

VERITAS DGC LAND INCORPORATED
SOUTH JONAH 3-D VIBROSEIS PROJECT
ENVIRONMENTAL ASSESSMENT
WY-040-EA02-136

Prepared for

U.S. Department of the Interior
Bureau of Land Management

Rock Springs and Pinedale Field Offices

July 2002

Prepared by

Kail Consulting Ltd., an environmental consulting firm, with guidance, participation, and independent evaluation by the Bureau of Land Management (BLM), prepared this environmental assessment. The BLM, in accordance with federal regulation 40 CFR 1506.5(a) and (b), is in agreement with the findings of the analysis and approves and takes responsibility for the scope and the content of this document.

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INTRODUCTION

On April 4, 2002, Veritas DGC Land, Inc. (Veritas) filed a Notice of Intent (NOI) with the Bureau of Land Management (BLM) Rock Springs Field Office (RSFO) to conduct a vibroseis 3-D geophysical project. This application has been assigned serial number WYW-155218 and is known as the South Jonah 3-D Vibroseis Project (SJ3D). The application covers 410 square miles in Sweetwater and Sublette Counties, Wyoming. A courtesy copy was filed with the Pinedale Field Office (PFO) as the northern portion of the project area lies within the PFO administrative boundary. On May 20, 2002, Veritas filed an amendment to the NOI slightly adjusting the southern boundary of the project, bringing the SJ3D project to a total of 411 square miles. A copy of the NOI and the amendment can be viewed at the RSFO.

The rectangular SJ3D project area overlies 262,400 acres including the southern portion of the Jonah Gas Field in Sublette County and continuing south 12 miles into Sweetwater County. Total surface area within the project is approximately 411 square miles, but actual surface use area by the proposed seismic program would be restricted to 100-foot wide corridors along the seismic lines, a small percentage of the total project area. Approximately 98% (257,888 acres) of the project area is public land managed by the BLM, about 2% (4,472 acres) are lands managed by the State of Wyoming, and less than 1% (40 acres) is private land, as reflected on Map 1. A 7.5-minute scale map of the proposed project area showing the proposed locations of source and receiver points can be found at the RSFO. About one-fifth of the SJ3D lies within the PFO jurisdictional area and the remaining four-fifths lies within the RSFO area. RSFO is the lead office for analyzing and administering this proposed undertaking. Sections affected by the proposed project include:

T24N R110W Sections 1-6
T24N R111W Section 1

T25N R108W Sections 1-36
T25N R109W Sections 1-36
T25N R110W Sections 1-36

T26N R108W Sections 1-36
T26N R109W Sections 1-36
T26N R110W Sections 1-36

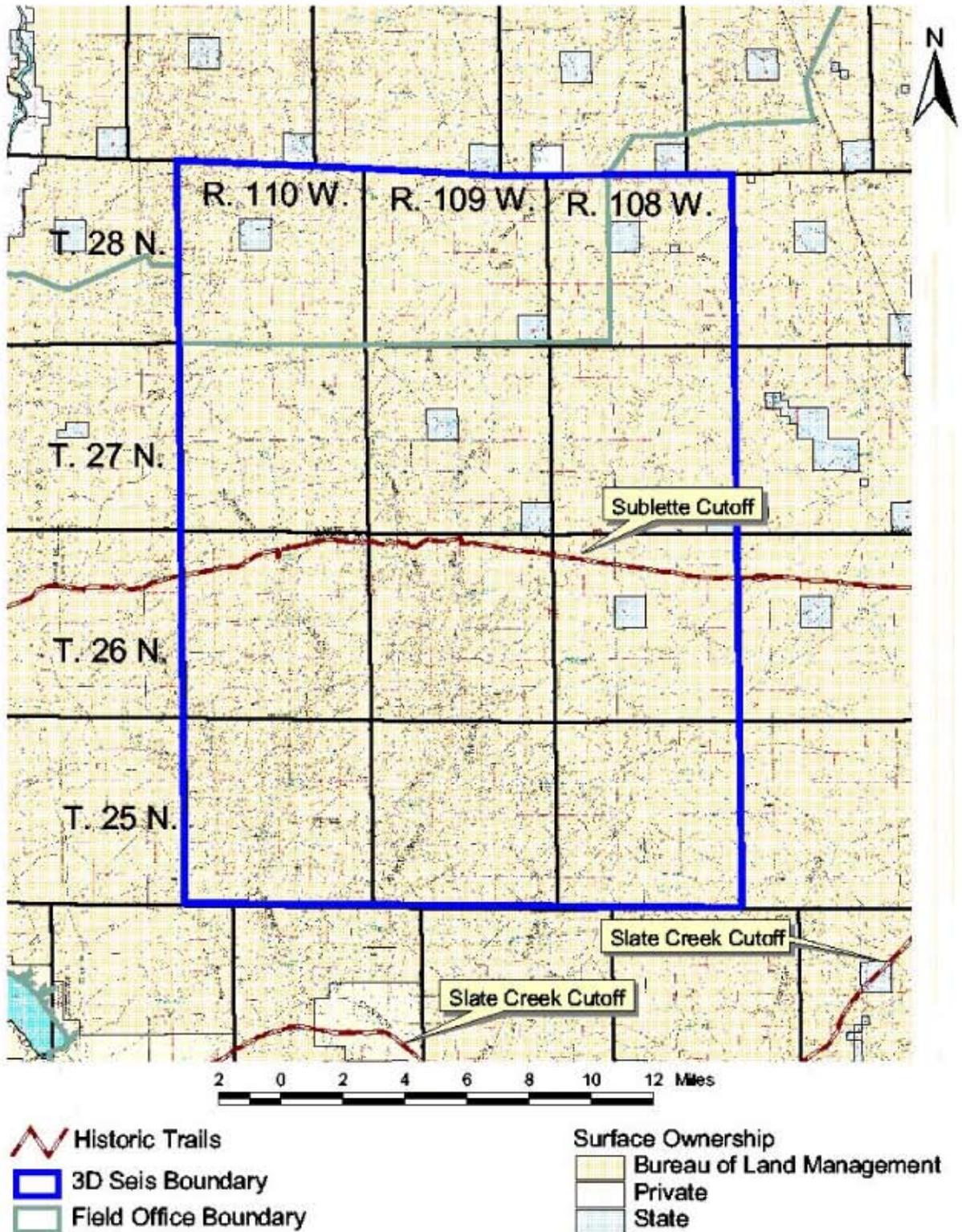
T27N R108W Sections 1-36
T27N R109W Sections 1-36
T27N R110W Sections 1-36

