



## Bureau of Land Management

Anchorage Field Office  
6881 Abbott Loop Road  
Anchorage, AK 99507  
<http://www.anchorage.ak.blm.gov>

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**Environmental Assessment**  
**Oil and Gas Geophysical Exploration, 43 CFR Part 3150**  
CGGVeritas d/b/a Veritas DGC Land Inc.  
AA-086838  
AK-040-07-EA-036



### **Location:**

*Surface and Subsurface Estate*

#### Seward Meridian

- Parcel 1. Lot 1, N $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , SW $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$ , and that portion of the NE $\frac{1}{4}$ SE $\frac{1}{4}$  north of the Sterling Hwy., exclusive of that portion of the N $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  northwest of the Sterling Hwy., Sec. 21, T. 2 N., R. 12 W. (240 acres)
- Parcel 2. Lot 1, Sec. 23, T. 1 N., R. 13 W. (39.08 acres)
- Parcel 3. N $\frac{1}{2}$ S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , Sec. 13, T. 1 N., R. 13 W. (10 acres)
- Parcel 4. S $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  and SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (15 acres)

#### *Split Estate*

#### Seward Meridian

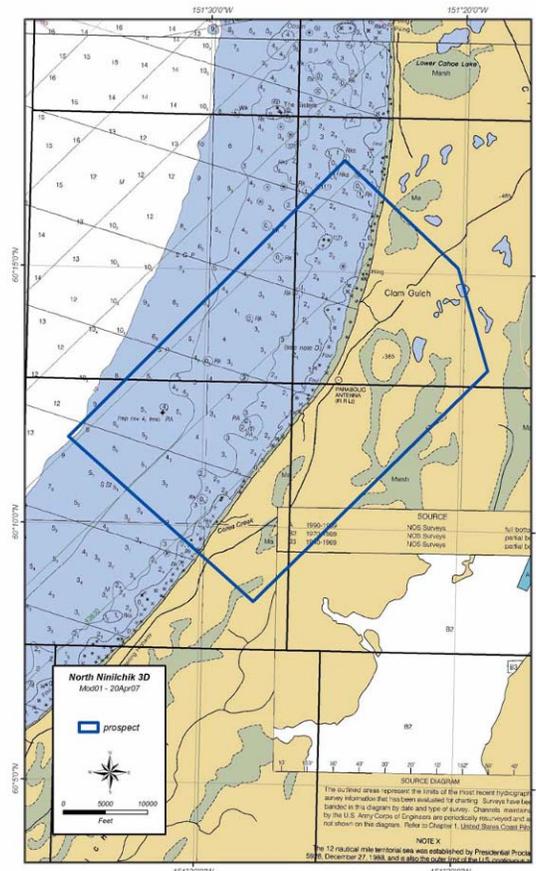
- Parcel 5. Lot 1, Sec. 12, T. 1 N., R. 13 W. (49.84 acres)
- Parcel 6. N $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , Sec. 13, T. 1 N., R. 13 W. (20 acres)
- Parcel 7. S $\frac{1}{2}$ S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , Sec. 13, T. 1 N., R. 13 W. (10 acres)
- Parcel 8. Lot 5, Sec. 23, T. 1 N., R. 13 W. (4.96 acres)
- Parcel 9. N $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (20 acres)
- Parcel 10. N $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (5 acres)
- Parcel 11. E $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (5 acres)
- Parcel 12. Lot 2, Sec. 6, T. 1 N., R. 12 W. (40.91 acres)
- Parcel 13. SW $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$  Sec. 8, T. 1 N., R. 12 W. (160 acres)
- Parcel 14. Lots 1, 2, 3 and 4, Sec. 18, T. 1 N., R. 12 W. (154.08 acres)
- Parcel 15. Lot 2, Sec. 21, T. 2 N., R. 12 W. (1 acre)
- Parcel 16. Lots 2 and 3, Sec. 12, T. 1 N., R. 13 W. (51.6 acres)
- Parcel 17. Lot 1, Sec. 14, T. 1 N., R. 13 W. (29.01 acres)

### **Prepared By:**

Branch of Energy and the Anchorage Field Office  
August 20, 2007

## I. INTRODUCTION

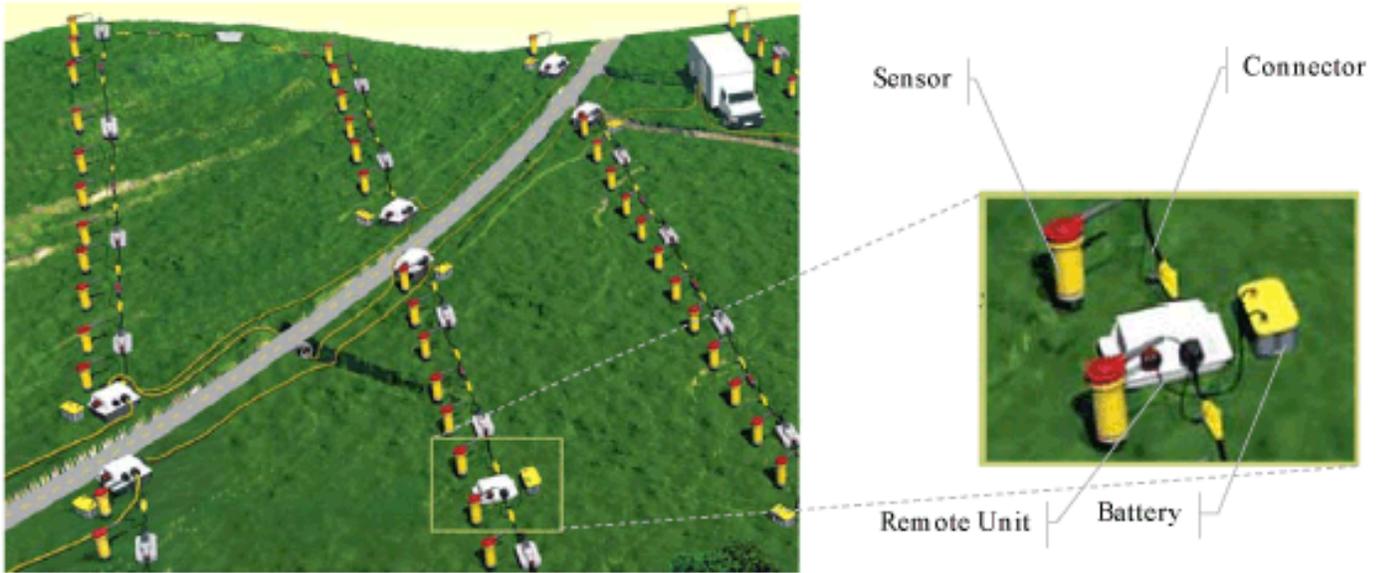
CGGVeritas d/b/a Veritas DGC Land Inc. (Veritas), 2450 Cinnabar Loop, Anchorage, Alaska 99507, (907) 276-6037 whose agent is Rick Trupp, [Rick.Trupp@cggveritas.com](mailto:Rick.Trupp@cggveritas.com), has applied to the Bureau of Land Management, Anchorage Field Office, for a permit to conduct oil and gas geophysical exploration in the vicinity of Clam Gulch on the Kenai Peninsula. Exploration will be conducted through a seismic survey. Analysis of the data acquired through the seismic survey will produce a graphical representation of the earth's subsurface geologic structure or a seismic profile of the area. The images will allow Veritas' client, Marathon Oil Company, to evaluate the area for its oil and gas potential.



**Figure 1 Clam Gulch land and water seismic survey area.**

Acquisition of seismic data involves the transmission of controlled acoustic energy into the earth and recording the energy that is reflected back from geologic anomalies below ground.

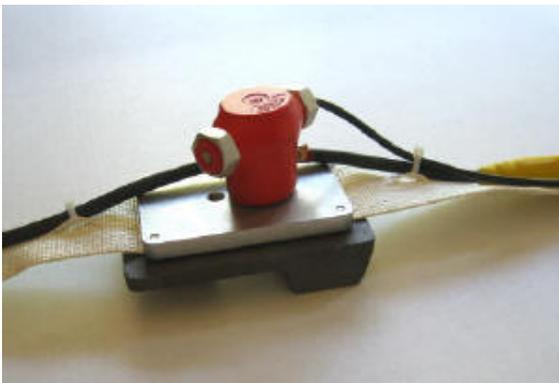
Energy source (shot holes) and receiver layout patterns are pre-planned. Computer based software is used to calculate the distance needed between the location of shot holes. The geophysical contractor's crew will lay out a line or several lines of sensitive receivers, called geophones or jugs, on the ground. Another crew will lay out a similar grid of shot holes. GPS technology is used to record the exact position of shot holes and receivers to facilitate data analysis.



**Figure 2 Receiver or geophone survey lines.**



**Figure 3 Geophone ribbon**



**Figure 4 An example of a receiver or geophone.**



**Figure 5 Another example of a receiver or geophone.**

The shot hole or explosives method is one method of producing acoustic energy. By drilling small holes into the ground, and packing them with capped explosives (directed towards the center of earth), followed by detonation, geophones are able to acquire the data necessary to map the rock strata that are underneath the receivers. When buried and detonated in plugged shot holes, explosives produce a sharp, acoustically clean energy pulse. Because the charge is small and deeply buried, only a small pulse is felt up to a few hundred feet away on the surface.

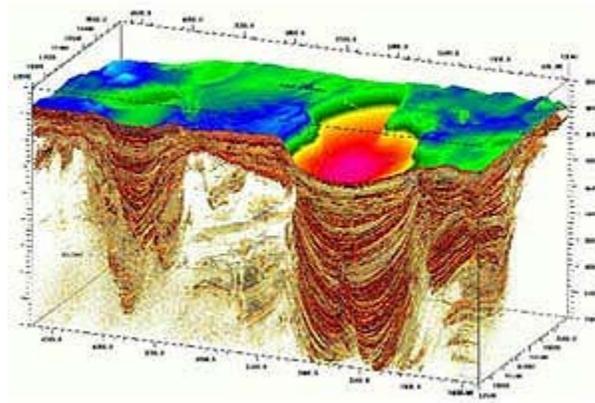


**Figure 6 Shot hole pre-detonation**



**Figure 7 Shot hole post-detonation**

Information regarding the structure and nature of the reflecting strata is derived from the two-way travel time and other attributes of the returning energy. Processing these reflections produces a graphic 3D representation of the earth's subsurface geologic structure or a seismic profile of the area.



**Figure 8 3D graphic of subsurface**

A. Land Status:

Surface Estate

There are approximately 304 acres of Bureau of Land Management administered lands within the proposed seismic survey area, all are selected by Cook Inlet Region, Inc., an ANCSA regional corporation, AA-020298. The lands are described as follows:

Seward Meridian

- Parcel 1. Lot 1, N $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , SW $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$ , and that portion of the NE $\frac{1}{4}$ SE $\frac{1}{4}$  north of the Sterling Hwy., exclusive of that portion of the N $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  northwest of the Sterling Hwy., Sec. 21, T. 2 N., R. 12 W. (240 acres)
- Parcel 2. Lot 1, Sec. 23, T. 1 N., R. 13 W. (39.08 acres) [Under lease A-024399]
- Parcel 3. N $\frac{1}{2}$ S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , Sec. 13, T. 1 N., R. 13 W. (10 acres)
- Parcel 4. S $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  and SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (15 acres)

containing an aggregate land area of approximately 304 acres.

Split Estate

There are approximately 552 acres of land within the proposed seismic survey area where the surface estate has been conveyed out of Federal ownership and the United States has retained an interest in the subsurface estate. The Bureau of Land Management has management responsibility for subsurface interests owned by the United States. The lands are described as follows:

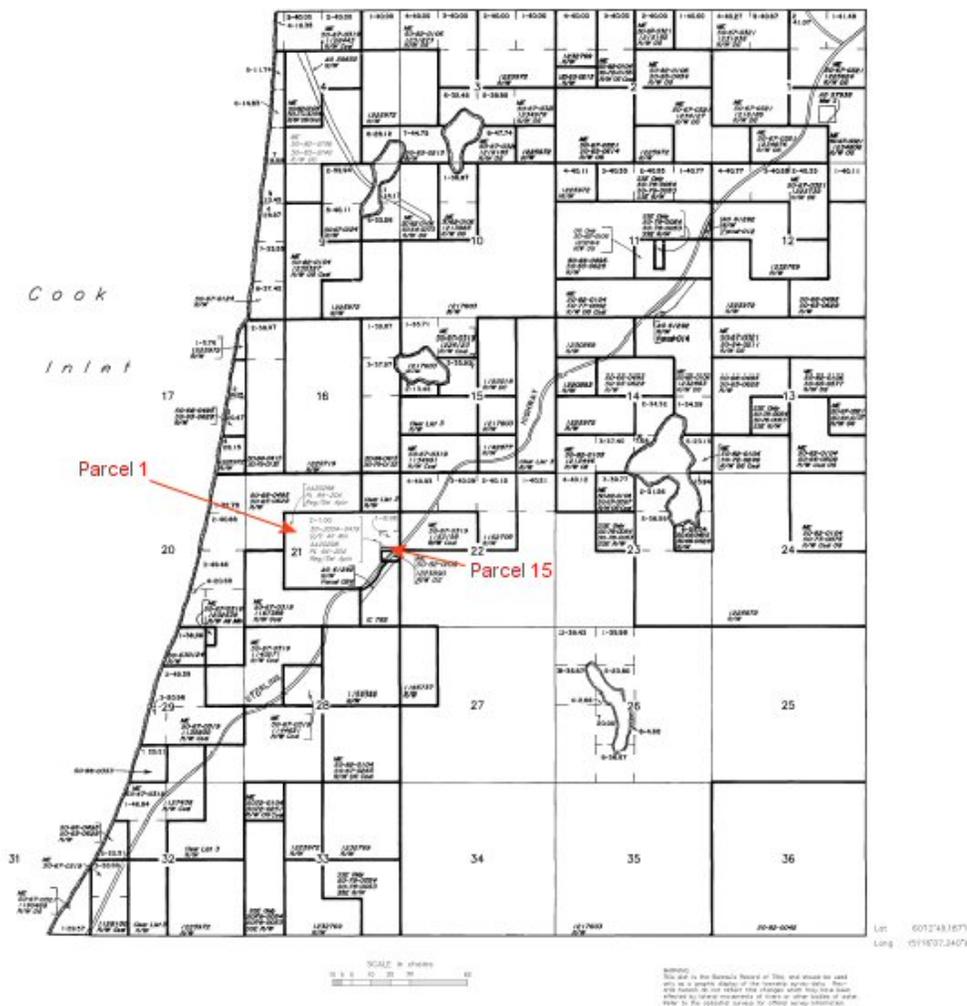
Seward Meridian

- Parcel 5. Lot 1, Sec. 12, T. 1 N., R. 13 W. (49.84 acres) [Under Lease, A-024399], Patent No. 50-72-0282
- Parcel 6. N $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , Sec. 13, T. 1 N., R. 13 W. (20 acres), Patent No. 1213093
- Parcel 7. S $\frac{1}{2}$ S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , Sec. 13, T. 1 N., R. 13 W. (10 acres), Patent No. 50-66-0606
- Parcel 8. Lot 5, Sec. 23, T. 1 N., R. 13 W. (4.96 acres) [Under Lease, A-024399], Patent No. 1225971
- Parcel 9. N $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (20 acres), Patent No. 1235371
- Parcel 10. N $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (5 acres), Patent No. 50-72-0170
- Parcel 11. E $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (5 acres), Patent No. 50-65-0650
- Parcel 12. Lot 2, Sec. 6, T. 1 N., R. 12 W. (40.91 acres), Patent No. 1195689
- Parcel 13. SW $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$  Sec. 8, T. 1 N., R. 12 W. (160 acres), Patent No. 50-64-0114
- Parcel 14. Lots 1, 2, 3 and 4, Sec. 18, T. 1 N., R. 12 W. (154.08 acres), Patent No. 50-64-0224
- Parcel 15. Lot 2, Sec. 21, T. 2 N., R. 12 W. (1 acre), Patent No. 50-2004-0419
- Parcel 16. Lots 2 and 3, Sec. 12, T. 1 N., R. 13 W. (51.6 acres), Patent No. 50-65-0628 [Under Lease, A-024399]
- Parcel 17. Lot 1, Sec. 14, T. 1 N., R. 13 W. (29.01 acres), Patent No. 50-65-0628 [Under Lease, A-024399]

containing an aggregate land area of approximately 552 acres.



