



**STATE OF ALASKA**  
**Department of Natural Resources**  
**Division of Parks and Outdoor Recreation**

**Special Park Use Permit**  
**(11 AAC 18.010)**

**PERMIT #:** LAS 30116  
**Name of Permittee:** Alaska Gasline Development Corporation  
**Project Name (if applicable):** Geotechnical Exploration  
**Address:** 3201 C Street, Suite 200  
**City/State/Zip Code:** Anchorage, AK 99503

**This permit authorizes the Alaska Gasline Development Corporation (AGDC) to perform the following activity(s) within Denali State Park, Willow Creek State Recreation Area, and Captain Cook State Park per the approved project description (Attachment A):**

- Geotechnical borehole drilling on State owned or managed park land, 8-inches in diameter and up to 100' deep, to collect soil samples in support of the geotechnical study program for the proposed Alaska Stand Alone Pipeline Project (ASAP) and the Alaska Liquefied Natural Gas Pipeline Project (AKLNG);
- Clearing small trees and brush from a 25 to 50 foot radius at each borehole site where necessary, with wider clearing needed at sites used for helicopter landings, and up to 15 feet wide clearing along routes identified for access;
- Cross-country travel from established rights-of-way to access sites identified in Attachment A. Equipment to be used includes small tracked vehicles (~1,500 lbs), a helicopter portable drill rig (~6,500 lbs), and a track mounted drill rig and support vehicle (~35,000 lbs each); and
- Installing casings for the temporary placement of thermistors, piezometers and inclinometers at borehole locations identified in Attachment A.

This permit is effective beginning **March 2, 2015** and ending **December 31, 2016** unless sooner terminated at the discretion of the State of Alaska, Department of Natural Resources, Division of Parks and Outdoor Recreation. This permit does not convey an interest in state land and as such is revocable at will. No preference right for use or conveyance of the land is granted or implied by this authorization.

All activities shall be conducted in accordance with the following General and Special Stipulations, and in conjunction with the approved project description (Attachment A).

### **General Stipulations**

1. **Authorized Officer.** The Authorized Officer for the Alaska Department of Natural Resources (DNR), Division of Parks and Outdoor Recreation (DPOR) is the Director or designee. The Authorized Officer may be contacted at the address and phone number on the signature page of the authorization. The Authorized Officer reserves the right to modify these stipulations or use additional stipulations as deemed necessary. The permittee will be advised before any such modifications or additions are finalized.
2. **Indemnification.** The permittee's contractors and subcontractors shall defend, indemnify, and hold the State of Alaska harmless from and against any and all claims, damages, suits, losses, liabilities, and expenses for injury to or death of persons and damage to or loss of property arising out of or in connection with the entry on and use of state land authorized under this permit by permittee, its contractors, subcontractors, and their employees.
3. **Use Fees.** Pursuant to 11 AAC 05.010(H)(ii), the permittee shall pay to the DPOR an annual use fee of **\$2,500.00**. The use fee is due on or before the annual anniversary of the effective date of this permit without the necessity of any billing by DPOR.
4. **Late Payment Penalty Charges.** The permittee shall pay a fee for any late payment. The amount is the greater of either the fee specified in 11 AAC 05.010 or interest at the rate set by AS 45.45.010(a) and will be assessed on a past-due account until payment is received by the state.
5. **Returned Check Penalty.** A returned check fee as provided in 11 AAC 05.010 will be assessed for any check on which the bank refuses payment. Late payment penalties shall continue to accumulate.
6. **Change of Address.** The permittee shall maintain current contact information with DPOR. Any change of address must be submitted in writing to the Authorized Officer.
7. **Valid Existing Rights.** This authorization is subject to all valid existing rights in and to the land. Authorized concurrent users of state land, their agents, employees, contractors, subcontractors, and licensees, shall not interfere with the operation or maintenance activities of each user. The State of Alaska makes no representations or warranties, whatsoever, either expressed or implied, as to the existence, number, or nature of such valid existing rights.
8. **Reservation of Rights.** DPOR reserves the right to grant additional authorizations to third parties for compatible uses on or adjacent to the land under this authorization. DPOR may require authorized concurrent users of state land to enter into an equitable operation or maintenance agreement.
9. **Assignment.** This permit may not be transferred or assigned to another individual or corporation without written consent from the Authorized Officer.

10. **Amendments.** Permittee proposals requiring the amendment of this permit must be in submitted in writing and accompanied by a \$100 filing fee. To conduct activities other than that in the approved plan of operations or development plan, the applicant must have prior authorization from the Authorized Officer.
11. **Permit Extensions/Renewal.** Any request for permit extension or renewal should be submitted at least 30 days prior to the end of the authorized term.
12. **Permit Expiration/Termination.** On or before permit expiration or termination of this authorization by the permittee, all improvements and other chattels shall be removed from the site. The site shall be restored to a clean safe condition. If the permittee fails to remove the improvements in compliance with this requirement, the department may see, destroy, or remove the improvements, whichever is more convenient for the department, at the permittee's expense, including the department's costs associated with restoration and expenses incurred in the performance of these duties.  
  
Advisory: To avoid being responsible for additional fees, any permittee planning to terminate a permit must do so prior to the date on which the annual land use fee is due. To successfully terminate a permit, a permittee must satisfy the site restoration and reporting requirements of this authorization prior to requesting termination.
13. **Inspections.** Authorized representatives of the State of Alaska shall have reasonable access to the subject parcel for purposes of inspection. Subject to the reimbursable services agreement between the permittee and DPOR, the permittee is responsible for reimbursement of State expenses for routine inspections of the subject activity, inspections concerning non-compliance, and a final close-out inspection.
14. **Compliance with Governmental Requirements; Recovery of Costs.** Permittee shall, at its expense, comply with all applicable laws, regulations, rules and orders, and the requirements and stipulations included in this authorization. Permittee shall ensure compliance by its employees, agents, contractors, subcontractors, licensees, or invitees.
15. **Other Authorizations.** The issuance of this authorization does not alleviate the necessity of the permittee to obtain authorizations required by other agencies for this activity.
16. **Violations.** This authorization is revocable immediately upon violation of any of its terms, conditions, stipulations, nonpayment of fees, or upon failure to comply with any other applicable laws, statutes and regulations (federal and state). Should any unlawful discharge, leakage, spillage, emission, or pollution of any type occur due to permittee's, or its employees', agents', contractors', subcontractors', licensees', or invitees' act or omission, permittee, at its expense shall be obligated to clean the area to the reasonable satisfaction of the State of Alaska.

17. **Compliance.** Failure to comply or meet the terms and conditions of this permit could impede the ability to seek subsequent authorizations from DPOR.
18. **Directives.** Directives may be issued for corrective actions that are required to correct a deviation from design criteria, project specifications, stipulations, state statutes, or state regulations. Work at the area subject to the Directive may continue while implementing the corrective action. Corrective action may include halting or avoiding specific conduct, implementing alternative measures, repairing any damage to state resources that may have resulted from the conduct, or other action as determined by DPOR.
19. **Stop Work Orders.** Stop Work Orders may be issued if there is a deviation from design criteria, project specifications, stipulations, state statutes, or state regulations and that deviation is causing or is likely to cause significant damage to state resources. Under a Stop Work Order, work at the area subject to the Stop Work Order may not resume until the deviation is cured and corrective action is taken. Corrective action may include halting or avoiding specific conduct, implementing alternative measures, repairing any damage to state resources that may have resulted from the conduct, or other action as determined by DPOR.
20. **Alaska Historic Preservation Act.** The Alaska Historic Preservation Act (AS 41.35.200) prohibits the appropriation, excavation, removal, injury, or destruction of any state-owned historic, prehistoric (paleontological) or archaeological site without a permit from the commissioner. Should any sites be discovered during the course of field operations, activities that may damage the site will cease and the Office of History and Archaeology in the Division of Parks and Outdoor Recreation (907) 269-8721 and shall be notified immediately.
21. **Public Trust Doctrine.** The Public Trust Doctrine guarantees public access to, and the public right to use navigable and public waters and the land beneath them for navigation, commerce, fishing and other purposes. This authorization is issued subject to the principles of the Public Trust Doctrine regarding navigable or public waters. DPOR reserves the right to grant other interests consistent with the Public Trust Doctrine.
22. **Public Access.** All operations must be conducted in a manner that will ensure minimum conflict with other users of the area. There shall be no interference with free public use of state lands and waters. Public access may not be restricted without prior approval of the Authorized Officer.
23. **Use of Existing Roads and Trails.** Existing roads and trails shall be used wherever possible. Trail width shall be kept to the minimum necessary. Trail surface may be cleared of timber, brush, stumps, and snags.
24. **Site Restoration.** On or before permit expiration, or termination of this authorization by the Permittee, the site shall be vacated and all improvements, personal property, and other equipment shall be removed. In the event Permittee fails to comply with this requirement, the

State, at its discretion, may remove and dispose of improvements and restore the site at the expense of Permittee.

25. **Notification of Discharge.** The Permittee is responsible for cleaning up any oil spills or other pollutants on the State lands, tidelands, or submerged lands that result from activities under this permit. Any fuel, oil, or other pollutant discharge or spill shall be reported immediately to the State Pipeline Coordinator's Office, at (907) 269-6403.

The permittee shall immediately notify DNR and DEC by phone of any unauthorized discharge of oil to water, any discharge of hazardous substances (other than oil), and any discharge of oil greater than 55 gallons on land. All fires and explosions must also be reported. The DNR 24 hour spill report number is (907) 451-2678; the Fax number is (907) 451-2751. Notification of a discharge must be made to the nearest DEC Area Response Team during working hours: Anchorage (907) 269-3063, fax (907) 269-7648; Fairbanks (907) 451-2121, fax (907) 451-2362; Juneau (907) 465-5340, fax (907) 465-2237. The DEC oil spill report number outside normal business hours is (800) 478-9300.

26. **Wastewater Disposal.** Disposal of wastewater from any operation associated with this authorization to state lands or waters is specifically prohibited, unless otherwise approved by the Alaska Department of Environmental Conservation.
27. **Solid Waste.** All solid waste and debris generated from the activities conducted under this authorization shall be removed to a facility approved by the ADEC prior to the expiration, completion, or termination of the authorization or activities. Temporary storage and accumulation of solid waste (prior to its removal) be stored in a manner that prevents a litter violation under AS 46.06.080.
28. **Fire Prevention, Protection and Liability.** The permittee shall take all reasonable precautions to prevent and suppress forest, brush, and grass fires, and shall assume full liability for any damage to state land resulting from negligent use of fire. The State of Alaska is not liable for damage to the permittee's personal property and is not responsible for forest fire protection of the permittee's activity. Notify the Division of Forestry area office when crews are working remotely in case a fire starts (Fairbanks 907-451-2600 and Mat-Su 907-761-6300). Call 911 or 1-800-237-3633 to report a wildfire. The permittee must have a method to communicate to personnel in the field and for field personnel to communicate back to the office.
29. **Insurance Required:** Without limiting indemnification, the liability insurance required of commercial operators in State Park units shall be a minimum \$100,000 per person \$300,000 combined single limit per occurrence public liability insurance. Coverage shall include premise operations, independent contractor's products/completed operations, broad form property damage, blanket contracts and personal injury inducements. The liability insurance policy must also list the State of Alaska as "additional insured" and must provide for a 30-day notification to the State of cancellations, non-renewal, or material alteration of insurance.

*Advisory Regarding Violations of the Permit Guidelines: Pursuant to 11 AAC 18.025(e), a person who violates a provision of a permit issued under this chapter (11 AAC 18) may have their permit revoked by the Director or local park officer for failure to abide by any permit condition or limitation.*

### **Special Stipulations**

30. **Operation Plan.** Authorized activities are to be based on the scope of work represented in the approved project description (Attachment A).
31. **Borehole Drilling Operations.** Borehole drilling operations will be limited to seasonal dates when park use is low. In areas of the park that are undisturbed, cross country travel and use of drill rigs will be allowed when snow cover is sufficient to protect underlying vegetation; and the park is open to tracked snow vehicles.
32. **Staging Area.** The permittee may temporarily stage equipment in the park. Any large rocks, or barrels located at the entrance of the access road/trail may be removed to allow equipment to enter the park, but must be put back into place when demobilizing equipment from the area.
33. **Geotechnical Summary Report.** A report summarizing the geotechnical investigations shall be submitted to DPOR within 6 months following the end of the permit term. The report must include geological information related to the parks physiographic setting, terrain/landforms, and subsurface conditions.
34. **Completion Report.** A status report shall be submitted to DPOR on a monthly basis that provides the status and locations of the activities performed. A final completion report shall be submitted within 30 days of termination of permit activities. The reports shall contain the following information:
  - a) photos taken from various locations before, during, and after installation and demobilization of the thermistors and data loggers, including dates when the photos were taken;
  - b) A description of the activities conducted under this authorization and their status;
  - c) a list of the actual location of each site used and a depiction of each site on a pipeline alignment sheet with aerial photo;
  - d) a list of the types vehicles and equipment used;
  - e) a statement of cleanup activities and methods of debris disposal; and
  - f) a report of any known incidents of damage to the ground or existing vegetation cover and follow-up corrective actions that may have taken place while operating under this authorization.

Any report that includes the above noted information may be sent in lieu of the completion reports. The information in "a" through "e" above should be highlighted or otherwise marked for easy reference.

**35. Tundra Damage Reports.** Incidents of damage to the vegetative mat and follow-up corrective actions that have occurred while operating under this authorization shall be reported to the Authorized Officer within 72 hours of occurrence.

**36. Site Disturbance.**

a) Site disturbance shall be kept to a minimum to protect local habitats. All activities at the site shall be conducted in a manner that will minimize the disturbance of soil and vegetation and changes in the character of natural drainage systems. Particular attentions must be paid to prevent pollution and siltation of streams, lakes, ponds, waterholes, seeps and marshes, and to prevent disturbances to fish and wildlife populations and habitats.

b) Brush clearing is allowed, but should be kept to the minimum necessary to conduct or complete the authorized activity.

**37. Clearing Vegetation, Tree Cutting and Brushing.** The permittee may need to clear vegetation, cut down trees, and remove brush to access drill sites. The clearing of vegetation shall be conducted in a way that minimizes the ability of the public to use the cleared areas for public recreation. The cutting down of trees that measure more than 4" at diameter breast height should be minimized to the extent necessary to perform the work; the cutting down of trees larger than 12" diameter breast height will require consultation between the permittee and DPOR. Any stumps created as a result of cutting shall be flush cut within 12" of the ground. Downed trees and cut brush shall be placed across drill sites and access routes to the drill sites, and situated in a way that looks natural, and prevents unauthorized vehicle use to occur in the park. Brush shall not be windrowed along access routes.

**38. Timber Harvest.** Large trees, greater than four (4) inches in diameter, shall be disposed of as follows:

a) **White Spruce:** To minimize the potential for bark beetle outbreaks resulting from harvest or clearing operations, felling of white spruce or creation of white spruce slash should not be completed during the bark beetle flight period (approximately May 1-July 31), if possible. Any operations in or near white spruce should be conducted to minimize root compaction and/or mechanical damage to the lateral roots.

Any white spruce slash (greater than 4" in diameter) resulting from project operations should be processed (e.g. processed for firewood or debarked and/or chipped) before the next beetle flight period. The following guidelines are provided to mitigate bark beetle population buildups resulting from permit operations:

- 1) If suitable equipment is available, debarking of spruce slash pieces >4" diameter is preferred.
  - 2) Cut white spruce should be bucked onsite into manageable bolts (logs) and stacked into tight triangular decks of 10-15 bolts. Decks can be placed in the woods, but should be placed away from residual white spruce.
  - 3) Bolts and slash shall be placed to prevent their being introduced into any surface waters.
- b) All other tree species: Logs shall be cut into 10-15 foot lengths and placed so they cannot roll or be introduced into any surface waters.
  - c) When feasible, firewood should be made available for public use, such as along the Parks Highway corridor or along other improved access roads.
  - d) Removal of non-white spruce brush, slash and immature trees will be accomplished by any of the following two methods:
    - 1) Spreading and scattering in the adjacent brush area without damaging other trees, or
    - 2) Chipping and scattering in such a way as to preclude their being washed into any surface waters.
  - e) Placement of felled trees, brush, or slash shall not block access along existing trails.
39. **Equipment operation.** Equipment, other than vessels, must not enter the open water areas of a watercourse during winter. Filling of low spots and smoothing by the use of snow and ice is allowed. Ice or snow bridges and approach ramps constructed at stream, river, or slough crossings shall not contain extraneous material (i.e., soil, rock, brush or vegetation).
40. **Debris and Cleanliness.** Trails, campsites, and work areas must be kept clean. All solid waste including incinerator residue shall be backhauled to a solid waste disposal site approved by DEC. Trash, survey lath, roadway markers, and other debris that has accumulated along roads or cross country routes shall be picked up and properly disposed of prior to freeze-up the following winter.
41. **Fuel and Hazardous Substances.** Secondary containment<sup>1</sup> shall be provided for fuel or hazardous substances<sup>2</sup>.

<sup>1</sup> Secondary containment means an impermeable diked area or portable impermeable containment structure capable of containing 110 percent of the volume of the largest independent container. Double-walled tanks do not qualify as secondary containment unless an exception is granted for a particular tank.

<sup>2</sup> Hazardous substances are defined under AS 46.03.826 as (a) an element or compound which, when it enters the atmosphere, water, or land, presents an imminent and substantial danger to the public health or welfare, including fish, animals, or vegetation; (b) oil; or (c) a substance defined as a hazardous substance under 42 U.S.C. 9601(14).

- a) **Container<sup>3</sup> marking:** All independent fuel and hazardous substance containers shall be marked with the contents and the permittee's or contractor's name using paint or a permanent label. (Note: The permittee is ultimately responsible for contractor's compliance with these stipulations.)
- b) **Fuel or hazardous substance transfers:** Secondary containment or a surface liner<sup>4</sup> must be placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends during fuel or hazardous substance transfers. Appropriate spill response equipment must be on hand during any transfer or handling of fuel or hazardous substances to respond to a spill of up to five gallons. Transfer operations shall be attended by trained personnel at all times.
- c) **Vehicle refueling:** Vehicle refueling shall not occur within the annual floodplain or tidelands.
- d) **Storing containers within 100 feet of waterbodies:** Containers with a total capacity larger than 55 gallons which contain fuel or hazardous substances shall not be stored within 100 feet of a waterbody.

