

## **APPENDIX G**

### **Site-Specific Trenchless Crossing Plans**

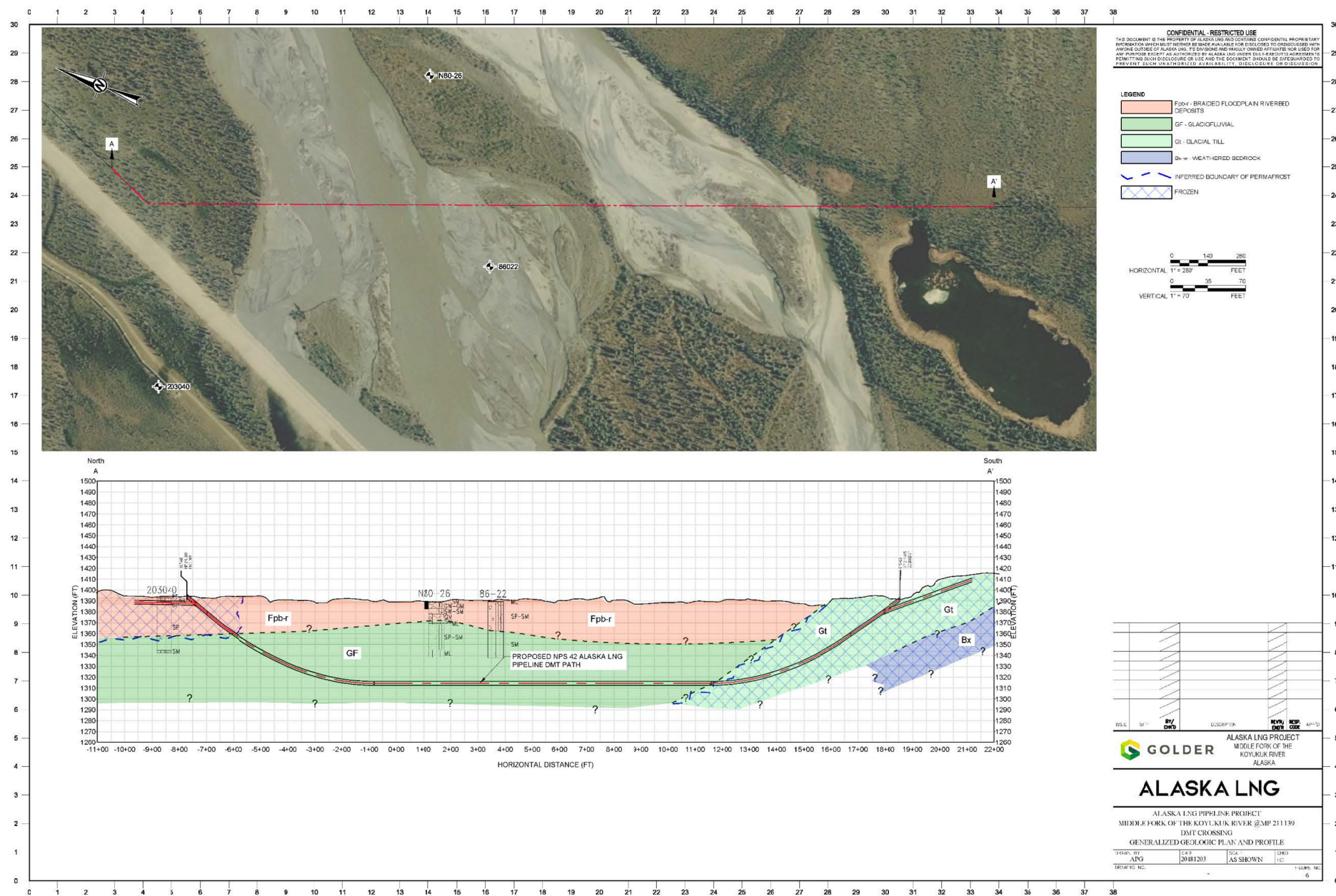
## **APPENDIX G: SITE-SPECIFIC TRENCHLESS CROSSING PLANS**

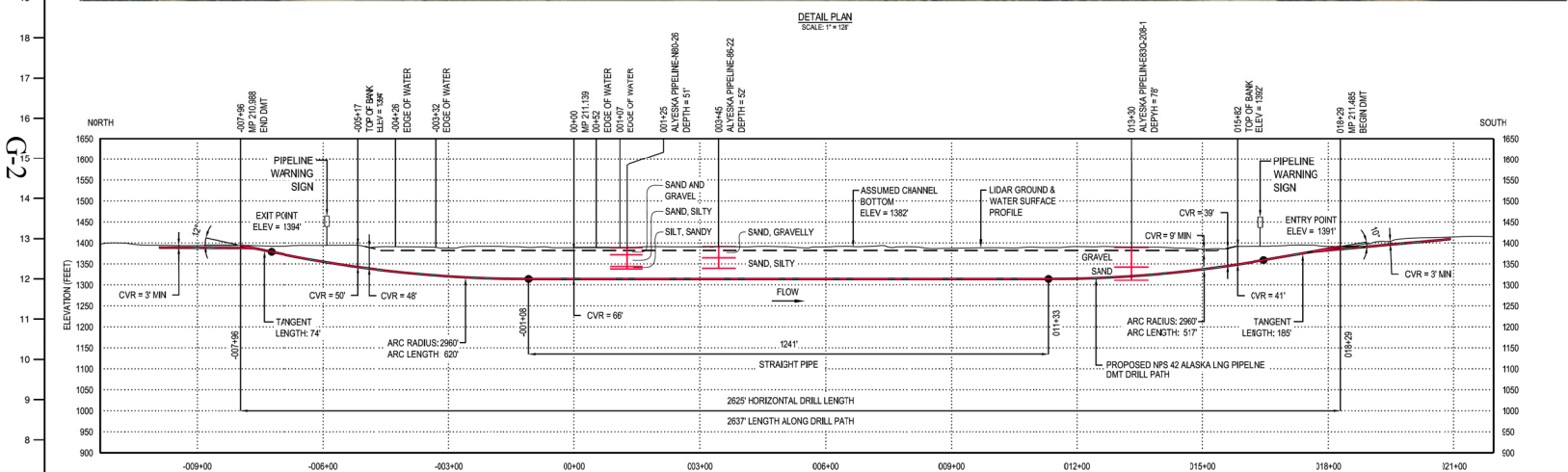
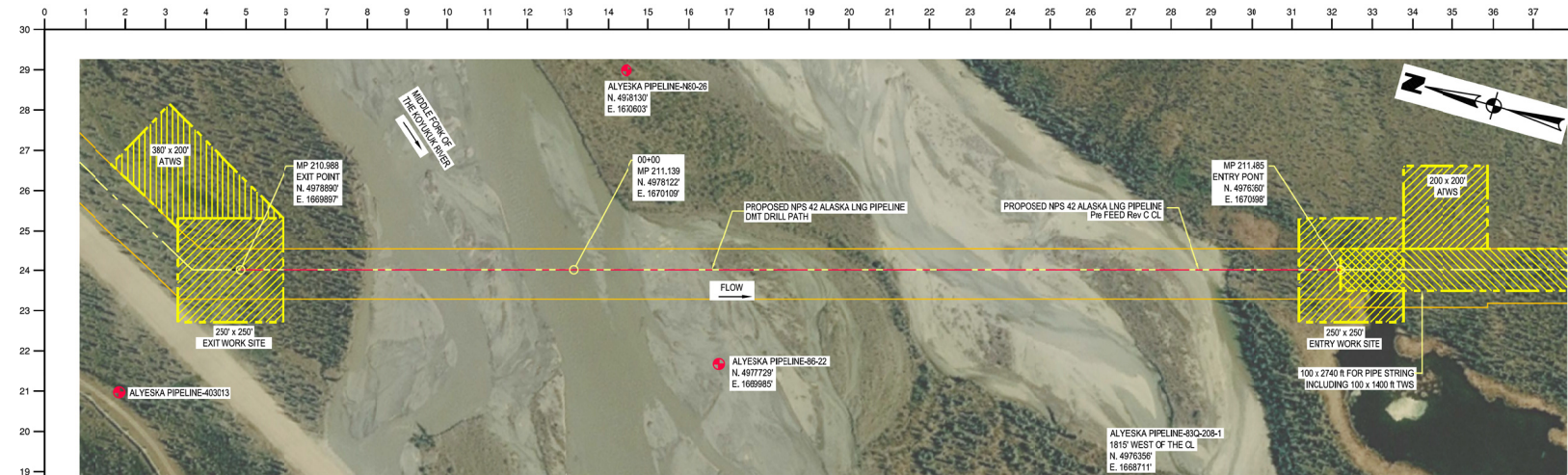
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| Chulitna River MP 641.930 .....            | G-7 |
| Deshka River MP 704.867 .....              | G-9 |

## G-1

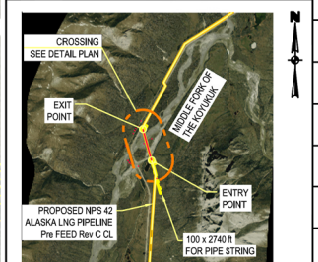




| PIPE SPECIFICATION TABLE |           |    |       |                        |                     |                 |
|--------------------------|-----------|----|-------|------------------------|---------------------|-----------------|
| PIPE TYPE                | PIPE SIZE | OD | WT    | PIPE SPECIFICATION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

| COORDINATES TABLE                |                  |               |
|----------------------------------|------------------|---------------|
| COORD. SYSTEM                    | DATUM            | ZONE          |
| GCS_NAD_1983_NSR5 2007           | NAD 83_NSR5 2007 | ALASKA ZONE 4 |
| CROSSING COORDINATES @ MP 211.13 |                  |               |
| N. 4978122                       |                  |               |
| E. 1670109                       |                  |               |