T28N R108W Sections 1-36
T28N R109W Sections 1-36
T28N R110W Sections 1-36

Need for the Proposed Action

The proposed action, the SJ3D geophysical project, is needed to acquire and evaluate subsurface geological data for possible exploration and/or development of oil and gas reserves. Geophysical exploration utilizing 3 D techniques is an intensive data acquisition and computer synthesis system used to analyze and three-dimensionally depict subsurface geology/stratigraphy. The technique is capable of locating and displaying unknown subsurface strata that potentially contain producible hydrocarbons. This proposed project partially overlies a known hydrocarbon-bearing geological structure, specifically the Jonah Gas Field. All federal

VERITAS South Jonah 3D Seismic Project



minerals within the SJ3D have been leased for oil and gas development or are available for lease (Map 12, Green River Resource Management Plan; p. 12, Pinedale Resource Management Plan). Well drilling in portions of the SJ3D project area is ongoing and is scheduled to continue in the foreseeable future. The proposed SJ3D is designed to collect subsurface data which should enable wells to be drilled with a much greater probability of locating producible hydrocarbons than is normally attainable by utilizing previous methods such as two-dimensional (2D) seismic data and wildcat wells. Completion of the project should result in fewer non-productive wells, or 'dry holes,' being drilled in an area, and therefore, less overall surface disturbance from access roads, pipelines, and drill sites.

Conformance with Applicable Land Use Plans

The Proposed Action is subject to the Green River Resource Management Plan (GRRMP), approved August 1997 and the Pinedale Resource Management Plan (PRMP), approved December 12, 1988. The Rock Springs Field and Pinedale Field Offices, as required by 43 CFR 1610.5, have determined that the Proposed Action is in conformance with the decisions, guidelines, terms, and conditions of the two RMPs. The Proposed Action is in conformance with the GRRMP decisions pertaining to geophysical operations near congressionally designated historic trails. The Proposed Action affects the Sublette Cutoff of the Oregon Trail system in the RSFO. The Slate Creek Cutoff of the Oregon-California Trail system lies outside of and to the south of the project area by at least 3.9 miles (Map 1; this EA will not further address the Slate Creek Cutoff). Geophysical operations adjacent to designated historic trails are prohibited or restricted within 300 feet of the trail. Exceptions may be allowed if supported by site-specific analysis. Veritas proposes to remain at least 300 feet from the trail and lay out the source lines (vibe points) parallel to the trail (although the vibe points would be located in a zigzag pattern) to protect the visual integrity of the trail viewshed.

This Environmental Assessment was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended. Authority for the Proposed Action and alternatives is contained in the Mineral Leasing Act of 1920 as amended, and in the Code of Federal Regulations at 43 CFR 3150.

Impacts resulting from project operations including impacts to private and state lands are addressed in the analysis. However, BLM's authority for imposing mitigative measures, including terms and conditions for approval of the NOI, pertains only to the federal lands, except on issues relating to 1) sites listed, eligible, or potentially eligible for the National Register of Historic Places and 2) species listed as threatened, endangered, proposed for listing, and candidate species under the Endangered Species Act.

Relationship to Statutes, Regulations, and Other Plans

The Proposed Action is in compliance with state and county land use guidelines. The project area overlaps portions of two producing natural gas fields including the Jonah Gas Field and the Blue Forest Unit of the Fontenelle project area. Natural gas exploration and development in these fields have been analyzed. The plans for development in these two producing fields include the Fontenelle Infill Drilling Project Environmental Impact Statement (EIS) and Amended Record of Decision (ROD, March 1997) and the Modified Jonah Field II Natural Gas DR/EA (March 2000) and the Jonah Field II Natural Gas Development Project EIS/ROD (April 1998).

Issues and Concerns

The BLM issued a news release on April 30, 2002, allowing a 30-day comment period on the proposal. A copy of the release was also sent to environmental groups, state agencies, and the historic trails group. The news release was published in the local paper (Rock Springs Rocket-Miner) on May 3, 2002, and the statewide newspaper (Casper Star Tribune) on May 10, 2002. Seven comment letters were received in response to the news release and can be found in Appendix A along with BLM's response. Issues and concerns identified during internal and external scoping include the following:

- Cultural resources and Sublette Cutoff of the Oregon Historic Trail and associated viewshed, potential conflicts with trail visitors
- Wildlife and their habitat – sage grouse leks/nesting habitat, mountain plover habitat, borrowing owl, prairie dog towns/complexes, raptors, and potential conflicts with pronghorn antelope hunting (9/10-10/30)

- Threatened, Endangered, Proposed, and Candidate Plant and Animal Species
- BLM sensitive species
- Vegetation and soils, including steep slopes associated with canyons
- Range improvements including allotment or pasture fencing and water wells
- Mineral resources including existing oil and gas wells
- State required permits
- Advantage of using seismic data collection resulting in less unnecessary surface disturbance associated with wildcat exploratory drilling
- Exploratory drilling alternative
- Alternative starting at southern end of the project area
- National Energy Policy
- Use of vehicles to conduct seismic operations
- Socioeconomic impacts
- President's National Energy Policy and Secretary of Interior's 4 "Cs" philosophy to promote conservation practices with energy development
- Access to conduct seismic operations

DESCRIPTION OF THE ALTERNATIVES

Alternative 1 – Proposed Action to Conduct Vibroseis on Entire Project Area

During the survey/staking phase, Veritas proposes to utilize a crew of 8-12 surveyors using the global positioning system (GPS) to accurately place pin flags or wooden lath at predetermined points along receiver and source lines. All terrain vehicles (ATVs) would be used for some of the survey work.

