

ENVIRONMENTAL ASSESSMENT
West Forelands Well Site
Federal Lease No. A-035017
EA No. AK-040-00-002

Type of Action: Construct road access, install pipeline and well head facilities to begin gas production from the West Forelands No. 1 well.

Location: SE¹/₄ SE¹/₄, Section 21, T. 8 N., R. 14 W., SM.

Applicant: Forcenergy Inc

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I. INTRODUCTION

During a meeting to discuss potential Unitization of lease A-035017, BLM became aware of an unauthorized road located on the lease. The operator, Forcenergy Inc (Forcenergy) built approximately 1.5 miles of road (~5800 feet on lease) providing access to the West Foreland #1(WF #1) well from the West McArthur River Unit (WMRU). The WF #1 well is located on federal lease A-035017 in the SE¹/₄ SE¹/₄ of section 21, T. 8 N., R. 14 W., Seward Meridian. The lease surface is owned by the Salamatof Native Association, Inc. (Salamatof) and private allottees. The mineral divided estate is owned by the Cook Inlet Regional, Inc. (94.2%) and the United States (5.8%).

The access road was built in accordance with approvals by CIRI, Salamatof and the Army Corp of Engineers (COE). Forcenergy was unaware that the road construction also required approval by the BLM. [Because the road is directly related to producing the lease, authorization under the lease terms is required. Section 14(g) of the Alaska Native Claims Settlement Act, requires administration of the minerals by the United States. Accordingly, in addition to CIRI, Salamatof and COE, BLM must also approve installation of the road and other surface disturbances related to the mineral development/production. The approval process for road construction normally occurs during the application for permit to drill as part of the lease terms. However, because of the remoteness, this well was drilled using air support in 1961, and no road was necessary.]

Forcenergy has also proposed to install a pipeline and well head facilities for the WF #1 well. Approval for these projects has been received from Salamatof, COE and CIRI.

A. Purpose and Need for the Proposed Action

The BLM has received Sundry Notice (SN) applications for access road construction, pipeline installation, and well head facility construction/installation at the WF #1 well. Connection and production of this gas well is necessary for Forcenergy to obtain fuel gas to further develop and produce oil resources at the West McArthur River Unit. Development and production from this federal lease will ensure maximum and efficient recovery of this known gas reserve and the West McArthur River Oil field. The Proposed Action is in accordance with the terms of the lease and federal laws and regulations.

B. Conformance With Land Use Plan

The BLM has not developed a land use plan for surface or subsurface oil and gas development in the West Forelands area. However, this environmental analysis assesses the impacts of the Proposed Action and provides a basis for a decision on the proposal in accordance with federal regulations (43 CFR 1610.8(b)(1)).

C. Relationship to Statutes, Regulations, Policies, Plans or Other Environmental Analyses

The SN applications for access, pipelining and production facilities are in accordance with the terms of the federal lease and federal regulations. These operations have received approval by Salamatof, CIRI and the COE. These operations should have also received BLM approval prior to commencement.

Even though installation has occurred without authorization, the BLM must process the applications and issue the appropriate approvals and stipulations. BLM's authorization does not relieve the applicant of the responsibility to acquire future permits or approvals from other federal or Alaska State agencies per their regulatory requirements. Such approvals could include, but are not limited to, state and native corporation authorizations, state and federal air quality permits, and COE permits.

II. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVE

A. Proposed Action

Forcenergy has proposed to produce the existing WF #1 well. This entails constructing road access, separation facilities and a pipeline.

Unauthorized road construction has already occurred. This entailed placing gravel on top of the organic debris resulting from the clearing of a 40-50 foot right-of-way. Gravel necessary for the road construction was obtained from existing permitted gravel pits. Gravel for well pad repairs/maintenance would be obtained from these same sources. The road will be used for year round access to the WF #1 well and facilities.