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REFERENCE DRAWINGS

| NO. | DESCRIPTION     |
|-----|-----------------|
| 1   | SEE DETAIL PLAN |
| 2   | SEE DETAIL PLAN |
| 3   | SEE DETAIL PLAN |
| 4   | SEE DETAIL PLAN |
| 5   | SEE DETAIL PLAN |
| 6   | SEE DETAIL PLAN |
| 7   | SEE DETAIL PLAN |
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| 35  | SEE DETAIL PLAN |
| 36  | SEE DETAIL PLAN |
| 37  | SEE DETAIL PLAN |
| 38  | SEE DETAIL PLAN |

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  
MNN - 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  
p/g - POUNDS PER SQUARE INCH GAUGE  
3LPE - THREE LAYER POLYETHYLENE

LEGEND:  
• BOREHOLE

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| NO. | DATE     | BY | CHKD | DESCRIPTION         | REV | DATE | BY | CHKD | DESCRIPTION |
|-----|----------|----|------|---------------------|-----|------|----|------|-------------|
| 1   | 20150303 | US | AL   | RE-DESIGNED FOR USE | -   | -    | -  | -    | -           |
| 2   | 20150303 | US | AL   | RE-DESIGNED FOR USE | -   | -    | -  | -    | -           |
| 3   | 20151103 | US | AL   | ISSUED FOR USE      | -   | -    | -  | -    | -           |

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NIRAS, Alaska

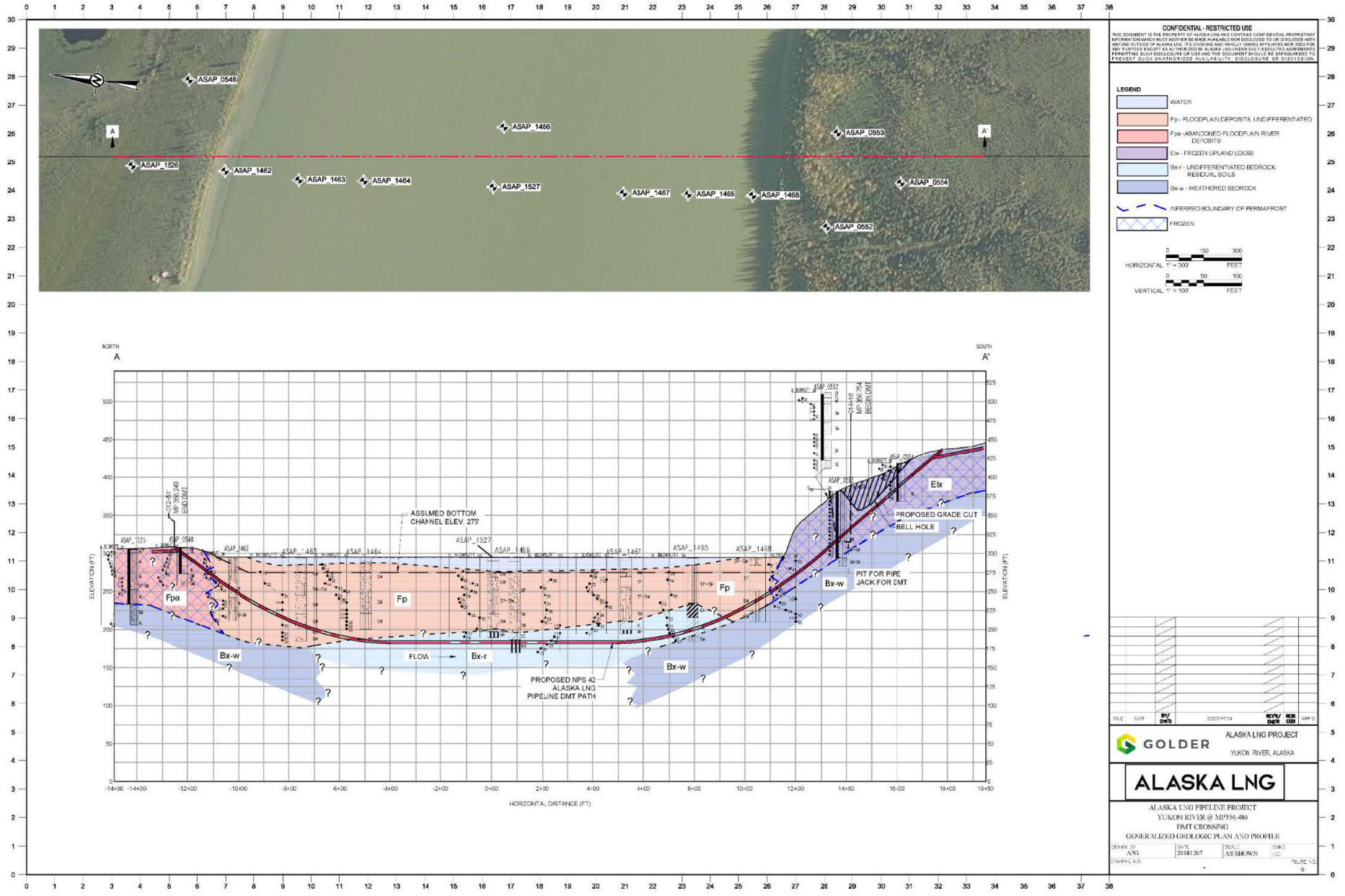
**Alaska LNG™**  
ALASKA LNG PIPELINE PROJECT  
MIDDLE FORK OF THE KOYUKUK RIVER @ MP 211.139  
WPC 127  
DMT CROSSING PLAN & PROFILE