SURVEYED TOWNSHIP 2 NORTH RANGE 12 WEST OF THE SEWARD MERIDIAN, ALASKA



STATUS OF PUBLIC DOMAIN  
 LAND AND MINERAL TITLES

MTP

FOR OTHERS DETERMINE DISPOSAL OR USE OF UN-DEVELOPED LANDS, INQUIRE FOR CLASSIFICATION, MINERAL RIGHTS AND/OR OTHER PUBLIC PURPOSES, REFER TO INDEX OF MISCELLANEOUS DOCUMENTS.

City Creek Unit and Agreement 14-08-0001-7301  
 Approved 2/28/2007

Sec. 28	32.43
Sec. 29	43
Sec. 30	46
Sec. 31	46
Sec. 32	43
Sec. 33	43

Elmer George Shuckles, Coal, Crust Area effective 4/24/1961

Sec. 31	46
Sec. 32	43
Sec. 33	43

and that part of Coal Area map in the D-7

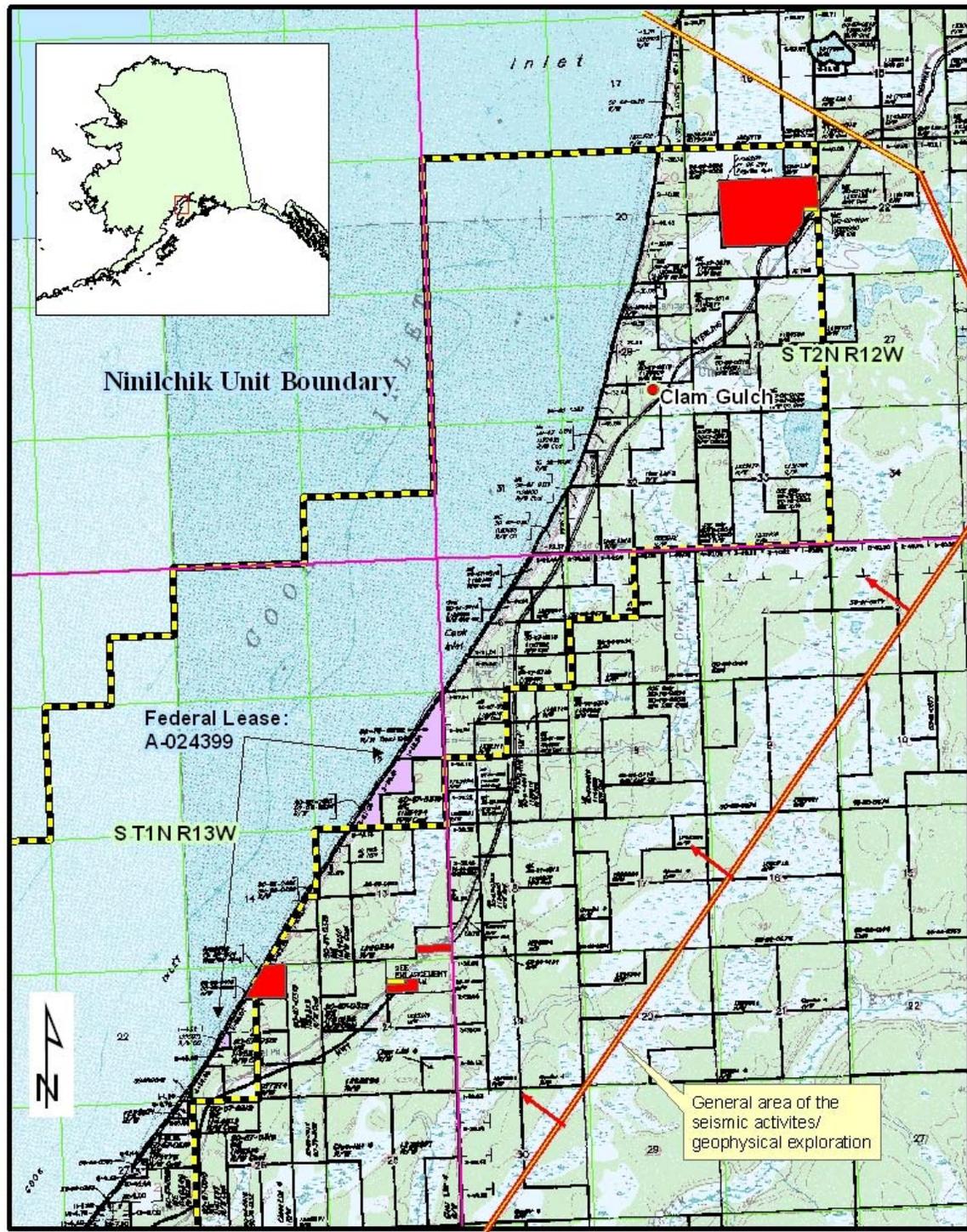
Sec. 31	
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PLD 2186 and D affects Lands/Minerals not conveyed

AS0463	50	41510	3
AS0877	51	Private and State Only	

Figure 10 T 2 N, R 12 W, SM.





All red areas are BLM surface lands.

0 0.25 0.5 1 1.5 2 Miles

Figure 12 BLM administered and managed lands within the seismic survey area.

- B. Relationship to Statutes, Regulations, Policies, Plans or other Environmental Analyses:  
The exploration and development of federal oil and gas interests is an integral part of the Bureau of Land Management's oil and gas leasing program under the Mineral Leasing Act of 1920 as amended (30 USC 181 et seq.), the Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.), the Federal Onshore Oil and Gas Royalty Management Act of 1982 (30 USC 1701 et seq.), the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 USC 226 et seq.) and the Energy Policy Act of 2005 (Public Law 109-58; 119 Stat. 596).

Permitting:

Parties wishing to conduct oil and gas geophysical exploration operations on Bureau of Land Management administered/managed lands in Alaska are required to complete an application for an oil and gas geophysical exploration permit, 43 CFR §3152.1; NOTICE OF INTENT AND AUTHORIZATION TO CONDUCT OIL AND GAS GEOPHYSICAL EXPLORATION OPERATIONS, BLM Form 3150-4. In addition, a NOTICE OF COMPLETION OF OIL AND GAS GEOPHYSICAL EXPLORATION OPERATIONS, BLM Form 3150-5, must be filed with the agency within 30 days of the completion of geophysical exploration operations. In Alaska, the permittee also must submit all data and information obtained in carrying out the exploration plan to the authorized officer, 43 CFR §3152.6(a). Finally, in accordance with the provisions of 43 CFR §3154.1, Veritas must file an appropriate bond with the Bureau of Land Management prior to commencing operations.

Surface Estate:

The surface estate parcels identified above have all been selected for conveyance to Cook Inlet Region, Inc. Title 43 of the Code of Federal Regulations section 2650.1 paragraph (2)(i) requires that:

Prior to the Secretary's making contracts or issuing leases, permits, rights-of-way, or easements, the views of the concerned regions or villages shall be obtained and considered....

The views of Cook Inlet Region, Inc. were solicited by email on August 28, 2007 and Cook Inlet Region, Inc. by return email dated August 30, 2007 advised the Bureau of Land Management that the corporation "... does not object to the seismic exploration," Appendix A.

Split Estate:

The patent or title documents to split estate parcels 5 through 14 contain a clause reserving to the United States:

... oil and gas in the land so patented, and to it, or persons authorized by it, the right to prospect for, mine, and remove such deposits from the same upon compliance with the conditions and subject to the provisions and limitations of the Act of March 8, 1922 (42 Stat. 415).

The patent or title document to split estate parcel 15 contains the following reservation language:

All the mineral deposits in the lands so patented pursuant to the Act of October 21, 1976, 43 U.S.C. 1719, including without limitation, substances subject to disposition under the general mining laws, the general mineral leasing laws, the Materials Act and the Geothermal Steam Act, and to it, or persons authorized by it, the right to prospect for, mine and remove the minerals from the same under applicable law and such regulations as the Secretary of the Interior may prescribe. This includes all necessary and incidental activities conducted in accordance with the provisions of the mining, geothermal and mineral leasing and material disposition laws in effect at the time such activities are undertaken, including without limitation, necessary access and exit rights, all drilling underground, open pit or surface mining operations, storage and transportation facilities deemed necessary and authorized under law and implementing regulations.

*See* Appendix B for copies of all split estate patent documents.

The American Heritage Dictionary of the English Language, Fourth Edition (2006) defines “prospect” as “To explore for mineral deposits or oil.”

The above notwithstanding, where the minerals are federally owned and the surface is privately or State owned, no authorization is necessary from the Bureau of Land Management to conduct geophysical operations, 43 CFR §3150.0-1(b). Rather than permitting the operator under its reserved right to conduct oil and gas exploration, the United States relies on the operator to establish its right to explore for oil and gas on split estates through a private contract between the surface landowner and the operator. Thus, operators must work with the surface owner to obtain access to private lands and the State permitting agency for authorization of operations proposed on State lands, *See* BLM IM No. 2003-131, Appendix C, [www.blm.gov/bmp/Split\\_Estate.htm](http://www.blm.gov/bmp/Split_Estate.htm) Further, Veritas is expected to exercise the same level of care on the surface estate of a split estate as it does on Federal public lands.

#### Oil and Gas Leaseholds:

Parcel 2 and Parcels 5, 8, 16 and 17 are all under an Oil and Gas Lease, A-024399. Parcel 2 remains in Federal ownership. The patent to Parcel 8, Patent No. 1225971, contains the following language:

Except that this patent shall not convey the oil and gas in the above described lands until oil and gas leases Anchorage 024399, 024400, 055620, 024356 and 055625 shall terminate or be relinquished, but upon such termination or relinquishment of the said leases all the rights and interests to the oil and gas deposits in the above described lands shall automatically vest in the patentee.

This entry is made under Section 29 of the Act of February 25, 1920 (41 Stat. 437) and the Act of March 4, 1933 (47 Stat. 1570) and the patent is issued subject to the rights of prior permittees or lessees to use so much of the surface of said lands as is required for mining operations, without compensation to the patentee for damages resulting from proper mining

operations, for the duration of oil and gas leases Anchorage 024399, 024400, 055620, 024356 and 055625 and any authorized extension of said leases.

The patent to Parcels 16 and 17, Patent No. 50-65-0628, contains the following language:

Except that this patent shall not convey the oil and gas in the following lands until the oil and gas leases listed shall terminate or be relinquished, but upon such termination or relinquishment of the said leases, all the rights and interests to the oil and gas deposits in the said lands shall automatically vest in the patentee.

As to the following lands, this entry is made under Section 29 of the Act of February 25, 1920 (41 Stat. 437) and the Act of March 4, 1933 (47 Stat. 1570) and the patent is issued subject to the rights of prior permittees or lessees to use so much of the surface of the said lands as is required for mining operations for the duration of the leases and any authorized extensions thereof, without compensation to the patentee for damages resulting from proper mining operations.

Oil and Gas lease A-024399 is listed as it affects title to Parcels 16 and 17, Lots 2 and 3, Sec. 12, T. 1 N., R. 13 W., SM and Lot 1, Sec. 14, T. 1 N., R. 13 W., SM, respectively.

Oil and Gas lease A-024399 remains in effect, as it pertains to Parcels 2, 5, 8, 16 and 17. Oil and Gas lease A-024399 provides the following:

*Rights of lessee* – The lessee is granted the *exclusive privilege* to drill for, mine, extract, remove, and dispose of ... [oil] ... and gas deposits, except helium gas, in the lands leased, ... [together] ... with the right to construct and maintain thereon, all works, ... plants, waterways, roads, telegraph or telephone lines, pipe- ... [lines] ... reservoirs, tanks, pumping stations, or other structures necessary ... [for] ... full enjoyment thereof, for a period of 5 years, and so long thereafter as oil or gas is produced in paying quantities; subject to any unit ... [agreement] ... heretofore or hereafter approved by the Secretary of the Interior, the provisions of said agreement to govern the lands subject ... where inconsistent with the terms of this lease.

[Emphasis added.]

The joint policy statement by the United States Department of the Interior and the United States Department of Agriculture. 2007. *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development; The Gold Book*. BLM/WO/ST-06/021+307/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp. at page 5 provides the following:

Geophysical operations may be conducted on most Federal lands by bonded geophysical operators, regardless of whether the Federal lands are leased or by whom they are leased.

and further provides the following at page 3:

Constraints that are consistent with the rights granted by the lease may be imposed on the location of access roads, well sites, and facility sites or the timing of geophysical exploration.

Thus, as Oil and Gas Lease A-024399 grants the lessee an *exclusive privilege* to drill for, extract, remove and dispose of oil and gas deposits together with the right to surface use of the parcels, Veritas must negotiate appropriate setbacks from operations and infrastructure with the lease operator. Further, Veritas is expected to exercise the same level of care on the surface estate of parcels affected by oil and gas lease A-024399, Parcels 2, 5, 8, 16 and 17, as it does on Federal public lands.

Permissions:

Veritas is currently engaged in securing authorizations and permissions from appropriate parties to include but not limited to the Kenai Peninsula Borough, the State of Alaska, Cook Inlet Region, Inc., and private property owners. The following table indicates the number of permissions and rejections received by Veritas as of September 5, 2007 at 4:35 PM.