Forcenergy has also proposed to construct minimal gas processing facilities at the WF #1 well. These facilities will be located within the previously disturbed well pad area. No new surface disturbance or disturbance outside the existing well pad will be necessary. Equipment needs will include a surface safety valve, line heater, gas scrubber, glycol dehydration unit, 500 gallon water tank and a pipeline pig launcher. This equipment is necessary to remove water from the gas prior to shipping via pipeline to the WMRU.. The only products from the processing will be water, natural gas and a small amount of emissions (water, carbon dioxide, carbon monoxide, nitrous oxides) from burning the natural gas to run the line heater and dehydration unit. Two small permanent structures will be required to house the equipment. The buildings will be approximately 14' by 26' and 8' by 20'.

**EA No. AK-040-00-002
Federal Lease No. A-035017
West Forelands No. 1 Well**

In addition to the road and processing facilities Forcenergy is proposing to run a pipeline connecting the WF #1 well to production facilities in the WMRU. The pipeline will carry natural gas from the WF #1 well to be used for fuel gas in the oil production process at the WMRU. Approximately 1.5 miles of 6", schedule 80 pipeline will be buried adjacent to the road. The pipeline will be placed in a trench and buried to a minimum of 3 feet below ground surface. The 40-50 feet of vegetation already cleared for the road construction alleviates the need for additional clearing for the pipeline construction. A contract archaeologist will walk the pipeline route during the construction phase to ensure no cultural or paleontological resources are encountered. The maximum anticipated pipeline pressure is 1150 psi (pounds per square inch). Construction off lease is scheduled to commence around mid November and be completed in early December, 1999. Forcenergy would like to commence construction on the federal lease immediately following the off-lease construction. The combined construction activities should require a few weeks to complete.

The WF #1 well is expected to produce for at least 10-20 years. Following the useful life, the well will be plugged as specified by federal and state regulations. The abandonment process requires analysis of the well bore to determine intervals that require isolation by means of mechanical devices, cement or a combination of both. Well abandonment is designed to ensure a secure well bore that precludes fluid migration between zones of concern and/or from these zones to the surface. The most widely used plugging medium is cement. However, additives to adjust hardening times and other properties are often necessary. Many types of mechanical devices to ensure proper cement placement may also be used.

Surface reclamation will be done in accordance with the terms of the leases and/or any existing surface use plan/agreement for the lease between Forcenergy and the surface owners. Generally, all equipment and gravel will be removed from the site and used elsewhere. The disturbed area will be re-contoured to near pre-disturbed ground surface conditions and Surface gravel may also be left in place and contoured to blend in with the topography. Under such conditions the gravel area would still be fertilized and re-seeded or left to re-vegetate itself.

B. Alternative A - No Action

Alternative A is the No Action Alternative. This alternative would deny construction of the road access and installation of the pipeline and well head facilities. Activities described in the Proposed Action would not occur. However, the No Action Alternative could result in additional impacts depending upon whether the road is reclaimed. Because the road is already built, reclamation would be per requirements of the surface owners. [Reclamation of the existing road is highly unlikely as an extension of this road is planned. The combined extension and

EA No. AK-040-00-002
Federal Lease No. A-035017
West Forelands No. 1 Well

existing road would provide access to a Forcenergy facility located south of the WF #1 well. That facility is unrelated to the federal lease development. BLM will have no jurisdiction over authorization, use, construction, or any other aspects of the road extension. Should the no action alternative be selected, BLM would have no jurisdiction to require reclamation of the existing road over the objections of the surface owners (Salamatof and allottees).

Production operations at the WMRU would continue. Periodic work overs of the wells, equipment replacement, well site visitations, injection of produced waters, etc., would continue until the existing WMRU wells deplete the proven oil reserves. The federal WF #1 well would remain shut-in.