|             |                             |          |      |           |
|-------------|-----------------------------|----------|------|-----------|
| DRAWN BY    | DATE                        | SCALE    | CHKD | ISSUE NO. |
| LW          | 20150303                    | AS SHOWN | AL   | 2         |
| DRAWING NO. | USAP-WP-YDPLX-00-000026-000 |          |      |           |

- NOTES:
- ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
  - LIMITED SUBSOIL INFORMATION IS AVAILABLE.
  - THE GROUND PROFILE IS BASED ON LIDAR OBTAINED IN 2014. ELEVATIONS ARE GEODETIC.
  - THE CROSSING DESIGN IS CONCEPTUAL AND IS TO BE CONFIRMED DURING DETAILED ENGINEERING.
  - THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED DURING SUMMER.
  - 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.
  - FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZ-00-000054-000.

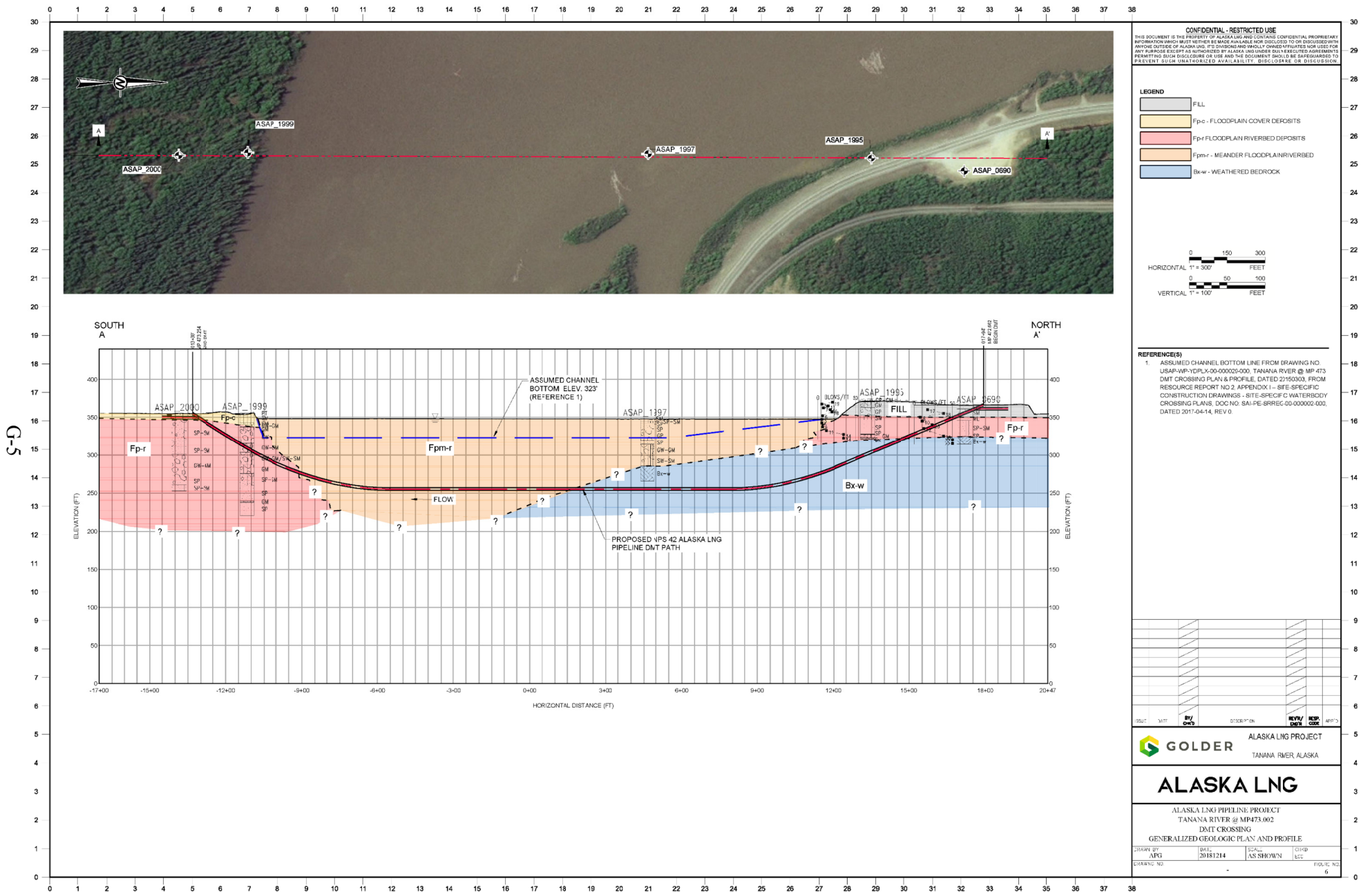
# Generalized Geologic Plan and Profile

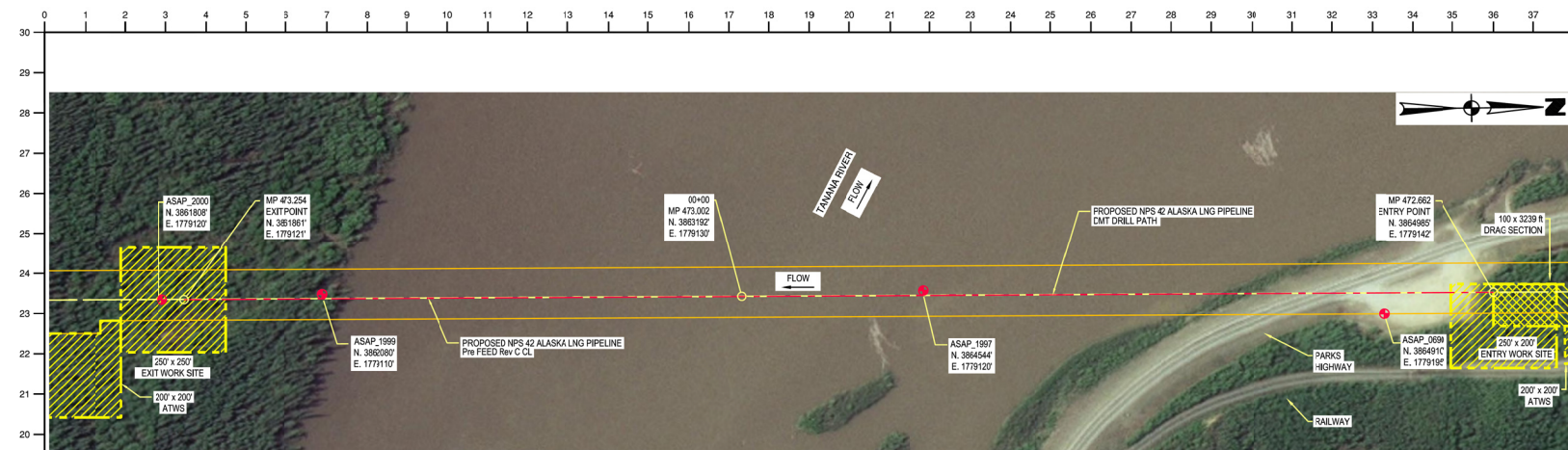
G-3



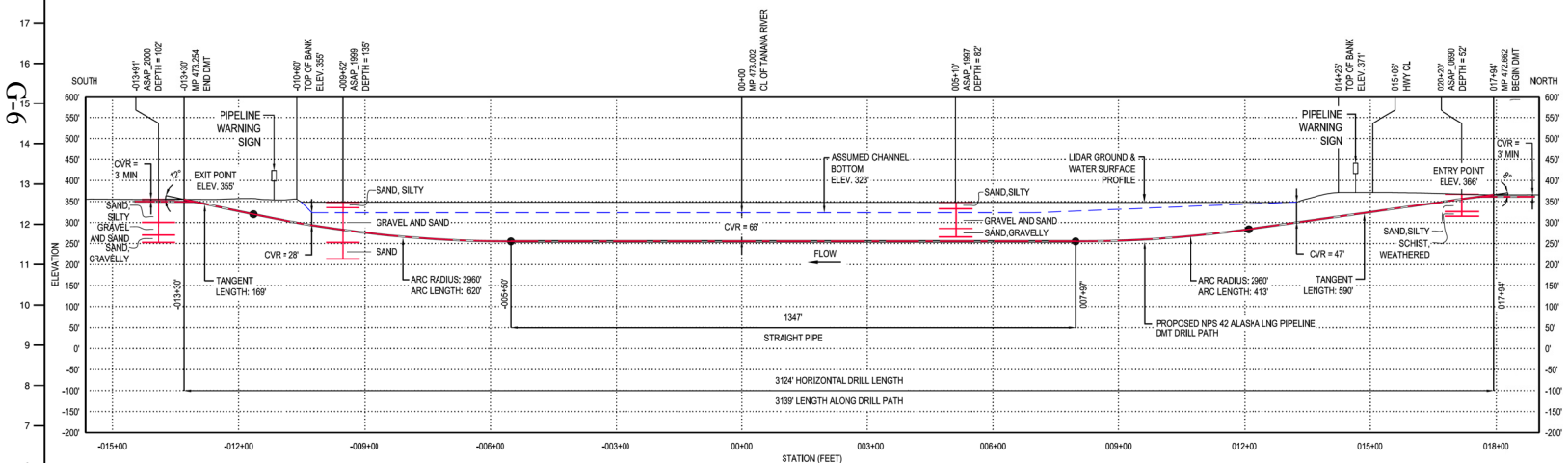


# Generalized Geologic Plan and Profile





DETAIL PLAN  
SCALE: 1" = 128'