Eighty-three receiver lines would be aligned in an east/west direction across the project area, spaced 1,540 feet apart. Along these lines, receiver/geophone points would be pin-flagged every 220 feet.

Eighty-two zigzag-patterned source lines would be aligned generally in an east-west direction across the project area between the receiver lines. Along these lines, source (vibration or 'vibe') points would be stationed every 311 feet if possible. Occasional source points would be staked in offset positions to avoid rough terrain, existing facilities, or other areas of concern such as wetland areas, steep slopes, and archaeological sites. Normal survey parameters allow for up to a 1,540-foot offset. Any change in direction of the drive path along source lines would be marked by orange flagged lath, while source points in line between lath would be marked by numbered pin-flags. All laths would be marked with reflective tape for improved visibility during nighttime operations.

During the data acquisition phase of the project, 3D geophysical data would be recorded with specialized equipment including cables, geophones, one truck-mounted recording or transcribing unit (the recorder or transcriber), and buggy-mounted vibroseis vehicles (buggy vibes).

A helicopter would be used to transport receiver equipment along receiver lines. Caches of cables, data collectors, batteries, and geophones would be placed along receiver lines, normally at 6 geophone station intervals (every 1,320 feet) or closer when necessary. Equipment unpacking and layout, geophone placement and cable connection work, and equipment bundling for helicopter pick-up would be accomplished by crews of pedestrian workers who would alternately layout and pick-up as needed. No truck or buggy vibe traffic is planned along receiver lines; only helicopter-assisted pedestrians and ATVs would be used. Cable deployment and other field operations would be performed an average of 14 hours per day during daylight hours.

Once a minimum of 8 receiver lines are functional, four to six buggy vibes would be used to create an energy source at each source point. If or where deemed advantageous by Veritas, two independent sets of four to six buggy vibes may work in tandem on adjacent blocks of source points to speed up project completion. Any source line would be traversed only once by the buggy vibe. As the project proceeds to the interior of the 3D project area, a minimum of 14 live receiver lines would be used: 7 ahead of the energy source and 7 behind.

In working through the project area, the buggy vibes would proceed side-by-side along source lines traversing approximately 4.7 linear miles per square mile. Two or three buggy vibes would be located on each side of

the flagged centerline. The units would create an energy source (vibe) of 6 sweeps at each source point. The SJ3D project includes a planned total of 33,845 source points. Buggy vibes would follow GPS and flagged travel routes to move from one source line to another. Recording activities would be performed 24 hours per day, except in areas of rough terrain where work would be limited to daylight hours for safety reasons.

The buggy vibes are 12 feet 6 inches high by 35 feet 6 inches long by 11 feet 6 inches wide. Each buggy weighs 65,000 pounds and is equipped with 43-inch wide (3.6-foot) low-pressure tires, which gives them a ground pressure of less than 16 PSI. This configuration provides for optimum traction (minimal spinning) while minimizing soil compaction, resulting in reduced potential for two-track roads being formed. Vibrator pads measuring 4.5 feet by 7.5 feet are centered under the vehicle. Refueling of buggy vibes would be at existing roads and trails only, and away from any live water areas.

Veritas would use either an RSR recording system or a MRX recording system. The MRX system involves a continuous cable that connects all receiver stations and receiver lines to each other and to the recording truck where the data are collected.

The RSR recording system uses multiple, independently operating sets of 6 geophone arrays (one array per receiver station), which are connected to each other and to a field data collector box with a battery. The RSR system stores the data within each data collector box, and requires downloading /collection periodically. A field technician driving an ATV with a 25-pound data collection unit to each field box accomplishes RSR data downloading/collection. Collected data are then transported to the field office for transcribing. The data would have to be collected on each receiver line 2-3 times during the recording phase. Veritas has made the operational commitment to minimize ATV trips along each line during the recording phase, with each trip using a different route when practical to minimize vegetation and surface disturbance.

In both systems, receiver lines would be repaired/troubleshoot as needed via use of ATVs. The ATVs are typical one-passenger four-wheelers with 9-inch (0.7-foot) wide tires.

For the purposes of this analysis, it is assumed that six buggy vibes would travel once along all source lines and off-road access routes totaling approximately 1,940 linear miles. Additionally, it is assumed that ATVs would travel all receiver lines (a total 1,424 linear miles) 10 times. These assumptions constitute a 'worst case' scenario, as it is possible that 4 buggy vibes rather than 6 would be used, and it is possible that the MRX recording system would be used (i.e., reduced ATV use on receiver lines).

Based on the above figures, 5.2 acres of tire-to-ground contact are expected per linear mile of buggy vibe traffic route (2 tires x 3.6 feet wide each x 6 buggy vibes in a side-by-side pattern = 43 feet wide x 5,280 feet per linear mile / 43,560 square feet = 5.2 acres direct tire contact per linear mile). With approximately 1,940 miles of off-road buggy vibe routes, a total of 10,088 acres would be affected by SJ3D buggy vibe tires. Additionally, 157 acres would be impacted by vibe pads (33,845 vibe points x (4.5 x 7.5 feet) wide vibrator pads x 6 buggy vibes). Also, 2,591 acres would be affected by SJ3D ATV tires (2 tires x 0.7 feet wide x 5,280 feet per linear mile / 43,560 sq feet = 0.182 acres tire contact per linear mile x 1,424 miles of off-road ATV traffic anticipated x 10 passes = 2,591). A total of (10,088 + 157 + 2,591 acres =) 12,836 acres of direct impact is approximately 4.9% of the overall 262,400-acre area within the project boundary. This 4.9% direct (tire and vibe pad) impact to the land surface of the SJ3D will be used repeatedly in this EA. It should be noted that the ATVs weigh approximately 1,000 pounds or less than 3% of the weight of a vibe buggy. Consequently, the actual impact upon vegetation would be substantially less than the buggy vibes.

Several helicopter staging areas and equipment staging areas would be required. Staging areas provide for temporary placement of cable and geophone trailers, helicopter fuel storage, helicopter landing pad, and parking for crew transport vehicles. Staging area locations are yet unidentified, but would be located on previously disturbed areas such as well pads, or where feasible on State or private land. If staging areas are required on BLM land, they would be permitted separately. Several survey base stations for GPS radio towers would also be required and these too, should they be located on BLM land, would be specifically permitted. All staging areas and survey base stations would be surveyed for applicable resources (i.e., cultural, and certain wildlife and plant species).

