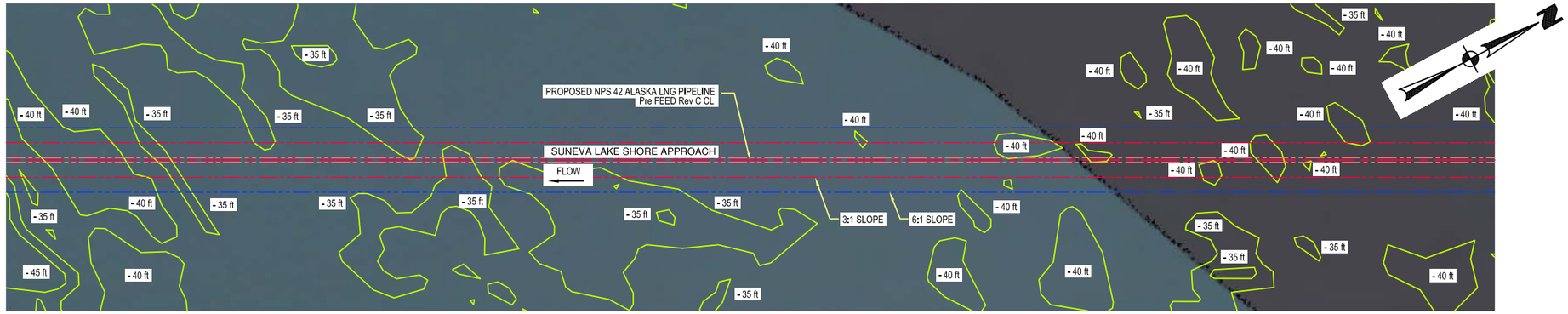
ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG

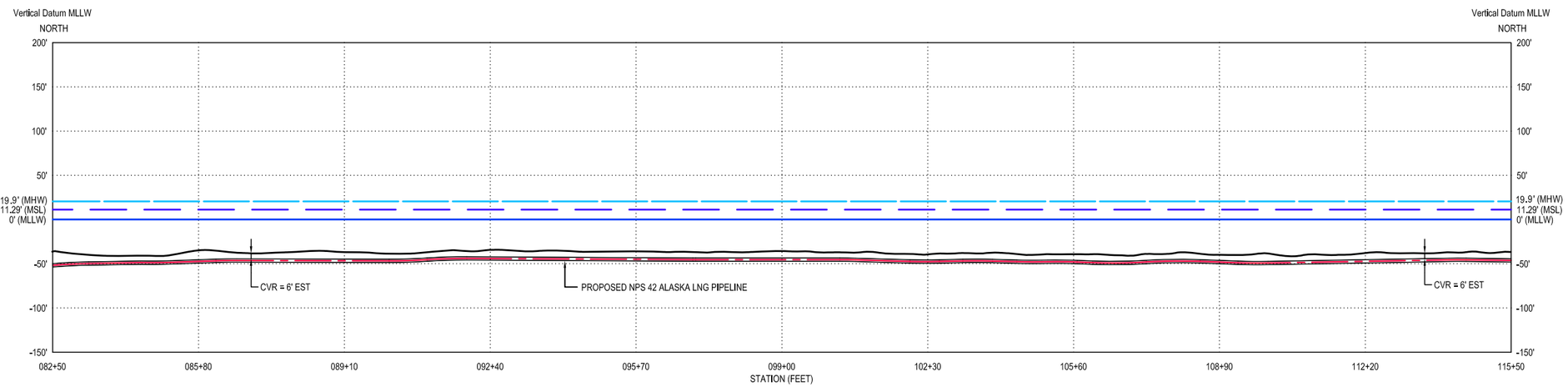
ALASKA LNG PIPELINE PROJECT
SUNEVA LAKE SHORE APPROACH @ MP 793.130
SHEET 4 OF 7
OPEN CUT CROSSING PLAN & PROFILE PULL FROM BEACH/VESSEL

DRAWN BY	DATE	SCALE	CHKD / APPVD
LW	20160501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000070-004
ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



PROFILE ALONG PROPOSED NPS 42 ALASKA PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
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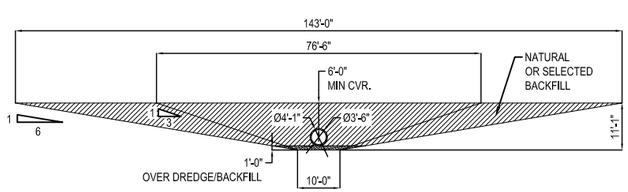

SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
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NOTES:

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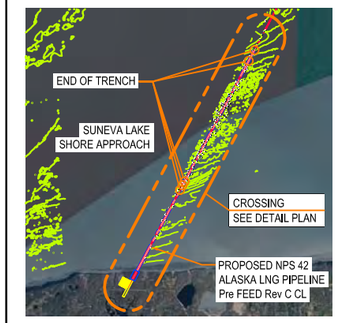