PROFILE ALONG PROPOSED NPS 42 ALASKA LNG PIPELINE  
HORIZONTAL SCALE: 1" = 32'  
VERTICAL SCALE: 1" = 13'

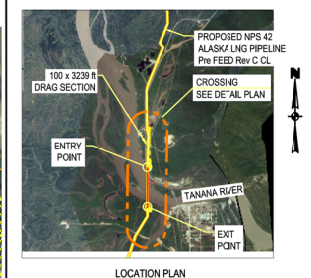
| PIPE TYPE  | PIPE SIZE | OD | WT    | PIPE SPECIFICATION     | MOP  | DESIGN PRESSURE | COATING | CATHODIC PROTECTION |
|------------|-----------|----|-------|------------------------|------|-----------------|---------|---------------------|
|            |           | in | lb    |                        | psig | psig            |         |                     |
| LINE PIPE  | NPS 42    | 42 | 0.677 | API 5L Grade X70M PSL2 | 2075 | 2075            | 3 LPE   | YES                 |
| HEAVY WALL | NPS 42    | 42 | 1.24  | API 5L Grade X70M PSL2 | 2075 | 2075            | 3 LPE   | YES                 |

| COORD. SYSTEM                     | DATUM            | ZONE          |
|-----------------------------------|------------------|---------------|
| GCS_NAD_1983_NSR5 2007            | NAD 83_NSR5 2007 | ALASKA ZONE 4 |
| CROSSING COORDINATES @ MP 473.002 |                  |               |
| N. 3863192<br>E. 1779137          |                  |               |

#### NOTES:

- ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
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- THE CONSTRUCTION PERIOD IS TENTATIVELY SCHEDULED DURING SUMMER.
- 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.
- FOR ADDITIONAL GEOTECHNICAL INFORMATION SEE FEDERAL ENERGY REGULATORY COMMISSION MAJOR WATERBODIES SITE CHARACTERISTICS AND INSTALLATION METHODOLOGY REPORT - USAP-WP-GRZZ-00-000054-000.

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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
- MNL - 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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| DATE     | BY | CHKD | DESCRIPTION    | REV | APPD |
|----------|----|------|----------------|-----|------|
| 20181130 | WJ | WJ   | ISSUED FOR USE | 1   | JT   |
| 20190708 | WJ | WJ   | ISSUED FOR USE | 2   | JT   |

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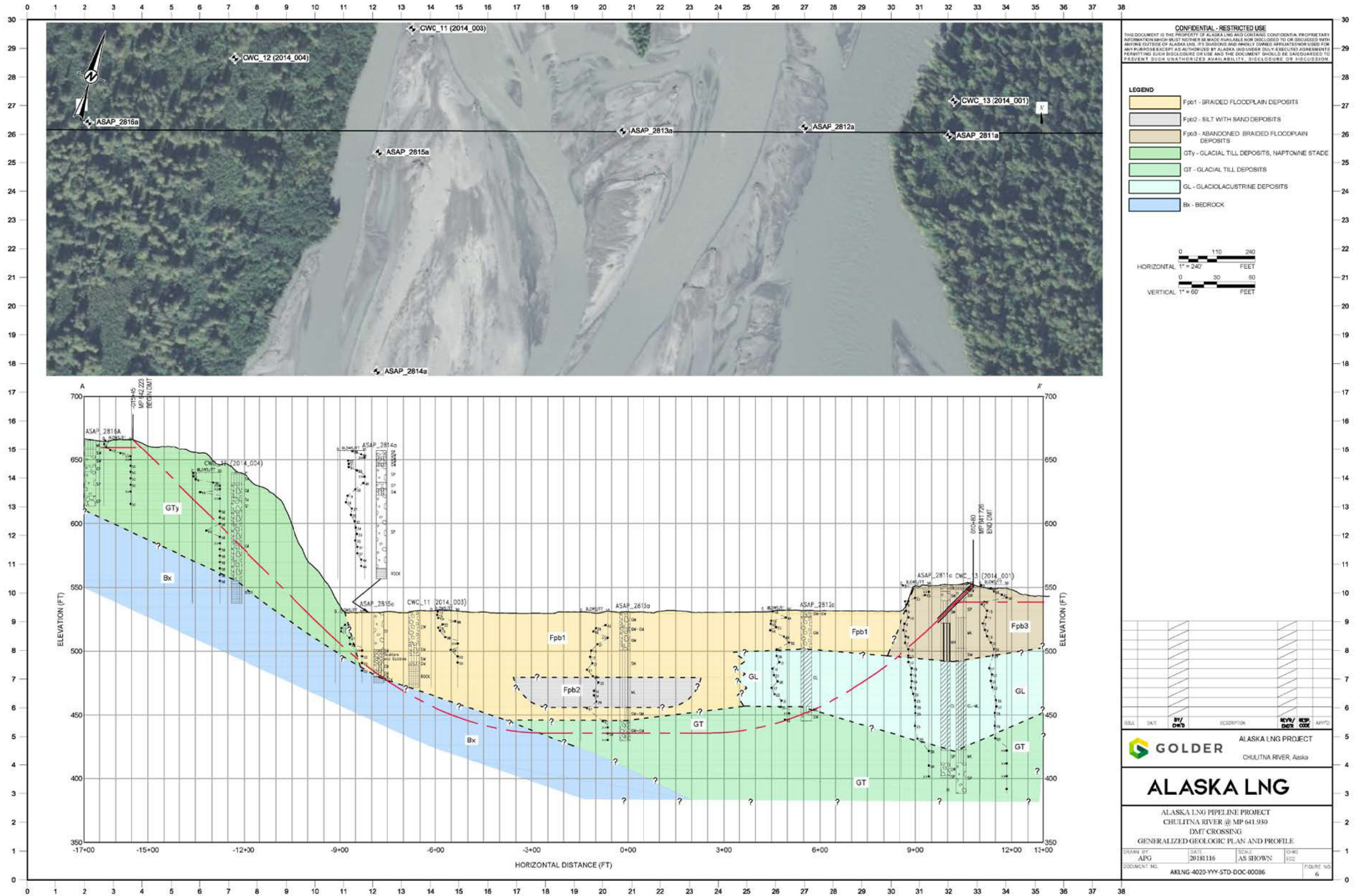
**Alaska LNG**™