The project clean-up phase would proceed concurrently with the recording phase. Pin flags, lath, ribbon flagging, and trash would be collected daily as the recording crew works through the project area. These materials would be deposited at a Wyoming Department of Environmental Quality approved disposal site.

Survey/staking of the proposed project was granted an exception on May 13, 2002, to allow surveying and staking of source and receiver points subject to restrictions (i.e., use of ATVs in mountain plover habitat). Activity began on May 19, 2002. Archeological inventory of BLM portions of the project began May 25, 2002. Geophysical recording is scheduled to commence mid-July 2002 (tentative), and should be completed by approximately mid-October 2002. Recording operations are anticipated to start in the north end of the project area and proceed south.

Applicable permits would be acquired from the BLM, State of Wyoming Oil & Gas Conservation Commission, Sweetwater and Sublette Counties, and appropriate surface owners.

Alternative 2 - Remove Buggy Vibe Operations From Overlap Area (Agency-Preferred Alternative)

This alternative was developed based on the cumulative analysis of Alternative 1 (Proposed Action). It is the same as Alternative 1 with the exception of not allowing source (vibe) points on a portion of the project where multiple seismic projects have occurred (see Map 2). Source points would be dropped from approximately 22 square miles. Geophone cable would still be placed over 10 of the 22 square miles and some source points would occur along the boundary of the area where the previous seismic projects overlap to maintain data continuity. Geophone placement in the north end (Southwest Jonah Gas Field (SWJGF) overlap area) would occur on approximately 40 linear miles. The geophone lines would be accessed by ATVs to replace batteries, damaged cable, and/or download data from the RSR collection boxes if the RSR system is used. The ATV operations would be conducted on existing roads where possible. All off-road ATV operations in the SWJGF overlap area would be spread out and would avoid stands of tall sagebrush (i.e., stands of brush plants that are taller than 2 feet). Off-road ATV operations are estimated to occur on approximately three-fourths of the 40 miles of geophone line in the SWJGF overlap area. This would equate to roughly 50 acres or less than 1% of the surface area in the SWJGF multiple overlap area. All other aspects of Alternative 1 on the remaining 389 square miles of the project area would be the same.

No Action Alternative

Under the No Action alternative, the vibroseis project would not be authorized on BLM-administered lands. Operations could still occur on state and private lands. Considering that BLM-administered lands comprise about 98% of the SJ3D, adoption of this alternative would effectively result in cancellation of the project. Existing land and resource use activities within the project area would continue as is including exploratory and infill drilling for fluid mineral. Increased exploratory drilling could take place since the geophysical data would not be available. The Affected Environment descriptions presented in this EA also constitute the effects of the No Action alternative unless otherwise noted.

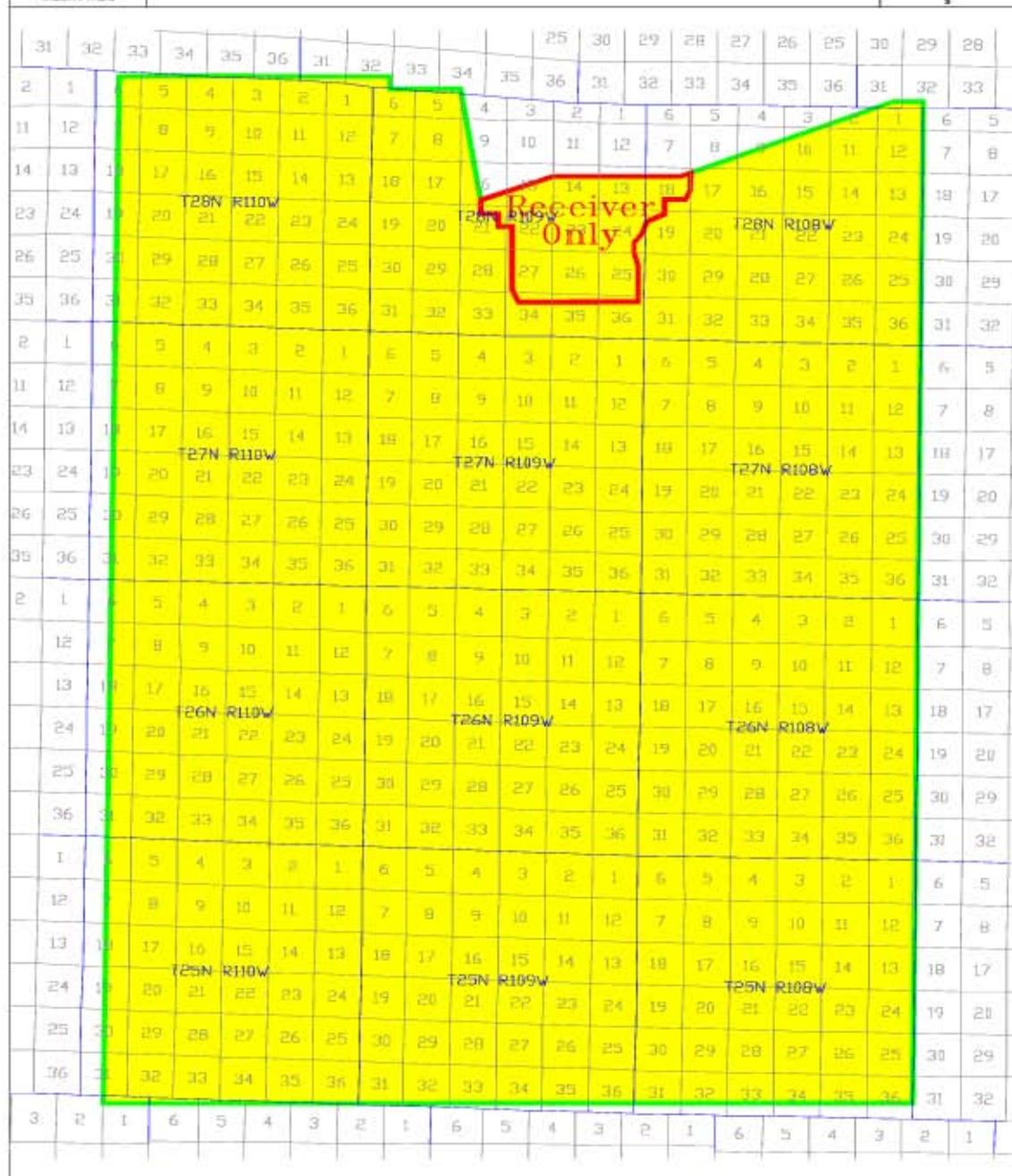
Alternatives Considered But Eliminated From Detailed Study