INTEREST	KPB #	EA #	holes	geo	Notice	Permission
BLM Sur	13704008	Parcel 1	11	2	6/18/2007	Pend
BLM Sur	13717124	Parcel 1	6	2	6/18/2007	Pend
BLM Sur	13905020	Parcel 2	1	2	6/18/2007	Pend
BLM Sur	13905033	Parcel 3	1	1	6/18/2007	Pend
BLM Sur	13905034	Parcel 3	0	1	6/18/2007	Pend
BLM Sur	13905012	Parcel 4	0	0	6/18/2007	Pend
BLM Sub	13901015	Parcel 5	0	0	6/27/2007	Yes
BLM Sub	13901017	Parcel 5	1	1	8/16/2007	Yes
BLM Sub	13901016	Parcel 5	2	0	6/27/2007	Yes
BLM Sub	13901004	Parcel 5	0	1	6/27/2007	Blank
BLM Sub	13901011	Parcel 5	0	0	6/27/2007	Blank
BLM Sub	13901010	Parcel 5	1	0	6/27/2007	No
BLM Sub	13901026	Parcel 5	0	1	6/27/2007	Blank
BLM Sub	13901027	Parcel 5	0	0	6/27/2007	Blank
BLM Sub	13901012	Parcel 5	0	0	8/3/2007	Yes
BLM Sub	13901013	Parcel 5	0	0	8/3/2007	Yes
BLM Sub	13901014	Parcel 5	0	0	6/27/2007	Blank
BLM Sub	13905052	Parcel 6	1	1	6/27/2007	Yes
BLM Sub	13905053	Parcel 6	1	0	6/27/2007	Yes
BLM Sub	13905038	Parcel 6	1	1	8/9/2007	Yes
BLM Sub	13905036	Parcel 7	0	0	6/28/2007	Cond
BLM Sub	13905035	Parcel 7	0	0	6/27/2007	Blank
BLM Sub	13905049	Parcel 8	0	0		Missing
BLM Sub	13905058	Parcel 9	1	0	7/17/2007	Yes
BLM Sub	13905059	Parcel 9	1	0	7/17/2007	Yes
BLM Sub	13905060	Parcel 9	2	0	7/17/2007	Yes
BLM Sub	13905061	Parcel 9	0	0	7/17/2007	Yes
BLM Sub	13905062	Parcel 9	0	0	7/17/2007	Yes
BLM Sub	13905063	Parcel 9	1	0	7/17/2007	Yes
BLM Sub	13905064	Parcel 9	0	1	7/17/2007	Yes
BLM Sub	13905011	Parcel 10	2	1	6/27/2007	Blank

INTEREST	KPB #	EA #	holes	geo	Notice	Permission
BLM Sub	13905007	Parcel 11	0	1	6/28/2007	Cond
BLM Sub	13902072	Parcel 12	0	1	6/27/2007	Blank
BLM Sub	13902068	Parcel 12	0	1	6/27/2007	Blank
BLM Sub	13902071	Parcel 12	0	1	6/27/2007	Cond
BLM Sub	13902069	Parcel 12	1	0	6/27/2007	Blank
BLM Sub	13902091	Parcel 12	0	0	6/27/2007	Yes
BLM Sub	13902092	Parcel 12	0	0	6/27/2007	Yes
BLM Sub	13902012	Parcel 12	0	0	6/27/2007	Yes
BLM Sub	13902073	Parcel 12	0	1	6/27/2007	Blank
BLM Sub	13902040	Parcel 13	9	2	6/27/2007	No
BLM Sub	13902078	Parcel 13	0	1	6/27/2007	Blank
BLM Sub	13902079	Parcel 13	3	2	6/27/2007	Yes
BLM Sub	13902080	Parcel 13	3	1	6/27/2007	Yes
BLM Sub	13902081	Parcel 13	0	1	6/27/2007	Yes
BLM Sub	13906001	Parcel 14	11	3	6/27/2007	No
BLM Sub	13906002	Parcel 14	5	2	6/27/2007	No
BLM Sub	13704033	Parcel 15	0	1		Missing
BLM Sub	13901001	Parcel 16	6	3		Missing
BLM Sub	13905042	Parcel 17	6	1		Missing

The 13 split estate parcels have been subdivided into 46 distinct parcels. Veritas has received permission to proceed on 22 of those parcels. They have received four refusals to proceed and three responses that condition their exploration on providing gas to the premises; Veritas is treating the latter as refusals to proceed. It is not known whether the 12 blanks are solicitations yet to be responded to or whether the landowners returned the documents blank. Veritas failed to solicit the permission of the Kenai Peninsula Borough on three parcels and a private landowner on another. The private landowner's parcel is one acre and is unaffected by the pre-plan shot hole grid or the geophone grid. The loss of access to Parcel 14 will result in a 154-acre hole in Veritas' data set.

National Marine Fisheries Service:

An application for incidental harassment authorization has been filed with the National Marine Fisheries Service for the off shore portion of the seismic survey, Appendix D. The off shore portion of the seismic survey and the environmental consequences of the off shore seismic survey are beyond the scope of this document and within the province of the National Marine Fisheries Service.

Corps of Engineers and Clean Water Act:

Veritas will be conducting the seismic survey under U.S. Army Corps of Engineers Nationwide Permit (6) *Survey Activities (3/16/2007)*.

Survey activities, such as core sampling, seismic exploratory operations, plugging of seismic shot holes and other exploratory-type bore holes, exploratory trenching, soil surveys, sampling, and historic resources surveys.

See Appendix E.

Categorical Exclusion:

The Department of the Interior has determined and found that the proposed action is within a category of actions that do not individually or cumulatively have a significant effect on the human environment and that neither an environmental assessment nor an environmental impact statement is required, 40 C.F.R. §1508.4 (2006).

Specifically, the proposed action qualifies as a categorical exclusion under U.S. Department of the Interior Department Manual Part 516, Chapter 11, paragraph 11.9 B. *Oil, Gas, and Geothermal Energy*, subparagraph (6):

Approval of Notices of Intent to conduct geophysical exploration of oil, gas, or geothermal, pursuant to 43 CFR 3150 or 3250, when no temporary or new road construction is proposed.

60 Fed. Reg. 45539 (August 14, 2007)

However, the Department Manual also requires that proposed actions be consistent with applicable Bureau of Land Management land use plans regarding design features, best management practices, terms and conditions, conditions of approval and stipulations, 516 DM 11.9, *Actions Eligible for a Categorical Exclusion*. While there is a land use plan for this area, Southcentral Planning Area, dated March 1980, it does not address multiple use of Federal public lands on the Kenai Peninsula nor does it address, other than superficially, the prospect of geophysical exploration on distinct planning blocks, none of which are on the Kenai Peninsula.

C. Conformance with Land Use Plan:

The Bureau's current plan for the area, the Ring of Fire Resource Management Plan, is in its final stage of approval but is not yet finalized. Title 43 of the Code of Federal Regulations Section 1610.8 (b) (1) provides that "... where public lands are not covered by a ... resource management plan, an environmental assessment ... plus any other data and analysis necessary to make an informed decision, shall be used to assess the impacts of the proposal and to provide a basis for a decision on the proposal." The following is an environmental assessment of the proposed action, 42 U.S.C. §4332(c) and 40 CFR 1508.18.

D. **PURPOSE AND NEED FOR THE PROPOSED ACTION**

The goal of the Set America Free Act of 2005 is to develop an energy policy that will achieve energy self-sufficiency by 2025 within the three contiguous North American nations of Canada, Mexico, and the United States, Section 1422, 119 Stat. 1064. The Bureau of Land Management's oil and gas program is intended to encourage the development of domestic oil and gas reserves; thereby, reducing national dependence upon foreign energy supplies. The Proposed Action would provide high definition imaging of the subsurface geology in the seismic survey area and would aid in the identification of potential sub-surface geologic targets that may contain commercial quantities of oil and/or natural gas. The subsurface geologic information generated from the survey may ultimately reduce the number of exploratory wells required to evaluate the subject acreage thereby resulting in less overall surface disturbance associated with any future exploratory drilling operations.

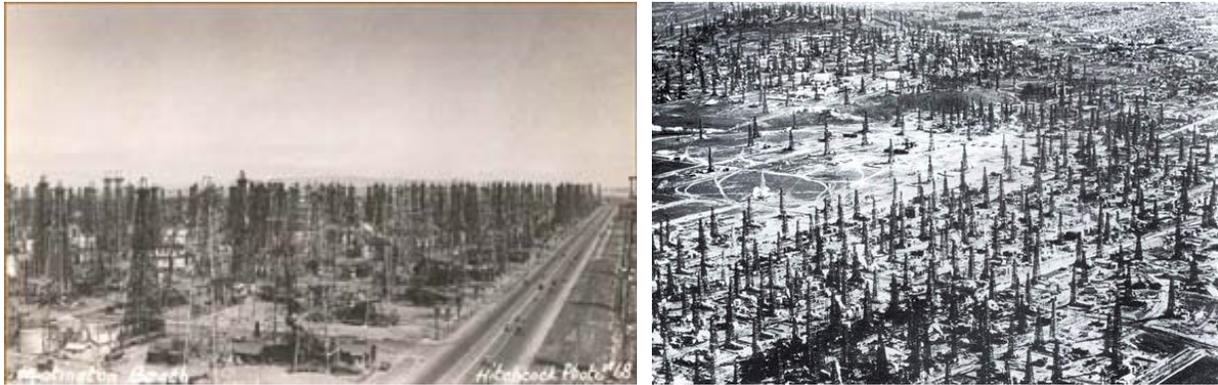


Figure 13. This historic postcard of Huntington Beach and this 1932 aerial of Signal Hill, California depict numerous oil wells – consequences of early twentieth century drilling plans. Now, seismic surveys can paint a picture of the subsurface in order to better target oil and gas reserves. This results in fewer dry holes and less drilling, or even no drilling if seismic data suggests a low potential for oil or gas.

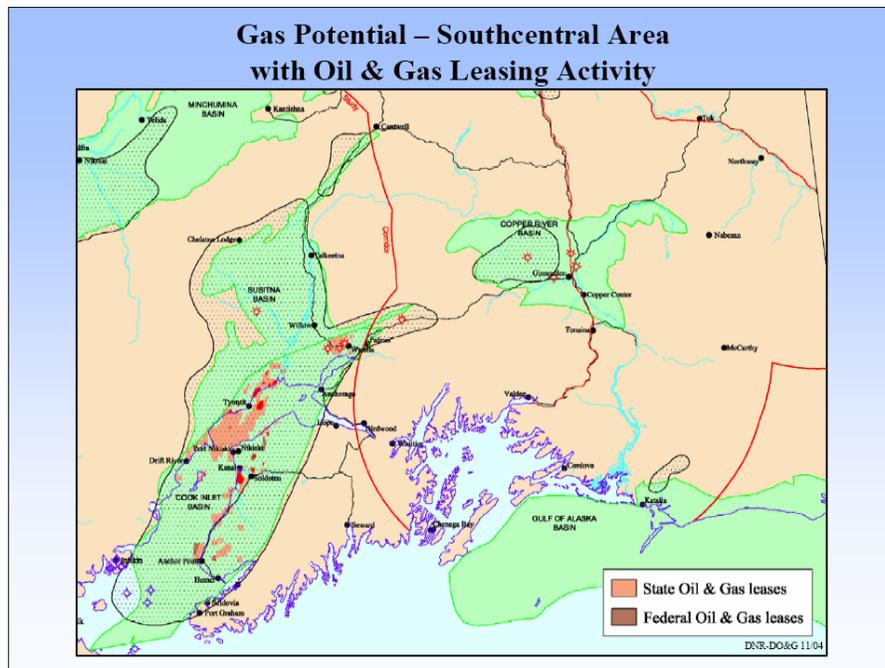


Figure 14 Gas potential, Cook Inlet, map presented to The House Special Committee on Oil and Gas, January 18, 2005, State of Alaska, Department of Natural Resources, Division of Oil and Gas.





**Figure 16** In this photograph, the shooter's helper attaches the cut-to-fit cap to the shot preparing it for detonation. With the cut to fit system, no blasting caps are used until it is time to detonate the charge. Explosives are placed in the shot hole with primer cord attached instead of an electric blasting cap. This prevents someone from setting the hole off prematurely and improves field safety for personnel and the general public. The primer cord disintegrates upon detonation.

Drill rigs will be moved to preliminary shot hole locations by helicopter. The actual location of shot holes will be adjusted to avoid impacts to vegetation, particularly tree stands, riparian zones and watercourses.



**Figure 17** Sling Load Operations.

Drill rigs are powered by diesel fuel, are heliportable and low ground pressure.



**Figure 18 Drill rig**

Helicopter and operations staging will not occur on Bureau administered or managed lands.



**Figure 19 Staging**

The placement of receiver or geophone ribbons, Figure 3, above, may also be done by helicopter where access is limited.



**Figure 20 Geophone ribbon placement by helicopter.**

Seismic survey operations will begin on or about September 8, 2007 and are anticipated to be completed by November 15, 2007.

Veritas will contract the land survey portion of the seismic survey to Extreme Surveys, Inc., PO Box 895, Dubois, WY 82513 (307) 455-2796. Extreme Surveys, Inc. personnel have a combined industry experience in excess of 100 years in seismic surveying and geophysical exploration, have the ability to work in extreme terrain and are experienced in heliportable work and utilization of speed limited all terrain vehicles.

Extreme Surveys, Inc. will utilize GPS units moving along pre-arranged survey lines (shot hole and geophone grids) to collect data from each receiver and shot point location. Survey crews will be supported with trucks and all terrain vehicles. Shot hole detonation and data recordation will occur in quarter mile grids. Crew members will walk the shot hole and geophone grid lines to detonate shot hole charges and to collect data from the geophones. Vehicles will only be used on existing roads and trails and only in a support capacity, see Figure 22, below.

All drilling will be accomplished with heliportable drills supported by an AS 350 BA (A Star) helicopter.



**Figure 21 A Star 350**

Veritas has estimated that each drill rig will average 10-15 holes per day. Crew personnel would typically work a 14-hour workday.

Recording operation onshore will involve a crew of 48 people:

- 1 Operations Manager
- 1 QC Rep
- 1 Project Manager
- 1 Recording Crew Manager
- 1 Observer
- 1 JO/Linesman
- 24 Front/Back Crew
- 2 Trouble Shooters
- 1 HSE Advisor
- 3 Helicopter Pilot
- 2 Mechanic
- 1 Cable repair
- 4 Bear Guards
- 1 Permit Agent
- 1 Landing Zone Coordinator
- 2 Shooters
- 1 Clerk
  
- 48 Total

Some of the above crew members are support personnel and will not be on the ground in the field. Crew accommodations will be in Kenai or in the North Ninilchik area. All fuel will come from commercial sources or be stored off of BLM administered or managed lands. From the above personnel list it is assumed that there will be three helicopters and at least three drill rigs and ground crews in

the field. It is also assumed that there will be one detonation/data recording crew on the ground.



**Figure 22** This picture shows two shooters, the lead shooter has a Shot Pro decoder and shooting pack which he will use to detonate a shot hole. The second shooter is an armed wilderness safety guide to protect personnel from bears. The third individual in the background is a shooter helper.

Data processing will be conducted by Veritas at a staging area off of Bureau administered or managed lands.

Proffered mitigation measures by Veritas:

Upon completion of the project, all of the recording instruments or geophones and lathing marking shot holes will be recovered and removed from the survey area. All trash and personal waste associated with work crews will be gathered, removed from the survey area and properly disposed of.

Existing roads, trails, and natural clearings will used wherever possible while satisfying seismic survey location requirements. Trail and line widths will be kept to a minimum. There will be no site or trail clearing. The use of ground contact vehicles for off-road travel is limited to those areas that have adequate ground frost and snow cover to prevent damage to the ground surface and vegetative mat. Existing snow machine trails, will be marked with crossed survey lath where they intersect receiver cables and the receiver cables will be buried in the snow beneath the traveled surface of the existing trail.

Equipment, other than vessels, will not enter open water areas of a watercourse during winter. All stream crossings shall be over ice of sufficient thickness to support the weight of the vehicles and equipment. Ice or snow bridges constructed at stream crossings will not contain extraneous material (i.e., soil,

rock, wood, or vegetation) and will be removed or breached before spring breakup.

Stream banks will not be modified, altered, or disturbed to facilitate stream crossings without prior written approval from the Alaska Department of Natural Resources, Office of Habitat Management and Permitting with notification to Alaska Department of Natural Resources, Division of Oil and Gas (907 269-8776 or fax 907 269-3484).

To the extent practical the crossing of major fish bearing water bodies by mechanized equipment will be minimized by using batch line installation techniques on each side of the fish bearing water body.

To the extent feasible and prudent new access routes and seismic lines must cross water bodies perpendicular or near perpendicular to the watercourse to minimize crossing length and potential bank disturbance. Clearings at water body crossings will employ a jogged approach along both sides to obstruct line of sight from the crossing.

Explosives will not be detonated within, beneath, or adjacent to marine, estuarine, or fresh waters that support fish and wildlife during periods when fish or marine mammals are present unless the detonation of the explosive produces an instantaneous pressure rise in the water body of no more than 2.5 psi or unless the water body, including its substrate, is frozen. Explosives will not produce a peak particle velocity greater than 0.5 inches per second in a spawning bed during the early stages of egg incubation.

For the shallow hole explosive technique the minimum offset from fish-bearing stream and lakes for explosive speeds up to 26,000 feet per second (such as Pentolite):

<u>Charge</u>	<u>Minimum Offset</u>
1 lb.	37 feet
2 lbs.	52 feet
5 lbs.	82 feet
10 lbs.	116 feet
25 lbs.	184 feet
50 lbs.	200 feet

Quantities (lbs.) of charge between the categories will use the minimum offset for the next higher category. Exceptions to this setback, or new categories, will be approved by the Alaska Department of Natural Resources, Division of Oil and Gas in consultation with Alaska Department of Fish and Game.

Minimum offsets for shallow-hole explosives are based upon the use of explosives with detonation delays of 8 milliseconds or greater occurring between each charge such that no explosion or combination of explosions will produce an instantaneous pressure in fish bearing waters which exceeds 2.5 psi.