III. AFFECTED ENVIRONMENT

A. Geology, Topography and Soils

Karlstrom (1964) describes the surficial geology in this area as Quaternary proglacial-lake-bottom sediments. These sediments underlie a terraced and channeled surface between major morainal belts. Quaternary age sediments are as much as 1,000 feet thick and overlie Tertiary rocks of the Kenai Group. This group consists mostly of siltstones, fine sandstones, and shales. The WF #1 well location is within Kenai Lowlands (Karlstrom, 1964) in a Seismic Risk Zone 3. This area could experience earthquakes of Richter magnitude 6.0 to 8.8 and could suffer major structural damage in the event of a large earthquake (COE, 1978). In the vicinity of the access road, proposed pipeline and WF #1 well site, soil types consist of glacial till, lacustrine deposits of sand and silt and glacial outwash deposits with layers of gravel and sandy gravel. Isolated peat deposits are also present. Elevations for the area generally range from sea-level to a little more than 100 feet above sea-level.

B. Hydrology and Water Quality, Surface & Ground

Drainage of the lowlands for this area is generally to the east. Surface water of the wetlands have low turbidity and are often brownish in color. This brownish or "tea colored" water is attributed to the staining by organic compounds and to high iron content. This staining is natural and is not associated with oil and gas activities. Generally, surface and ground water quality is considered good.

C. Air Quality

No air quality data is available for the WF #1 well site. However, air quality for the Cook Inlet and Kenai peninsula area is generally considered good. Fires, smoke, volcanic eruptions, and pollutants drifting from the west can affect visibility and air quality.

Most of the land in the Kenai Peninsula Borough is classified by the Alaska Department of Environmental Conservation (ADEC) as Class II air sheds. Class II air sheds are generally pollution free and allow some industrial development. Air quality may be temporarily affected by dust and exhaust from other construction and operational activities.

D. Vegetation and Wetlands/Riparian Zones

The proposed action would occur in the Kenai Lowlands area on the westside of Cook Inlet. Because the Kenai Lowlands were created from complex, largely modified, moraines, low rolling hills separate the nearly level wetlands of muskeg and swamp. In general, the area is poorly drained (as evidenced by the muskeg, swamp and numerous lakes) and generally free of perma-frost except for isolated lenses beneath bogs or frosted area. Dwarf shrubs usually dominate over a mat of sedges, mosses, and lichen which overlies a peaty substrate.

The USFWS National Wetlands Inventory maps of the area, identify two types of wetlands along the road corridor. These are generally described as persistent saturated scrub bog and persistent semipermanent flooded scrub bog. An aerial survey of wetlands in June, 1999, by Forcenergy and two environmental consultant staff revealed two additional wetland areas consisting of birch, alder and spruce. These are described as intermittent wetlands, with general drainage from east to west.

The proposed access road and pipeline crosses open to closed white and/or black spruce forest with scattered stands of birch and cottonwood. These forests are interspersed with wetland openings consisting of lowland sedge-moss bog meadows. Depending on forest canopy cover, the under story in the forested areas consists of varying amounts of willow and alder, dwarf birch, blueberry, cranberry, Labrador tea, crowberry, feather mosses, etc. Bluejoint grass tends to dominate open areas over a wide range of growing sites.

E. Wildlife

Moose are common as successional vegetation provides plentiful browse. Other mammals known to inhabit the area include redbacked voles, red squirrels, muskrats, porcupines, and hares (James M. Montgomery Consulting Engineers, (1992).

The Kenai Lowlands support many species of birds and waterfowl. The list of species includes white crowned sparrow, tree swallows, northern or black-backed woodpeckers, juncos, yellow-rumped and yellow warblers, fox sparrows, Lincoln sparrows, Savannah sparrows, least sandpipers, white-crowned sparrows, whimbrels, parasitic jaegers, sandhill cranes, common loons, red-necked grebes, surf scoters, trumpeter swans, greater scaup, American widgeon, arctic terns, mallards, Bonaparte's gulls, Barrow's goldeneyes, red-throated loons, and red-necked phalaropes (James M. Montgomery Consulting Engineers, 1992, citing a letter from Bailey, 1992; Rosenberg, 1986). Bald eagles nest in the Kenai National Wildlife Refuge. Beaver Lake has a known nest (James M. Montgomery Consulting Engineers, 1992, citing a "personal communication" from Joyce, 1992).