The Council of Environmental Quality regulations implementing NEPA require BLM to rigorously explore and objectively evaluate all reasonable alternatives and to briefly explain the reasons for any alternatives that are eliminated from detailed study (40 CFR 1502.14 (a)).

No Land Vehicle Operations Alternative (Heliportable Drill Only) - Based on a previous suggestion from the Wyoming Outdoor Council, Jackson Hole Conservation Alliance, and Greater Yellowstone Coalition for similar projects in the past, a 'no land vehicle operations' alternative was considered. Under this alternative, only man-portable drilling equipment transported by crews on foot, or heliportable drills, would be used to drill shot holes for the subsequent deployment of explosive charges as the energy source. No off-road vehicle operations would occur in connection with this method of operations. Drill cuttings would be placed back in the holes. In compliance with Wyoming Oil & Gas Conservation Commission Rules and Regulations Chapter 4, Section 6, Paragraph P, bentonite would be used in any holes drilled into water bearing zones. Cap wires would be buried until the explosives are detonated. After detonation, the cap wires would be cut off below ground levels. Cable placement and other facets of the project would be the same as Alternative 1.



South Jonah Non-Exclusive 3D Survey
Sublette & Sweetwater Counties, Wyo



To produce roughly comparable geophysical data under this alternative, Veritas would drill an 80-foot deep hole loaded with a 30-pound bottom-hole explosive charge at each source point. Man-portable drills are not capable of drilling 80-foot holes; therefore, heliportable drills would have to be used exclusively. Approximately 33,845 shot hole locations within the 411 square mile SJ3D would be required equating to approximately 82 source locations per square mile. Each shot hole would take approximately one to two hours to drill including transportation to and from each shot hole. The smaller and lighter heli-drills may average five shot holes per day. Using ten heli-drills, production could average 50 holes per day. Over 22 months of continuous drilling with no weather days or other downtime would be required to complete the drilling phase. Twenty drills would reduce this drilling window by 50% if 20 heli-drills could be found. The recording phase would take five months. The disturbance to wildlife would last much longer (11 to 22 months) if the shot hole method were required.

The economic impact, in terms of costs to Veritas, would be substantial and likely prohibitive. Veritas has determined that the exclusively heliportable drilling program would more than quadruple the cost of the geophysical 3D project, making it economically infeasible (the economic benefit derived by selling the data would be outstripped by the cost of conducting the survey under this alternative). The average total cost of drilling a heliportable-drilled source point meeting these specifications is approximately \$1,200 per source point and would render the cost of the project under this alternative to be in excess of \$40 million vs. roughly \$10+ million under the proposed action, (see Appendix B, Letter from Richard Trevino, Veritas DGC Land, Inc.). Because selection of this alternative would result in project cancellation, environmental consequences of adoption this alternative would be the same as for the No Action alternative, which is analyzed in detail. Thus, full analysis of this alternative was deemed unreasonable.

Alternate Design Alternative – An alternative was considered that would require seismic operations to begin at the southern end of the project area as opposed to the northern end to avoid greater sage-grouse nesting time frames in the northern portion of the project area. This alternative was dropped from detailed study because it would require Veritas to completely redesign the vibroseis project. A major redesign would be costly and would delay operations. It is very possible that nesting activities would be completed by mid-July and the GRRMP and PRMP allow for exceptions to seasonal restrictions if conditions warrant (see applied approval conditions under the wildlife section and cumulative impacts). Alternative 1 is subject to RMP requirements, and sage grouse surveys would be conducted prior to operations. In certain areas, potential impacts to vegetation due to the need to duplicate certain work (e.g., re-surveying for source and receiver points) would be increased unnecessarily. Based upon these circumstances, the alternate design alternative was deemed unreasonable for detailed study.

Exploratory Drilling Alternative – This alternative was considered but dropped from detailed study since it is recognized that exploratory drilling could take place anywhere within the analysis area but BLM can not predict the location of an exploratory well until an application for permit to drill is actually received. Further, infield drilling in areas where oil and gas reserves have been developed (i.e., Jonah Gas Field and the Blue Forest Unit) is likely to take place regardless of geophysical operations. Additionally, 3D geophysical operations are an effective tool in determining areas where economically viable fluid energy resources may occur which reduces the potential impacts of unnecessary and undue surface disturbance associated with drilling dry holes. Thus, impacts of an exploratory drilling alternative would be the same as the No Action alternative, which is analyzed in detail.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The geographic area of the Proposed Action is delineated in the Introduction, and is shown on Map 1.

Critical elements and other resources potentially affected by the Proposed Action are described in this portion of the EA. This section also provides an analysis of impacts/potential environmental consequences resulting from project implementation, and presents the expected impacts/ environmental consequences of the No Action alternative. Finally, this section of the EA presents mitigation measures that would be applied to the project if approved. These measures were developed in response to the anticipated impacts, in conformance with the current RMPs.

Critical elements of the human environment (identified by the BLM NEPA Handbook H-1790-1 and subsequent Executive Orders), their status in the project area, and whether they would be affected by the proposed project are listed on Table 1.