42. **Drilling Compounds.** Any drilling compounds used that do not meet the criteria of AS 46.03.100(e)(4) must be disposed of at a DEC-approved facility.

43. **Reclamation.**

- a. If topsoil and/or overburden muck is disturbed or removed on account of exploration activities it shall be separated and stockpiled for future reclamation of the site. This material shall be protected from erosion and contamination by acidic or toxic materials and shall not be buried by other materials.
- b. In performing reclamation of disturbed areas, disturbed ground shall be reshaped and re-contoured to blend with surrounding physiography using excavated materials. Following reshaping and re-contouring, topsoil and organic material shall be re-spread over the surface in order to facilitate the re-growth of natural vegetation.
- c. Shallow auger holes (limited to the depth of overburden) shall be backfilled with auger cuttings to the top of the hole.
- d. All drill hole casings shall be removed prior to closure of this permit.

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<sup>3</sup> Containers means any item which is used to hold fuel or hazardous substances. This includes tanks, drums, double-walled tanks, portable testing facilities, fuel tanks on small equipment such as light plants and generators, flow test holding tanks, slop oil tanks, bladders, and bags. Manifoldded tanks must be considered as single independent containers. Vehicles, including mobile seismic tanks, are not intended to be included under this definition.

<sup>4</sup> Surface liner means any safe, non-permeable container (e.g., drips pans, fold-a-tanks, etc) designed to catch and hold fluids for the purpose of preventing spills. Surface liners should be of adequate size and volume to contain the worst-case spill that is likely to occur.

- e. All drill holes shall be plugged with bentonite holeplug, a benseal mud, or equivalent slurry, for a minimum of 10 feet within the top 20 feet of the drill hole in competent material. The remainder of the hole will be backfilled to the surface with drill cuttings. If water is encountered in any drill hole, a minimum of 7 feet of bentonite holeplug, a benseal mud, or a cement slurry shall be placed immediately above the static water level in the drill hole. Complete filling of the drill holes, from bottom to top, with bentonite holeplug, benseal mud, or equivalent (cement) slurry is also permitted and is considered to be the preferred method of hole closure.
- f. If artesian water flow conditions are encountered, the operator shall contact DPOR (907-269-8400) or the Department of Environmental Conservation (907-269-7549 or 1-866-956-7656) for hole plugging requirements.

**44. Restoration/Rehabilitation of Site.**

- a) All rehabilitation shall be completed to the satisfaction of DNR or the applicable land manager.
- b) The permittee shall immediately restore areas where soil has been disturbed, or the vegetative mat has been damaged or destroyed. Restoration shall be accomplished in accordance with the directives of the DNR Plant Materials Center, Bodenbug Road, HC 02, Box 7440, Palmer, AK 99645, (907) 745-4469.
- c) On or before the termination of seasonal use, all holes shall be backfilled with sand, gravel native materials, or a substitute approved by the Authorized Officer.

**45. Prohibited Activities.** Vehicle maintenance, campsites and storage or stockpiling of material on the surface ice of lakes, ponds or rivers is **prohibited**.

**46. Migratory Bird Treaty Act.** The provisions of the federal Migratory Bird Treaty Act must be adhered to when applicable.

**47. Endangered Species.** The provisions of the federal and State Endangered Species Acts must be adhered to at all times. The Endangered Species Acts provide that there will be no activity permitted that jeopardizes the continued existence of the endangered species or results in the destruction or adverse modification of habitat of such species.

**48. Fish Habitat.** All activities below the ordinary high water line shall avoid sensitive fish life stages and their habitats. ADFG may attach timing and location restrictions for sensitive fish time periods, including periods for spawning, rearing, migration, and overwintering.

**49. Bald Eagle Nest.** A minimum undisturbed 330-foot radius area shall be maintained around each bald eagle nest tree at all times. The applicant shall contact the U.S. Fish & Wildlife Service to identify bald eagle nests. An average distance of 1,500 feet shall be maintained between helicopters and active bald eagle nest trees.

50. **Bear Avoidance.** Operations must avoid grizzly bear dens by one-half mile unless alternative mitigative measures to minimize disturbance are authorized by DNR after consultation with DFG. Known bear den locations shall be obtained from the (DFG) Division of Wildlife Conservation (Fairbanks (907) 459-7231; Anchorage (907) 267-2253) prior to starting operations. Occupied dens encountered in the field must be reported to the above, and avoided.

Operations must avoid known polar bear dens by one mile. Known den locations shall be obtained from the U.S. Geological Survey (907-786-3800 or 1-800-362-5148) prior to starting operations. New dens encountered in the field must be reported to the above, and subsequently avoided by one mile.

51. **Seasonal Use Restriction.** Seasonal use or equipment restrictions may be implemented by the Authorized Officer during breakup or freeze up conditions, hunting or fishing seasons, or migration and nesting seasons, or for areas of sensitive habitat.
52. **Risk.** Permittee does any work under this permit at its own risk.
53. **Helicopter Use.** The permittee will provide DPOR with a schedule of proposed helicopter use within the park. Under this authorization helicopter use within the park is allowed from 8am until 10pm per helicopter per day.
54. **Contractor Orientation.** Contractors tasked with brush clearing and drilling operations on park managed lands must meet with DPOR staff to undergo a brief orientation on park management objectives. The orientation will also consist of reviewing the terms and conditions of this permit.
55. **Mat-Su Area Parks Contact.** When working in the Denali State Park and Willow Creek State Recreation Area, the permittee must contact the Area Superintendent three days prior to operating in the park. For Mat-Su Area Parks contact Wayne Biessel, Area Superintendent, at (907) 745-8935, [wayne.biessel@alaska.gov](mailto:wayne.biessel@alaska.gov).
56. **Kenai Area Parks Contact.** When working in the Captain Cook State Recreation Area, the permittee must contact the Area Superintendent three days prior to operating in the park. For Kenai Area Parks contact Jack Blackwell, Area Superintendent, at (907) 262-5581, [jack.blackwell@alaska.gov](mailto:jack.blackwell@alaska.gov).





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## Geotechnical Borehole Program and Material Source Exploration Program Denali State Park

### Purpose

The Alaska Gasline Development Corporation (AGDC) is planning to conduct borehole drilling along the alignment and to explore for material sources in the vicinity of the Alaska Stand Alone Pipeline/ASAP corridor. This information will be used to determine the quantity, quality, and location of proposed material to be used for project construction. It will also provide geotechnical and geophysical information along the alignment for design purposes.

AGDC's winter material source exploration and borehole program along the alignment is scheduled for January 15, 2015 through April 30, 2015. The program includes access, drilling, and collection of geotechnical and geophysical data on State lands. The proposed geotechnical areas and access are shown in the attached table and maps.

### Access and Clearing

Access to proposed borehole locations in the Denali State Park will include helicopter drilling primarily (72) and tracked rig drilling (15) for boreholes close to existing access roads or trails or naturally open areas (Table 1). Tracked rig access routes were selected based on topography, and use existing clearing as much as possible. Overland travel will include snow machines for initial vegetation cutting around the borehole and off road support to transport fuel to the drill rig. GPS equipment will record track lines of the access routes.

For helicopter drilling, vegetation will be cleared around borehole locations up to a 50 foot radius to safely land the drill rig. Cutting crews will take a snow machine to proposed borehole locations ahead of the drilling crew to cut vegetation for the helicopter landing zones. The crew will take snow machines to weave their way through vegetation to get to the boreholes locations. Cutting is not expected for snow machine access. To allow new temporary access routes for boreholes near the Parks Highway, it may be necessary to cut vegetation a 10 foot wide trail. New temporary access will be minimal as the program is primarily a helicopter drilling program.

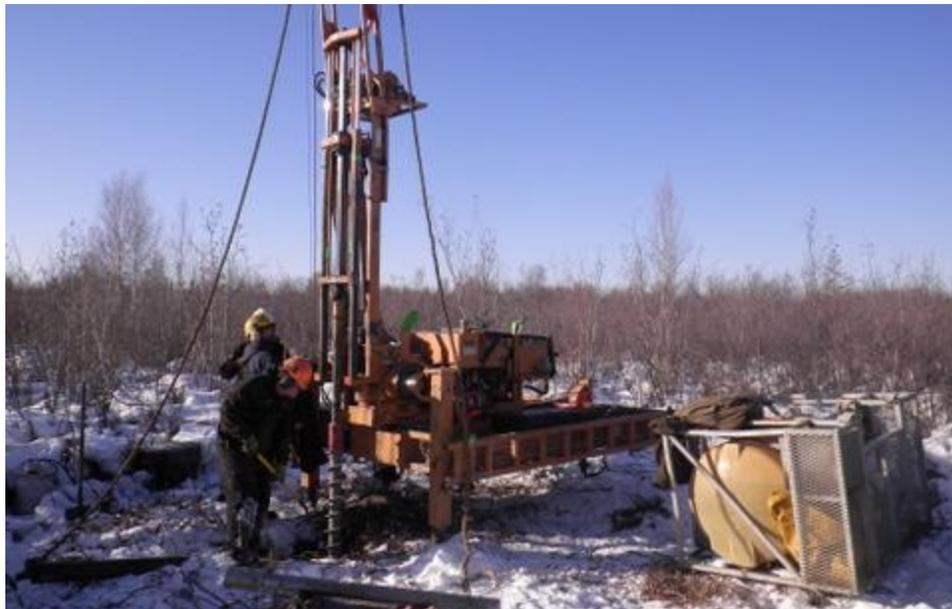
Equipment will operate in a manner that avoids or minimizes any disturbance to roots and soil. Woody vegetation will be cut just above ground level using chain saws or hand tools. Where practicable, equipment will drive over vegetation to minimize clearing and cutting. To avoid establishing trails that may be attractive to off-road vehicle users, straight, linear routes will be avoided to the extent practicable. The minimum amount of clearing will be

performed to maintain a safe work environment. If it is necessary to cut trees greater than two to four inches in diameter, they will be disposed of according to the requirements of the State permit. Trees and brush will be cut into sections and scattered to promote rapid drying.

AGDC will obtain a lane closure permit from the Department of Transportation at the locations where tracked rig access is proposed from the Parks Highway. One lane would be closed temporarily for 20 minutes to offload the tracked rig from the low boy trailer. Contracted traffic controllers will set up cones and will manage traffic through the open lane.

### Geotechnical Borehole Drilling

At each borehole location, a drill rig will advance an 8-inch borehole to a depth of up to 100 feet with discrete soil samples collected at specified intervals (Table 1). The majority of borehole depths will be 25 to 50 feet, but will vary depending on site conditions observed in the field. Depending on the subsurface conditions, more than one attempt at advancing the boring may be necessary at each location to obtain the necessary depth for sample collection. Collected soil samples will be transported to a lab for analysis (e.g., water content, particle size, specific gravity, porosity, and resistivity). After sample collection, boreholes will be backfilled with bentonite first, then soil cuttings produced during drilling. AGDC contractors will plug the borehole with two feet of bentonite when drilling in upland areas where substantial amounts of water are not encountered during the drilling process. When water is encountered during borehole drilling, AGDC contractors will plug the hole with a minimum of seven feet of bentonite with soil cuttings as the final backfill. It takes approximately one day to drill two boreholes and the program will likely work south to north. See photo 1 below showing a heli drill rig advancing a borehole.



**Photo 1: Borehole drilling with a heli-drill rig**

### Geotechnical Data Monitoring and Collection

A one inch diameter PVC casing will be installed at some boreholes and will extend from the bottom of the borehole to about 36 inches above the ground surface (Table 1). The casing will be used as a conduit for either a piezometer for monitoring groundwater levels or a thermistor for measuring soil temperature. Some of the boreholes will house a satellite transmitting data logger with a temperature acquisition cable to measure soil temperatures regularly (Photo 2). The temperature acquisition cables are arctic-grade to remain flexible when cold. All posts will be marked with red and white reflective tape for visibility. Casing placement may vary depending on conditions encountered in the field.

Field crews will return to the casing twice a year (spring and fall) to physically take instantaneous soil and ground water temperature measurements with hand held equipment. Other sites with data loggers installed, will be visited if data loggers require maintenance or replacement. Once data collection is complete (two years), all instrumentation will be removed. AGDC will contact the Denali State Park Ranger when data collection at the casing sites are planned.



**Photo 2: Example of a casing and a casing with temperature acquisition cable and fiberglass unistrut post with datalogger.**

## Material Exploration Sources

AGDC has five material exploration sites proposed for the geotechnical program. These five sites are illustrated in the attached mapbook and Table 2. Borehole drilling activity and vegetation cutting as noted above will occur at the proposed material exploration areas. The number of boreholes drilled for each material exploration site is listed in Table 2.

## Personnel and Equipment

Typically, a three or four-person field crew will conduct the borehole drilling and material sampling. Vegetation clearing for tracked rig access and borehole drilling will be completed by a two to four-person crew. A two-person crew will also conduct the return visits for data collection and maintenance using snow machines or helicopter. Vehicles will remain on existing trails and crew will travel on foot where necessary.

The helicopters proposed for the program include a heavy lift helicopter to sling the drill rig to each borehole location, and one small (R44) helicopter to transport the crew. The associated equipment and fuel needed for the geotechnical program would be staged at the Summit Lake Airport or Talkeetna Airport. The tractor and trailer (lowboy) would be temporarily staged at pullouts along the Parks highway when the crew is drilling with the tracked rig. Pull outs used will be near Parks Highway Milepost (MP) 166, 156, 147, and 136. Crew will stay in Cantwell or Trapper Creek in commercial facilities during the drilling program.

## Proposed Mitigation

Track mounted rig movement will be limited along access trails to one direction if possible to minimize vegetation damage. AGDC is planning to drill the majority of the boreholes within Denali State Park via helicopter and only boreholes located close to naturally open areas would be accessed with a track rig where cutting would be minimal. Activities will be conducted in a manner to minimize disturbance to natural drainage systems and fish and wildlife resources. Trash will be removed daily and disposed of in properly permitted facilities.

Previously unidentified archaeological resources encountered during clearing or drilling will be reported immediately to the State Historic Preservation Office personnel. All work will stop at the site until further instruction is provided.

## Fuels and Lubricants

Containment structures will be present under the equipment when fueling and under any potential spill sources. No fueling will take place over water or within 100-feet of a water body. No fuel containers will be stored on the ground. All fuel containers will be stored in or on vehicles. Up to 500 gallons of fuel may be necessary. Each vehicle will contain a spill kit and safety equipment including fire extinguishers.

# Attachment A

## LAS 30116

Alaska Gasline Development Corporation  
Page 5 of 5

### Other Permits

AGDC has obtained or is in the process of obtaining other permits:

1. ADOT lane closure permits for offloading the tracked rig
2. ADFG Fish habitat permits for stream crossings, water use, and instream borehole drilling



**Table 1. Geotechnical Borehole Locations in the Denali State Park**

Borehole ID	MTRS	Latitude	Longitude	Borehole Completion	Request	Equipment	Access	Notes
<b>Denali Fault to Susitna MP 556 - 668</b>								
ASAP_2517	S033N002W16	62.948	-149.663	Casing	Borehole Only	Heli	S033N002W16	No trail, heli drilling
ASAP_2520	S033N002W16	62.944	-149.669	Backfill	Borehole Only	Heli	S033N002W16	No trail, heli drilling
ASAP_2521	S033N002W21	62.937	-149.675	Casing	Borehole Only	Heli	S033N002W21	No trail, heli drilling
ASAP_2522	S033N002W21	62.937	-149.675	Casing	Borehole Only	Heli	S033N002W21	No trail, heli drilling
ASAP_2523	S033N002W21	62.936	-149.676	Backfill	Borehole Only	Heli	S033N002W21	No trail, heli drilling
ASAP_2524	S033N002W29	62.927	-149.693	Backfill	Borehole Only	Heli	S033N002W29	No trail, heli drilling
ASAP_2525	S033N002W29	62.918	-149.707	Backfill	Borehole Only	Heli	S033N002W29	No trail, heli drilling
ASAP_0983	S033N002W31	62.911	-149.713	Casing	Borehole and Access	Track	S033N002W31	Access from Parks Hwy ROW
ASAP_1410	S033N002W31	62.910	-149.714	Backfill	Borehole and Access	Track	S033N002W31	Access from Parks Hwy ROW, across frozen wetland to borehole
ASAP_2528	S033N003W36	62.901	-149.744	Backfill	Borehole Only	Heli	S033N003W36	No trail, heli drilling
ASAP_2529	S032N003W02	62.896	-149.769	Backfill	Borehole Only	Heli	S032N003W02	No trail, heli drilling
ASAP_2530	S032N003W02	62.895	-149.773	Backfill	Borehole Only	Heli	S032N003W02	No trail, heli drilling
ASAP_2531	S032N003W02	62.895	-149.774	Backfill	Borehole Only	Heli	S032N003W02	No trail, heli drilling
ASAP_2532	S032N003W02	62.893	-149.779	Backfill	Borehole Only	Heli	S032N003W02	No trail, heli drilling
ASAP_2533	S032N003W02	62.892	-149.781	Backfill	Borehole Only	Heli	S032N003W02	No trail, heli drilling
ASAP_2534	S032N003W02	62.885	-149.796	Backfill	Borehole Only	Heli	S032N003W02	No trail, heli drilling
ASAP_2535	S032N003W10	62.881	-149.810	Casing	Borehole Only	Heli	S032N003W10	No trail, heli drilling
ASAP_2536	S032N003W10	62.880	-149.814	Casing	Borehole Only	Heli	S032N003W10	No trail, heli drilling
ASAP_2537	S032N003W10	62.879	-149.818	Backfill	Borehole Only	Heli	S032N003W10	No trail, heli drilling
ASAP_2538	S032N003W10	62.879	-149.823	Backfill	Borehole Only	Heli	S032N003W10	No trail, heli drilling
ASAP_2539	S032N003W10	62.879	-149.830	Backfill	Borehole Only	Heli	S032N003W10	No trail, heli drilling
ASAP_2540	S032N003W09	62.878	-149.833	Casing	Borehole Only	Heli	S032N003W09	No trail, heli drilling
ASAP_2541	S032N003W09	62.875	-149.849	Backfill	Borehole Only	Heli	S032N003W09	No trail, heli drilling
ASAP_2542	S032N003W09	62.872	-149.860	Backfill	Borehole Only	Heli	S032N003W09	No trail, heli drilling
ASAP_2543	S032N003W08	62.871	-149.862	Backfill	Borehole Only	Heli	S032N003W08	No trail, heli drilling
ASAP_2544	S032N003W17	62.870	-149.864	Backfill	Borehole Only	Heli	S032N003W17	No trail, heli drilling
ASAP_2545	S032N003W20	62.856	-149.879	Backfill	Borehole Only	Heli	S032N003W20	No trail, heli drilling
ASAP_2546	S032N003W20	62.854	-149.880	Casing	Borehole Only	Heli	S032N003W20	No trail, heli drilling