Although no fuel storage or fueling operations will occur on Bureau of Land Management lands, stationary fuel storage facilities will not be placed within the annual floodplain of a watercourse or closer than 100 ft. to a water body. There will be no fueling, servicing or repair of vehicles or equipment, and no vehicles will be left unattended within the floodplain or below the ordinary high water line of any river, lake or stream or closer than 100 ft. to a water body.

Hazardous materials, petroleum, or petroleum products will be stored within a lined impermeable basin with a minimum storage capacity equivalent to 110% of the largest independent storage container plus 12 inches of freeboard. Sorbent material in sufficient quantity to handle operation spills will be on hand at all times for use in the event of an oil or fuel spill. All hazardous material containers and fuel drums will be marked with the contents, and Veritas' name.

Trails and campsites will be kept clean. Trash, survey lath, trail markers, and other debris will be picked up and disposed of at an Alaska Department of Environmental Conservation approved landfill or solid waste transfer site. Domestic garbage and putricibles may be incinerated in compliance with the air quality regulations in 18 AAC 50 and the ashes backhauled to an Alaska Department of Environmental Conservation approved disposal facility; stored frozen on-site in animal-proof containers with periodic backhaul to an approved waste disposal facility; or stored non-frozen on-site in animal-proof containers with daily backhaul to an approved waste disposal facility.

Seismic lines will be inspected for damage and debris by helicopter after the snow melts. Trash or debris will be recovered and properly disposed of prior to freeze-up the next winter. Surface damage will be recorded and reported to the proper land management authority for follow-up action by Veritas.

Intentional harassment, disturbance or displacement of wildlife by crew will not be allowed. Activities will not be conducted within one-half mile of known occupied grizzly and black bear dens, unless alternative mitigation measures are approved by Alaska Department of Fish and Game with notice to Alaska Department of Oil and Gas. Known den sites will be obtained from Alaska Department of Fish and Game's Division of Wildlife Conservation prior to entering the survey area. Occupied dens encountered in the field will be reported to the above, and subsequently avoided by one-half mile until alternative measures are approved.

The crew will be transported to and from field locations by personnel carriers, vehicles or small aircraft.

Due to the amount of lakes and streams in the area, Veritas will have an aggressive ice checking program in place. Surveyors who are the first people in the area will check streams and lakes with 18 Volt Dewalt drills and 2" drill stems to insure sufficient ice cover exists. They will log the freeboard and depth of water under the ice.

Crossings will be made from bank to bank in a direction that is substantially perpendicular to the direction of normal stream flow and will be made only at locations with gradual sloping banks. There will be no crossings at locations with sheer or cut banks.

The bed or banks of any stream will not be bored, excavated or altered. Drills will not operate within 100' of any streams other than to traverse the area when proper conditions allow.

Equipment will not enter open water areas of any watercourses during these operations. Crossings will occur only while low water, frozen conditions are adequate to facilitate crossings and prevent equipment from becoming trapped or stranded. Ice checking equipment will be used to insure ice can support equipment crossing it.

To avoid additional freeze-down of deep-water pools harboring over wintering fish, watercourses shall be crossed at shallow riffle areas from point bar to point bar. Compaction or removal of the insulating snow cover from deep-water pool areas of rivers will be avoided. Exceptions can be authorized on a case by case basis if it is determined that the pool is deep enough to prevent complete freeze down.

When conditions do not allow survey crews to cross a stream where a shot hole line or geophone line intersect it, Extreme Surveys will scout to either side to find a suitable location to cross the stream. On many of the streams in this area the existing winter trail system already crosses area streams. Every effort will be made to use existing crossings whenever possible.

There are numerous private properties within the program area. Permissions will be obtained from each individual whose property or easement is crossed. This permitting effort will take place prior to the project's inception. *In the case of landowners who deny access, lines will be moved as needed to avoid those properties.* [Emphasis added.]

Winter trail systems will be used by crews to access and travel through the area. Traveling an existing trail is preferred to creating new trails. The seismic vehicles are well lit with beacons and should be very visible to the recreational users in the area. The rights of private landowners and recreational users will be respected by the seismic teams.

The following also appears in the notice and solicitations sent to the split estate property owners:

There will be approximately 16 holes drilled per mile. The holes will be 25ft deep and 3 inches in diameter. Each hole will have a 5 pound charge. Heliportable drills will be used in all aspects of the program. Recording equipment will be transported by helicopter, and/or packed in from roads or access points. Shot holes will

remain an adequate distance from all water wells, building and foundations to ensure no damage occurs. Our operations will be conducted without any cutting or clearing of vegetation. Operationally, VERITAS DGC may work in the following timing window: September 2007 – December 2007. A company representative will keep the landowner notified of the impending progress of the program.

By email dated September 5, 2007, Veritas advised the Bureau that they will maintain a set back of 300 feet from all improvements including drinking water wells, septic systems and foundations.

Shot hole and geophone lines:

The actual location of shot holes, shot hole lines and geophone lines constitute confidential information; as this is a public document, they are not depicted in the following figures.

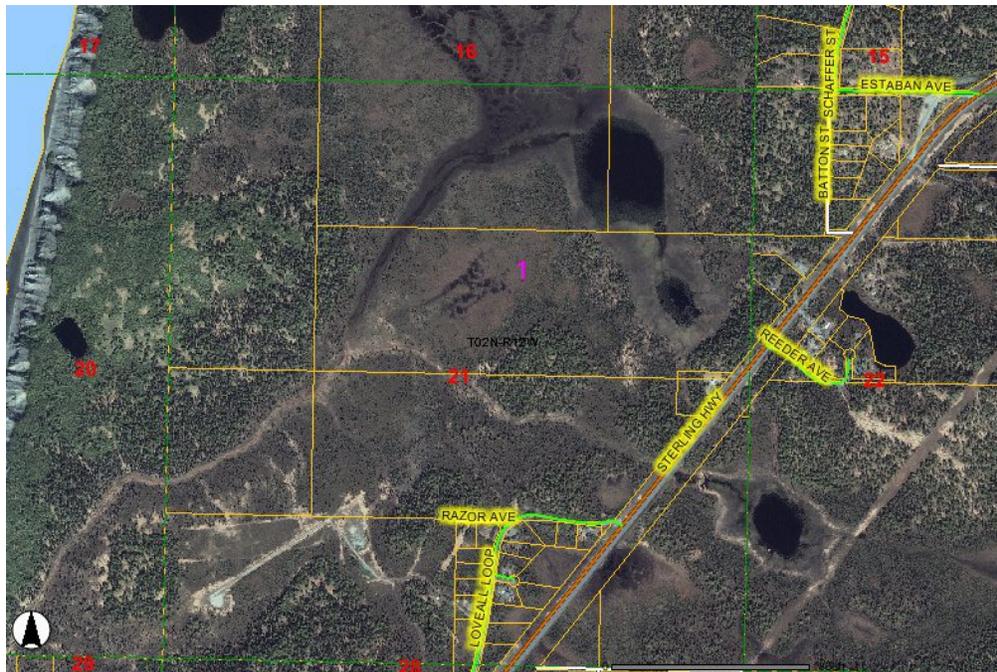


Figure 23 Parcel 1 has 3 shot hole lines with 17 shot holes and 3 geophone lines running diagonally across the parcel.



Figure 24 Parcel 2 has one shot hole line with one shot hole and two geophone lines running diagonally across the parcel.

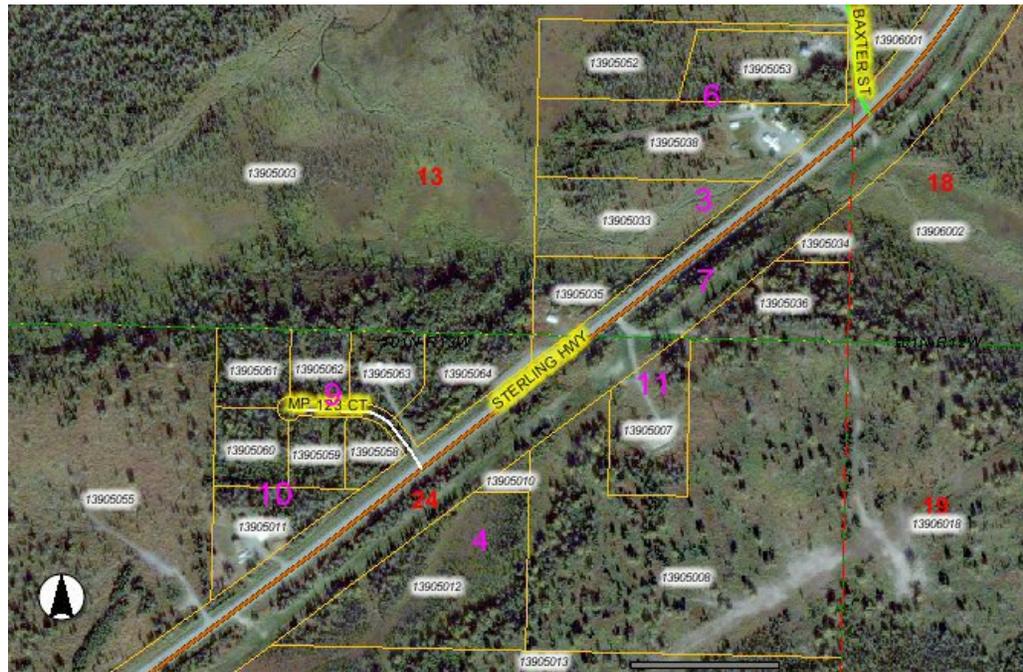


Figure 25 Parcel 3 has one shot hole line crossing it with one shot hole. It also has one geophone line crossing it. Parcel 4 is unaffected by the seismic survey. Parcel 6 has been subdivided into three parcels since conveyance out of Federal ownership; it has one shot hole line crossing it with three shot holes. One geophone line crosses Parcel 6. Parcel 7 is also unaffected by the seismic survey. Parcel 9 has been subdivided into seven parcels since conveyance out of Federal ownership; it has one shot hole line crossing it with five shot holes. One geophone line also crosses Parcel 9. Parcel 10 has one shot hole line crossing it with two shot holes; one geophone line crosses the parcel. There are no shot hole lines crossing parcel 11 but one geophone line does cross the parcel.





Figure 28 Parcel 12 has been subdivided into eight parcels since conveyance out of Federal ownership. One shot hole line crosses the parcel with one shot hole. One geophone line crosses the parcel.

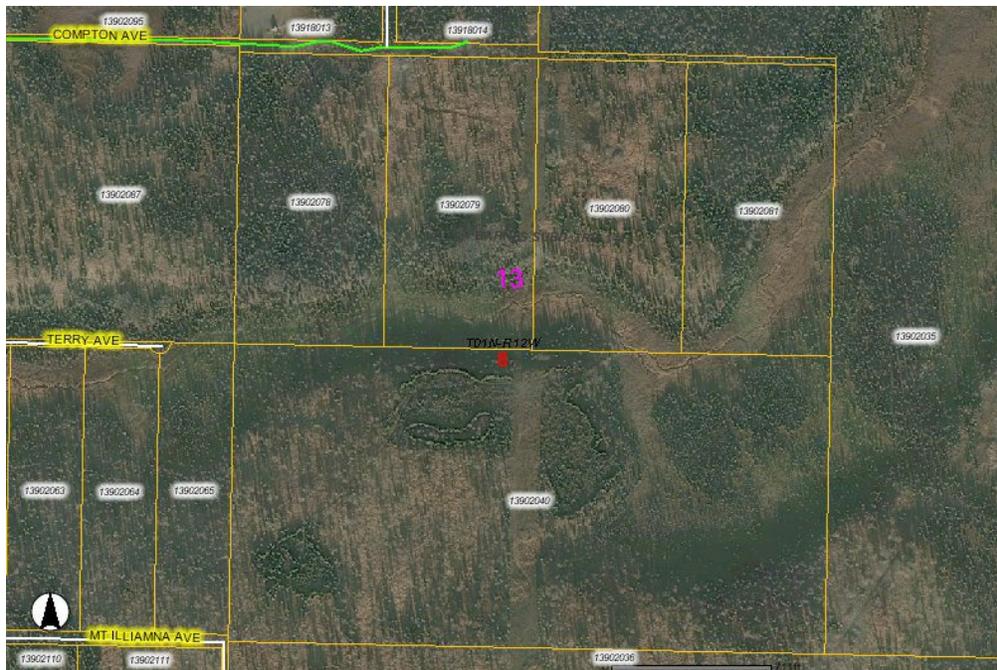


Figure 29 Parcel 13 has been subdivided into five parcels since conveyance out of Federal ownership. Two shot hole lines cross the parcel with 15 shot holes. Three geophone lines cross the parcel.

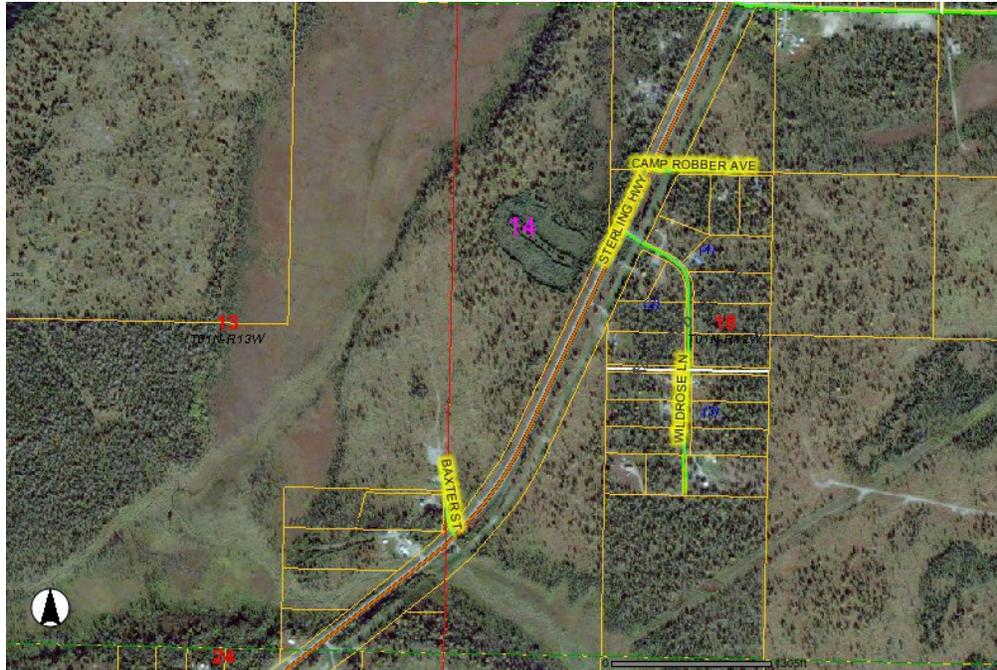


Figure 30 Parcel 14 has three shot hole lines crossing it with 16 shot holes. Four geophone lines run through the parcel. The surface landowner has denied Veritas and Extreme Surveys use of the parcel.