The forested coastal habitats along the road and proposed pipeline corridor provide year round habitat for black bear, brown bear, moose, lynx, martin and wolves. Migrant and resident landbirds use the area's shrub and forest communities for nesting. Adjacent coastal mudflats and the intermittent shrub wetlands provide habitat for breeding and migrant shorebirds and waterfowl.

F. Socioeconomic Environment

The well is located adjacent to the WMRU. The surface estate is owned by native allottees and Salamatof. The mineral estate is divided and owned mostly by CIRI with a small interest by the United States. The WMRU oil field is located within the Kenai Borough and the larger socioeconomic environment of the Kenai peninsula and Cook Inlet area.

More than half of the people in the Kenai Peninsula Borough live in or near the towns of Nikiski, Kenai, Soldotna, Sterling, and Kasilof. The largest of these communities is Kenai which is located approximately 35 miles southeast of the well pad across the Cook Inlet. The U.S. Census for Kenai in 1990 was 6,327; the Alaska Department of Labor estimated the population in 1995 at 7,006 for Kenai (ADF&G, 1995).

The Kenai Peninsula supports a diversified economy including oil and gas extraction, petroleum refining, fishing and fish processing, tourism, timber harvesting, transportation, and recreation.

Recreational uses include fishing, hunting, camping, hiking, canoeing, etc. Kenai Borough is one of the most heavily used recreational areas in the State.

Oil and gas exploration and production also have a long history within the Kenai Borough providing numerous and relatively high paying employment opportunities. The town of Kenai is considered the center of the oil and gas industry on the peninsula.

G. Critical Elements:

The following critical elements of the human environment are either not present or would not be affected by the Proposed Action or No Action Alternative:

- Areas of Critical Environmental Concern
- Cultural Resources
- Environmental Justice
- Farmlands (Prime or Unique)
- Floodplains
- Invasive, Non-native Species (plants)
- Native American Religious Concerns
- Subsistence
- Threatened or Endangered Species
- Wastes, Hazardous/Solid
- Wild and Scenic Rivers
- Wilderness

IV. ENVIRONMENTAL CONSEQUENCES

A. Impacts of the Proposed Action

1. Geology, Topography and Soils

Pipeline and road construction activities will slightly alter the existing topography and disturb the top few feet of the existing soil profile. It is estimated that 3 acres will be disturbed in this manner for the pipeline installation. Approximately 4 additional acres have been disturbed for the road surface construction. The road was constructed by placing approximately 15,000 cubic yards of gravel in a 20-24 foot wide strip (inside the 40-50 foot wide clearing) on top of the felled vegetation and existing soil profile.

All facility installation activities will occur on the existing WF #1 well pad. Vegetative clearing and grading of the existing gravel pad are anticipated. Gravel will be obtained from an existing gravel quarry. No additional acreage will be disturbed during the removal of any gravel.

2. Hydrology & Water Quality

Only minor changes to the hydrologic conditions of existing surface waters are anticipated from the road installation. Water movement may be impaired as a result of the road bed. The installation of culverts will minimize this impact. Very minor increases in turbidity to surface water is anticipated per the design of the road and pipeline.

Only natural gas with a small volume of water is expected to be produced from the WF #1 well. The water will be separated at the well head facilities. The water will be stored in tanks on location and periodically transported by truck to an approved disposal well in the WMRU for subsurface injection. Impacts to water quality could occur should produced water be spilled on the surface.

Although not anticipated and highly unlikely, a release of a natural gas liquid and/or liquid hydrocarbon could impact surface and subsurface water quality. Natural gas liquids would rapidly evaporate and disperse into the atmosphere. Heavier liquids could penetrate the soils and enter the ground waters. Should the release pose potential fire/explosive hazards, it would be burned or ignited consuming the fuel. A pipeline break or similar release of natural gas would quickly dissipate into the atmosphere.