**Table 1. Geotechnical Borehole Locations in the Denali State Park**

Borehole ID	MTRS	Latitude	Longitude	Borehole Completion	Request	Equipment	Access	Notes
ASAP_2547	S032N003W30	62.828	-149.919	Casing	Borehole Only	Heli	S032N003W30	No trail, heli drilling
ASAP_2548	S031N004W02	62.804	-149.977	Casing	Borehole Only	Heli	S031N004W02	No trail, heli drilling
ASAP_2549	S031N004W10	62.796	-149.994	Backfill	Borehole and Access	Track	S031N004W10	Access from Parks Hwy ROW, across frozen wetland to borehole
ASAP_2550	S031N004W10	62.795	-149.994	Casing	Borehole and Access	Track	S031N004W10	Access in Parks Hwy ROW to borehole
ASAP_2551	S031N004W16	62.783	-150.024	Backfill	Borehole Only	Heli	S031N004W16	No trail, heli drilling
ASAP_2552	S031N004W16	62.773	-150.045	Backfill	Borehole Only	Heli	S031N004W16	No trail, heli drilling
ASAP_2553	S031N004W20	62.766	-150.068	Backfill	Borehole and Access	Track	S031N004W20	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2554	S031N004W20	62.765	-150.070	Backfill	Borehole and Access	Track	S031N004W20	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2555	S031N004W19	62.759	-150.091	Backfill	Borehole and Access	Track	S031N004W19	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2556	S031N004W30	62.754	-150.109	Backfill	Borehole Only	Heli	S031N004W30	No trail, heli drilling
ASAP_2557	S031N005W25	62.749	-150.123	Casing	Borehole and Access	Track	S031N005W25	Access in Parks Hwy ROW, borehole in ROW
ASAP_2558	S031N005W25	62.750	-150.124	Casing	Borehole and Access	Track	S031N005W25	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_1001	S031N005W25	62.746	-150.134	Casing	Borehole and Access	Track	S031N005W25	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2559	S031N005W25	62.740	-150.145	Backfill	Borehole and Access	Track	S031N005W25	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2560	S031N005W35	62.739	-150.145	Backfill	Borehole and Access	Track	S031N005W35	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2561	S031N005W35	62.729	-150.170	Backfill	Borehole Only	Heli	S031N005W35	No trail, heli drilling
ASAP_2562	S030N005W03	62.722	-150.180	Backfill	Borehole Only	Heli	S030N005W03	No trail, heli drilling
ASAP_2563	S030N005W03	62.714	-150.193	Backfill	Borehole Only	Heli	S030N005W03	No trail, heli drilling
ASAP_2564	S030N005W03	62.712	-150.197	Backfill	Borehole Only	Heli	S030N005W03	No trail, heli drilling
ASAP_2565	S030N005W10	62.708	-150.202	Backfill	Borehole Only	Heli	S030N005W09	No trail, heli drilling
ASAP_2566	S030N005W09	62.702	-150.223	Backfill	Borehole Only	Heli	S030N005W09	No trail, heli drilling
ASAP_2567	S030N005W17	62.684	-150.243	Casing	Borehole and Access	Track	S030N005W17	Access from Parks Hwy ROW, across frozen wetland to borehole
ASAP_2568	S030N005W21	62.670	-150.230	Backfill	Borehole and Access	Track	S030N005W21	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2569	S030N005W28	62.666	-150.227	Backfill	Borehole Only	Heli	S030N005W28	No trail, heli drilling
ASAP_2570	S030N005W28	62.656	-150.224	Backfill	Borehole Only	Heli	S030N005W28	No trail, heli drilling
ASAP_2571	S030N005W33	62.642	-150.219	Backfill	Borehole Only	Heli	S030N005W33	No trail, heli drilling
ASAP_2572	S029N005W04	62.632	-150.224	Backfill	Borehole Only	Heli	S029N005W04	No trail, heli drilling
ASAP_2806	S029N005W04	62.631	-150.229	Backfill	Borehole and Access	Track	S029N005W04	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2807	S029N005W04	62.629	-150.232	Backfill	Borehole Only	Heli	S029N005W04	No trail, heli drilling
ASAP_2808	S029N005W04	62.626	-150.233	Backfill	Borehole Only	Heli	S029N005W04	No trail, heli drilling
ASAP_2809	S029N005W09	62.621	-150.234	Backfill	Borehole Only	Heli	S029N005W09	No trail, heli drilling
ASAP_2810	S029N005W08	62.620	-150.241	Backfill	Borehole Only	Heli	S029N005W08	No trail, heli drilling



**Table 1. Geotechnical Borehole Locations in the Denali State Park**

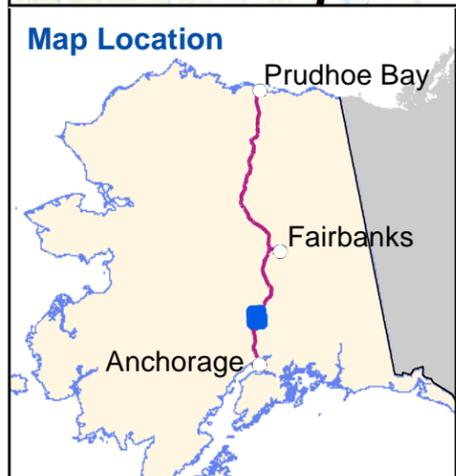
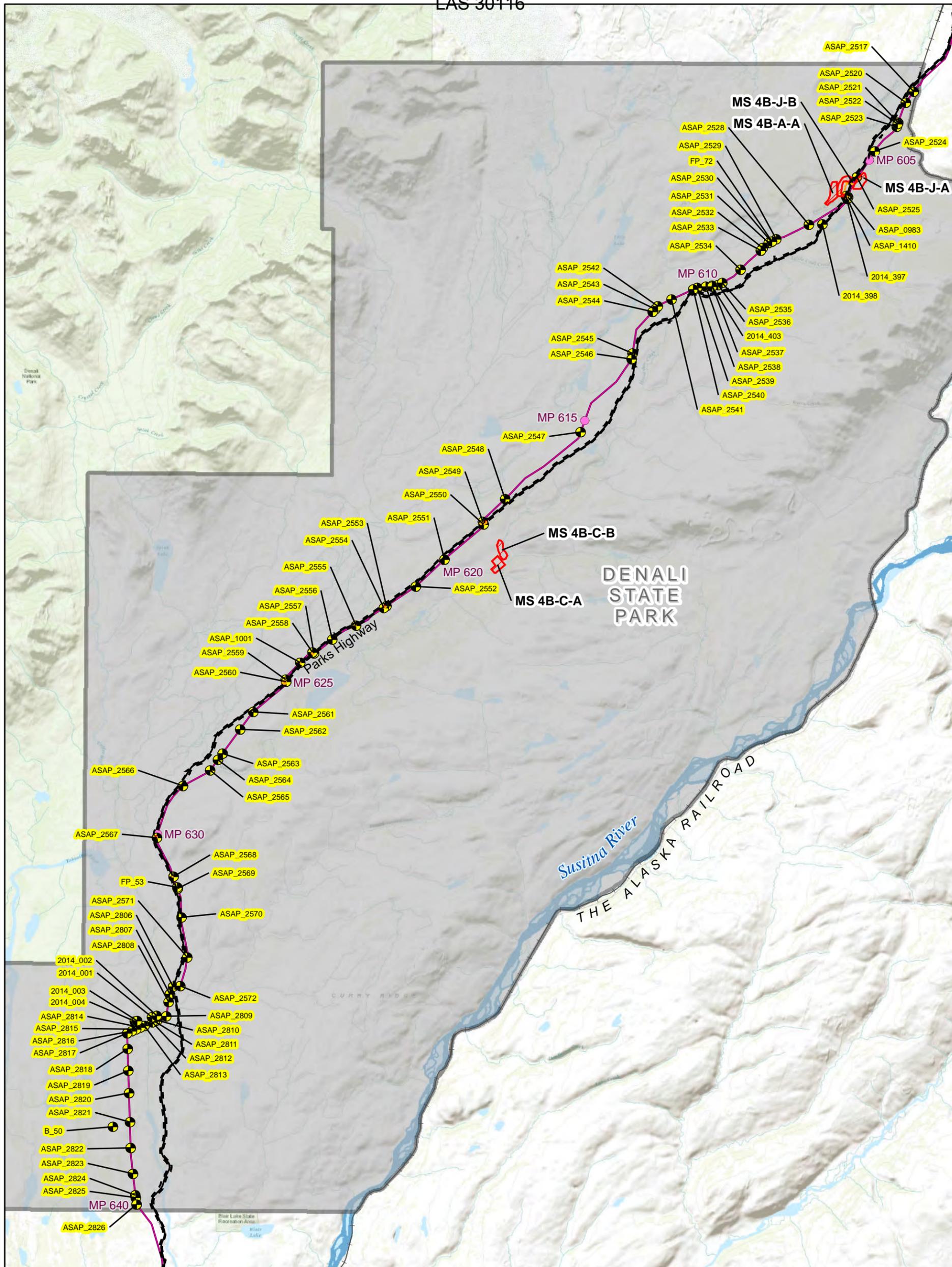
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ASAP_2811	S029N005W08	62.619	-150.243	Backfill	Borehole Only	Heli	S029N005W08	No trail, heli drilling
ASAP_2812	S029N005W08	62.619	-150.245	Casing	Borehole Only	Heli	S029N005W08	Borehole in Chulitna River
ASAP_2813	S029N005W08	62.618	-150.251	Casing	Borehole Only	Heli	S029N005W08	Borehole in Chulitna River
ASAP_2814	S029N005W08	62.617	-150.254	Casing	Borehole Only	Heli	S029N005W08	Borehole in Chulitna River
ASAP_2815	S029N005W08	62.616	-150.257	Casing	Borehole Only	Heli	S029N005W08	No trail, heli drilling
ASAP_2816	S029N005W08	62.616	-150.261	Casing	Borehole Only	Heli	S029N005W08	No trail, heli drilling
ASAP_2817	S029N005W08	62.615	-150.264	Casing	Borehole Only	Heli	S029N005W08	No trail, heli drilling
ASAP_2818	S029N005W17	62.609	-150.264	Casing	Borehole Only	Heli	S029N005W17	No trail, heli drilling
ASAP_2819	S029N005W17	62.602	-150.263	Backfill	Borehole Only	Heli	S029N005W17	No trail, heli drilling
ASAP_2820	S029N005W20	62.594	-150.263	Backfill	Borehole Only	Heli	S029N005W20	No trail, heli drilling
ASAP_2821	S029N005W20	62.584	-150.262	Backfill	Borehole Only	Heli	S029N005W20	No trail, heli drilling
ASAP_2822	S029N005W29	62.574	-150.261	Backfill	Borehole Only	Heli	S029N005W29	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2823	S029N005W32	62.565	-150.259	Backfill	Borehole Only	Heli	S029N005W32	No trail, heli drilling
ASAP_2824	S029N005W32	62.558	-150.257	Backfill	Borehole Only	Heli	S029N005W32	Access in Parks Hwy ROW, borehole on edge of ROW
ASAP_2825	S029N005W32	62.557	-150.257	Casing	Borehole Only	Heli	S029N005W32	No trail, heli drilling
ASAP_2826	S029N005W32	62.554	-150.256	Casing	Borehole Only	Heli	S029N005W32	Access in Parks Hwy ROW, borehole on edge of ROW
B_50	S029N005W19	62.582	-150.275	Casing	Borehole Only	Heli	S029N005W19	No trail, heli drilling
2014_004	S029N005W08	62.619	-150.258	Casing	Borehole Only	Heli	S029N005W08	No trail, heli drilling
2014_003	S029N005W08	62.619	-150.257	Casing	Borehole Only	Heli	S029N005W08	No trail, heli drilling
2014_001	S029N005W08	62.621	-150.246	Casing	Borehole Only	Heli	S029N005W08	No trail, heli drilling
2014_002	S029N005W08	62.621	-150.242	Casing	Borehole Only	Heli	S029N005W08	No trail, heli drilling
FP_53	S030N005W28	62.666	-150.227	Casing	Borehole Only	Heli	S030N005W28	No trail, heli drilling
2014_403	S032N003W10	62.879	-149.818	Casing	Borehole Only	Heli	S032N003W10	No trail, heli drilling
FP_72	S032N003W02	62.895	-149.772	Casing	Borehole Only	Heli	S032N003W02	No trail, heli drilling
2014_398	S033N002W31	62.901	-149.733	Casing	Borehole and Access	Track	S033N002W31	Access in Parks Hwy ROW, borehole on edge of ROW
2014_397	S033N002W31	62.911	-149.715	Casing	Borehole and Access	Track	S033N002W31	Access in Parks Hwy ROW, borehole on edge of ROW

Coordinates: Decimal degrees, NAD 83

**Table 2. Material Source Exploration Areas  
Denali State Park Winter 2015**

Material Exploration Site	Exploration Area MTRS	Number of boreholes	Casing	Access Method	Crew Access	Access MTRS
MS 4B-A-A	S033N002W30 S033N002W31	12	4	Heli Drilling	Heli/snow machine	S033N002W30 S033N002W31
MS 4B-J-B	S033N002W30 S033N002W31	17	4	Heli Drilling	Heli/snow machine	S033N002W30 S033N002W31
MS 4B-C-B	S031N004W11 S031N004W14	8	3	Heli Drilling	Heli/snow machine	S031N004W11 S031N004W14
MS 4B-C-A	S031N004W11 S031N004W14 S031N004W15	8	4	Heli Drilling	Heli/snow machine	S031N004W11 S031N004W14 S031N004W15
MS 4B-J(A)	S033N002W029, S032N003W030,	12	2	Heli Drilling	Heli/snow machine	S033N002W029, S032N003W030,

Coordinates: decimal degrees, NAD 83



**Alaska Stand Alone Pipeline / ASAP**

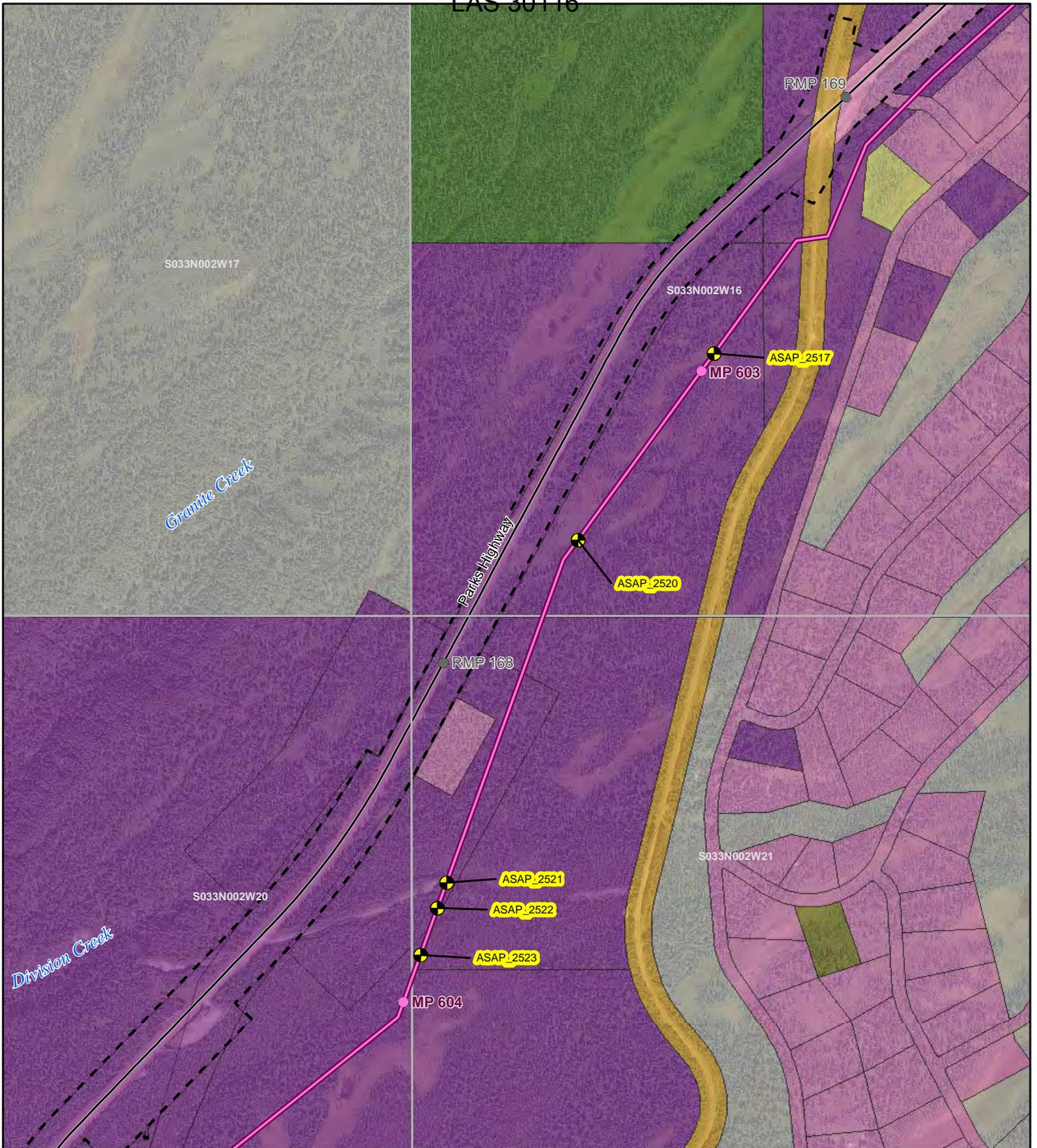
Alaska Gasline Development Corporation  
2014-2015 Field Program  
Boreholes, Material Sites  
and Access Roads within  
Denali State Park