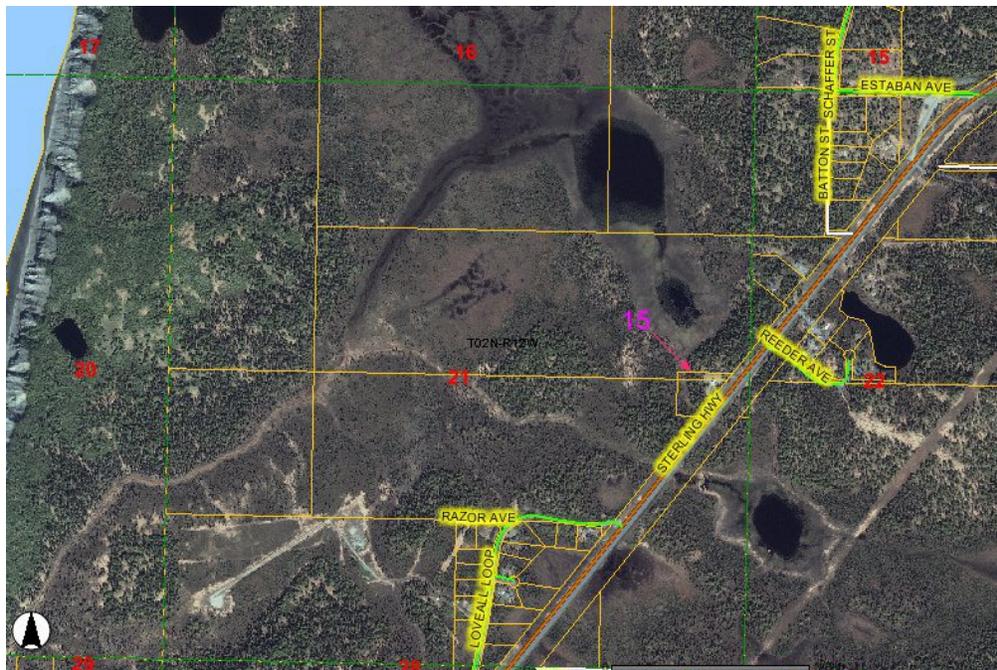


Figure 31 Parcel 15 is not affected by shot hole lines or shot holes. One geophone line runs through it.



Figure 32. Parcel 16 has one shot hole line crossing it and six shot holes. Three geophone lines run through the parcel.

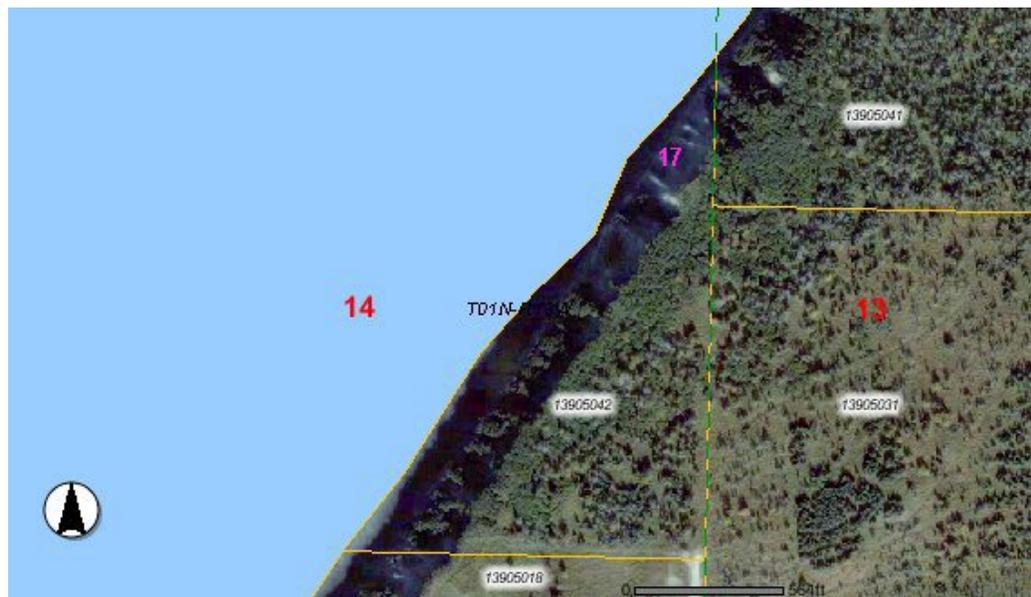


Figure 33. Parcel 17 has one shot hole line crossing it with six shot holes. One geophone line crosses the parcel.

B. Vibrosis Alternative:

The acoustic energy necessary to conduct the survey could be attained by vibrosis through the use of vibrator buggies.



**Figures 17 and 18 Vibrator Buggies**

The buggies work in groups. The seismic survey area's terrain does not lend itself to the use of the buggies and this alternative will receive no further discussion.

C. No Action Alternative:

Under the No Action Alternative, CGGVeritas would not be authorized to detonate explosive charges or receive signals on Bureau administered and managed lands, preventing them from obtaining complete seismic survey coverage. The data gaps could possibly be overcome as Bureau administered and managed lands represent such a small portion of the desired acquisition area. If Veritas can not compensate for the gaps, the graphic representation of subsurface anomalies may be of dubious value.

III. AFFECTED ENVIRONMENT

The following text was taken from [http://www.kenaipeninsula.org/kenai\\_guide/habitats.htm](http://www.kenaipeninsula.org/kenai_guide/habitats.htm)

The Kenai Peninsula lies at the junction of two major ecosystems: temperate rainforest and boreal forest. On the rainy east and south coasts, the shorelines are lined with mossy rainforest and wetlands. On the drier north and west sides of the peninsula, shrub lands, wetlands, and boreal forest dominate. In between rise the rugged Kenai Mountains, with peaks that reach 5,000 and 6,000 feet—where higher elevations and huge snowfalls create glacial and cold tundra habitats.

The fringe of dense, dripping evergreen forest along the eastern side of the Kenai Peninsula is the northernmost reach of the largest temperate rainforest on Earth, a band of habitat that stretches from South-central Alaska to Northern California. Whittier, in the heart of this wet zone, gets 200 inches of precipitation (rain and snow) each year. In the coastal rainforest, September and October are the wettest months, and April and May are the driest. That rainfall supports a forest of predominantly Sitka spruce trees with some western hemlock.

The rainforest is home to a number of forest-loving bird species, such as Townsend's warblers, chestnut-backed chickadees, flycatchers, and crossbills. Porcupines feed on bark, needles, and tender understory plants. In summer, bears bed down among the roots of streamside trees. Red squirrels are masters of this habitat, dashing and chattering among the branches overhead.

Here and there within the rainforest, you'll come across openings that look like meadows dotted with tiny dark pools. The wet "soil" in these bogs is largely an accumulation of dead moss and other organic matter, which creates an acidic, low-nutrient environment that few forest plants can tolerate. Tannins leached from vegetation color the water brown. Tiny insect-eating sundew plants trap bugs with sticky hairs. Aromatic heath-family plants such as Labrador tea grow as low bushes, and hardy conifers known as shore pines (a variety of lodgepole pine) grow into fascinating bonsai-like stunted forms. Few animals rely completely on these bog habitats, but ground-nesting birds such as juncos often raise their broods in hollows in the moss, and bears and other animals make frequent visits.

On the northwest side of the Kenai Peninsula, across the mountains from the rainforests that fringe Prince William Sound, the climate is colder and drier, producing a forest very different from the wet coastal one. This boreal forest (sometimes called "taiga") is part of one of the world's largest biomes, extending across North America from Alaska to Newfoundland and across Eurasia from Norway to Siberia. It consists of mixed evergreens and hardwoods, interspersed with wetlands and lakes.

Climate, water, fire and insects shape the boreal forest. Trees are adapted to cold temperatures, low sun angles, low precipitation, wet soils, and short growing seasons. Periodic fires and large insect infestations kill most of the overstory spruce trees, allowing deciduous trees such as aspen and birch to remain a significant part of the forest.

In the Kenai Peninsula's boreal forest lands, well-drained uplands are dominated by white spruce and birch stands. Dead snags—the results of fire and insect damage—form gray pillars, mined by woodpeckers. Willow, cranberry, currant, rose, and bearberry shrubs grow in patches on the forest floor.

In wet areas such as valley bottoms and glacial plains, where soils are soggy, acidic and cold, the primary overstory trees tend to be Lutz and black spruce. These slender, scruffy-looking trees rarely exceed a foot in diameter. The Lutz spruce, a hybrid between white and Sitka spruce, occupies small hills left by glaciers and other relatively drier areas. Willows and alders form thickets, and many areas have lush grass understories. The landscape is sprinkled with bogs, ponds, and small lakes.



Mammals of the boreal forest include mice and voles, snowshoe hares, red squirrels, lynx, martens, and short-tailed weasels (ermine). Moose, and occasionally caribou, wander between forest and nearby wetlands to forage. Wolves, coyotes and wolverines follow into the trees.

Gray jays, blackbilled magpies, spruce grouse, boreal chickadees, woodpeckers, and owls are among the birds that nest and forage in the boreal forest.

The following text was originally published in the book *Terrestrial ecoregions of North America: a conservation assessment* from Island Press and prepared by R. Hagenstein and T. Ricketts, World Wildlife Fund, 2001, National Geographic Society.

This ecoregion surrounds the upper reaches of Cook Inlet in south central Alaska, and is surrounded by the mountains. Its relatively mild climate, level to rolling topography, and coastal position have made it the focus of most of the human activity in Alaska. These factors have also contributed to the wide variety of vegetation communities found in the ecoregion. The most widespread are coniferous, broadleaf, and mixed forests, dominated in differing combinations by black spruce (*Picea mariana*), white spruce (*P. glauca*), Sitka spruce (*P. sitchensis*), quaking aspen (*Populus tremuloides*), balsam poplar (*P. balsamifera*), black cottonwood (*P. trichocarpa*) and paper birch (*Betula papyrifera*) (Gallant et al. 1995). Other important communities include low scrub, tall scrub, low scrub bog, mesic graminoid, graminoid herbaceous, and wet forb herbaceous communities.

The Cook Inlet Taiga enjoys a generally mild climate in comparison with interior and arctic Alaska. Average annual precipitation ranges from 380 mm to 680 mm across the region. Average daily minimum temperature in winter is -15°C, while average daily maximum temperature in summer is 18°C. Soils are formed with wind-blown loess from the glacial floodplains and with volcanic ash from mountains to the west. The soils lie on top of glacial deposits. Unlike the majority of the other relatively low elevation ecoregions in Alaska, the Cook Inlet Taiga was extensively glaciated during the Pleistocene.

This ecoregion probably has experienced the most extensive human disturbance and alteration in Alaska. Nevertheless, it remains approximately 90 percent intact, and still supports all of the top level terrestrial predators within, or close to, their natural ranges of variation. (These predators include brown bear (*Ursus arctos*), wolf (*Canis lupus*), wolverine (*Gulo gulo*), and coyote (*Canis latrans*.) The ecoregion also produces all five species of Pacific salmon, which support a wide range of terrestrial species as well as large commercial, sport, and subsistence fisheries.

The Kenai River watershed is worthy of special note for its biological values. It supports all five species of Pacific salmon including a unique stock of the world's largest king salmon. The Kenai River also supports the second highest concentration of overwintering American bald eagles in Alaska. Virtually the entire population of Wrangell Island snow geese uses the mouth of the Kenai River and Trading Bay (on the west side of Cook Inlet) as a migratory staging area each spring. Finally, populations of wolf, bear, lynx, and other animals on the Kenai Peninsula are separated from the rest of Alaska by water, glaciers, and development and subject to local extirpation as a result of development, exploitation, and habitat changes.

Wildfire occurrence is moderate to high (especially in dry years), and fires range in area from 1 ha to 22.7 km<sup>2</sup>, averaging 1.6 km<sup>2</sup> (Gallant et al. 1995). Spruce bark beetle is also

a common disturbance in the forests of this ecoregion. A current infestation has reached all parts of the ecoregion with up to 80 percent of the mature spruce in many stands killed. The spruce bark beetle is naturally occurring and may be the most important cause of stand renewal in the ecoregion.

#### *Habitat Loss and Degradation*

As stated above, although this ecoregion is the most impacted by human activity of any in Alaska, only approximately 10 percent of its area is altered or heavily altered. Most human disturbance is concentrated in the urban and residential development of the lower Kenai River, Anchorage Basin, and Palmer-Wasilla area. Some agriculture occurs in Palmer and Point McKenzie, across Knik Arm from Anchorage. Other forms of human land use include timber harvest and oil and gas exploitation on the Kenai Peninsula and across Cook Inlet from Anchorage.

Both areas have high potential for resource exploitation, however, with timber harvest occurring throughout most parts of the ecoregion (especially in response to an on-going spruce bark beetle epidemic), oil and gas development occurring in large parts of the Kenai Peninsula and on the west side of Cook Inlet, and potential coal mining on the west side of the Inlet in the future. Recreational and subsistence hunting and fishing are generally managed well, although potential for unsustainable hunting exists.

#### *Remaining Blocks of Habitat*

The ecoregion is naturally divided into two large blocks of relatively intact habitat by Cook Inlet. One block, covering the Susitna Valley and the west side of Cook Inlet, is larger than 10,000 km<sup>2</sup>. The second block, on the Kenai Peninsula, is subdivided into two smaller blocks of about 4,000 km<sup>2</sup> each by the Kenai River and the human development along it.

#### *Degree of Fragmentation*

The ecoregion is fragmented into 3 major blocks, but this is due to major water bodies.

#### *Degree of Protection*

Important protected areas include:

- Kenai National Wildlife Refuge - southern Alaska
- Chugach State Park - southern Alaska
- Nancy Lake State Recreation Area - southern Alaska
- Redoubt Bay Critical Habitat Area - southern Alaska
- State Game Refuges: Susitna Flats, Trading Bay and Palmer Hay Flats - southern Alaska

*Type and Severity of Threats*

Major threats include:

- Continued development along the Kenai River and overuse of the Kenai River, restricting wildlife movement, removing habitat, and disturbing hydrologic functioning.
- Unsustainable timber harvest in the extensive forests throughout the ecoregion
- Expansion of oil, gas, and coal development on the Kenai Peninsula and west side of Cook Inlet with potential for localized but severe impacts on surrounding habitat.
- Over-exploitation of fish and game stocks.
- Killing of bears for defense of life and property that come into conflict with growing human residential areas.

*Suite of Priority Activities to Enhance Biodiversity Conservation:*

- Kenai River watershed - balancing community needs and wildlife requirements.
- Susitna Valley forests - implement planning to prevent unsustainable timber harvest from occurring. Monitor coal and oil and gas development activities.



**Figure 34. Coastal Village, Kenai Peninsula, Alaska.**

A. Critical Elements of the Human Environment:

1. The following critical elements of the human environment have been analyzed and are either not present or will not be affected by the Proposed Action or the No Action Alternative:

- Air Quality
- Areas of Critical Environmental Concern
- Environmental Justice
- Farmlands (Prime or Unique)
- Flood Plains
- Native American Religious Concerns
- Wild and Scenic Rivers
- Wilderness

Subsistence:

Surface Estate:

The surface estate parcels to be affected are selected by Cook Inlet Regional, Inc., an ANCSA Regional Native Corporation, AA-020298. As such, they do not meet the definition of “public lands” under Section 102 (3)(A) of the Alaska National Interest Lands Conservation Act and the proposed action is not subject to the subsistence provisions of Title VIII of the act.

Split Estate:

Although the subsurface interests reserved to the United States in split estates are “public lands” within the meaning of Section 102 of the Alaska National Interest Lands Conservation Act, it remains that subsistence resources are attributes of the surface estate, which has been conveyed out of Federal ownership. As the surface estate no longer meets the definition of “public lands” under Section 102 of the Alaska National Interest Lands Conservation Act, Title VIII of the act is inapplicable.

2. The following critical elements of the human environment have been analyzed and may be affected by the Proposed Action or the No Action Alternative:

Cultural Resources:

Cultural resources are known to exist in this area ranging from the pre-historic to the cold war periods. Although there are many reported cultural sites for this area and at least four of them occur within the Area of Potential Effect for this project, no systematic surveys have been done here. The Area of Potential Effect includes areas that have high potential for previously undiscovered cultural resources.

Threatened & Endangered Species:

Steller’s Eiders:

The Alaska Department of Fish and Game listed the Alaska breeding population of Steller’s eider as a Species of Special Concern in 1993. In 1997, the U. S. Fish and Wildlife Service (USFWS) also listed the Alaska breeding population of Steller’s eider as threatened under the Endangered Species Act

(16 U.S.C. 1531 et seq.). The U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game conducted aerial surveys from 2000 – 2003, and provided information on the distribution of Steller’s eider. The observations confirmed the presence of Steller’s eider along the east side of Cook Inlet from Clam Gulch to the Homer Spit.