TABLE 1 - Critical Elements of the Human Environment

Element	Status on the SJ3D	Addressed in EA
Air quality	Minimally affected	Yes
Areas of critical environmental concern	None present	No
Cultural resources	Potentially affected	Yes
Environmental justice	Not affected	No
Farmlands, prime or unique	None present	No
Floodplains	None present	No
Native American religious concerns	Potentially Affected	Yes
Noxious/invasive plants	Potentially affected	Yes
Threatened and endangered species	Potentially affected	Yes
Wastes (hazardous or solid)	Not affected	Yes
Water quality (surface and ground water)	Potentially affected	Yes
Wetlands/riparian zones	Potentially affected	Yes
Wild and scenic rivers	None present	No
Wilderness	None present	No

Other resource values potentially affected by the Proposed Action include the following resources: minerals, paleontology, soils, vegetation, range and livestock grazing, wild horses, wildlife, visual resources, recreation, socio-economics, noise and safety, and cumulative impacts.

This discussion provides analysis of the potential environmental consequences that would result with project implementation. Because the potential impacts for Alternative 2 are the same as Alternative 1 with the exception of the cumulative impact analysis found later in the document, impacts of Alternative 2 are grouped with Alternative 1. Implementation of the No Action alternative would result in no change to the existing environment under this proposal and is grouped with the affected environment unless otherwise noted.

FLUID MINERALS/OIL & GAS (AND OTHER) FACILITIES

Affected Environment

Oil and gas exploration and production is ongoing within portions of the SJ3D project area (see Maps 6 and 7). The northern portion of the proposed 3D project overlaps with the highly active Jonah Gas Field. A total of 204 wells (producing, shut-in, or plugged-and-abandoned) are present within the project boundary (Wyoming Oil & Gas Conservation Commission records available via the internet at <http://wogcc.state.wy.us>). Vibroseis projects do not affect reservoir production/drainage.

Oil and gas wells and other (range, recreation, etc.) facilities on BLM lands are protected via standardized geophysical avoidance stipulations (PRMP, GRRMP, H-3150-1 Handbook).

Environmental Consequences of Alternative 1 and Alternative 2

Adoption of the Proposed Action would allow project participants to obtain and utilize 3D geophysical data, resulting in the greater likelihood of drilling producing wells, more efficient field development, and would be consistent with the National Energy Policy.

Vibroseis operations near existing oil/gas wells, buried pipelines, buried telephone cables, or overhead powerlines could cause transmission interference. With implementation of the safe distance prescriptions below, no impact to oil and gas related facilities is foreseen. Should unanticipated damage to existing facilities occur, Veritas would be required to repair any damage (also see approval conditions for other resources).

Environmental Consequences of No Action

Adoption of the No Action alternative is likely to result in the drilling of more exploratory wells and possibly 'dry holes' than would occur following completion of the proposed geophysical project. Dry holes, although they may provide important geologic data, are a financial waste and result in unnecessary and undue surface disturbance caused by construction of well pads and roads. Regardless, exploratory drilling could lead to the discovery of economically viable fluid minerals and would be consistent with the National Energy Policy. Until an application for permit to drill is received, BLM could not predict the location or number of exploratory wells that would be proposed under the No Action alternative. Due to the inability of BLM to predict the number or location of exploratory wells, it is impossible to determine the potential impacts on the remaining resource values (vegetation, wildlife, etc.) caused by possible exploratory drilling under the No Action Alternative. Any application for permit to drill would be subject to the appropriate level of environmental analysis including an assessment of impacts to affected surface resources.

Infill drilling would take place under the No Action alternative in the two producing natural gas fields found within the project area. These natural gas developments have been analyzed in previous environmental documents (Fontenelle Infill Natural Gas Infill Drilling Project EIS and the Jonah Natural Gas Project EIS). The decisions are currently being implemented.

Approval Conditions to be Applied

Vibroseis source points shall be located a minimum of 300 feet from standing structures and rock art sites unless written permission to encroach closer has been given by the land owner or operator (BLM 1994, H-3150-1 Handbook).

Veritas shall be required to repair any damage to facilities caused by their operations.

PALEONTOLOGICAL RESOURCES

Affected Environment/No Action Alternative

The Laney Member of the (Eocene age) Green River Formation is the geological surface exposure in the SJ3D project area. Petrified wood fragments may be anticipated on the ground surface but potential for fossils of scientific interest on the ground surface is relatively low. A BLM database search for known paleontological sites was performed for the SJ3D project area with one site identified (Dave Valenzuela, BLM-RSFO Geologist, 5/10/2002).

Environmental Consequences of Alternative 1 and Alternative 2

The proposed project is not expected to affect the paleontological site identified via the records search due to its depth of burial, limited outcrop exposure, and vegetative cover. This assessment is made based upon knowledge from numerous visits to the site (Dave Valenzuela, BLM-RSFO Geologist, personal communication) and constitutes a site-specific analysis for this project (p. 6, GRRMP).

Yet-unidentified fossils of scientific interest exposed on sensitive surfaces could be destroyed or damaged by vehicle traffic. With the implementation of the spread-out vehicle pattern (see approval conditions for visual resources) and the slope restrictions (see approval conditions for soils), impacts to paleontological resources are anticipated to be negligible. The standard discovery stipulation will apply.

Approval Conditions to be Applied

If vertebrate paleontological resources (fossils) are discovered on BLM land during project operations, Veritas shall suspend operations that could disturb the materials, and immediately contact the BLM Rock Springs Field Manager (Authorized Officer). The Authorized Officer will arrange for evaluation of the find within 5 working days and determine the need for any mitigative actions that may be necessary (p. 6, GRRMP). Any mitigation will 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 the operator 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 Officer.