1 in = 12,000 feet  
Map Scale 1:144,000

0 1 2 3 4 Miles

- Legend**
- Boreholes
  - ASAP Mileposts
  - ASAP Alignment
  - Material Exploration Sites
  - Major Roads
  - +— Railroads
  - Denali State Park

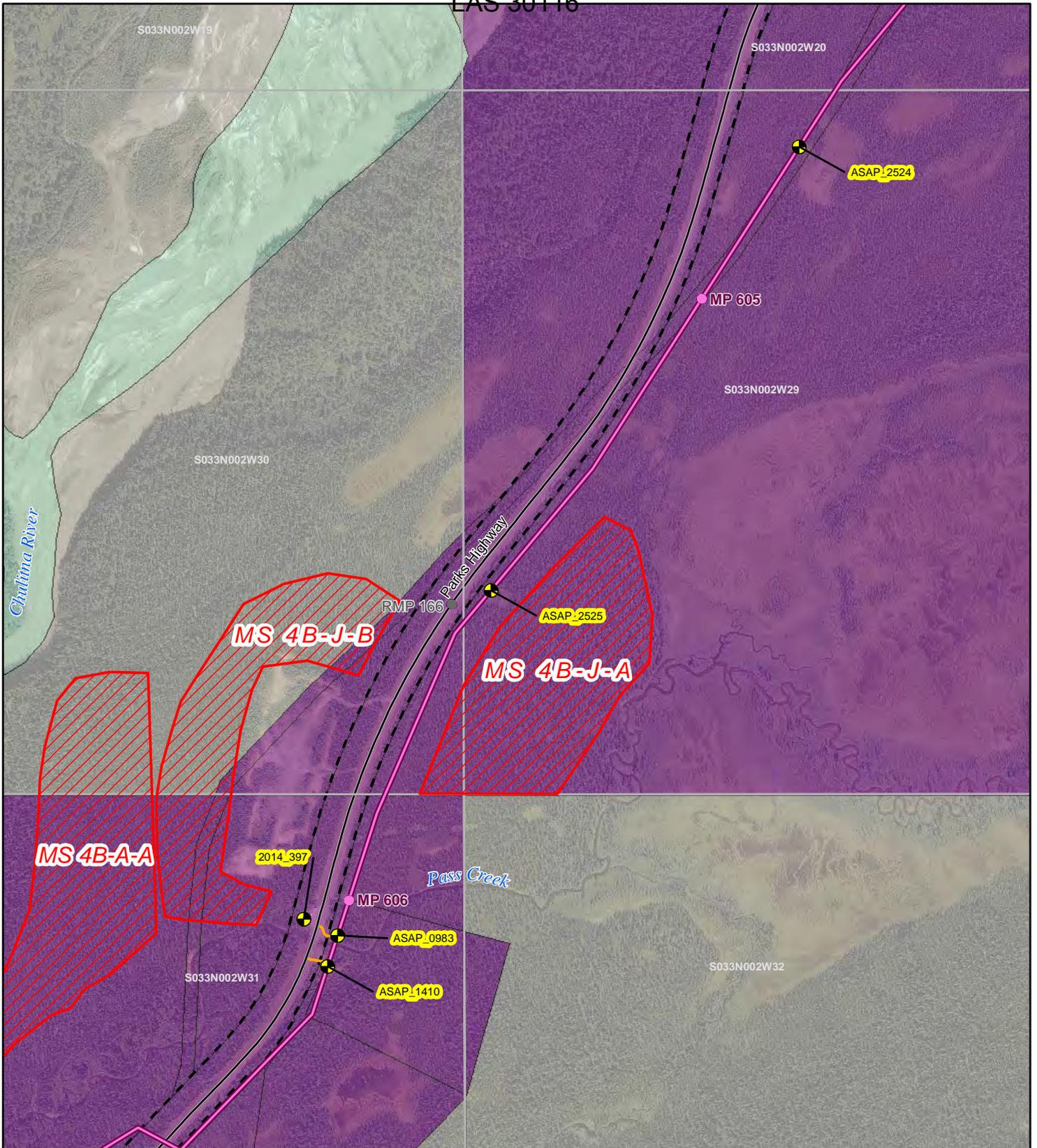
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Date	December 11, 2014
Sheet	1 of 1



**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites  
 Denali State Park  
 Map Scale 1:12,000

Legend	
●	Road Milepost
●	ASAP Milepost
—	ASAP Alignment
⊕	AGDC Boreholes
- -	Highway Right-of-Way
⬜	Native Allotment
⬜	Municipal/Borough
⬜	State of Alaska
⬜	Alaska Railroad
⬜	Federal
⬜	Private
⬜	Undetermined

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
Date	December 11, 2014
Sheet	Page 1 of 14

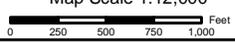


**Alaska Stand Alone Pipeline / ASAP**

Winter 2014/2015  
Geotechnical Borehole  
Material Sites & Access Locations  
Alaska Gasline Development Corporation Sites

Denali State Park

Map Scale 1:12,000



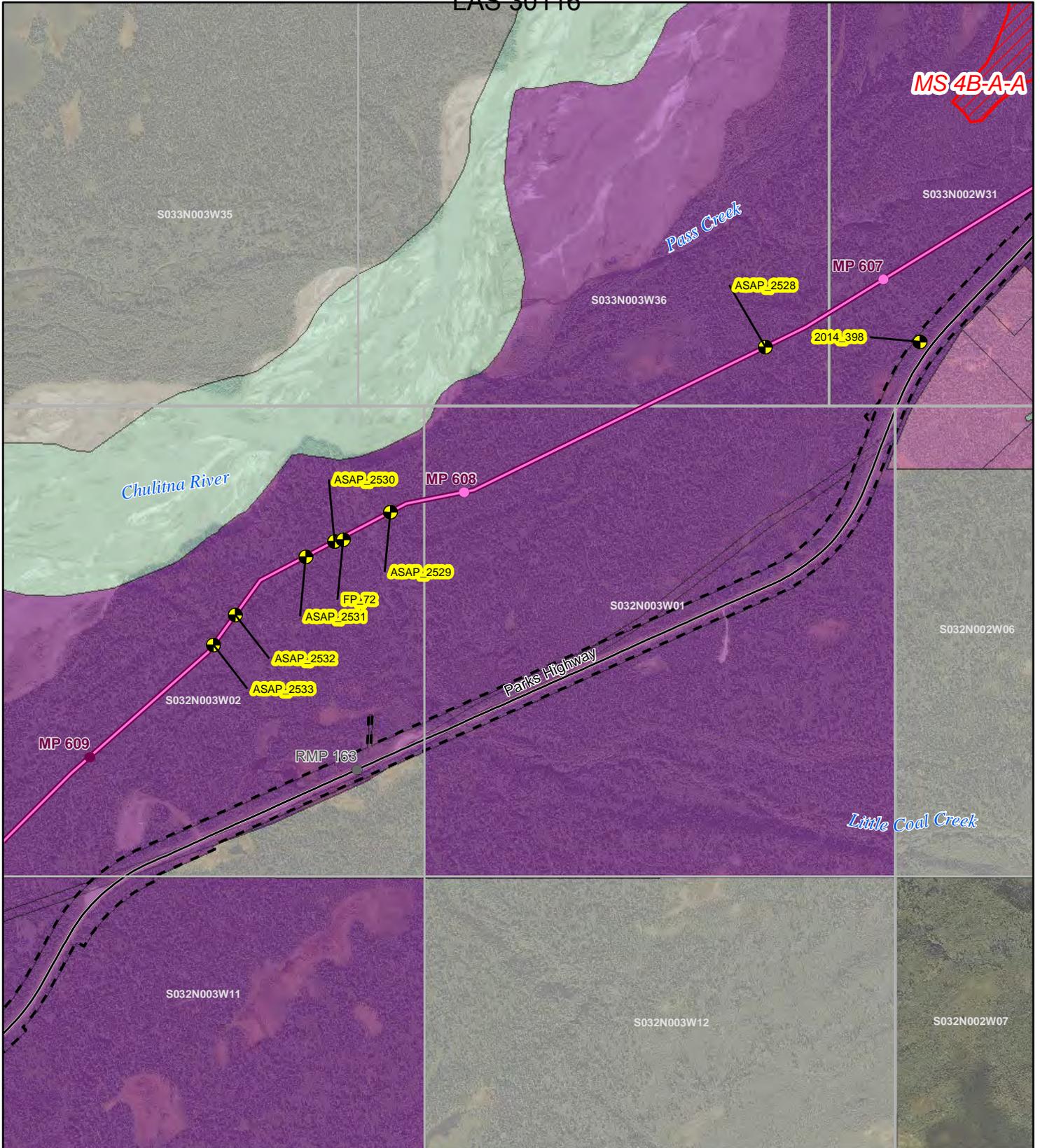
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- Road Milepost
- ASAP Milepost
- ASAP Alignment
- ⊙ AGDC Boreholes
- - Highway Right-of-Way
- New Borehole Access
- State of Alaska
- Undetermined
- Water



Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
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MS 4B-A-A



**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites

Denali State Park

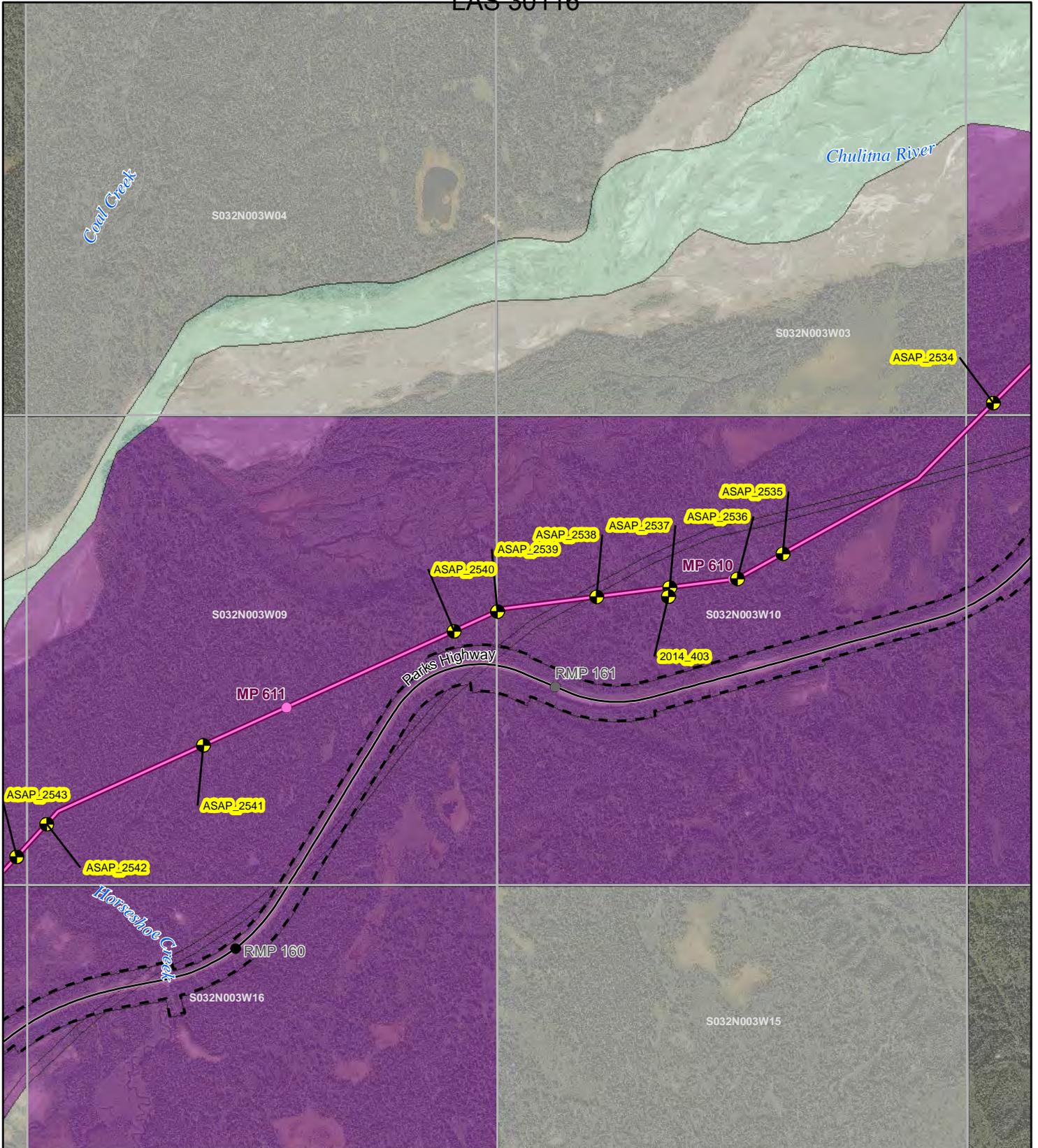
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0 380 760 1,140 1,520 Feet

**Legend**

- Road Milepost
- ASAP Milepost
- ASAP Alignment
- ⊕ AGDC Boreholes
- - Highway Right-of-Way
- State of Alaska
- Private
- Undetermined
- Water

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
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**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites

Denali State Park

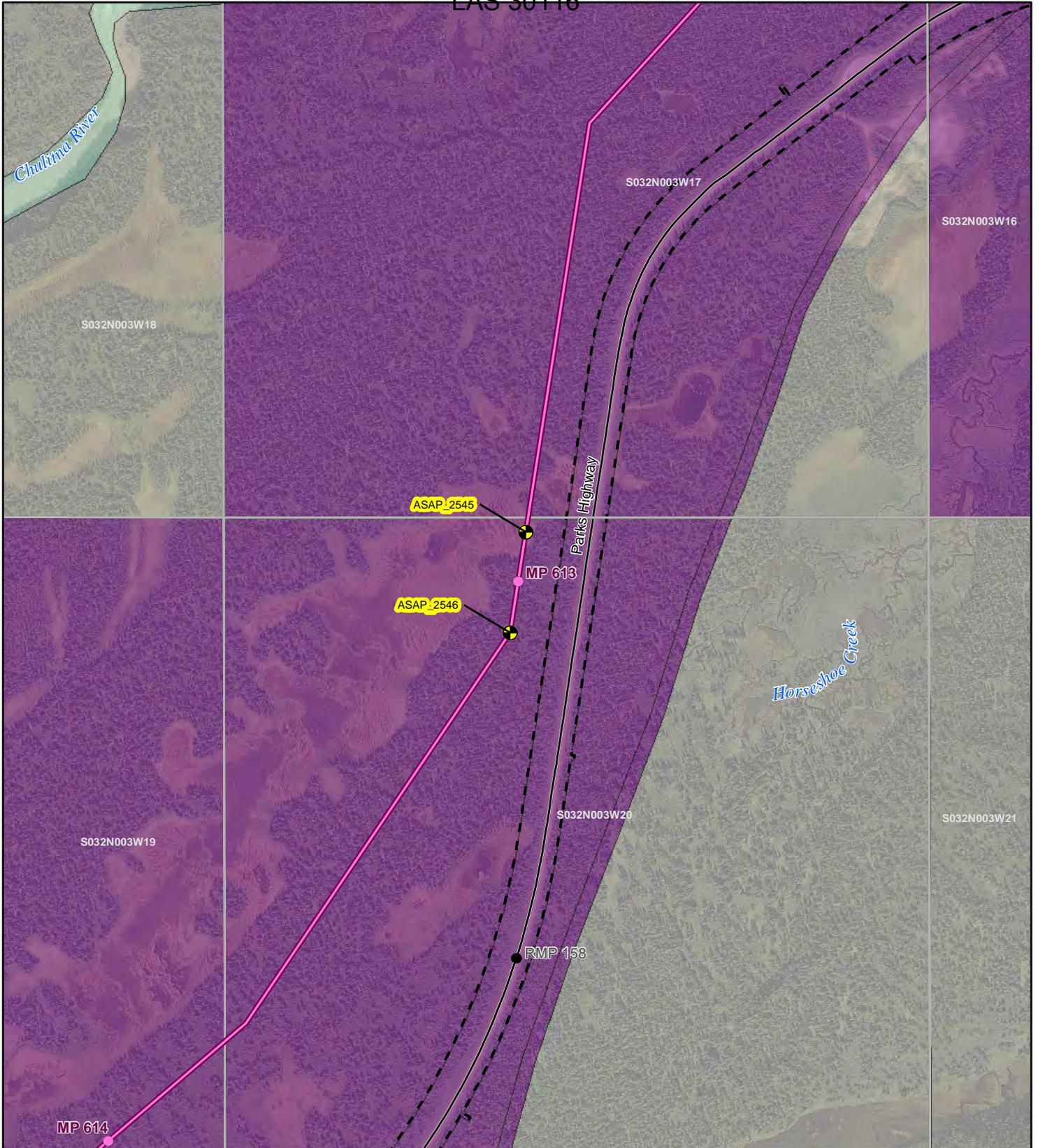
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0 380 760 1,140 1,520 Feet

**Legend**

- Road Milepost
- ASAP Milepost
- ASAP Alignment
- ⊙ AGDC Boreholes
- - Highway Right-of-Way
- State of Alaska
- Undetermined
- Water

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
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**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites