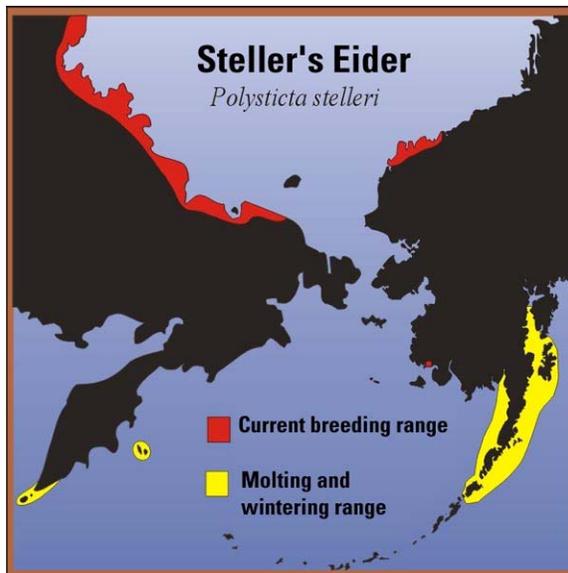


Figure 35 Steller's eider ranges.

Bald Eagles:

Heading south from Soldotna along the Sterling Highway to Homer, there are many opportunities to view eagles on the beach, sitting on the side of the bluffs or soaring around the mouths of the many streams that run into Cook Inlet.



Figure 36. The red areas indicate favorable Bald Eagle viewing areas on the Kenai Peninsula.



**Figure 37. Bald Eagles in Falling Snow, Kenai Peninsula, Alaska.**

Although the Bald Eagle has recently been taken off of the Endangered Species list, it and its nesting areas remain protected under the Bald Eagle Protection Act, 16 U.S.C. §668-668d.

Cook Inlet Beluga Whales:

Although the status of marine mammals are properly the province of the National Marine Fisheries Service and outside the scope of this document it is noted that on April 19, 2007 The National Oceanic and Atmosphere Administration's National Marine Fisheries Service (NOAA Fisheries Service) proposed listing the Cook Inlet beluga whale population as endangered under the Endangered Species Act. The number of beluga whales in Cook Inlet waters near Anchorage has dwindled to an estimated 302 animals and is at risk of going extinct within 100 years.

Waste, Hazardous/Solid:

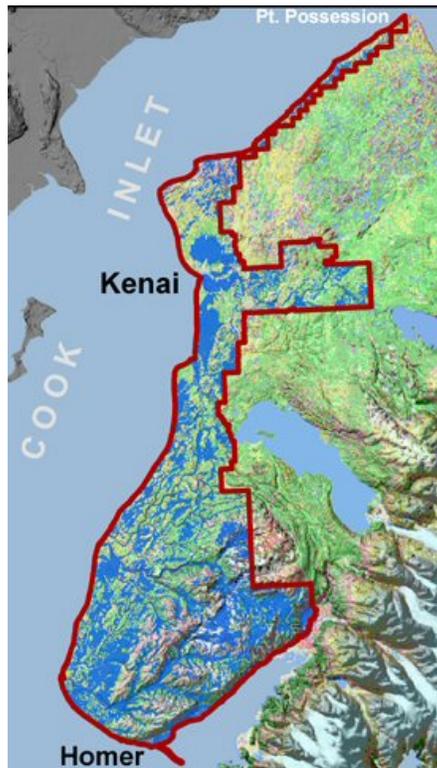
There are no known hazardous or solid wastes on Bureau administered lands in the seismic survey area. It is likely that there are such sites on other lands within the survey area.

The plan of operations for the geophysical survey minimizes the potential for creating conditions which may cause harm to human health or the environment from a solid or hazardous waste management perspective.

Water Quality (Surface/Ground):

The western part of Kenai Peninsula in southcentral Alaska is bounded by Cook Inlet and the Kenai Mountains. Ground water is the predominant source of water for commercial, industrial, and domestic uses on the peninsula. Mean daily water use in an oil, gas, and chemical processing area north of Kenai is more than 3.5 million gallons. Unconsolidated sediments of glacial and fluvial origin are the most productive aquifers. In the upper (northwestern) peninsula, almost all water used is withdrawn from unconsolidated sediments, which may be as thick as 750 feet. In the lower peninsula, unconsolidated sediments are thinner and are absent on many hills. Water supplies in the lower peninsula are obtained from unconsolidated sediments and bedrock, and a public-water supply in parts of Homer is obtained from Bridge Creek. Throughout the peninsula, ground-water flow occurs primarily as localized flow controlled by permeability of aquifer materials and surface topography. The concentration of constituents analyzed in water from 312 wells indicated that the chemical quality of ground water for human consumption varies from marginal to excellent. Even though the median concentration of dissolved solids is low (152 milligrams per liter), much of the ground water on the peninsula does not meet water-quality regulations for public drinking water established by the U.S. Environmental Protection Agency (USEPA). About 8 percent of wells sampled yielded water having concentrations of dissolved arsenic that exceeded the USEPA primary maximum contaminant level of 50 micrograms per liter. Concentrations of dissolved arsenic were as great as 94 micrograms per liter. Forty-six percent of wells sampled yielded water having concentrations of dissolved iron greater than the USEPA secondary maximum contaminant level of 300 micrograms per liter. Unconsolidated sediments generally yield water having calcium, magnesium, and bicarbonate as its predominant ions. In some areas, ground water at depths greater than a few hundred feet may be naturally too salty for human consumption. The leaking and spilling of fuel and chemical products and the disposal of industrial wastes has degraded the quality of ground water at numerous sites.

Wetlands/Riparian Zones:



**Figure 38. Wetlands (blue) occupy 41% of the area outlined in red.**

The following text was taken from :

[http://www.kenaipeninsula.org/kenai\\_guide/habitats.htm](http://www.kenaipeninsula.org/kenai_guide/habitats.htm)

Lakes and ponds—shallow or deep, large or small, cold, glacial and silty or black as strong tea—serve as important habitat for many of the Kenai Peninsula’s animals. Wetland birds such as grebes, loons, swans and ducks nest on lake fringes and rear their chicks on the lakes. Beavers and muskrats make their homes in and alongside lakes and wetlands. Moose forage heavily on aquatic plants in the summer months.



Lakes and ponds are particularly abundant in the flat glacial plains of the western side of the peninsula, where thousands checkerboard the landscape.

Most of these water bodies are dark with tannins and lignins leached from slowly-decomposing plant material in nearby forests and wetlands. Many are surrounded by thick mats of waterlogged moss.

Freshwater wetlands are among the most widespread of Kenai Peninsula habitats. They're incredibly important ecosystems, buffering floodwaters, filtering runoff, and providing shelter for nesting birds and wetland mammals such as beavers, muskrat, mink, and voles. Moose forage in wetlands during both summer and winter. Juvenile salmon shelter and grow in wetland channels. Wetlands in the Kenai River area are important summer feeding and calving grounds for the Kenai Lowlands caribou herd.

There are many different types of wetlands on the peninsula. Depending on water flow, a wetland may look like a lush meadow, a moss blanket, or a shrub thicket. Some wetlands are easy to traverse on foot, while others are downright treacherous. Some are tiny openings within thick forest, while others are enormous, tundra-like expanses. Characteristic plants vary with the site, but some common wetland plants on the peninsula are sphagnum mosses, grasses, sedges (including the puffball-topped "Alaska cotton"), horsetail, pond lily, dwarf birch, and sweetgale.

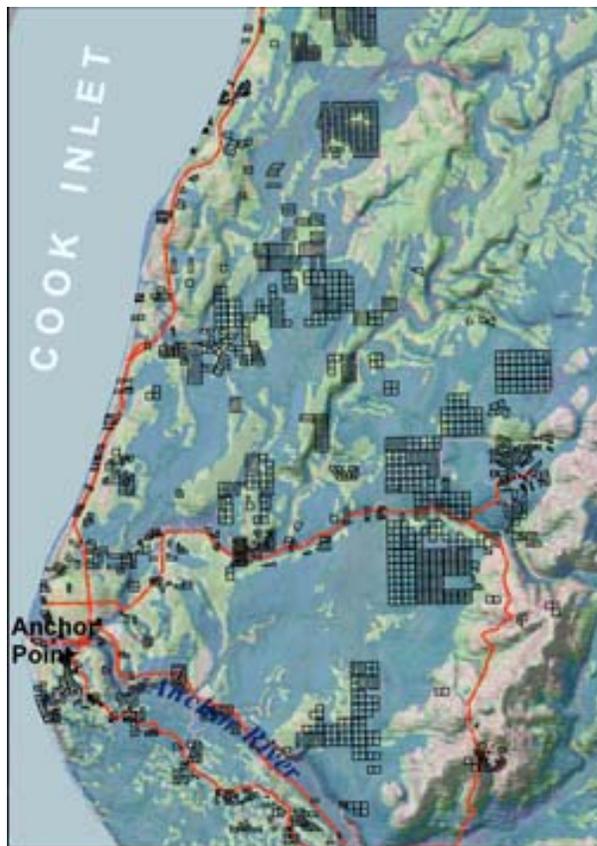


The Kenai Peninsula has thousands of small rivers and streams that collectively produce millions of salmon. Some rivers are crystal clear; others are milky, tan or gray with glacial silt; and others are brown.

Different types of rivers support different species of wildlife. Tumbling mountain streams are the homes of American dippers and harlequin ducks, while slow, placid oxbows shelter trumpeter swans and bank-nesting beavers. Bears patrol shallow streams where spawning salmon mill. The different species of salmon rely on different types of rivers for spawning and rearing. Chinook lay eggs in the gravels of fast-moving, large rivers. Pink and chum salmon spawn in small coastal streams. Sockeye rely on rivers that flow from lake systems. Coho use a wide variety of river types, from tiny side channels to beaver ponds to lakes.

Where rivers and streams join the sea, estuaries are created. Flooded by the twice-daily high tides, estuaries are mixing areas where fresh and salt water meet.

Life is abundant in estuaries. Marine worms, small crabs, insects, small clams and shrimp-like crustaceans thrive in the mud and silt, and are eaten by birds, fish and other wildlife. Kelp, green algae, eelgrass and other aquatic vegetation feed waterfowl and serve as rearing areas for young salmon. The meadow-like areas above all except the highest tides are characterized by salt-tolerant plants such as sedges, beach rye and goose-tongue. Sloughs meander through these wetland meadows, filling and draining as the tides change. Sculpin and flounder share these sloughs with salmon fry and threespine sticklebacks, small fish tolerant of fresh and salt water. Estuaries are important feeding areas for migrating waterfowl and shorebirds, and are year-round home to a variety of birds and animals. Estuaries are so fertile and productive that they export nutrients to the surrounding areas, enriching the ocean.



**Figure 1. A sampling of vacant private parcels less than 10 acres in size that are on wetlands (blue).**

Despite population growth on the Kenai Peninsula, most lowland wetlands are relatively pristine. Few watersheds have greater than about 5% impervious surface cover (roofs, roads, lawns and parking lots), the threshold that caused impairment to stream habitat, and chemistry in an Anchorage study ([Ourso and Franzel, 2003](#)). The Kenai Peninsula continues to change however, and nearly 10,000 privately owned, vacant parcels of less than ten acres are located on wetlands (figure 1). With increased human activity impacts to wetlands are inevitable. Twenty percent of the wetlands within the City of Homer have already been filled. Maintenance of valuable wetland functions requires careful management

in order to avoid the mistakes that have required costly correction elsewhere.

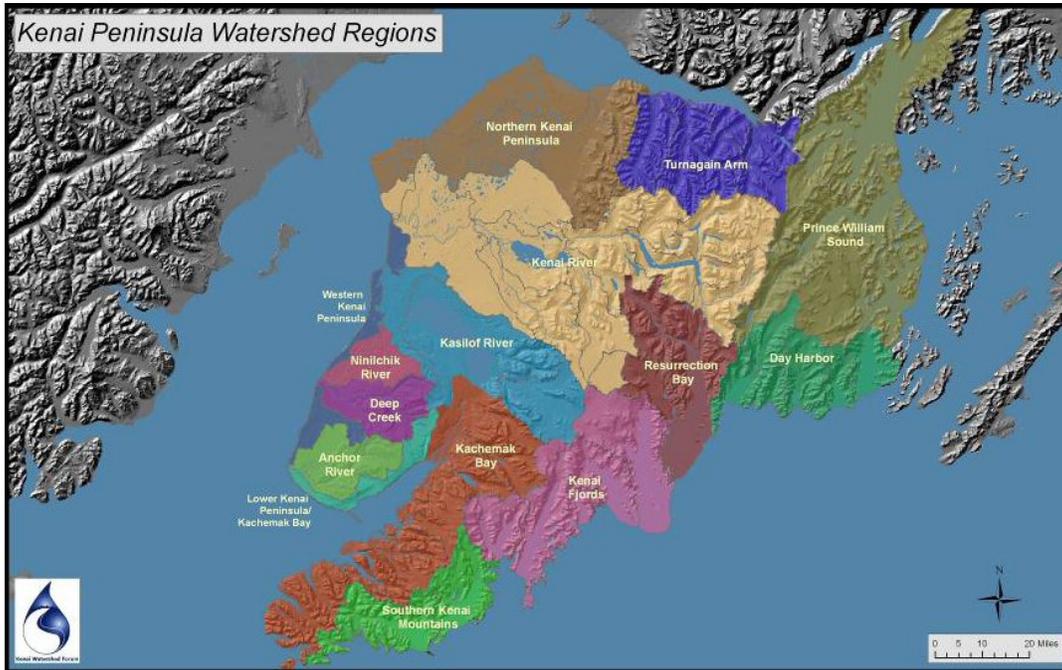


Figure 39 Kenai Peninsula Watersheds.

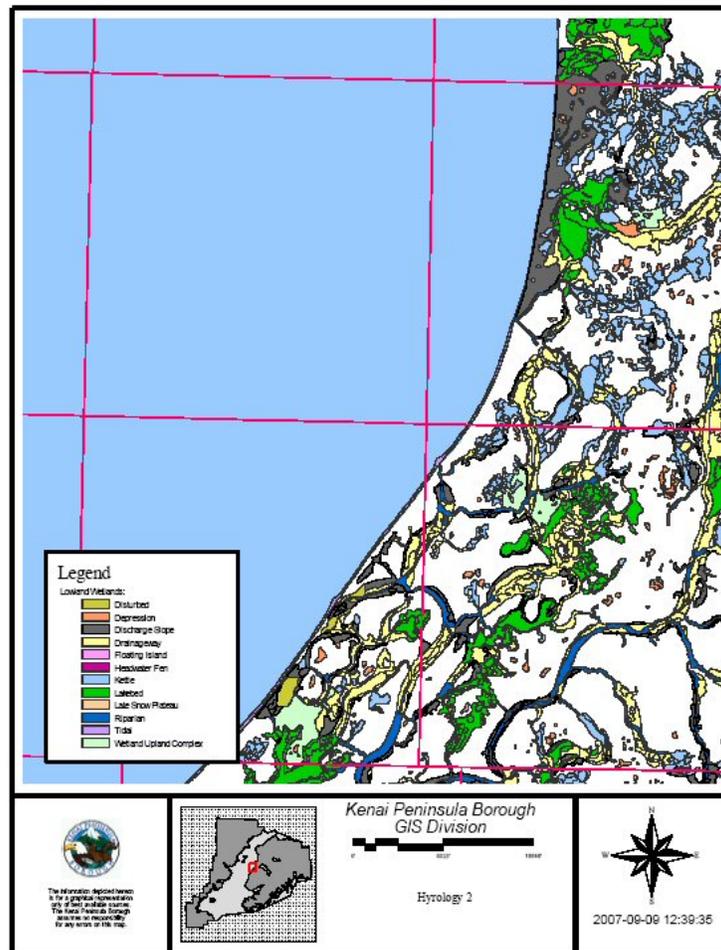


Figure 40 Wetlands and Riparian Zones in the project area.