SOILS

Affected Environment/No Action Alternative

Soils of the SJ3D area fall within the gross geomorphic group termed 'upland soils' (see PRA RMP DEIS, pp. 135-136 and GRRMP DEIS, pp. 337, 581-583, Map D). These soils are predominantly residuum developed in situ from sedimentary parent material, occurring on nearly level to very steep slopes (0-70%). Erodibility of these soils varies from moderate to high. Although usually well drained, areas of shale uplands and badlands have clay-like textures and salinity problems resulting in poor availability of moisture to plants. The combination of low precipitation, salinity, and excessively drained soils limits opportunities to mitigate impacts to soils. Overlying these residual soils in limited areas are alluvial re-deposits of this residual material and occasional aeolian deposits of foreign soils. Overall, the soils in the SJ3D are not considered unstable, sandy, or erosive, and no areas of hydrologic concern have been identified in the analysis area (p. 583, GRRMP and pp. 19-20, PRMP). Soils in Wyoming are especially dependent on vegetative cover to prevent erosion; ground cover and root systems anchor the soil, recycle elements, and add scarce organic matter. Slope is also a factor in soil erodibility (p. 337 GRRMP) and areas of rugged terrain and steep slopes are present in the SJ3D. For more information, see soils maps and technical data covering the entire project area in varying levels of detail available on BLM GIS files, in the Jonah II DEIS (pp. 3.11-14), and survey data on file with the Sublette and Sweetwater County Natural Resources Conservation Service Offices.

Environmental Consequences of Alternative 1 and Alternative 2

Impacts to soils in the form of compaction and gully erosion could be created, principally by the proposed off-road vehicle traffic. Compaction reduces capacity for soils to absorb moisture, and results in reduced root growth and plant vigor. Off-road vehicle operations would crush, and to a lesser extent break off, much of the above-ground vegetation, but root masses of grass and forbs remain alive and intact and continue to hold soil in place, reducing or avoiding erosion. Soil impacts from this project would be generally similar to, but less than, disturbance associated with block area chemical vegetative treatment projects, such as described in the Big Piney/LaBarge Coordinated Activity Plan Environmental Assessment (p. 73) which predicts soil loss rates up to 1/2 ton per acre per year. By offsetting individual vehicle drive paths (see approval conditions for visual resources), soil compaction, and erosion as well as vegetation damage, would be minimized. Consequently, compaction and soil erosion on level and gently sloping surfaces are anticipated to be negligible. Vehicle tire impacts would occur on approximately 4.9% of the total surface area encompassed by the project.

Soil loss would generally be higher on sparsely vegetated slopes over 25%. To protect soils, existing BLM standards limit surface disturbance on slopes greater than 25%. With implementation of the slope restriction prescribed below, the project should result in minimal impacts.

Impacts to soils may also occur as a result of surface rutting caused by vehicle operations on wet soils. Existing BLM standards call for closure during such conditions. With implementation of the saturated soil restriction prescribed below, the project should not result in impacts to wet soils.

Approval Conditions to be Applied

No vehicle operations (buggy vibes, recorder trucks, pickups, ATVs) will be allowed on slopes of 25% or greater (p. 159, GRRMP and p. 58, PRMP).

The operator shall conduct no vehicle operations during periods of saturated ground conditions when surface rutting could occur (p. 159, GRRMP and p. 58, PRMP). Operations shall be stopped when the soil is wet enough to create 3-inch ruts.

Any ruts created shall be repaired in a way that will produce the least disturbance (i.e., hand shovel).

WATER RESOURCES

Affected Environment/No Action Alternative

Named ephemeral drainages in the SJ3D area include Jonah Gulch, Alkali Creek, Reardon Draw, West and East Buckhorn Draws, Buckhorn Canyon, Slate Creek, and Eighteen Mile Canyon. No live streams are within the project boundary. Water resources include 5 impoundments (shown on the current 7.5-minute topographic quads for the area) and the stockwater wells (referenced in the grazing section of this EA). About 35 localized areas of palustrine shrub communities in the SJ3D project appear on the National Wetland Inventory maps available via the internet at <http://enterprise.NWI.FWS.gov/index.wetlandmaps>. These are small localities associated with reservoirs, small seeps/springs, isolated spots along various drainage bottoms, and in the vicinity of water wells. Potential also exists for other undocumented seeps, springs, and palustrine areas. Water wells, surface water, springs, and riparian areas on BLM lands are protected by standard avoidance stipulations.

Environmental Consequences of Alternative 1 and Alternative 2

Seismic operations, particularly a shothole method, near any springs, seeps, or riparian areas in the project area could disrupt the subsurface fissure or stream channel morphology, thus restricting or eliminating water flow. Vibroseis is not expected to affect such features. However, safe-operating distances would be observed and no impact is expected.

Vehicular traffic through riparian and wetland areas could result in a temporary increase in turbidity (water quality deterioration). If these areas are avoided, actual impacts are expected to be negligible. Vehicular traffic through/across the (ephemeral) stream channels could break down banks, increase sediment load, cause or accelerate erosion, and destabilize the channel. With application of the channel crossing stipulation listed below, however, no appreciable impact is foreseen.

'Recommended safe distances' from seismic source points to resources including springs are presented in Illustration 10 of the H-3150-1 Handbook for Onshore Oil and Gas Geophysical Exploration (BLM 1994). The recommended safe distance for vibroseis operations is 300 feet. The H-3150-1 Handbook specifies that if the BLM or any interested party wishes to modify the buffer distance presented in the Handbook, the burden of proof to justify the necessity of an increased distance or the safety of a decreased distance is the responsibility of the party wishing to make the change (ibid.).

Approval Conditions to be Applied

No vibroseis (source) points are permitted within 300 feet of springs, seeps, or riparian areas.

No vehicle traffic is allowed in wetland and riparian areas; traffic must remain on dry ground (project-specific analysis guidance at p. 9, 58, PRMP and p. 22, GRRMP).

Vehicular traffic across/through drainage channels is limited to sloping drainage sides or to vertical banks of less than 2 feet. Channel crossings shall be aligned perpendicular to the stream channel, to the extent practicable (project-specific adaptation of guidance at p. 22, GRRMP).

VEGETATION

Affected Environment/No Action Alternative

Vegetation in the project area is dominated by sagebrush with intermingled secondary areas of greasewood, desert-shrub, and mixed-grass prairie communities. Of note, the GAP Land Cover category delineations of

sagebrush occupying 80% or less of an area roughly correspond to the BLM 1986 classification in which shrub canopy cover is less than 35% and is sometimes referred to as low density sagebrush. Conversely, sagebrush occupation of at least 90% of an area equates to canopy cover of more than 35% and may be considered high density sagebrush cover (p. 3-54, Pinedale Anticline Project Area (PAPA) Draft Environmental Impact Statement (DEIS)). For additional information and detail, please refer to the GRRMP (pp. 341-344 and Map E), the PAPA DEIS, the range SVIM-SWIM inventories on file at the BLM Field Offices, and the Wyoming GAP Analysis available via the internet at <http://www.sdvc.uwyo.edu/clearinghouse/index.html>. Land cover/vegetation types in the SJ3D as identified by the GAP analysis are depicted on Map 3.