Denali State Park

Map Scale 1:12,000

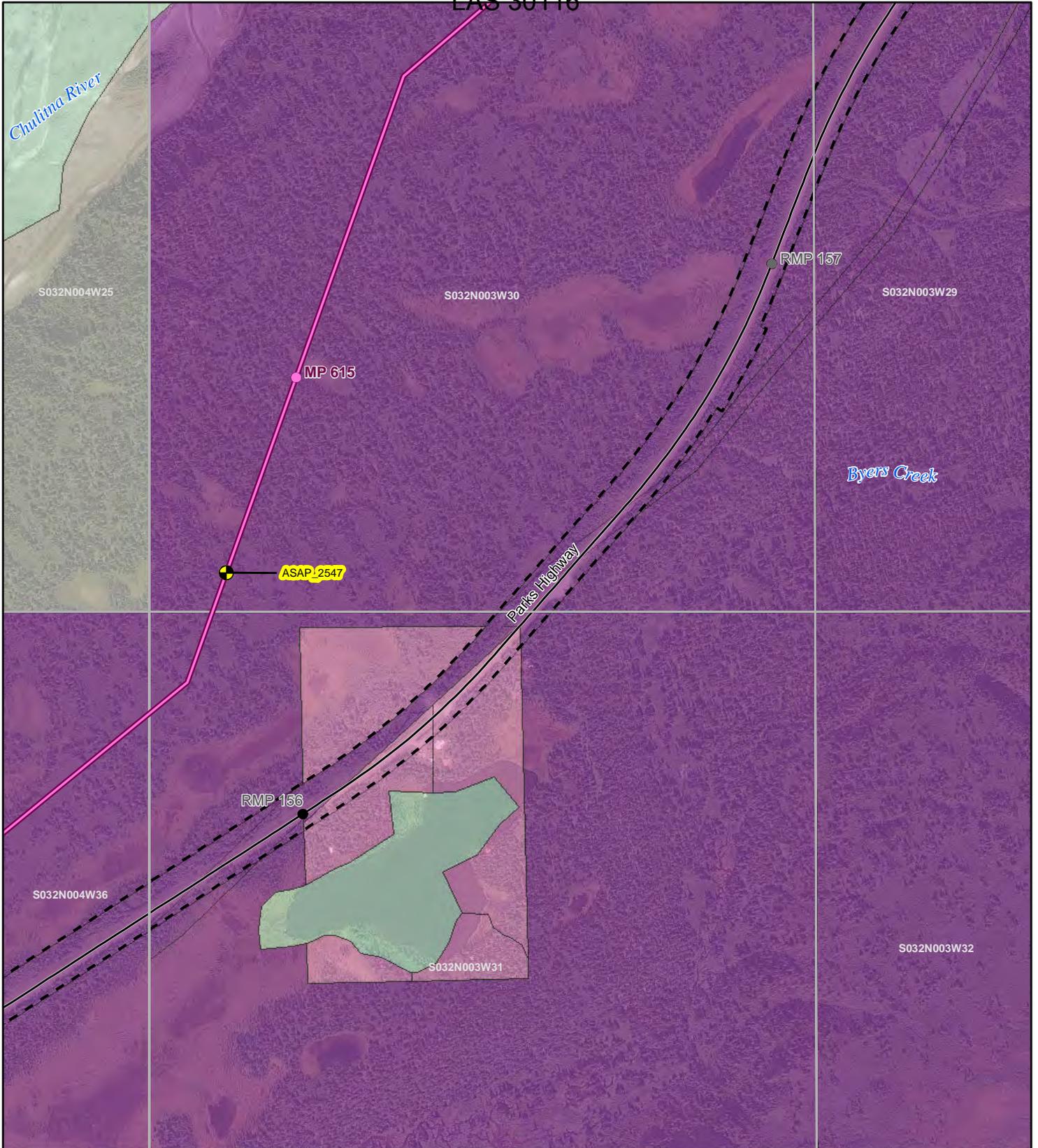
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**Legend**

- Road Milepost
- ASAP Milepost
- ASAP Alignment
- ⊗ AGDC Boreholes
- - Highway Right-of-Way
- State of Alaska
- Undetermined
- Water

Document ID	004-C-22-DWG-D-0008
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Attachment A  
LAS 30116

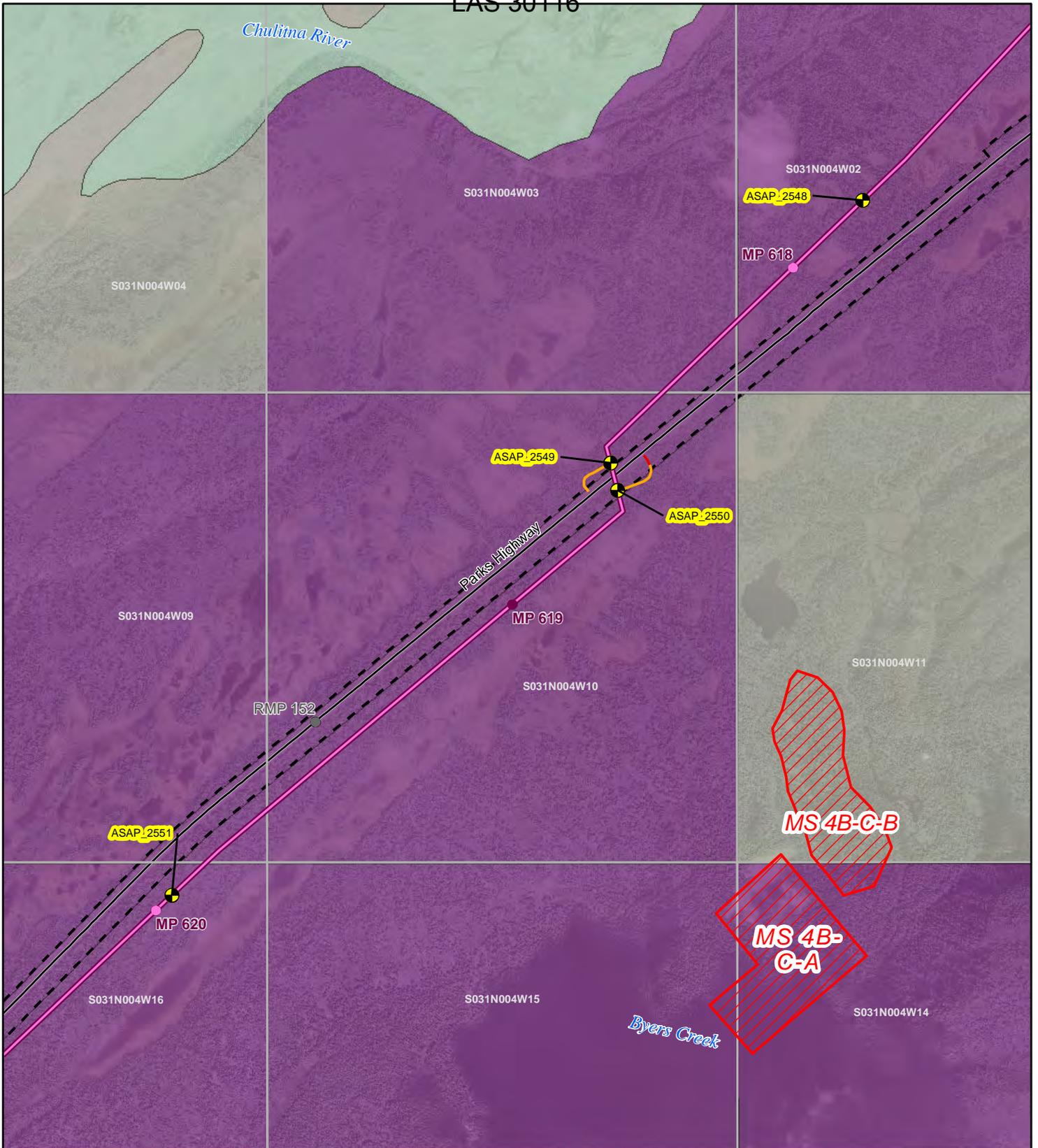


**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites  
 Denali State Park  
 Map Scale 1:12,000

**Legend**

- Road Milepost
- ASAP Milepost
- ASAP Alignment
- ⦿ AGDC Boreholes
- - Highway Right-of-Way
- State of Alaska
- Private
- Undetermined
- Water

Document ID	004-C-22-DWG-D-0008
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**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites

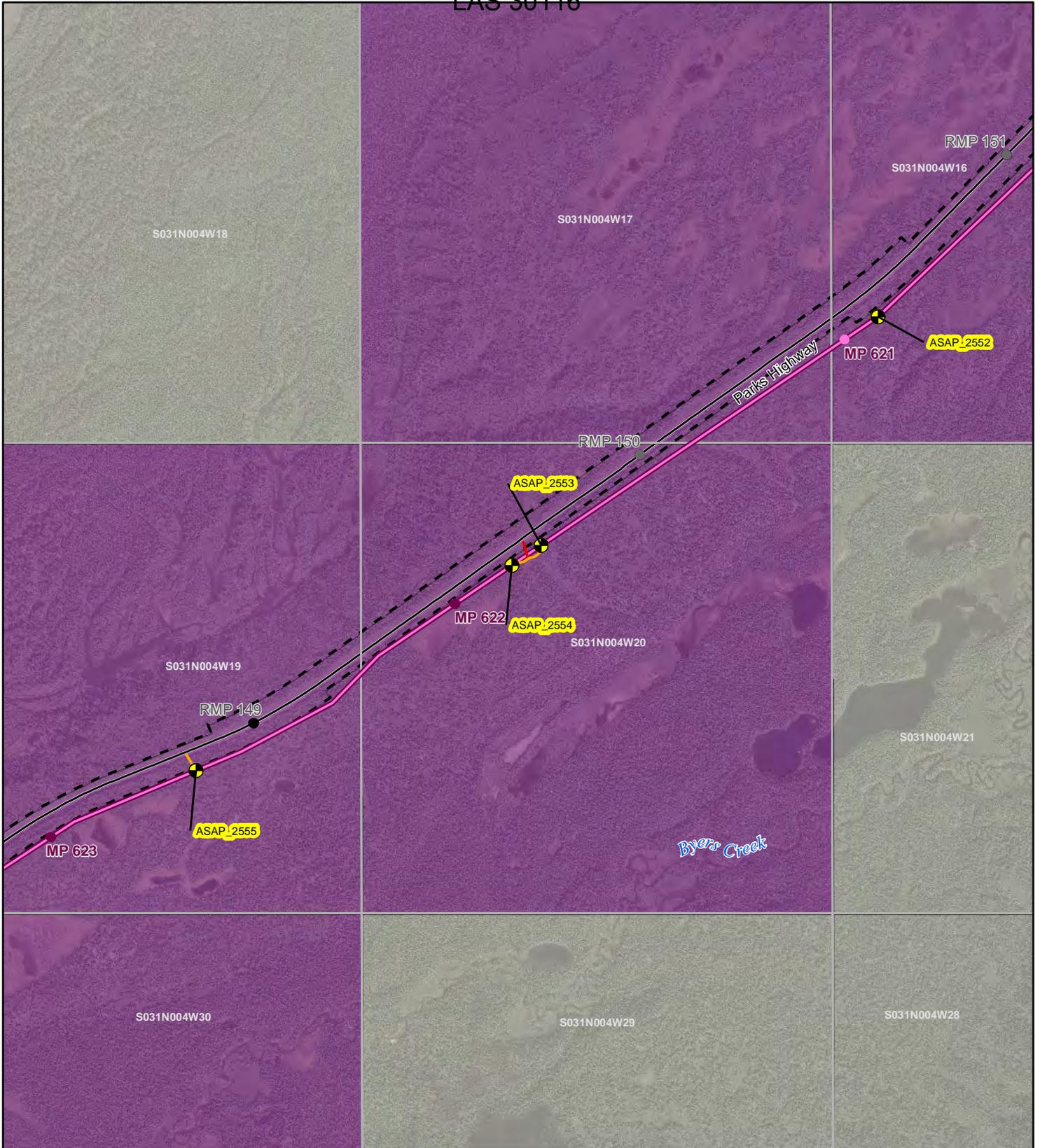
Denali State Park

Map Scale 1:18,000

**Legend**

Road Milepost	State of Alaska
ASAP Milepost	Undetermined
ASAP Alignment	Water
AGDC Boreholes	
Highway Right-of-Way	
Existing Borehole Access	
New Borehole Access	

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
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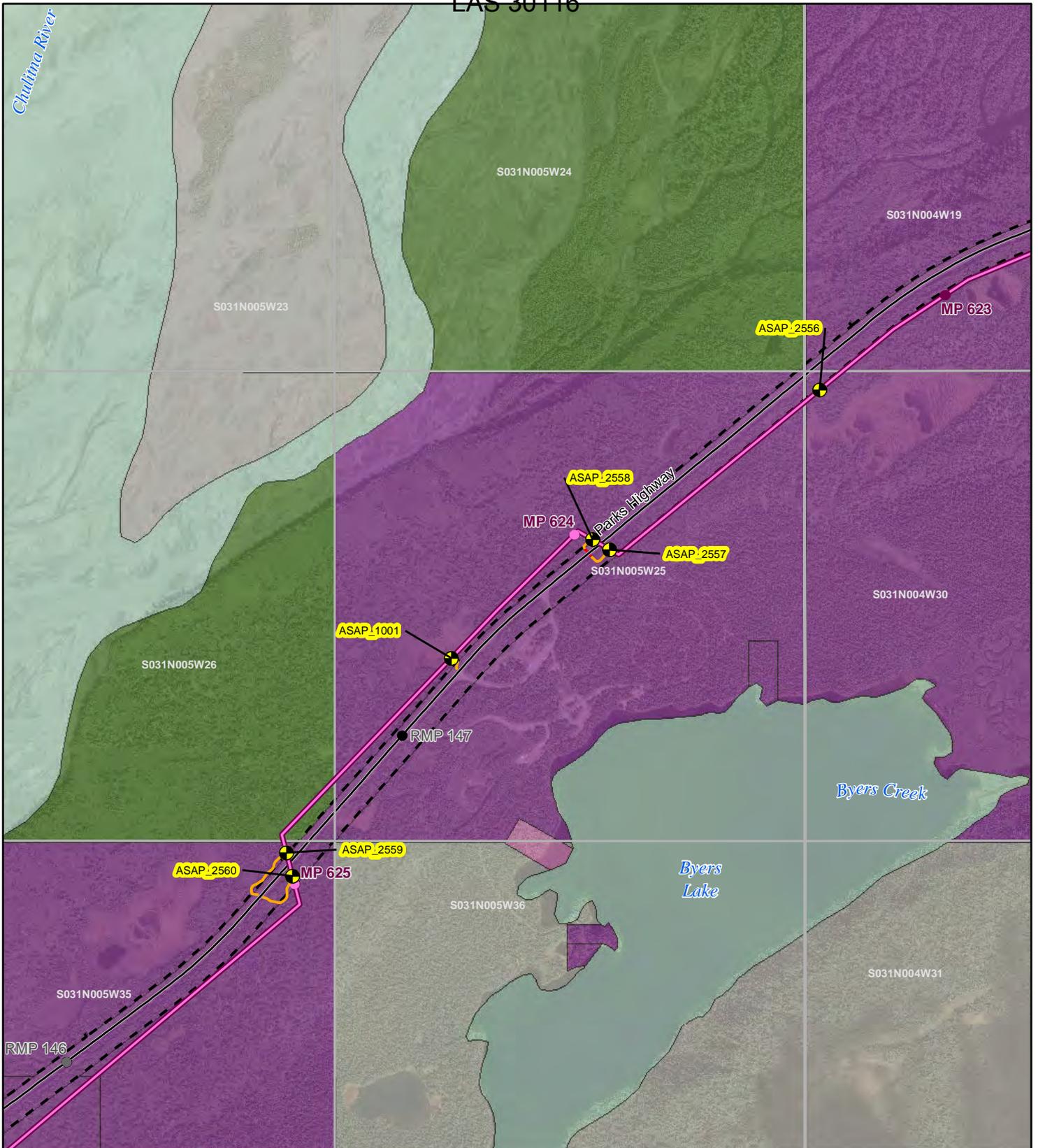


**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites  
 Denali State Park  
 Map Scale 1:18,000

**Legend**

- Road Milepost
- ASAP Milepost
- ASAP Alignment
- ⊕ AGDC Boreholes
- - Highway Right-of-Way
- Existing Borehole Access
- New Borehole Access
- ⊕ State of Alaska
- ⊕ Undetermined

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
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**Alaska Stand Alone Pipeline / ASAP**

Winter 2014/2015  
Geotechnical Borehole  
Material Sites & Access Locations  
Alaska Gasline Development Corporation Sites

Denali State Park

Map Scale 1:18,000

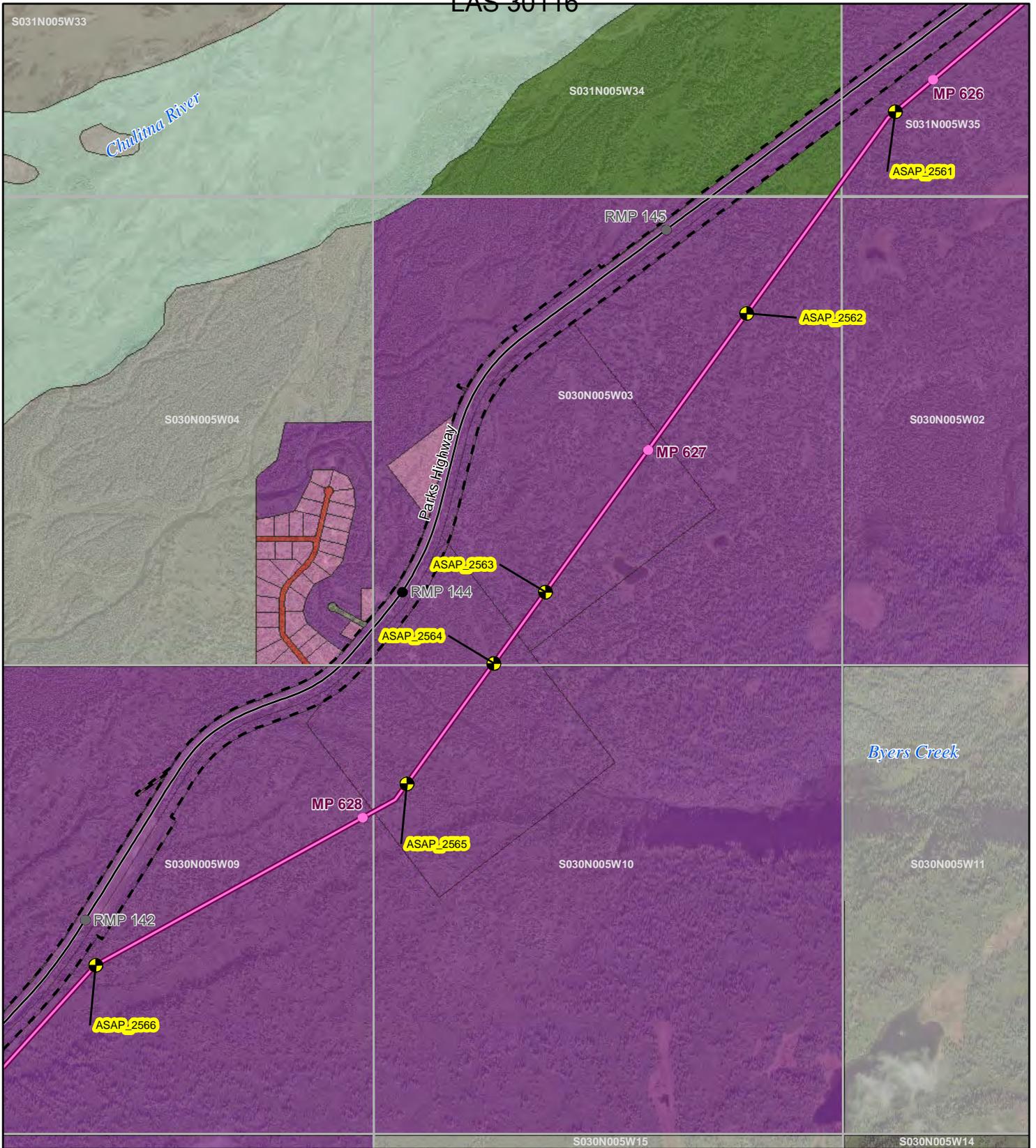
0 380 760 1,140 1,520 Feet

**Legend**

- Road Milepost
- ASAP Milepost
- ASAP Alignment
- ⊕ AGDC Boreholes
- - Highway Right-of-Way
- Existing Borehole Access
- New Borehole Access
- State of Alaska
- Federal
- Private
- Undetermined
- Water