Fuel spills, oil leaks, hydraulic line breaks and similar type “spills” also have potential to impact water quality. Such spills would likely be very small in volume and contained on the well pad at the facilities or on the gravel road. These spills would be immediately cleaned up.

3. Air Quality

An increase in traffic, ranging from automobiles to heavy equipment, will be prevalent during the road and pipeline construction phases. This will result in an increase in noise pollution, dust and other emissions along the road/pipeline corridor and well pad. The increase in emissions, during the construction phase (approximately 30 days) is not expected to change the current airshed classification of this area. Existing emissions occurring as a result of the ongoing WMRU oil field activities include particulate matter, methane, carbon dioxide, carbon monoxide, nitrous oxides, and water vapors. Future well-work and the final abandonment and rehabilitation of the WF #1 site will also increase noise pollution and emissions along the access route and around the pad, but these operations will be of short duration (one to fifteen days).

EA No. AK-040-00-002
Federal Lease No. A-035017
West Forelands No. 1 Well

No air quality impacts associated with a blowout are anticipated. A surface safety valve will be installed and tested prior to placing the well on production. This equipment will be used in the unlikely event of processing equipment failure. If an upset should occur, the equipment would seal the hole and contain the gas and any liquids until the surface equipment could be repaired. However, in the unlikely event of a natural gas release at surface, air quality could be impacted through the release of methane, propane, butane and other light-end natural gas components. Should the release pose potential fire/explosive hazards, the gas would be diverted from the well bore and burned or ignited consuming the fuel and releasing carbon dioxide, carbon monoxide, nitrous oxides and water.

4. Vegetation and Wetlands/Riparian Zones

Road and pipeline construction will require felling of all vegetation in the 40-50 foot right-of-way. No vegetative recovery will take place in the road proper until sometime after the road ceases to be used or is reclaimed. Herbaceous and small woody species are expected to recover rapidly along the pipeline and along road edges.

Vegetation adjacent to the roads may be adversely affected by vehicle dust. Such effects should be minor given the winter time construction and the frequency of rain showers in the spring.

The natural wetland flow will be impacted by the road corridor. Use of culverts at the key locations along the road will minimize impacts. The road bed and pipeline corridor will remove wetland habitat.

Potential releases of fluids and gases at the surface could kill vegetation and impact water quality. Surface releases will be minimized through the use of appropriate equipment including a surface safety valve.

5. Wildlife

Motor vehicle access to the immediate area surrounding the construction activities is almost exclusively restricted to oil and gas field workers. The increase in human activity and noise around the proposed construction area may temporarily displace existing wildlife in the immediate area. Upon completion of the construction operations, traffic and human activity will be minimal and should cause minimal displacement.

However, access to the area provided by the road will impact the big game, furbearer and waterfowl populations by potentially increasing hunting pressure in an area that would otherwise be inaccessible. The remoteness

of the area may also result in the illegal taking of wildlife. The road and pipeline corridor will cause a permanent loss of forest and wetland wildlife habitat.

6. Socioeconomic Environment

No impacts to the area's demographic conditions are anticipated as a result of the Proposed Action. No impacts to recreational activities are anticipated. Only day work is anticipated. Workers may be housed at the WMRU facilities or transported from Anchorage or Kenai on a daily basis. The construction project duration is too short to significantly affect local lifestyles. Production activities associated with the WF #1 well are anticipated to last for 15-20 years. However, the level of activities is so small it will easily be absorbed by the workforce at the WMRU. Production of gas will generate royalty revenues to CIRI and state and federal governments and surface right-of-way and damage compensation to the surface owners.

B. Impacts of the No Action Alternative

Impacts for the No Action Alternative would be very similar to those described for the road construction under the Proposed Action. As described earlier, the road construction would likely occur regardless of the outcome of this analysis. The road will be necessary to provide access to Forcenergy's facility south of the WF #1 well site and would not be subject to review by BLM.

1. Geology, Topography and Soils

No additional surface disturbance for pipeline installation or facility construction would occur under the No Action Alternative.