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

| DRAWN BY    | DATE                        | SCALE    | CHWD | ISSUE NO. |
|-------------|-----------------------------|----------|------|-----------|
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| DRAWING NO. | USAP-WP-YDPLX-00-000029-000 |          |      |           |

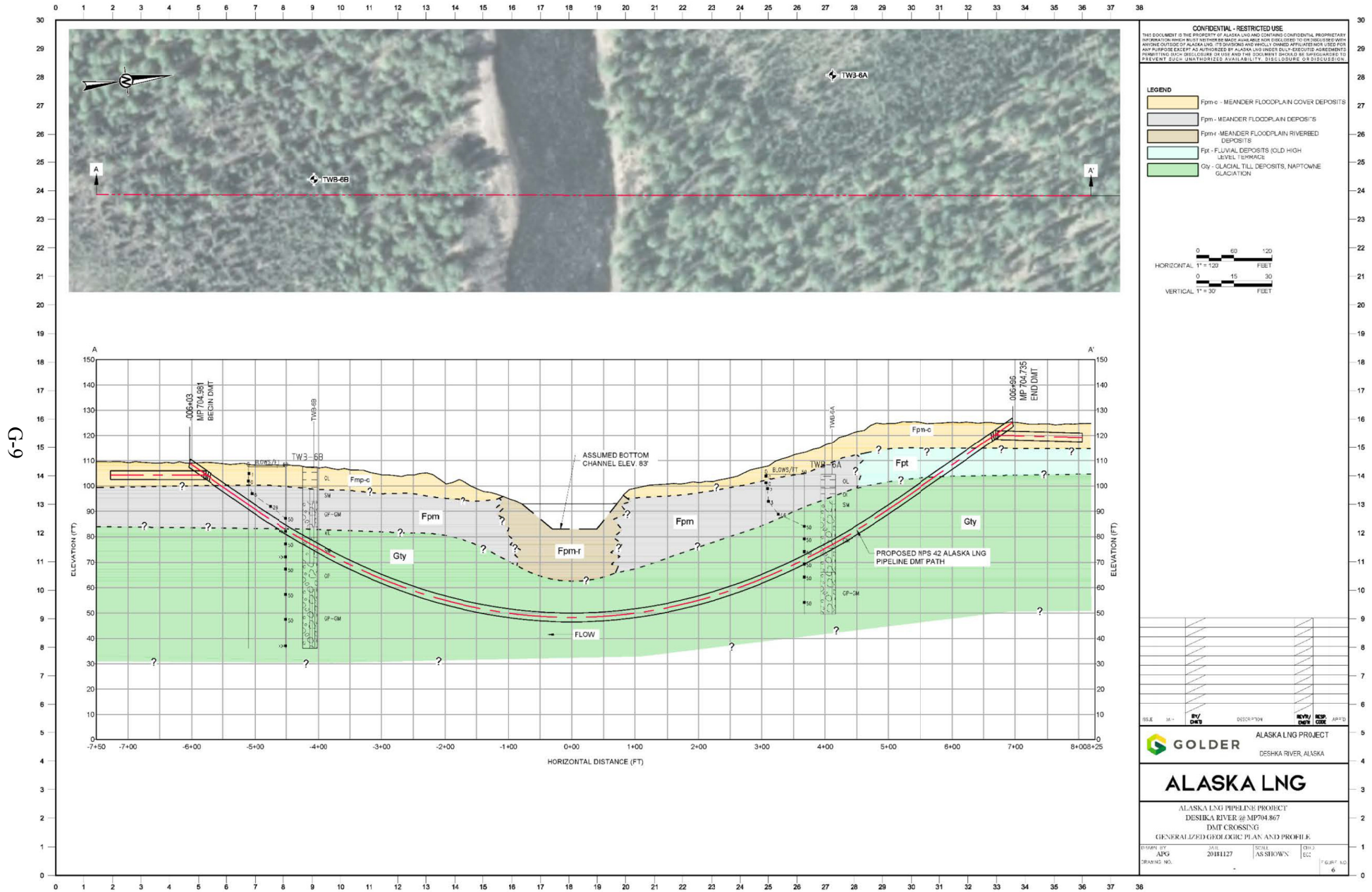
# Generalized Geologic Plan and Profile

G-7





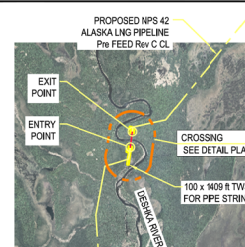
# Generalized Geologic Plan and Profile





DETAIL PLAN  
SCALE: 1" = 64'

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LOCATION PLAN  
NPS

#### 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 |
| NOZ    | - NO DRILL ZONE                         |
| psig   | - POUNDS PER SQUARE INCH GAUGE          |
| 3LPE   | - THREE LAYER POLYETHYLENE              |
| 3LPP   | - THREE LAYER POLYPROPYLENE             |

#### LEGEND:

• 2016 BOREHOLE

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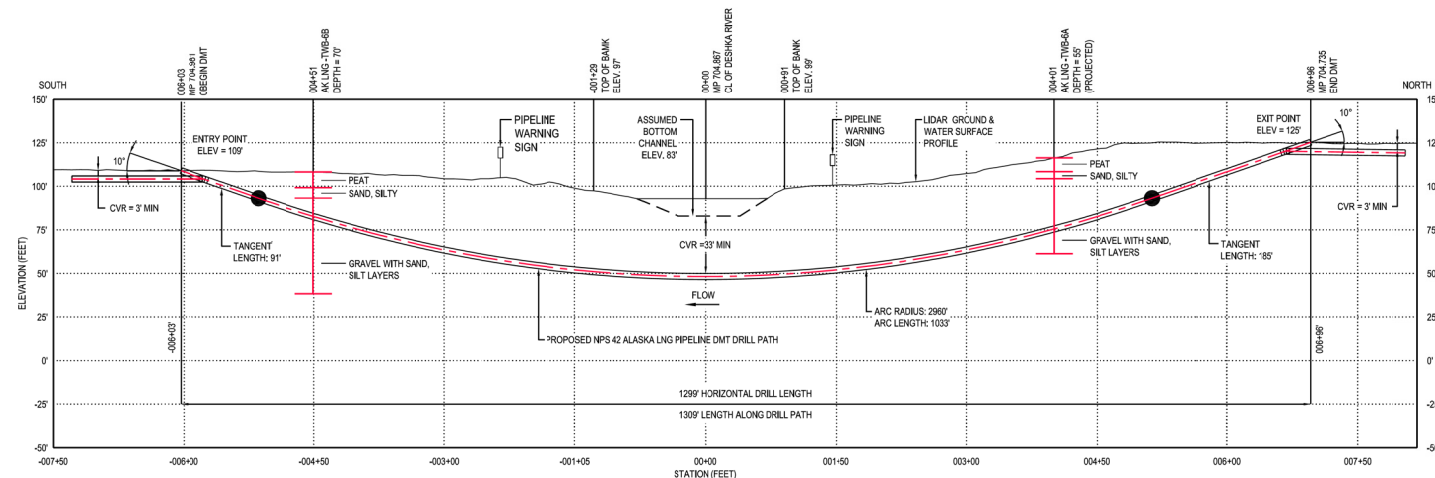
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| 20180628 | US | US   | ISSUED FOR USE | 2   |      | JT    |

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NINASK, Alaska

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ALASKA LNG PIPELINE PROJECT  
DESHKA RIVER @ MP 704.867  
WPC 173-B  
DMT CROSSING PLAN & PROFILE

DRAWN BY: LW DATE: 20160418 SCALE: AS SHOWN CHKD: JT  
DRAWING NO. USAP-WP-YDPLX-00-000065-000 ISSUE NO. 1



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

#### PIPE SPECIFICATION TABLE

| PIPE TYPE  | PIPE SIZE | OD | WT    | PIPE SPECIFICATION     | MOP  | DESIGN PRESSURE | COATING | CATHODIC PROTECTION |
|------------|-----------|----|-------|------------------------|------|-----------------|---------|---------------------|
|            |           | in | in    |                        | psig | psig            |         |                     |
| 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_NRSR 2007            | NAD 83 NRSR 2007 | ALASKA ZONE 4 |
| CROSSING COORDINATES @ MP 704.867 |                  |               |
| N. 2847593                        |                  |               |
| E. 1580878                        |                  |               |

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