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
Date	December 11, 2014
Sheet	Page 9 of 14

# Attachment A LAS 30116



**Alaska Stand Alone Pipeline / ASAP**

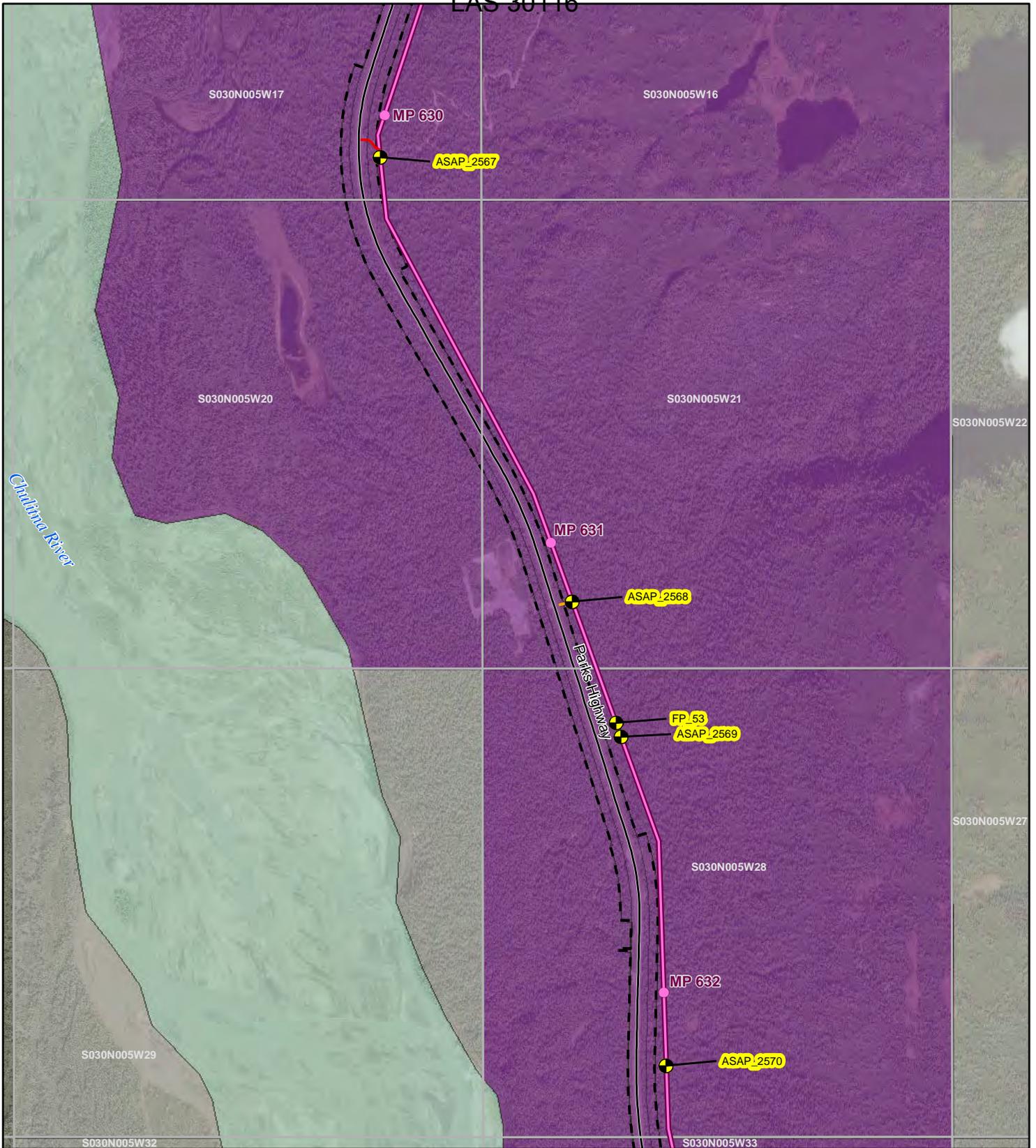
Winter 2014/2015  
Geotechnical Borehole  
Material Sites & Access Locations  
Alaska Gasline Development Corporation Sites

Denali State Park

Map Scale 1:18,000

Legend	
	Road Milepost
	ASAP Milepost
	ASAP Alignment
	AGDC Boreholes
	Highway Right-of-Way
	State of Alaska
	Federal
	Private
	Undetermined
	Existing ROW/Easement
	Water

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
Date	December 11, 2014
Sheet	Page 10 of 14

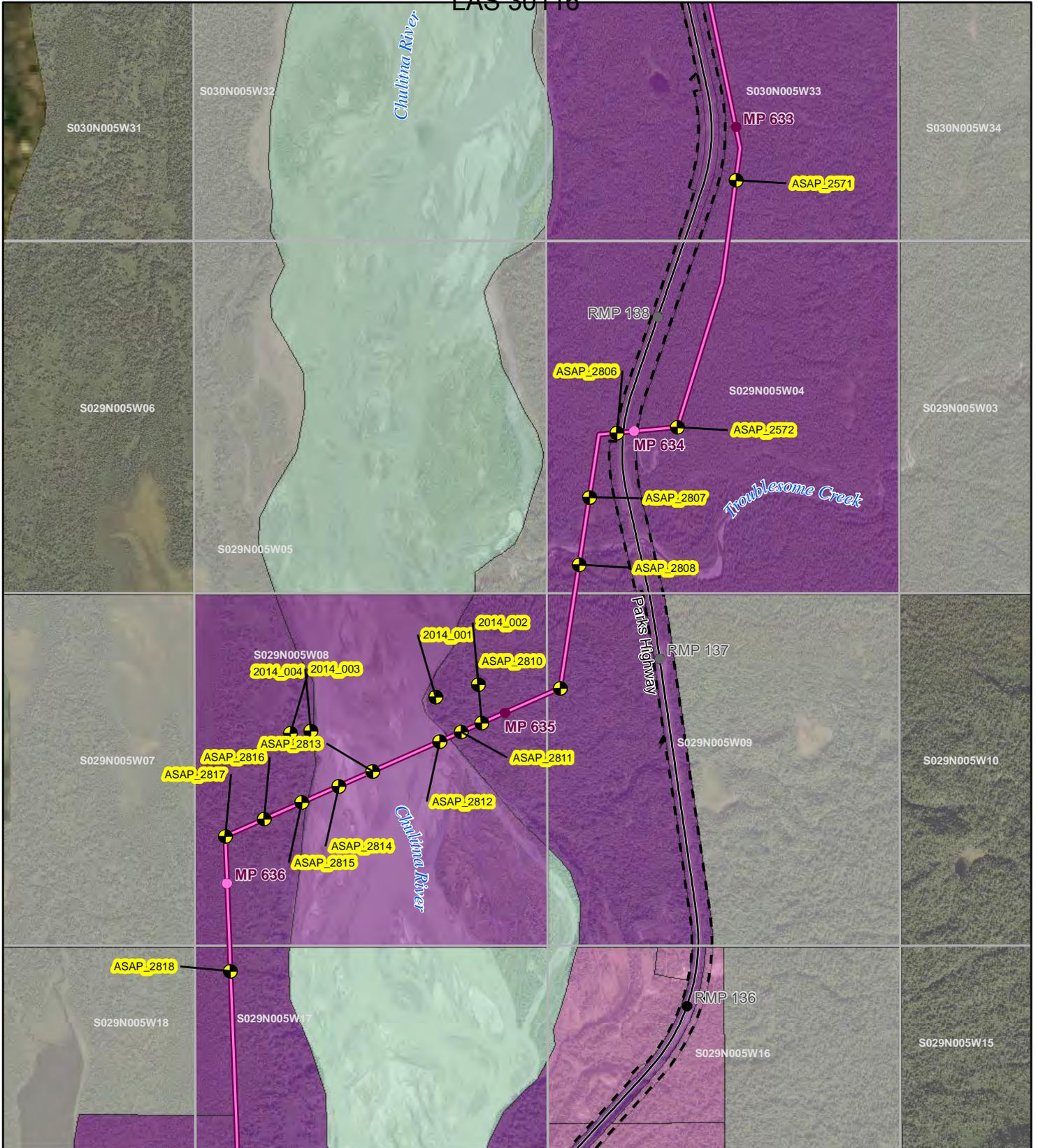


**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites  
 Denali State Park  
 Map Scale 1:18,000

Legend	
	ASAP Milepost
	ASAP Alignment
	AGDC Boreholes
	Highway Right-of-Way
	Existing Borehole Access
	New Borehole Access
	State of Alaska
	Private
	Undetermined
	Water

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
Date	December 11, 2014
Sheet	Page 11 of 14

# Attachment A LAS 30116



**Alaska Stand Alone Pipeline / ASAP**

Winter 2014/2015  
Geotechnical Borehole  
Material Sites & Access Locations  
Alaska Gasline Development Corporation Sites

Denali State Park

Map Scale 1:24,000

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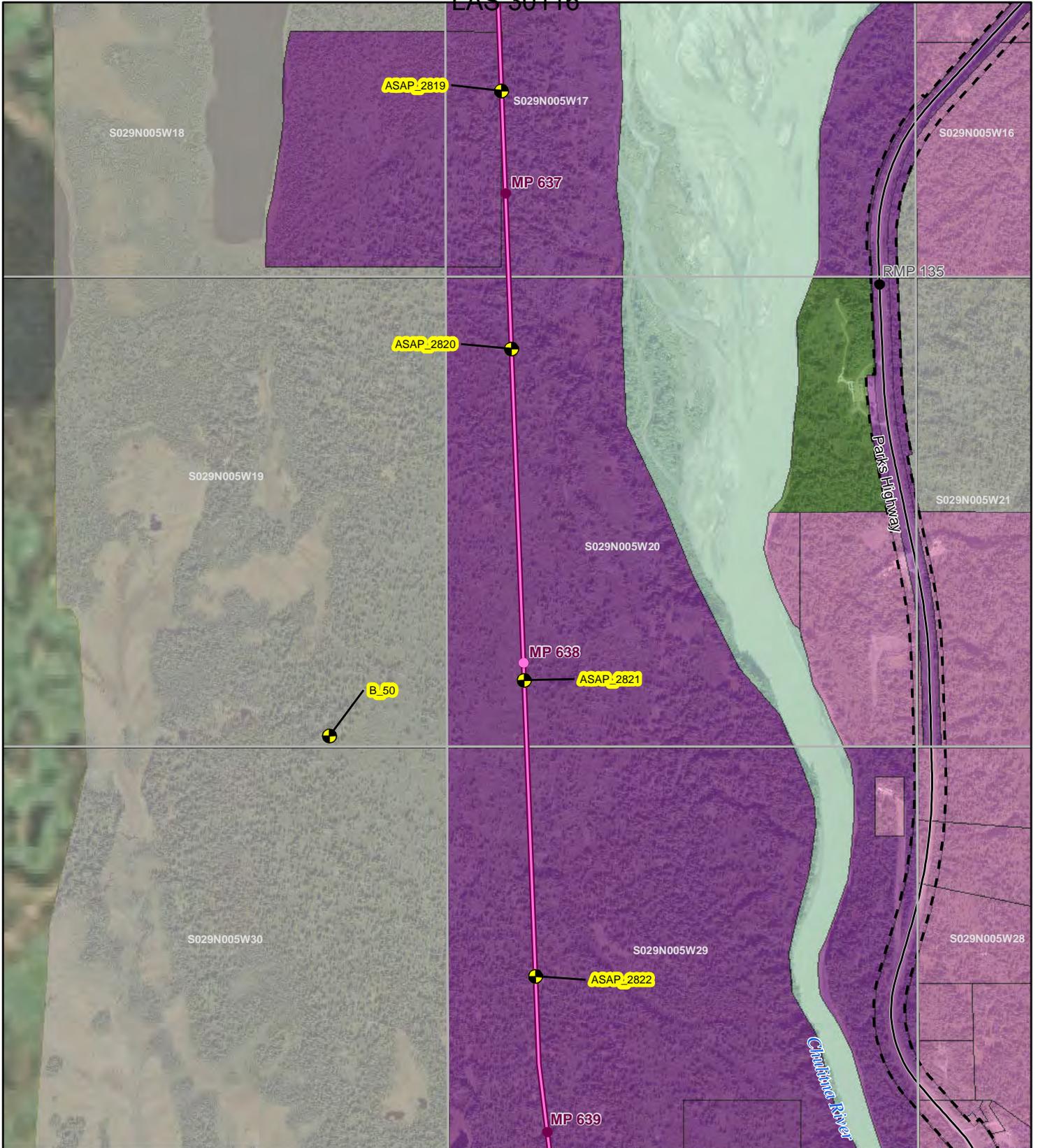
0 520 1,040 1,560 2,080  
Feet

Legend	
● Road Milepost	■ State of Alaska
● ASAP Milepost	■ Private
— ASAP Alignment	■ Undetermined
⊙ AGDC Boreholes	■ Water
- - Highway Right-of-Way	

**ALASKA GASLINE DEVELOPMENT CORP.**  
GAS FOR ALASKANS

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
Date	December 11, 2014
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Attachment A  
LAS 30116



**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites  
 Denali State Park  
 Map Scale 1:18,000

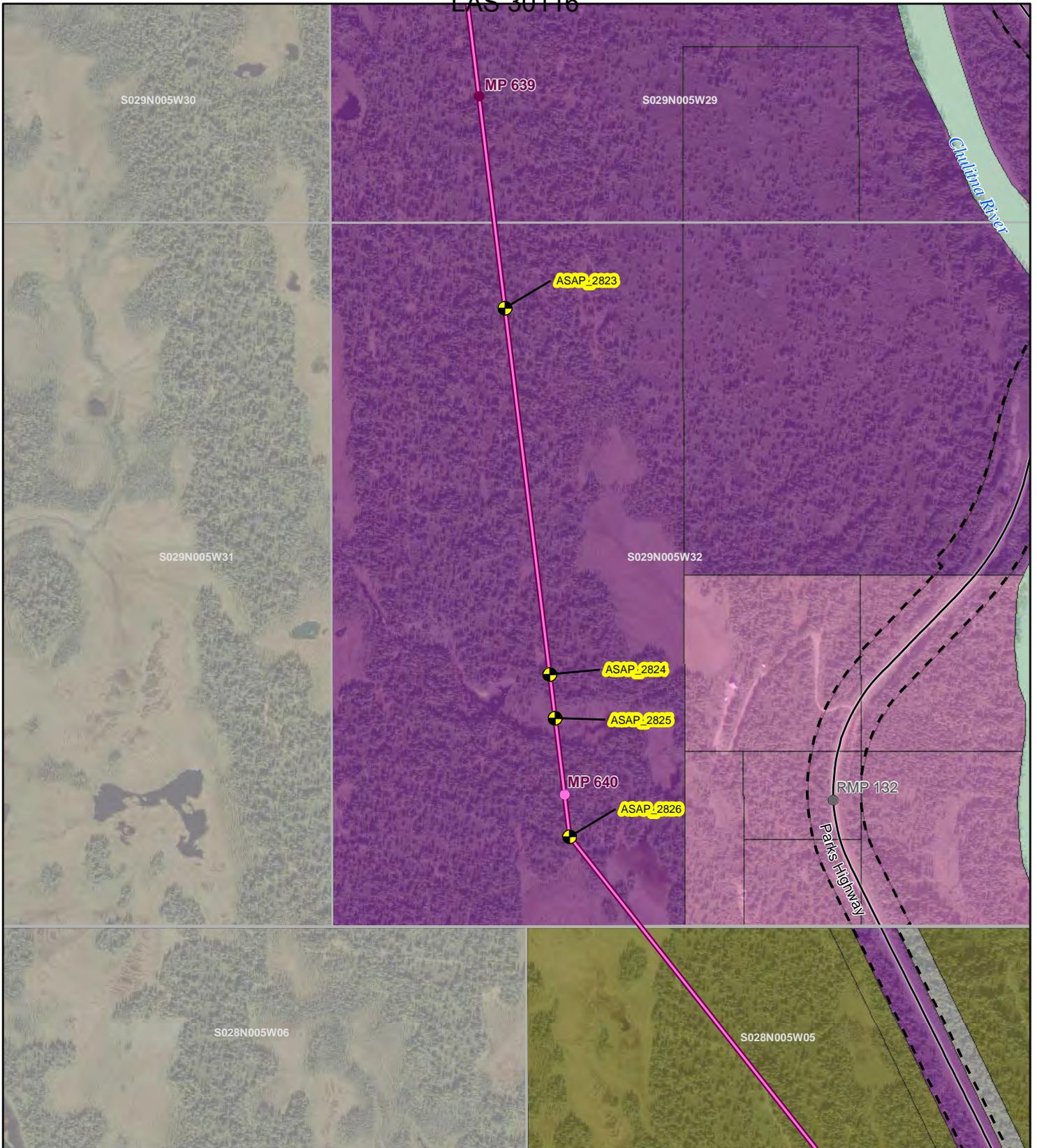
**Legend**

- Road Milepost
- ASAP Milepost
- ASAP Alignment
- AGDC Boreholes
- Highway Right-of-Way
- State of Alaska
- Federal
- Private
- Undetermined
- Water