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDPAL-00-000002-000	OFFSHORE PIPELINE ALIGNMENT SHEETS
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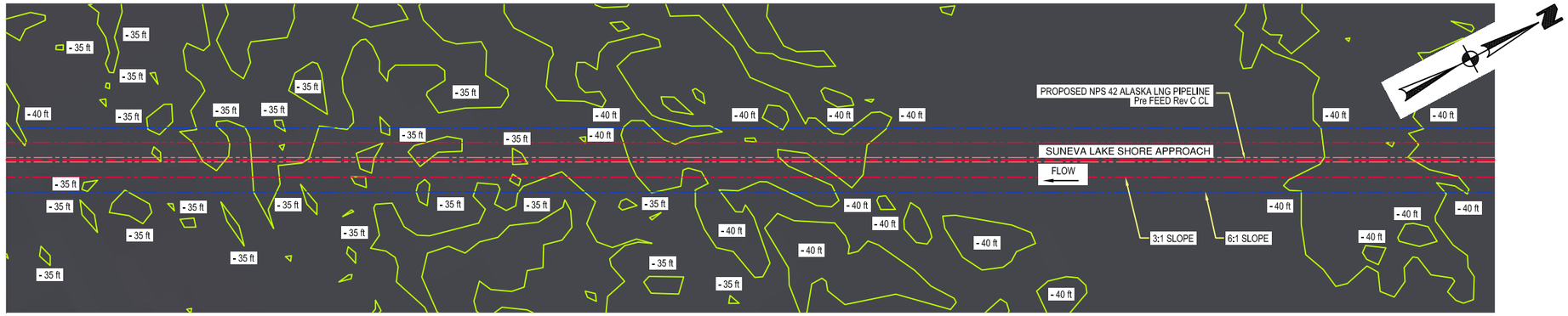
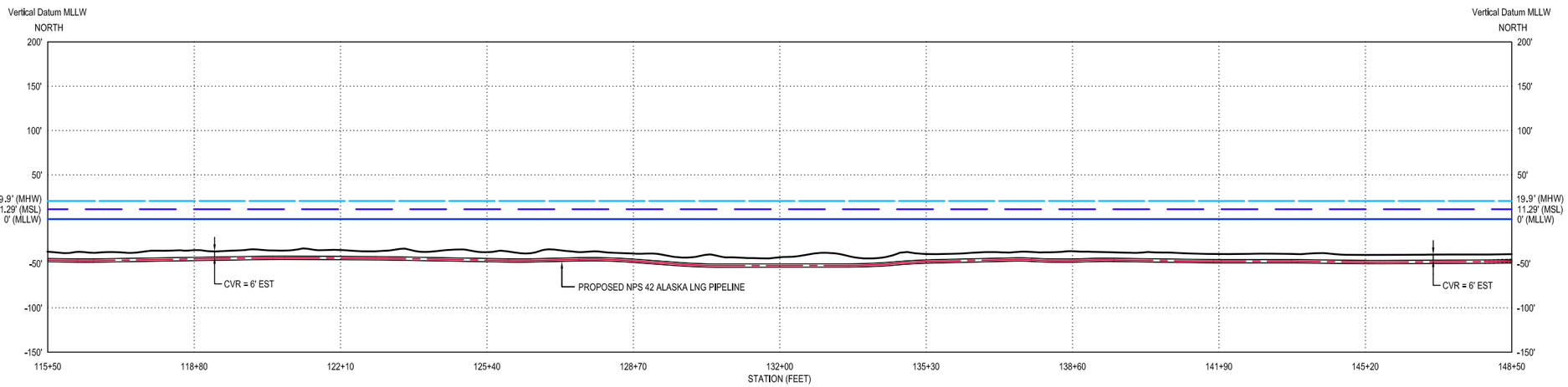
ALASKA LNG PIPELINE PROJECT
SUNEVA LAKE SHORE APPROACH @ MP 793.130
SHEET 5 OF 7
OPEN CUT CROSSING PLAN & PROFILE PULL FROM BEACH/VESSEL

DRAWN BY	DATE	SCALE	CHK'D / APPV'D
LW	20160501	AS SHOWN	DN / JT

DRAWING NO. USAP-WP-YDPLX-00-000070-005 ISSUE NO. 0



DETAIL PLAN
SCALE: 1" = 128'



PROFILE ALONG PROPOSED NPS 42 ALASKA PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
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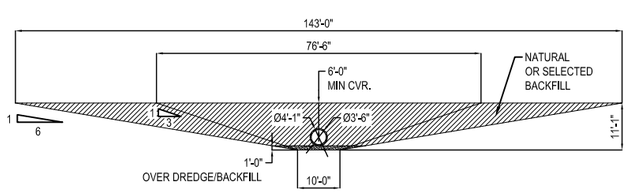