2. Hydrology and Water Quality

No impacts to subsurface resources would occur. Impacts to surface waters and hydrologic conditions would be identical to those described under the Proposed Action. A greater level of impacts, identical to those described for the Proposed Action, would result from BLM requiring rehabilitation of the unauthorized road under the No Action Alternative. Impacts resulting from the pipeline and surface facility construction would not occur.

3. Air Quality

Air quality would still be impacted under the No Action Alternative from reclamation of the unauthorized road, if such is pursued. The existing facilities at WMRU would still produce oil and gas, but would use gas from a different source to accomplish the production activities. There would still be releases of particulate matter, methane gas, carbon dioxide, carbon monoxide and nitrous oxides. There would be no potential for impacts from a pipeline leak associated with the WF #1 well. Vehicle emissions would be similar to the Proposed Action from vehicle traffic accessing Forcenergy's southern facility.

4. Vegetation and Wetlands/Riparian Zones

Vegetation clearing on the existing WF #1 well pad would not occur under the No Action Alternative. The road would still be built to access Forcenergy's southern facility. Impacts to vegetation and riparian zones would be identical to those described for the Proposed Action. Spills, leaks, etc. could still occur on the road from transport vehicles.

5. Wildlife

Impacts would be similar to those identified under the Proposed Action except that wildlife would not be subjected to the displacement impacts associated with pipeline and facility construction/installation. Vehicular travel on the roads would be less, but would still occur as a result of accessing the southern facility.

6. Socioeconomic Environment

Not providing the opportunity for the continued development of gas reserves could have future impacts on the natural gas supply. Although the proposed use of the gas is for fuel, future production could be tied into the existing pipeline infrastructure supplying gas to the Anchorage area. Halting production and development of the reserves accessible through the WF #1 well may result in a decline in the available gas for fueling electric power suppliers and home and business heating for the Kenai area, the city of Anchorage, and the Wasilla and Palmer valleys.

In addition, halting the continued development of the West Foreland's reserves could result in less than the maximum and efficient recovery of the known WMRU oil and gas reserves. As a result, some of this known recoverable reserve may never be recovered which would create a greater dependence on imported oil and gas.

As existing production continues to decline from not finding or developing replacement reserves, existing and future jobs for residents of the local communities and local, State, and federal revenue sources will be lost.

C. Cumulative Impacts

The Proposed Action will only slightly increase cumulative impacts to the resources.

The well head facilities could slightly increase air emissions adding to those already existing. Noise levels during the road, pipeline and facility construction operations would be cumulative to the existing WMRU field operations. These would be of short duration (approximately 30 days).

Other cumulative impacts could include increases in fluid wastes and a slight increase in the potential for oil, hydraulic fluids, glycol and similar type spills.

Loss of approximately 10-15 acres of habitat due to the road right-of-way would be a long-term (15-20) year cumulative impact. The impact would exist until the roadway is reclaimed.

Additional producible gas reserves will increase CIRI, state and federal revenues. Additional reserves could extend the WMRU field life increasing recoverable reserves and lengthening the duration of both the positive and negative impacts associated with that field.

D. Mitigation Measures

1. Culverts should be placed at road crossings to accommodate the natural flows of wetlands. Road width should be only as large as necessary to access and service the well pad and pipeline and discourage other non-industry access to the area.
2. Road and pipeline route will follow the higher ground where possible.
3. Vegetation felling for the right-of-way will be held to a minimum, but no greater than 50 feet in width.

4. Road edges should be maintained at a 3:1 slope. The pipeline ditch will be mounded to allow soil settlement and natural compaction. The pipeline corridor will be contoured following construction.

V. CONSULTATION AND COORDINATION

A. Persons and Agencies Consulted

The Alaska Heritage Resource Survey was consulted for occurrence of cultural resources. No other consultations were necessary.

B. List of Preparers

The following is a list of the primary personnel involved in preparing this document:

Peter Ditton, Petroleum Engineer
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A complete list of the individuals involved in preparing and reviewing this document are identified on the attached NEPA routing slip.

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