**ALASKA GASLINE DEVELOPMENT CORP.**  
 GAS FOR ALASKANS

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
Date	December 11, 2014
Sheet	Page 13 of 14

# Attachment A LAS 30116

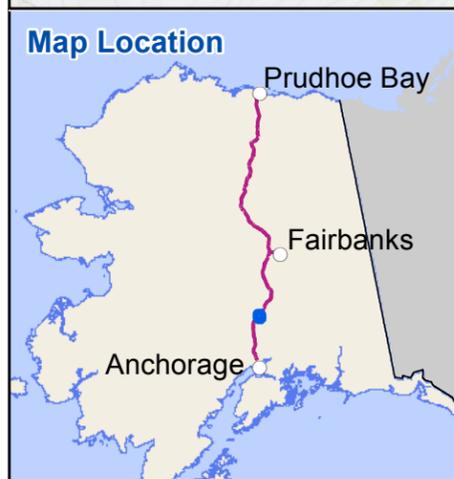
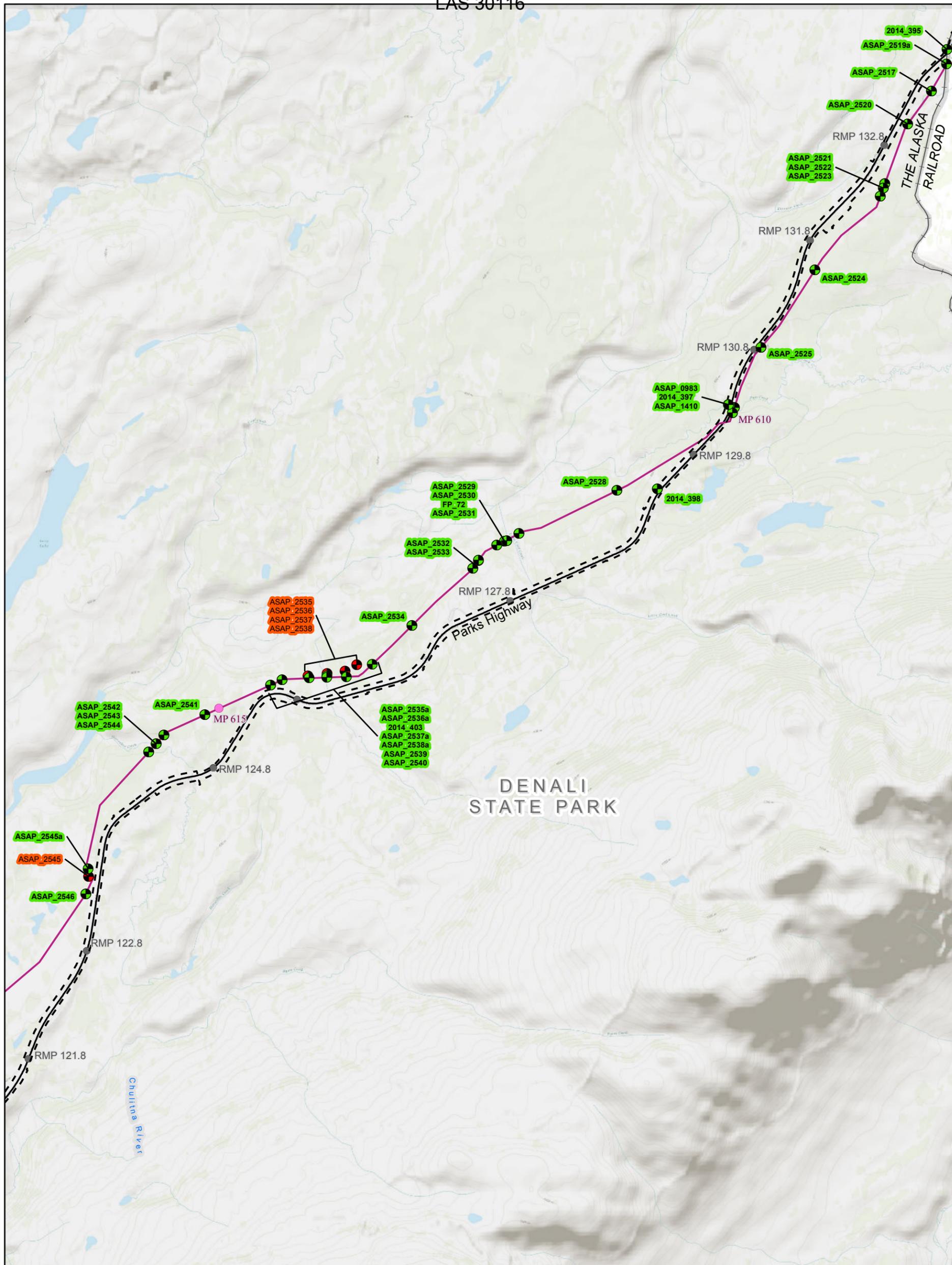


**Alaska Stand Alone Pipeline / ASAP**  
 Winter 2014/2015  
 Geotechnical Borehole  
 Material Sites & Access Locations  
 Alaska Gasline Development Corporation Sites  
 Denali State Park  
 Map Scale 1:12,000

Legend	
● Road Milepost	■ Municipal/Borough
● ASAP Milepost	■ State of Alaska
— ASAP Alignment	■ Private
● AGDC Boreholes	■ Undetermined
- - Highway Right-of-Way	■ Water

**ALASKA GASLINE DEVELOPMENT CORP.**  
GAS FOR ALASKANS

Document ID	004-C-22-DWG-D-0008
File Name	Boreholes_DenaliSP_141120
Date	December 11, 2014
Sheet	Page 14 of 14



**Alaska Gasline Development Corp.**  
 Alaska Gasline Development Corporation  
 Winter 2014/2015 Boreholes  
 Previous & Current Locations

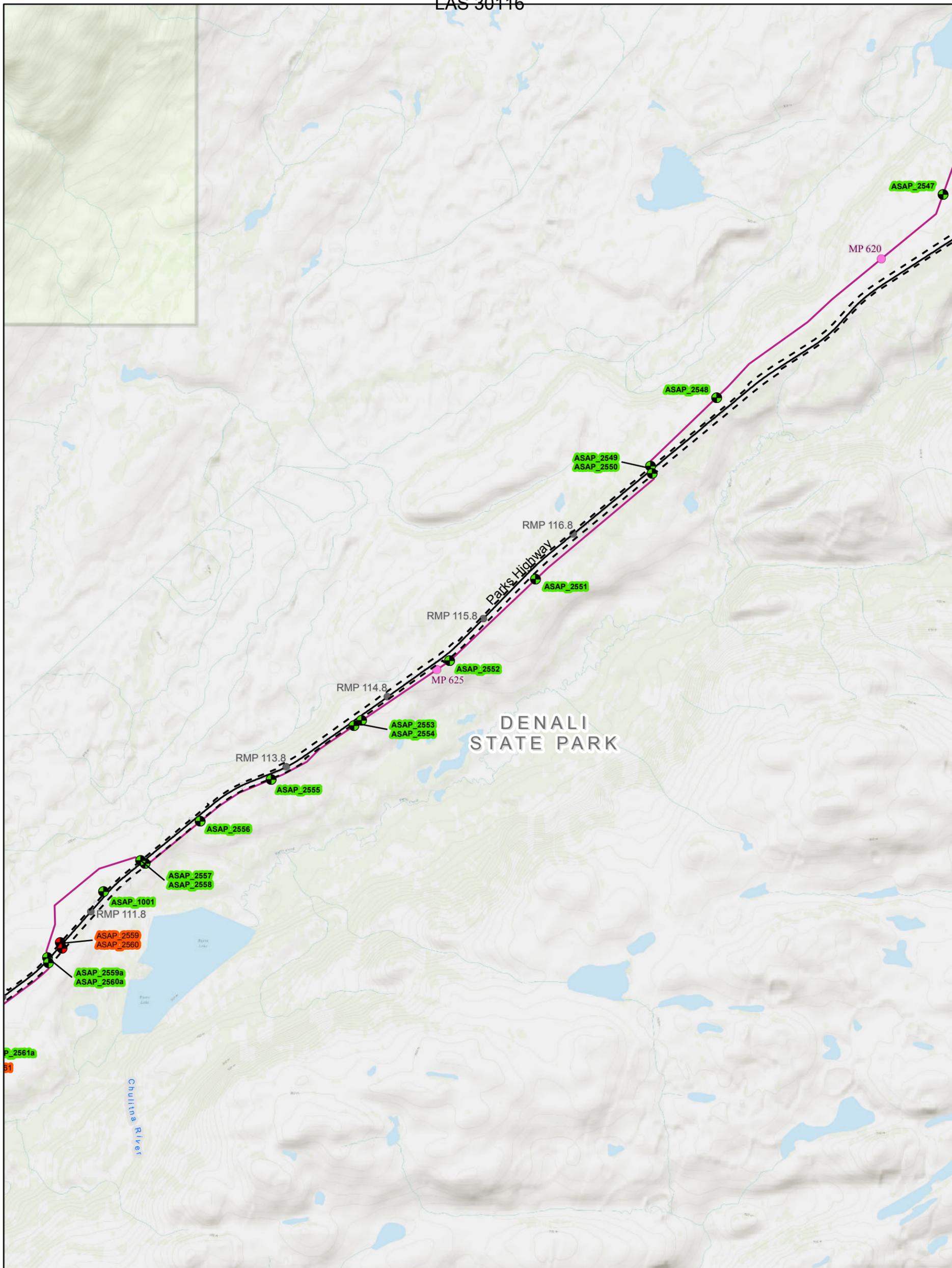
1 in = 4,000 feet  
 Map Scale 1:48,000

**Legend**

- **Current Borehole Locations**
- **Previous Borehole Locations**
- ASAP Alignment
- ASAP Mileposts
- Major Roads
- Railroads
- Denali State Park

**ALASKA GASLINE DEVELOPMENT CORP.**  
 GAS FOR ALASKANS

Document ID	004-C-22-DWG-D-0008
File Name	ERL_150219_BH_DenaliSP
Date	February 19, 2015
Sheet	Page 1 of 4



**Alaska Gasline Development Corp.**

Alaska Gasline Development Corporation  
 Winter 2014/2015 Boreholes  
 Previous & Current Locations

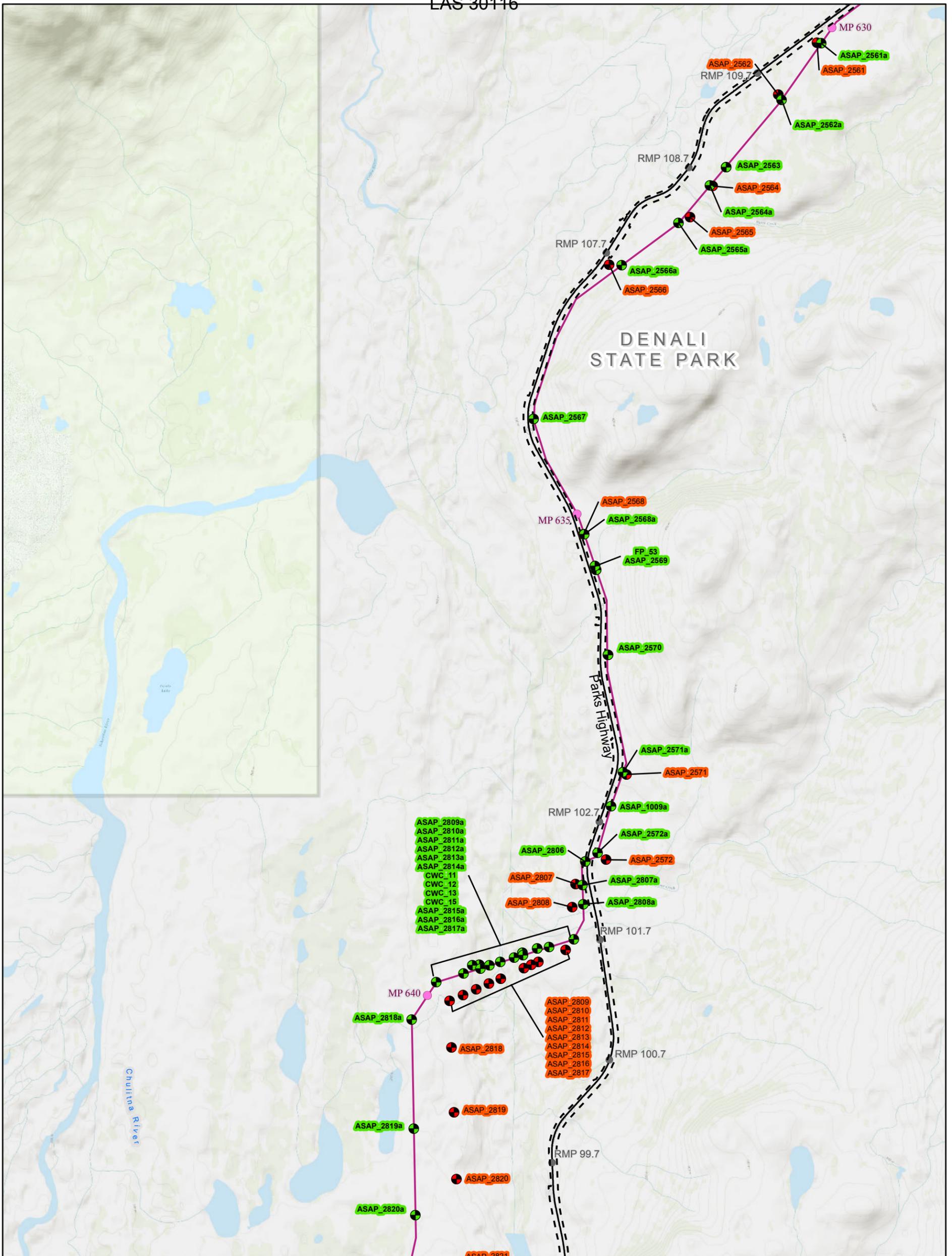
1 in = 4,000 feet  
 Map Scale 1:48,000

**Legend**

- **Current Borehole Locations**
- **Previous Borehole Locations**
- ASAP Alignment
- ASAP Mileposts
- Major Roads
- Denali State Park

**ALASKA GASLINE DEVELOPMENT CORP.**  
 GAS FOR ALASKANS

Document ID	004-C-22-DWG-D-0008
File Name	ERL_150219_BH_DenaliSP
Date	February 19, 2015
Sheet	Page 2 of 4



**Alaska Gasline Development Corp.**

Alaska Gasline Development Corporation  
Winter 2014/2015 Boreholes  
Previous & Current Locations

1 in = 4,000 feet  
Map Scale 1:48,000

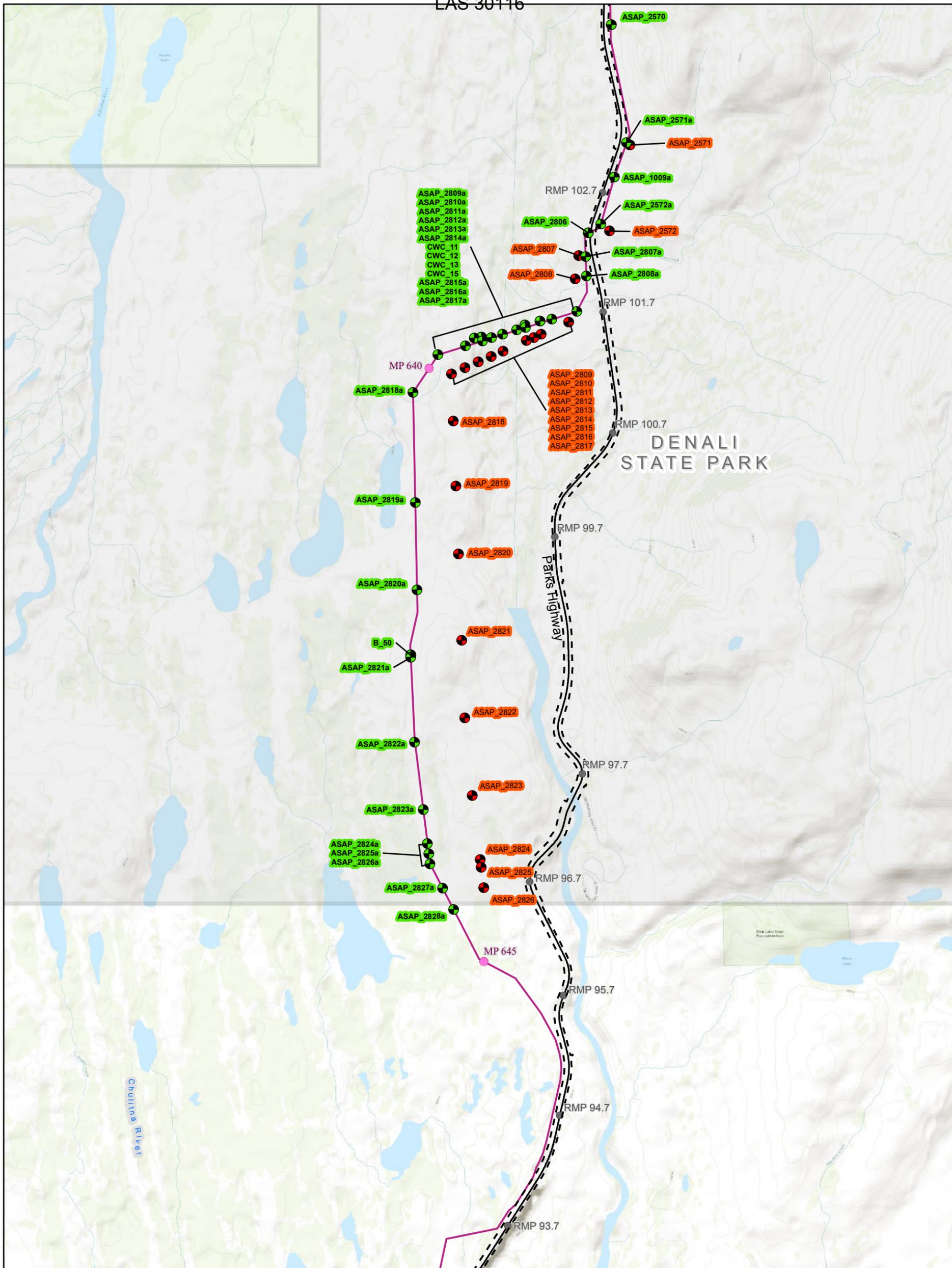
0 2,000 4,000 6,000 8,000  
Feet

**Legend**

- Current Borehole Locations
- Previous Borehole Locations
- ASAP Alignment
- ASAP Mileposts
- Major Roads
- Denali State Park

**ALASKA GASLINE DEVELOPMENT CORP.**  
GAS FOR ALASKANS

Document ID	004-C-22-DWG-D-0008
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**Alaska Gasline Development Corp.**

Alaska Gasline Development Corporation  
 Winter 2014/2015 Boreholes  
 Previous & Current Locations

1 in = 4,000 feet  
 Map Scale 1:48,000

0 2,000 4,000 6,000 8,000  
 Feet

**Legend**

- **Current Borehole Locations**
- **Previous Borehole Locations**
- ASAP Alignment
- ASAP Mileposts
- Major Roads
- ▭ Denali State Park

**ALASKA GASLINE DEVELOPMENT CORP.**  
 GAS FOR ALASKANS

Document ID	004-C-22-DWG-D-0008
File Name	ERL_150219_BH_DenaliSP
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## **Geotechnical Borehole Program Willow Creek State Recreation Area**

### **Purpose**

The Alaska Gasline Development Corporation (AGDC) is continuing to conduct geotechnical activities in the vicinity of the proposed Alaska Stand Alone Pipeline (ASAP) alignment. The information collected will be used to support engineering design activities along the proposed pipeline corridor.