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BELOW MHHW
SCALE 1" = 16'
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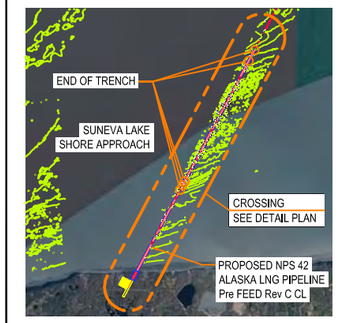

LOCATION PLAN
NTS

REFERENCE DRAWINGS

USAP-WP-YDPAL-00-000002-000	OFFSHORE PIPELINE ALIGNMENT SHEETS
USAP-WP-YDDET-00-000004-000	OFFSHORE PL ROUTE MAP (Rev C ROUTE)
BOULDER POINT MAP 01	PRELIMINARY GEOLOGY MODEL

ABBREVIATIONS & ACRONYMS

API	-	AMERICAN PETROLEUM INSTITUTE
BOP	-	BOTTOM OF PIPE
CVR	-	COVER
CWC	-	CONCRETE WEIGHT COATING
DEM	-	DIGITAL ELEVATION MODEL
DMT	-	DIRECTIONAL MICROTUNNELLING
EST	-	ESTIMATED
HDD	-	HORIZONTAL DIRECTIONAL DRILLING
LIDAR	-	LIGHT DETECTION AND RANGING
MHHW	-	MEAN HIGHER HIGH WATER
MIJ	-	MONOLITHIC ISOLATION JOINT
MLLW	-	MEAN LOWER LOW WATER
MOP	-	MAXIMUM OPERATING PRESSURE
MP	-	MILE POST
MSL	-	MEAN SEA LEVEL
NAVD88	-	NORTH AMERICAN VERTICAL DATUM OF 1988
NDZ	-	NO DRILL ZONE
psi	-	POUNDS PER SQUARE INCH
SA	-	SACRIFICIAL ANODE
TOP	-	TOP OF PIPE
3LPE	-	THREE LAYER POLYETHYLENE
3LPP	-	THREE LAYER POLYPROPYLENE

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ALASKA LNG PROJECT
LNG FACILITIES
Nikiski, Alaska

Alaska LNG™

ALASKA LNG PIPELINE PROJECT
SUNEVA LAKE SHORE APPROACH @ MP 793.130
SHEET 6 OF 7
OPEN CUT CROSSING PLAN & PROFILE PULL FROM BEACH/VESSEL

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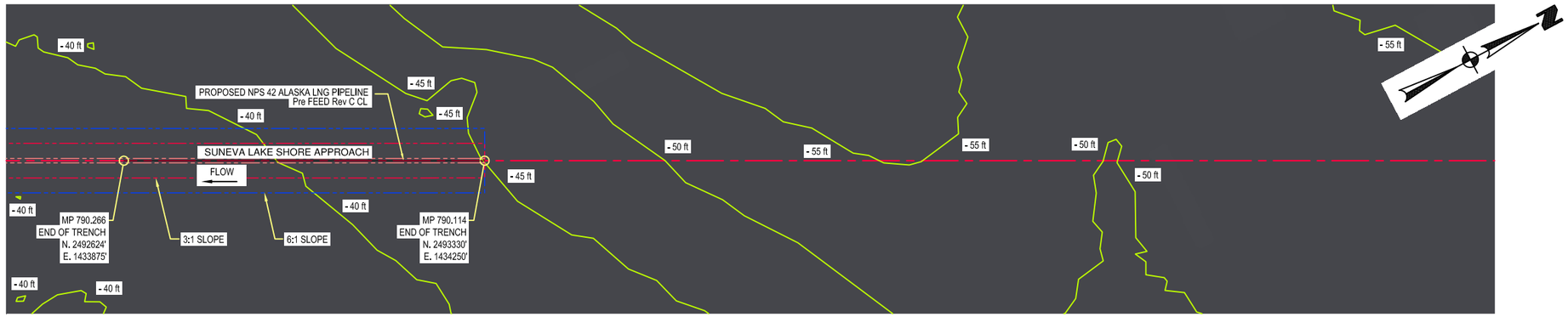
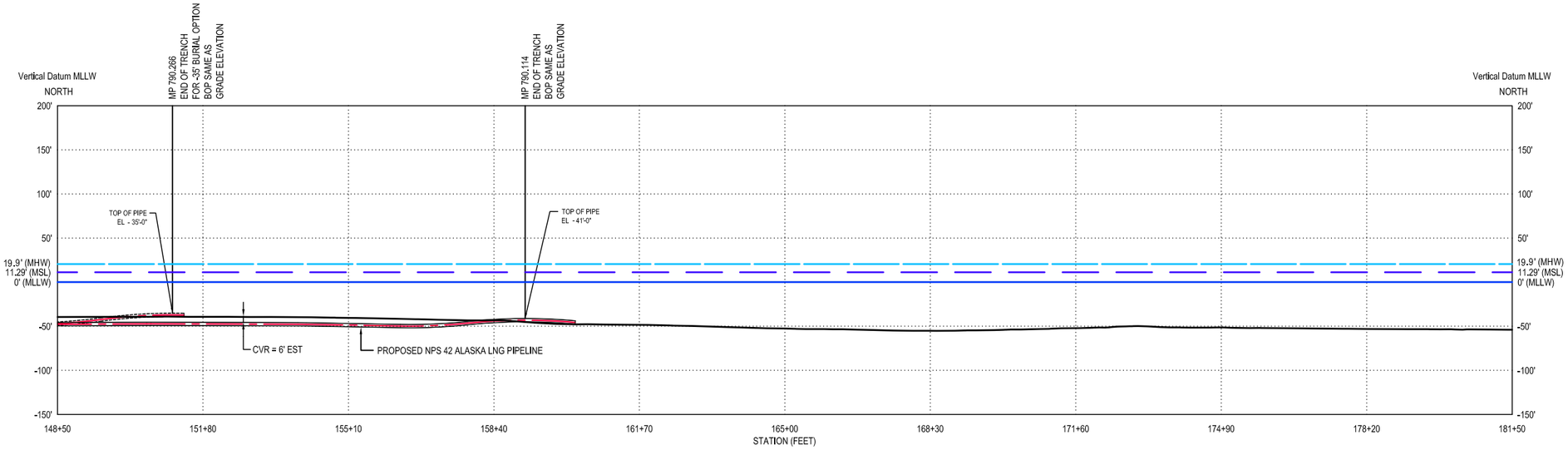