Non-Critical Elements of the Human Environment:

The following non-critical elements of the human environment have been analyzed and may be affected by the Proposed Action or the No Action Alternative:

Noise

The area of potential effect has been subjected to considerable human development. It is relatively urbanized by regional standards and interlaced with highways, neighborhood and subdivision road systems. While the Sterling Highway may have commercial development along it, the area is predominated with small villages and rural residential neighborhoods.

Surface Property Owners

On the road system out of Anchorage and between the communities of Kenai and Homer, the area has experienced considerable human intrusion and development. There are numerous private properties, commercial and residential, within the seismic survey area including the eleven split estate parcels identified above.

Vegetation

The area of potential effect is within the boreal forest (sometimes called "taiga"), which is part of one of the world's largest biomes, extending across North America from Alaska to Newfoundland and across Eurasia from Norway to Siberia. It consists of mixed evergreens and hardwoods, interspersed with wetlands and lakes.

There are a wide variety of vegetation communities found in the ecoregion. The most widespread are coniferous, broadleaf, and mixed forests, dominated in differing combinations by black spruce (*Picea mariana*), white spruce (*P. glauca*), Sitka spruce (*P. sitchensis*), quaking aspen (*Populus tremuloides*), balsam poplar (*P. balsamifera*), black cottonwood (*P. trichocarpa*) and paper birch (*Betula papyrifera*) (Gallant et al. 1995). Other important communities include low scrub, tall scrub, low scrub bog, mesic graminoid, graminoid herbaceous, and wet forb herbaceous communities.

IV. ENVIRONMENTAL CONSEQUENCES

A. Impacts of the Proposed Action:

1. Critical Elements of the Human Environment:

Cultural Resources:

While the effects of seismic waves upon buried cultural resources have not been widely studied, a potential for impacting contextual relations of subterranean artifacts may exist. The digging of the shot holes may impact cultural resources. A literature review of the area of potential effect identifies four known sites.

Threatened & Endangered Species:

The USFWS has determined that oil and gas exploration and development activities within three miles of the eastern shore of Cook Inlet, from Clam

Gulch to the southern bounds of the proposed seismic survey area, is likely to adversely affect Steller's eiders.

Although the Bald Eagle has recently been taken off of the Endangered Species list, it and its nesting areas remain protected under the Bald Eagle Protection Act, 16 U.S.C. §668-668d. Helicopters and ground crews may disturb the birds and their nesting areas.

Waste, Hazardous/Solid:

Potential for harm to the environment is presented by risks associated with spills of fuel, oil and/or hazardous substances during operation of machinery in the construction area. Accidents and mechanical breakdown of machinery are possible.

Water Quality (Surface/Ground):

The establishment of shot holes in watercourses would have an adverse but short term effect on sedimentation and turbidity. Veritas has indicated that the shot hole grid will be adjusted to avoid watercourses. Veritas has also adopted mitigation measures developed by the Alaska Department of Natural Resources and mitigation measures for working in watercourses and riparian zones common to the current generation of Resource Management Plans developed by the Bureau of Land Management.

Wetlands/Riparian Zones:

Parcels 1, 2 and 3 or three of the surface parcels include wetlands and riparian zones, see Figures 23, 24 and 25 above. The shot hole grid for Parcel 1 places a shot hole in the wetland in the northeast portion of the parcel. The shot hole grid for Parcel 2 places a shot hole in the southeast corner of the parcel, quite a distance from the riparian zone.

2. Non Critical Elements of the Human Environment:

Noise:

Helicopter, drill rig operations and ground crews will increase the noise levels in the survey area, particularly in staging areas.

Surface Property Owners:

Veritas will obtain permissions from each individual whose property is affected. Where landowners deny access, lines will be moved as needed to avoid those properties.

With regard to drinking water wells and septic systems, the seismic survey plan of operations calls for a set back of 300 feet from improvements including drinking water wells and septic systems. By statute Oklahoma, imposes a set back from wells (drinking water) and septic systems of 200 feet during seismic survey operations. Veritas' set back is more conservative.

Vegetation:

The local community has raised concerns over the slow rate of vegetation recovery on seismic lines. Veritas will adjust the shot hole and receiver grids so as not to impact tree stands. Veritas has also advised the agency and property owners in the survey area that operations will be conducted without any cutting or clearing of vegetation.

Trampling of vegetation remains an issue. Despite representations made to surface owners of packing in gear to accommodate the survey, the plan of operations also includes provisions for the use of all terrain vehicles. The project will be ongoing in the late fall when there is no snow cover or ground frost. Absent adequate snow cover and ground frost, the use of all terrain vehicles will disturb wetlands, vegetation and soils. No new access routes are proposed however and Veritas has limited its access to established roads and trails.

Mud and debris on equipment and personal field gear may carry seeds of invasive, noxious and/or non-native plants from work on other land bases in Alaska or outside.

B. Impacts of the No Action Alternative:

1. Critical Elements of the Human Environment:

Cultural Resources:

Under the no action alternative, Veritas may continue with its seismic survey but without permission to conduct operations on approximately 1% of the land mass involved in the survey area. Cultural resources on Bureau administered lands would be unaffected.

Threatened & Endangered Species:

There are two species involved in the survey area, Steller's eiders and the Bald Eagle. One Bureau administered parcel is involved in the seismic survey area along the bluff to Cook Inlet. That parcel, Parcel 2, is the closest to habitat frequented by Steller's eiders. It represents approximately two tenths of a percent of the entire on shore survey area. While denial of a permit to conduct seismic survey operations on Bureau administered lands would reduce the risk of harm to Steller's eiders, the reduced risk is insignificant.

Under the no action alternative, resident Bald Eagles on Bureau administered lands would not be at risk; however, the reduction of risk to the overall resident Bald Eagle population in the on shore seismic survey area would be insignificant.

Waste, Hazardous/Solid:

Under the no action alternative, Bureau administered lands would not be subjected to hazardous and solid waste impacts; however, the reduction of impacts on the overall on shore seismic survey area would be insignificant.

Water Quality (Surface/Ground):

Under the no action alternative, Bureau administered lands would not be subjected to water quality impacts; however, the reduction of impacts on the overall on shore seismic survey area would be insignificant.

Wetlands/Riparian Zones:

Under the no action alternative, Bureau administered lands would not be subjected to the risk of wetland and riparian zone impacts; however, the reduction of impacts on the overall on shore seismic survey area would be insignificant.

2. Non-Critical Elements of the Human Environment:

Noise:

Under the no action alternative, Bureau administered lands would not be subjected to impacts from noise; however, the reduction of impacts on the overall on shore seismic survey area would be insignificant.

Surface Property Owners:

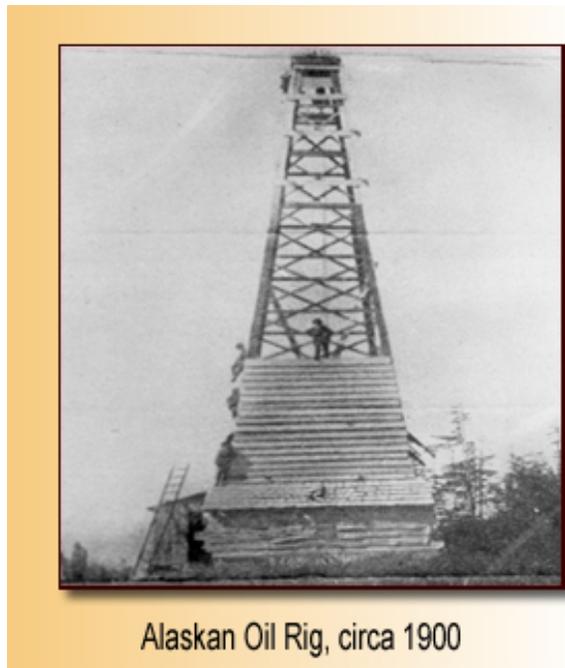
The risk of impacts to the surface estate of split estate landowners would remain the same under the no action alternative as Veritas would gain access to the surface estate under separate contract with the surface landowners.

Vegetation:

Under the no action alternative, vegetation on Bureau administered lands would not be impacted; however, the reduction of impacts on the overall on shore seismic survey area would be insignificant.

C. Cumulative Impacts:

Oil and gas exploration has been a part of the history of the Kenai Peninsula for nearly 150 years. The first historical references can be found in early reports from Russian explorers in the 1850's, who observed oil seeps on the Iniskin Peninsula on the west side of lower Cook Inlet. In the early 1900's, the first attempt at commercial oil exploration in Cook Inlet took place on the Iniskin Peninsula with the drilling of six exploration wells between 1900 and 1906, with out commercial success. Exploration continued through out the Cook Inlet Basin for the next 50 years with out success until the late 1950's, when commercial oil was finally discovered in Alaska.



**Figure 41**

The Kenai Peninsula is the birth place of the Alaska oil and gas industry with the discovery of Alaska's first commercially viable oil find in the Swanson River field in 1957. With that discovery, the Cook Inlet Basin became a focal point for oil and gas exploration that is still ongoing today. The discovery of oil in the Swanson River field is considered one of the driving factors in the formation and incorporation of the City of Kenai as a first class city in 1960 and the Kenai Peninsula Borough as a second class borough in 1964. Rapid economic and population growth followed during the next four decades to present day.



**Figure 42. Unocal Monopod Platform, Cook Inlet.**

Veritas' seismic survey may lead to the discovery of commercially viable oil and gas prospects which may lead to further development of oil and gas wells on the Kenai Peninsula and on off shore platforms. Such development may lead to further development of infrastructure to support the wells and platforms.

The Kenai watershed Forum, PO Box 2937, Soldotna, Alaska 99669, (907) 260-5449 has made the following projections for the Kenai Peninsula:

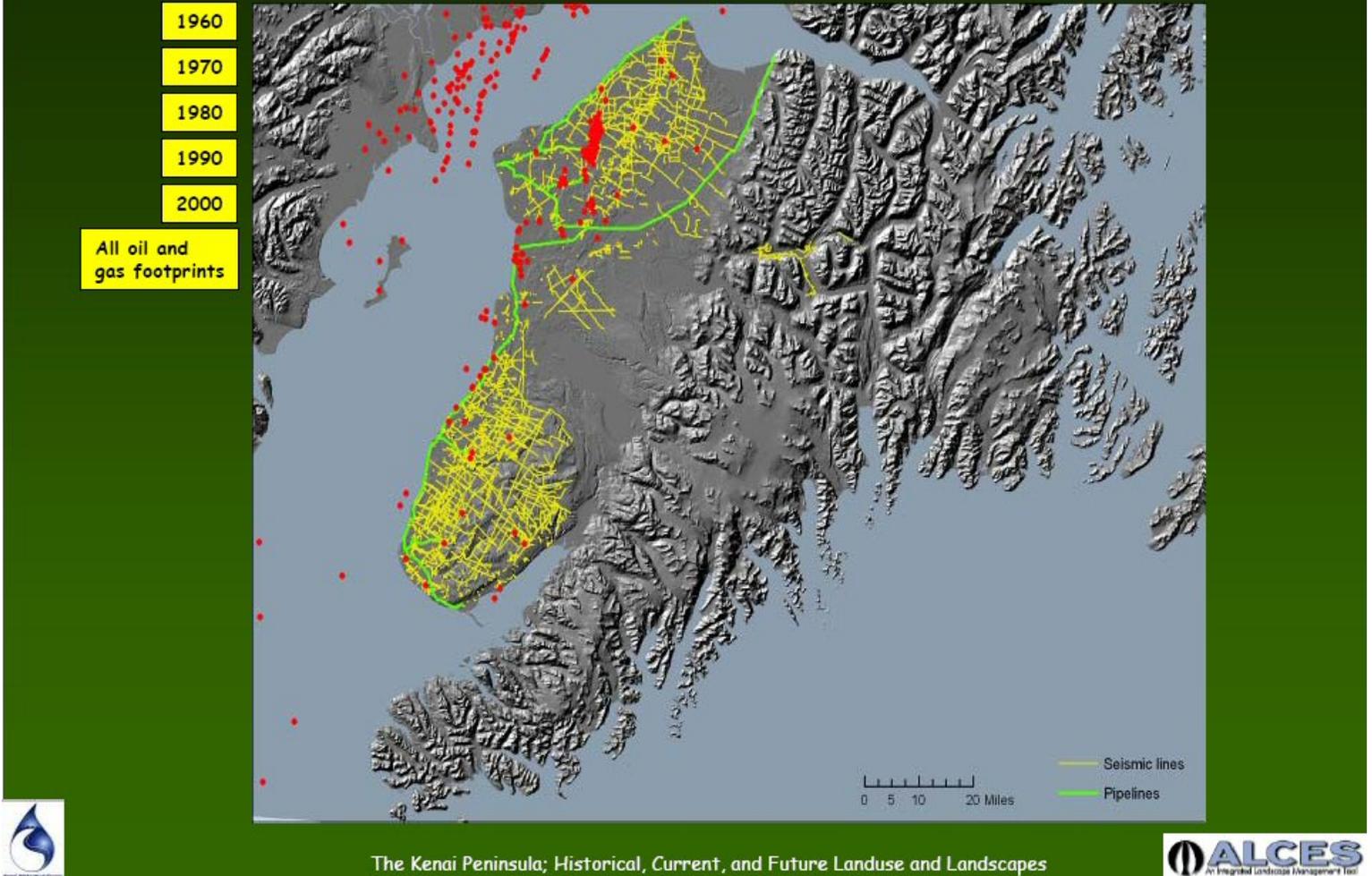
1. The human population will more than double in the next half century. So will the infrastructure.
2. The current emphasis on rural residential lifestyles is leading to a rapid loss of natural landscape and, from the perspective of infrastructure is expensive to build and maintain.
3. Increases in the human population and attendant road and culvert networks will lead to significant declines in quality and quantity of habitat for Coho, brown bear, and moose.
4. Climate change is projected to lead to a gradual, though significant change in landscape composition on the Peninsula.



**Figure 43. An example of Oil and Gas infrastructure on the Kenai Peninsula.**

# Oil and Gas Wells

(Data Source: well completion date from Alaska Oil and Gas Conservation Commission)



The Kenai Peninsula; Historical, Current, and Future Landuse and Landscapes

Figure 44. Oil and Gas development on the Kenai Peninsula including a depiction of seismic lines (yellow).

D. Mitigation Measures and Conditions of Approval:

The proffered mitigation measures, pages 23 to page 27, are appropriate actions or measures to avoid, minimize, rectify, reduce, eliminate or compensate for adverse environmental impacts and were an integral part of the proposed action and alternatives analysis. To the extent they are consistent with the following, the proffered mitigation measures will be incorporated into the final geophysical exploration permit.

Where there is an inconsistency or conflict between the following and the proffered mitigation measures, the following shall control:

General Provisions:

- 1) Veritas shall only be permitted conduct geophysical exploration on the following described Bureau administered lands:

Seward Meridian

- Parcel 1. Lot 1, N $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ , SW $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$ , and that portion of the NE $\frac{1}{4}$ SE $\frac{1}{4}$  north of the Sterling Hwy., exclusive of that portion of the N $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$  northwest of the Sterling Hwy., Sec. 21, T. 2 N., R. 12 W. (240 acres)
- Parcel 2. Lot 1, Sec. 23, T. 1 N., R. 13 W. (39.08 acres)
- Parcel 3. N $\frac{1}{2}$ S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ , Sec. 13, T. 1 N., R. 13 W. (10 acres)
- Parcel 4. S $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  and SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ , Sec. 24, T. 1 N., R. 13 W. (15 acres)

- 2) Authorization to conduct geophysical exploration on the above described lands shall be evidenced by a properly executed BLM Form 3150-4, NOTICE OF INTENT AND AUTHORIZATION TO CONDUCT OIL AND GAS GEOPHYSICAL EXPLORATION OPERATIONS.
- 3) In accordance with the provisions of 43 CFR §3154, Veritas shall provide the Bureau of Land Management, Minerals Division, Attn: Greg Noble, 6881 Abbott Loop Rd., Anchorage, AK 99507 with an appropriate bond to conduct geophysical exploration on federal public lands on the Kenai Peninsula, Alaska.
- 4) Within 30 days of completing its on shore geophysical survey operations, Veritas will file BLM form 3150-5, NOTICE OF COMPLETION OF OIL AND GAS GEOPHYSICAL EXPLORATION OPERATIONS, with the Bureau of Land Management, Minerals Division, Attn: Greg Noble, 6881 Abbott Loop Rd., Anchorage, AK 99507.
- 5) Veritas will submit all data and information obtained in carrying out the seismic survey to the Bureau of Land Management, Minerals Division, Attn: Greg Noble, 6881 Abbott Loop Rd., Anchorage, AK 99507, 43 CFR §3152.6.
- 6) Veritas shall conduct its operations in compliance with all Federal, State, and Local laws and orders, rules and regulations and ordinances; including but not limited to those relating to the environment.