AGDC's winter borehole program along the alignment is scheduled for January 15, 2015 through April 30, 2015. The program includes access, drilling, and collection of geotechnical and geophysical data on State lands. The proposed geotechnical areas and access are shown in the attached table and maps.

### **Access and Clearing**

Access to five boreholes in the Willow Creek State Recreation Area will include helicopter drilling. Overland travel will include snow machines for initial vegetation cutting around the borehole up to a 50 foot radius to safely land the drill rig. Cutting crews will take a snow machine to proposed borehole locations ahead of the drilling crew to cut vegetation for the helicopter landing zones. The crew will take snow machines to weave their way through vegetation to get to the boreholes locations. Cutting is not expected for snow machine access.

Equipment will operate in a manner that avoids or minimizes any disturbance to roots and soil. Woody vegetation will be cut just above ground level using chain saws or hand tools. The minimum amount of clearing will be performed to maintain a safe work environment. If it is necessary to cut trees greater than 2-4 inches in diameter, they will be disposed of according to the requirements of the State permit. Trees and brush will be cut into sections and scattered to promote rapid drying.

### **Geotechnical Borehole Drilling**

At each borehole location, a drill rig will advance an 8-inch borehole to a depth of up to 100 feet with discrete soil samples collected at specified intervals (Table 1). The majority of borehole depths will be 25 to 50 feet, but will vary depending on site conditions observed in the field. Depending on the subsurface conditions, more than one attempt at advancing the boring may be necessary at each location to obtain the necessary depth for sample collection. Collected soil samples will be transported to a lab for analysis (e.g., water content, particle size, specific gravity, porosity, and resistivity). After sample collection, boreholes will be backfilled with bentonite first, then soil cuttings produced during drilling. AGDC contractors will plug the borehole with 2 feet of bentonite when drilling in upland areas where substantial amounts of water are not encountered during the drilling process. When water is encountered during borehole drilling, AGDC

contractors will plug the hole with a minimum of 7 feet of bentonite with soil cuttings as the final backfill. It takes approximately one day to drill one borehole.



**Photo 1: A track mounted drill rig and support vehicle on ice  
(Approximate weight: 35,000 lbs).**

### **Personnel and Equipment**

Typically, a three or four-person field crew will conduct the borehole drilling and material sampling. Vegetation clearing for tracked rig access and borehole drilling will be completed by a two to four-person crew.

The helicopters proposed for the program include a heavy lift helicopter to sling the drill rig to each borehole location, and one small (R44) helicopter to transport the crew. The helicopter and other associated equipment and fuel needed for the geotechnical program would be staged at the Big Lake Airport or Willow Airport or as suggested by the Park Ranger or Superintendent.

### **Proposed Mitigation**

Track mounted rig movement will be limited along access trails to one direction if possible to minimize vegetation damage. Activities will be conducted in a manner to minimize disturbance to natural drainage systems and fish and wildlife resources. Trash will be removed daily and disposed of in properly permitted facilities.

Previously unidentified archaeological resources encountered during clearing or drilling will be reported immediately to the State Historic Preservation Office. All work will stop at the site until further instruction is provided.



### **Fuels and Lubricants**

Containment structures will be present under the equipment when fueling and under any potential spill sources. No fueling will take place over water or within 100-feet of a water body. No fuel containers will be stored on the ground. All fuel containers will be stored in or on vehicles. Up to 500 gallons of fuel may be necessary. Each vehicle will contain a spill kit and safety equipment including fire extinguishers.

### **Other Permits**

AGDC has obtained or is in the process of obtaining other permits:

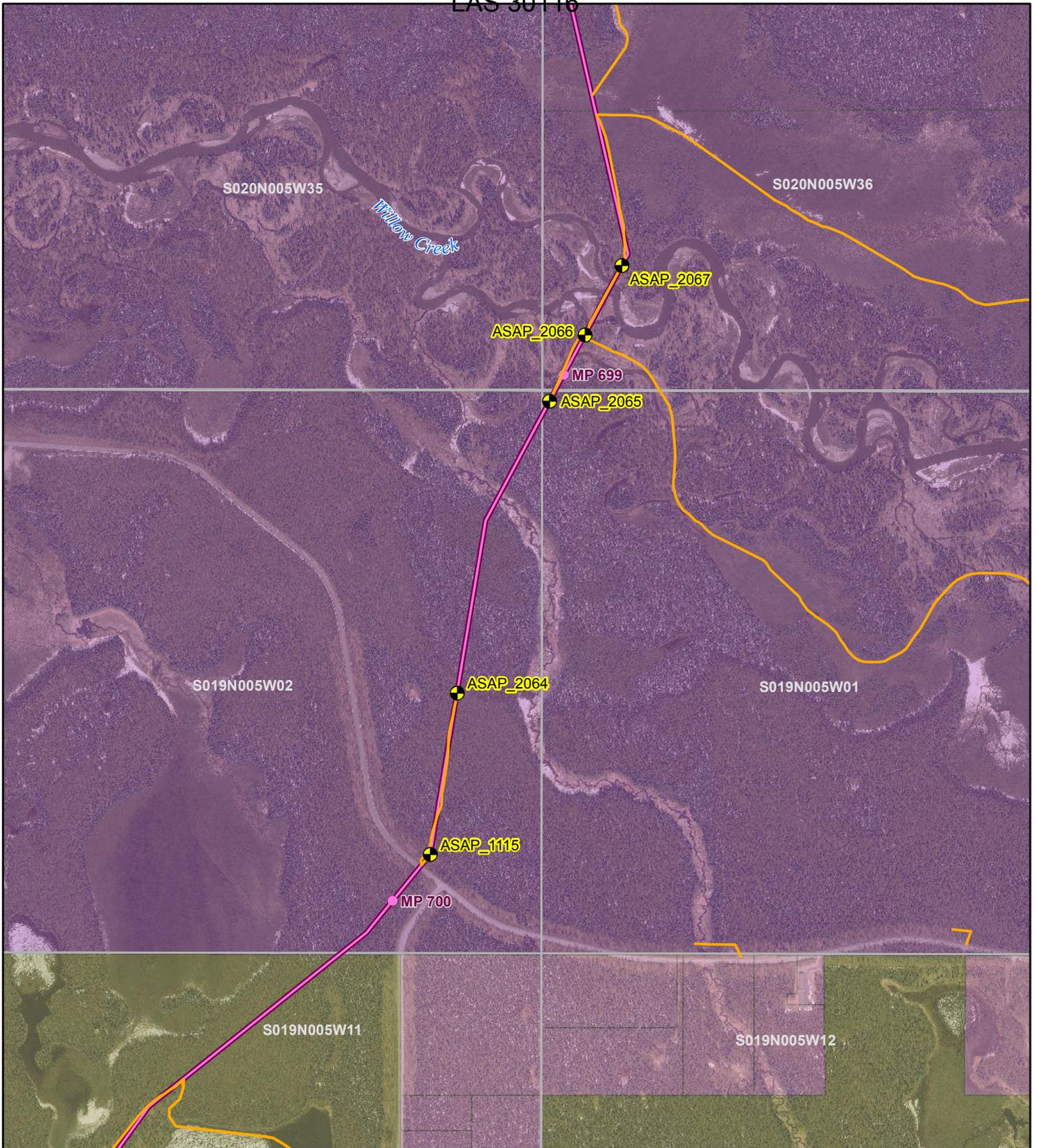
1. DMLW permits for access and borehole drilling
2. Fish Habitat permits for stream crossings, water use, and instream borehole drilling
3. Other land owner permissions

**Table 1. 2015 Winter Borehole Program  
Willow Creek State Recreation Area**

Borehole ID	MTRS	Latitude	Longitude	Borehole Completion	Request	Equipment	Access	Notes
<b>Susitna River South MP 668-727</b>								
ASAP_2067	S020N005W36	61.776	-150.111	Backfill	Borehole Only	Heli Rig	S020N005W36	no trail, heli drilling
ASAP_2066	S020N005W36	61.774	-150.113	Backfill	Borehole Only	Heli Rig	S020N005W36	no trail, heli drilling
ASAP_2065	S019N005W01	61.773	-150.115	Backfill	Borehole Only	Heli Rig	S019N005W01	no trail, heli drilling
ASAP_2064	S019N005W02	61.765	-150.120	Backfill	Borehole Only	Heli Rig	S019N005W02	no trail, heli drilling
ASAP_1115	S019N005W02	61.761	-150.122	Backfill	Borehole Only	Heli Rig	S019N005W02	no trail, heli drilling

Coordinates: decimal degrees, NAD 83

Attachment A  
LAS 30116



**Alaska Stand Alone Pipeline / ASAP**

Geotechnical Borehole and Access Locations

Willow Creek State Recreation Area

Map Scale 1:15,000

0 250 500 750 1,000 1,250 Feet

**Legend**

- 2014 Borehole
- ASAP Milepost
- ASAP Alignment
- New Borehole Access
- Municipal/Borough
- State of
- Private

Alaska Gasline Development Corporation  
3001 C Street, Suite 300 | Anchorage, AK 99503  
P 907.330.6300 | F 907.330.6309 | www.agdc.us

Document ID	004-C-22-DWG-D-0006
File Name	Boreholes_141003
Date	October 03, 2014
Sheet	1 of 1



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## Geotechnical Borehole Program Captain Cook State Recreation Area

### Purpose

The Alaska Gasline Development Corporation (AGDC) is planning to conduct geotechnical activities to collect information that will be used to support engineering design activities along the proposed pipeline corridor.

AGDC's winter borehole program along the alignment is scheduled for January 15, 2015 through April 30, 2015. The program includes access, drilling, and collection of geotechnical and geophysical data on State lands. The proposed geotechnical area and access is shown in the attached table and maps.

### Access and Clearing

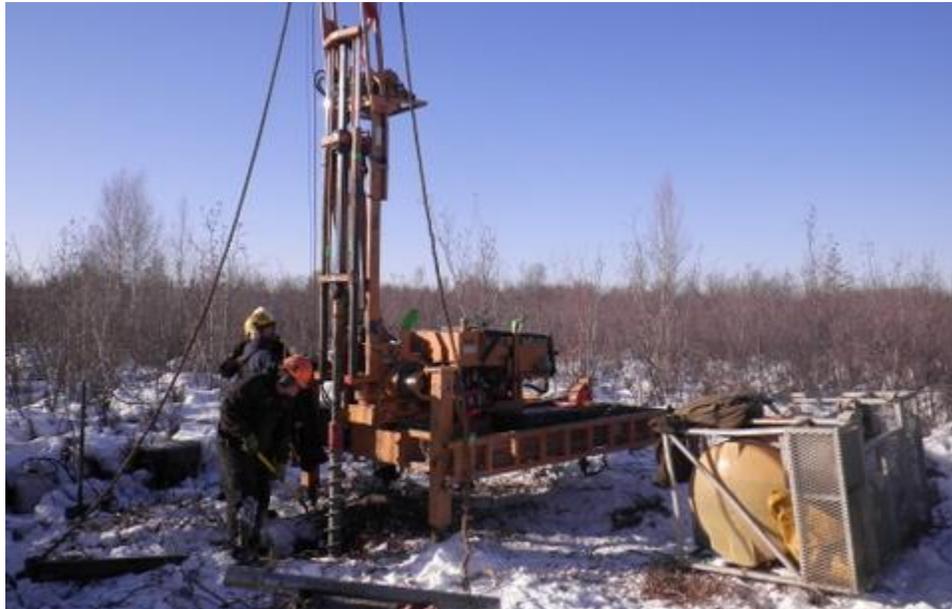
Access to one borehole in the Captain Cook State Recreation Area includes tracked rig access or heli drilling near the Kenai Spur Highway right-of-way (ROW) in the Swanson drainage. Tracked rig access routes were selected based on topography and existing clearings as much as possible. The access route from the highway to the proposed borehole is naturally open and vegetation clearing would be minimal (Figure 1).

Equipment will operate in a manner that avoids or minimizes any disturbance to roots and soil. Woody vegetation will be cut just above ground level using chain saws or hand tools. Where practicable, equipment will drive over vegetation to minimize clearing and cutting. If it is necessary to cut trees greater than two to four inches in diameter, they will be disposed of according to the requirements of the permit.

### Geotechnical Borehole Drilling

A drill rig will advance an 8-inch borehole to a depth of up to 100 feet with discrete soil samples collected at specified intervals (Table 1). The borehole depth will be 100 feet, but will vary depending on site conditions observed in the field. Depending on the subsurface conditions, more than one attempt at advancing the boring may be necessary to obtain the necessary depth for sample collection. Collected soil samples will be transported to a laboratory for analysis (e.g., water content, particle size, specific gravity, porosity, and resistivity). After sample collection, the borehole will be backfilled with bentonite first, then soil cuttings produced during drilling. AGDC contractors will plug the borehole with two feet of bentonite when drilling in upland areas where substantial amounts of water are not encountered during the drilling process. When water is encountered during borehole drilling, AGDC contractors will plug the hole with a minimum of seven feet of bentonite with soil cuttings as the final backfill. It takes approximately one day to drill one borehole

in the Swanson River bank. See Photo 1 below showing a heli drill rig advancing a borehole.



**Photo 1: Borehole drilling with a heli-drill rig**

### **Personnel and Equipment**

Typically, a three or four-person field crew will conduct the borehole drilling and material sampling. Vegetation clearing for tracked rig access and borehole drilling will be completed by a two to four-person crew. Vehicles will remain on existing trails and crew will travel on foot where necessary.

The tractor and trailer (lowboy) to haul the rig would be temporarily staged at pullouts along Kenai Spur Highway. The helicopter and fuel would be staged at McGahan Industrial Airpark, Butler Aviation, or Cartys Airstrip.

### **Proposed Mitigation**

Track mounted rig movement will be limited along access trails to one direction if possible to minimize vegetation damage. The tracked rig would travel over previously disturbed ground in the highway ROW which would reduce vegetation cutting substantially. Activities will be conducted in a manner to minimize disturbance to natural drainage systems and fish and wildlife resources. Trash will be removed daily and disposed of in properly permitted facilities.

Previously unidentified archaeological resources encountered during clearing or drilling will be reported immediately to the State Historic Preservation Office (SHPO) personnel. All work will stop at the site until further instruction is provided.

### **Fuels and Lubricants**

Containment structures will be present under the equipment when fueling and under any potential spill sources. No fueling will take place over water or within 100-feet of a water body. No fuel containers will be stored on the ground. All fuel containers will be stored in or on vehicles. Up to 500 gallons of fuel may be necessary. Each vehicle will contain a spill kit and safety equipment including fire extinguishers.

### **Other Permits**

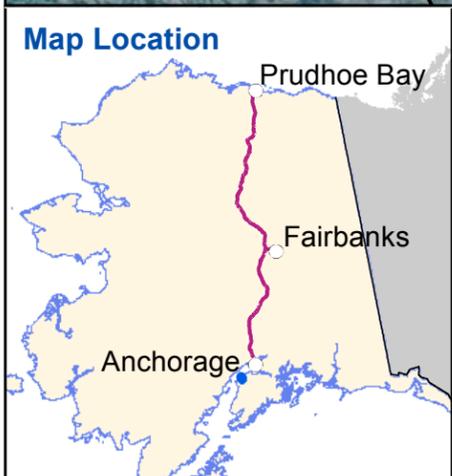
AGDC has obtained or is in the process of obtaining other permits:

1. ROW access authorization
2. SHPO concurrence

**Table 1. Geotechnical Borehole Location in the  
Captain Cook State Recreation Area**

Borehole ID	Latitude	Longitude	Borehole Completion	Request	Equipment	Access	Notes
<b>Nikiski Area</b>							
FP_56	60.799	-151.012	Backfill	Access and Borehole	Track/Heli Rig	Kenai Spur Highway	Access from Kenai Spur Highway ROW

Coordinates: decimal degrees, NAD 83



**AGDC Boreholes**  
**Captain Cook SRA**  
**AGDC Boreholes**  
 2014-2015 Field Program

1 in = 333 feet  
 Map Scale 1:4,000

**Legend**

- Borehole Locations
- Roads
- Borehole Access Trails
- PLSS Townships
- Conservation Units / Parks

**ALASKA GASLINE DEVELOPMENT CORP.**  
**GAS FOR ALASKANS**

Document ID	004-C-22-DWG-D-0008
File Name	AKLNG_NotSP_Boreholes_141125
Date	December 12, 2014
Sheet	1 of 1