DETAIL PLAN
SCALE: 1" = 128'



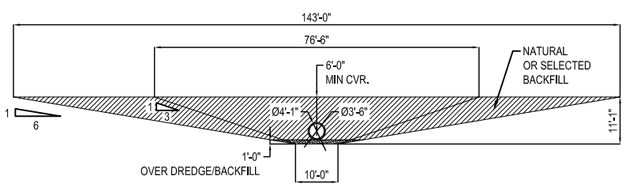
PROFILE ALONG PROPOSED NPS 42 ALASKA PIPELINE
HORIZONTAL SCALE 1" = 128'
VERTICAL SCALE 1" = 64'

PIPE SPECIFICATION TABLE

PIPE TYPE	PIPE SIZE	OD (inch)	WT (inch)	PIPE SPECIFICATION	MOP Psi	DESIGN PRESSURE Psi	COATING	CATHODIC PROTECTION
LINE PIPE	NPS 42	42	1.25	API 5L Grade X65	1700	2075	3.5" CWC	SA

COORDINATES TABLE

COORD. SYSTEM	DATUM	ZONE
GCS_NAD_1983_NSRS 2007	NAD 83_NSRS 2007	ALASK ZONE 4
COORDINATES @ MP 793.130 N. 2479284' E. 1426776'		



SUBSEA TRENCH
BELOW MHHW
SCALE 1" = 16'
AREA 3:1 = 479 ft²
AREA 6:1 = 848 ft²

NOTES:

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
2. FOR PRELIMINARY SUBSOIL INFORMATION REFER TO USAP-WP-GRZZZ-00-000035-000 (COOK INLET SHORELINE CROSSINGS – PRELIMINARY ENGINEERING GEOLOGY MODEL REPORT).
3. MINIMUM BEND RADIUS FOR PIPELINE BELOW MHHW IS 2500 FT, UNLESS OTHERWISE NOTED.
4. SHEET 3-7 ARE CONTINUATIONS FROM SHEET 1 OR 2.
5. PIPE BURIAL CONTINUATION BEYOND THE EXTENTS SHOWN ON SHEET 4 ARE INDICATIVE OF THE BURIAL REQUIRED TO REACH BEYOND THE SHALLOWER DEPTHS FOLLOWING THIS INITIAL TRANSITION POINT.

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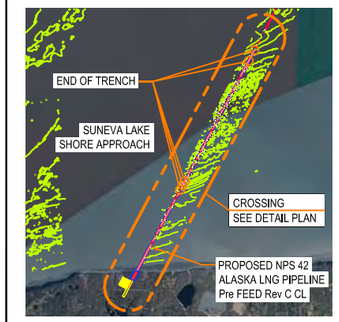

LOCATION PLAN
NTS

REFERENCE DRAWINGS

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SHEET 7 OF 7
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