- 7) Veritas agrees to indemnify, defend and hold the United States, its employee's, representatives, agents, successors and assigns, harmless from any and all claims, damages, injuries or death arising out of or in connection with its geophysical exploration operations including but not limited to any claim of or liability for error, omission or negligent or intentional act of Veritas, its agents, subcontractors or employees.
- 8) Veritas will provide the Bureau of Land Management with a copy of its State of Alaska, Department of Natural Resources, Division of Oil and Gas Geophysical Exploration Permit and application.
- 9) Operations will be conducted in such a manner as to leave the surface in as near its original condition as reasonably possible.
- 10) When the project has been finalized in design and routes have been selected based on resource concerns or avoidance, Veritas shall furnish the BLM with a revised NOI and final project maps.
- 11) All explosives stored or not used in the blasting operation will be destroyed or removed from federal lands.
- 12) Veritas shall protect all land survey markers.
- 13) Crews shall not camp or reside on federal lands during the course of the project.
- 14) Crew and equipment deployment, pickup, troubleshooting and other operations will be accomplished on foot and/or with helicopter support.
- 15) All terrain vehicles will be speed limited and be equipped with low ground pressure tires.
- 16) Veritas will conduct an environmental briefing for all employees, contractors and subcontractors, including pilots, which will cover the Conditions of Approval.
- 17) Veritas' geophysical exploration activities must not impede Alaska rural residents from pursuing traditional subsistence activities.

Right to suspend operations:

1. Operations will be suspended for flagrant or willful violations of terms of the NOI until such time as the problem is cured to the satisfaction of the authorized BLM officer or his/her designated representative
2. Operations will be suspended when in the opinion of the authorized BLM officer or his/her designated representative such action is necessary to insure public health and safety
3. The authorized BLM officer may suspend operations during periods of extreme fire danger, when warranted by conditions, (i.e., large fire activity on unit, severe shortage of resources, high potential for fire starts, fuel moistures are extremely low, etc.).
4. Operations will be suspended if in the opinion of the authorized BLM officer or his/her designated onsite representative weather conditions or soil/slope conditions may result in unacceptable soil damage in excess of that analyzed in the EA document.

Explosive Handling and Blasting Operation requirements:

1. Veritas its agents and contractors will perform all work with explosives in such a manner as not to endanger life or property.

2. The method of storing and handling explosives and flammable materials shall be in accordance with Occupational Safety and Health Administration (OSHA), U.S. Bureau of Alcohol, Tobacco, and Firearms (BATF), and U.S. Department of Transportation (DOT) regulations. Explosives and detonator caps shall be stored in a designated area in secure magazines. Signage for the magazines shall not be placed on the magazines, but on adjacent posts or other permanent structures. All storage places for explosives and flammable material shall be marked in accordance with applicable regulations.
3. In case of the loss or theft of explosives, the BLM and the Alaska State Troopers shall be notified immediately.
4. Flagmen or warning devices shall be used while operations are being conducted within or adjacent to road right-of-ways.
5. Observers, guards, or flagmen shall be posted at safe distances during blasting operations. There shall be a minimum of two crew members observing each detonated shot hole. The shot point coordinator shall wear PPE as prescribed by regulation or Company policy. The shot point coordinator shall ascertain that no personnel, public, wildlife or livestock are within 200 feet or the visual horizon of the hole to be detonated prior to detonation.
6. Roads/trails leading into the area shall be posted by the permittee stating, "Seismic Crew Ahead" or some similar verbiage.
7. No explosives boxes or prima cord reels shall be left in the field nor may they be burned on federal lands.

Fire Prevention and Reporting Measures:

1. Veritas shall coordinate project activities with appropriate fire-response agencies. The applicant shall prepare a brief but specific instruction plan (crew contingency plan) for emergency fire response and shall submit it to the authorized BLM officer or his/her designated representative for concurrence. The crew contingency plan will include a fire communications protocol for contacting the BLM and/or other appropriate agencies (i.e., Kenai Peninsula Borough) in the event of a fire.
2. Veritas will report all fires to the appropriate authorities.
3. All vehicles shall be equipped with fire extinguishers and shovels.
4. Helicopter landing zones at each staging area shall be equipped with fire extinguishers. In addition, each helicopter shall have a 100-gallon water bucket should the helicopters be needed to fight a fire in the area, regardless of the fire's source.
5. Vehicles with catalytic converters will be restricted to existing roads and motorized trails; parking or idling will not be permitted in portions of roads or trails with taller vegetation as determined by the authorized BLM officer or his/her designated representative.
6. Portable generators used in the project area will be required to have spark arresters.
7. All brush build-up around mufflers, radiators, headers, and other engine parts will be avoided; periodic checks shall be conducted to prevent this build-up.

8. Smoking will only be allowed in company vehicles and/or designated smoking areas; all cigarette butts shall be placed in appropriate containers and not thrown on ground or out windows of vehicles.
9. Cooking, campfires, or fires of any kind are not allowed on federal public lands.
10. Veritas will be strictly liable for all expenses incurred as result of incidences of fire attributable to its geophysical exploration operations.

Helicopter Operation Requirements:

1. Helicopters shall maintain FAA required distances for overflights of residences, buildings and other private land facilities.
2. Helicopters shall not harass or intentionally disturb wildlife species. This means helicopter pilots shall not go out of their way to observe or photograph wildlife; helicopter pilots shall take deliberate evasive action to avoid wildlife when observed.
3. Any sling loads or other materials intentionally jettisoned for safety purposes or accidentally dropped from helicopters shall be immediately retrieved.

Rights-of-way protection:

1. Shot holes shall be offset at industry accepted distances from rights-of-way, as set forth by the International Association of Geophysical Contractors to avoid disturbance to utility, access road, canal/drainage, and other land and realty features.

Cultural Resources:

1. Since areas with high potential for previously undiscovered cultural resources are located within the Area of Potential Effect, a qualified archaeologist should examine these areas before the seismic lines are set and shot holes are drilled. High potential areas for this area are within 1000 feet of the shoreline bluff and areas around stream inlets and outlets of interior lakes. If cultural sites are found, the shot holes should be relocated to at least 300 feet away from the site. Known cultural sites should have an archaeological monitor present during surface disturbance. The archaeologist should also record the site location, provide a site description and sketch map of any new sites. BLM should be provided a copy of the ensuing report that will be submitted to the SHPO.
2. All of the applicant's employees and their contractors shall be informed before commencement of project operations of critical elements of compliance with the Archeological Resources Protection Act (ARPA) and the National Historic Preservation Act (NHPA); and that any effects on, defacement of, or removal and/or disturbance of archaeological, historical, or sacred material shall not be permitted. Violation of the laws that protect these resources will be treated as a law enforcement/administrative disciplinary action.
3. If subsurface cultural resources are found during project operations, all work in the vicinity of the resource shall cease and the applicant shall notify the authorized BLM officer immediately. The applicant shall

implement appropriate measures requested by that agency to protect the resource until it can be adequately evaluated.

4. If human remains are encountered during project operations, all work in the vicinity of the remains shall cease and the remains shall be protected from further exposure or damage. The applicant shall notify the authorized BLM officer immediately of such a discovery.
5. Veritas is responsible for informing all persons associated with this project including employees, contractors and subcontractors under their direction that they shall be subject to prosecution for damaging, altering, excavating or removing any vertebrate fossil objects on site. Collection of vertebrate fossils (bones, teeth,) is prohibited without a permit. Unlawful removal, damage, or vandalism of paleontological resources will be prosecuted by federal law enforcement personnel.
6. If vertebrate paleontological resources (fossils) are discovered on BLM-administered lands during 3D seismic project operations, Veritas shall suspend operations that could disturb the materials, and immediately contact the authorized BLM officer or his/her designated representative. The authorized BLM officer will arrange for evaluation of the find within an agreed time frame and determine the need for any mitigation actions that may be necessary. Any mitigation would be developed in consultation with Veritas, who may be responsible for the cost of site evaluation and mitigation of project effects to the site. If Veritas can avoid disturbing a discovered site, there is no need to suspend operations; however, the discovery shall be immediately brought to the attention of the authorized BLM officer.
7. All vertebrate or scientifically important paleontological resources deemed to be of scientific value found as a result of the project baseline inventory will be avoided during operations. Avoidance in this case means "No heli-portable drilling/shot hole source generation within a distance of at least 50 linear feet of the outer edge of the paleontological locality as marked on the ground".

Threatened and Endangered Species:

1. Veritas will comply with the recommendations of the U.S. Fish and Wildlife Service where seismic survey operations may affect Steller's eiders, Appendix F.
2. No activities shall occur within 200 feet of a Bald Eagle or raptor nest, and helicopters shall avoid direct over flights of unoccupied Bald Eagle or raptor nests to protect their structural integrity.

Waste, Hazardous/Solid:

1. The project clean-up phase shall proceed concurrently with the recording phase. Equipment, pin flags, lathe, flagging, trash and any other materials brought in by the seismic crews shall be removed as the recording crew works through the project area.
2. Trash shall be packed out and disposed of properly at an Alaska Department of Environmental Conservation approved disposal site. No explosives boxes or prima cord reels shall be left in the field nor may they be burned on federal lands.

3. Storage containers are required for all refuse or garbage that may contain attractants. At staging areas, litter containers (for non-attractant litter) with functional, protective lids from wind shall be in use at all times. Litter shall be placed in containers immediately and not left on the ground to be policed at a later time.
4. Self-contained portable sewage disposal units shall be provided and used at staging areas. Contents of these units shall be disposed of at appropriate facilities. Away from staging areas, individuals shall bury human waste in holes six to eight inches deep.
5. Fuels, petroleum products, chemicals, or hazardous materials will not be stored on federal public lands.
6. Major hazardous waste spills shall be reported immediately to the authorized BLM officer or his/her designated representative, and the applicant shall clean up spills in accordance with all applicable regulatory guidelines and as outlined in the applicant's Emergency Response/Contingency Plan.
7. All spills or leaks of diesel fuel, hydraulic fluid, lubricating oil, and coolant, including contaminated soil material, shall be excavated to an appropriate container and transported to an approved disposal site.
8. The applicant shall clean up all project lath, flagging, solid waste, and incidental trash as operations proceed through an area. The collected trash shall be hauled to an Alaska Department of Environmental Conservation approved disposal site

Water Quality (Surface/ground):

- 1) Shot holes will not be located in active rivers or streams beds. Forging of rivers or streams shall be by foot perpendicularly from stream bank to stream bank. Vehicular travel up and down streambeds except by watercraft is prohibited unless ice is frozen to a sufficient depth to sustain the activity and the stream banks are a sufficient distance apart to allow for passage without adverse impacts to the banks..
- 2) Unless authorized by NPDES or state permit, disposal of wastewater into freshwater bodies, including wetlands, is prohibited.
- 3) Operations in river or stream channels will be avoided.
- 4) No operations of any kind will occur in anadromous steams.

Wetlands/Riparian Zones:

- 1) If soils are saturated geophysical exploration activities must be suspended to avoid trail braiding and rutting.
- 2) It is preferred that seismic survey operations on Bureau administered lands be conducted with adequate snow cover and ground frost to avoid wetland, vegetation and soil damage.
- 3) All ATV's used in the field by Veritas or Extreme Surveys will be speed limited and will employ low ground pressure tires.
- 4) Drilling of shot holes for geophysical exploration is prohibited where:
  - Artesian wells are suspected.
  - In wetland or riparian zones where perennially high water tables exist.
  - In areas where and when soils are saturated.
  - Immediately upslope from springs or bogs.

5. Drilling, off-road vehicular use (including ATVs), or any other surface-disturbing activity will be prohibited within 150 feet of the high water mark of any body of water or riparian/wetlands areas on federal lands. Helicopters shall be used to drop equipment to support placement of recording lines to reduce surface disturbance. River and stream channels will be avoided.
6. No wetland/riparian vegetation will be removed during any phase of the project.

Noise:

- 1) Veritas will conduct all seismic survey operations, including but not limited to helicopter operations and drill rig operation, in compliance with all local ordinances regarding noise and the appropriate time to conduct operations.

Surface Property Owners:

- 1) Veritas must provide notice to the current surface estate owners of the split estate parcels. The notice must advise the current surface estate owners of Veritas' intent to conduct a seismic survey on the real property and the date of operations.
- 2) Veritas must obtain the consent of the current surface estate owners of the split estate parcels to enter and conduct seismic survey operations.
- 3) Minimally, Veritas will exercise the same level of care on the surface of the split estate parcels as it will on the Federal Surface Estate Parcels identified herein.
- 4) Shot holes shall be located a minimum of 300 feet from any surface improvement including water wells, septic systems and building foundations regardless of ownership unless written consent to encroach further is obtained from the affected surface owner.
- 5) Veritas must negotiate appropriate setbacks with the operator under oil and gas lease A-024399 and minimally will exercise the same level of care on parcels subject to the lease, as it will under this permit on federal public lands. Veritas will take all necessary precautions to avoid interference with operations on the lease and damage of existing structures and facilities.
7. Shot holes will be located a minimum of 300 feet from oil/gas wells and pipelines, unless written permission to encroach closer has been given by the owner or lessee.

Vegetation:

1. No cutting of trees, shrubs or vegetation is authorized.
2. Veritas will clean mud and debris from all equipment and personal field gear prior to locating on Bureau administered lands. This will help prevent the inadvertent introduction of invasive, noxious, and non-native plants.
3. Driving of any wheeled vehicles in areas void of vegetation and having soils where tracks could be long-lasting shall be avoided, or the area hand-raked immediately after use to reduce the visual impact.

Reclamation:

1. All shot holes shall be plugged in order to prevent the potential interchange of surface and ground water and harm to yearling and newborn moose calves. Drilling mud shall be dispersed in the shot hole vicinity to allow for natural vegetation regeneration. Drilling mud shall be dispersed such that there will be no noticeable drilling mud visible within two years of the site disturbance.
2. Veritas shall reclaim and reseed all off-road areas disturbed by geophysical operations as directed by the authorized BLM officer or his/her designated representative. Reclamation efforts may include disking or ripping the ground surface, reseeding and mulching. Best management practices will be used in the re-vegetation efforts to insure a higher success rate in problematic areas.
3. The locations for reclamation efforts will be discussed and agreed upon between the BLM and Veritas after the completion of the project.
4. Reclamation of vegetation resources is considered met if there is evidence that the disturbed area is stable and that vegetation is or will become established to the same degree as the immediately adjacent area. Vegetation establishment normally takes two years or longer following reseeding.
5. Veritas will use certified "Weed Free Alaska Seed" when seeding reclamation sites. The seeds will be compatible with vegetation in the surrounding ecoregion.
6. In order to discourage the future use of seismic lines for unauthorized ORV/ATV travel, signs and barricades shall be placed at access points to seismic lines as deemed necessary by the authorized BLM officer or his/her designated representative. Natural barriers such as rocks and/or dead vegetation will also be used to the extent available in place of signs and/or artificial barriers.

V. CONSULTATION AND COORDINATION

A. Persons and Agencies Consulted:

Cook Inlet Region, Inc.  
U.S. Fish and Wildlife Service  
State of Alaska, Department of Natural Resources, Office of History and Archaeology  
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