Environmental Consequences of Alternative 1 and Alternative 2

The SJ3D project would involve direct surface impacts to approximately 12,836 acres of land, or 4.9% of the 262,400-acre project area (see Alternative 1 for calculation explanation). Reflecting land status in the area, approximately 98% of these vegetative impacts would occur on BLM-administered land, 2% would occur on State land, and less than 0.01% would occur on private land.

It has been observed on previous geophysical projects that woodier plants in the vehicle paths are sometimes impacted but grasses and forbs survive and continue to vegetate the vehicle paths. Brush kill is a function of multiple factors including brush type, amount of traffic, time of year, and moisture conditions. Geophysical projects conducted under snow and frozen ground conditions typically leave little to no visible trace, killing less than 5% of the brush which is driven on. Based on observations of past summer or fall 3D projects in areas of the relatively tall mountain and basin big sagebrush, approximately 60% of the sagebrush driven over is killed, another 20% is partially killed or "pruned," and the remaining 20% is undamaged. In environments where relatively low black and low sage predominates, brush kill by dry season projects is less with only approximately 40% of low sage in drive paths killed and another 20% partially killed or damaged. Relatively low-growing sage communities predominate in the subject project area with taller sage confined to small areas of deeper soils and greater available moisture such as on floodplains. It is assumed that the proposed period of project field operations this summer would occur during exceptionally dry weather conditions.

For the purposes of this analysis, it is estimated that up to 60% of all sagebrush driven over could be killed and that another 20% may be damaged. In other words, it is estimated that about 2.9% of the sagebrush in the overall project area may be killed (4.9% of project area is subject to tire impact x 60% of sagebrush driven on would be killed = 2.9%), while another 1% of sagebrush in the project area may be somewhat to negligibly damaged but not killed. This equates to approximately 7,610 acres of potentially killed sagebrush plus about 2,624 acres of damaged sagebrush, and another 2,624 acres of driven-on but undamaged sagebrush. Many sagebrush plants would stand back up after the buggy vibes pass over them helping deter future traffic on these vibe paths. Sagebrush loss incurred is considered short term, as young brushy plants naturally re-occupy the vehicle paths within a few years.

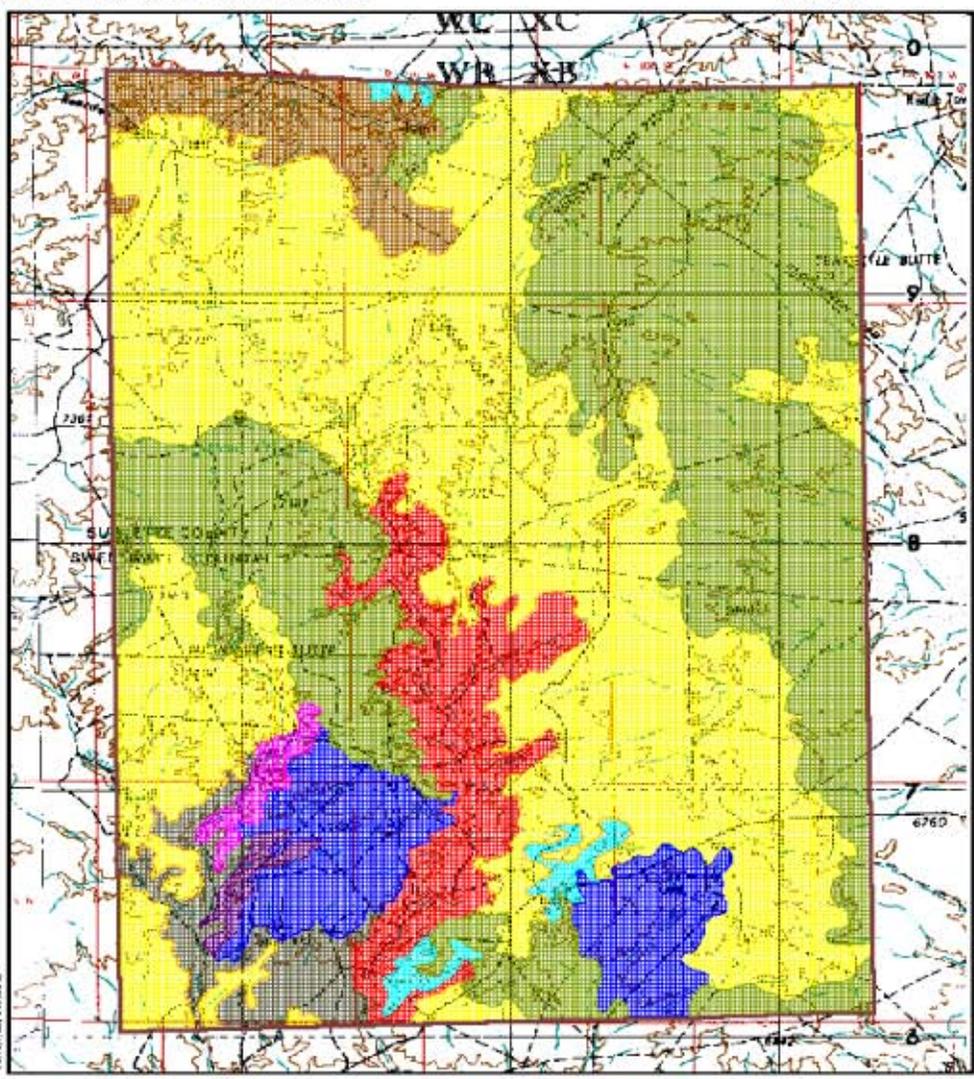
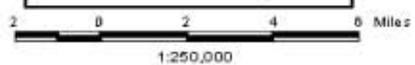
Vehicle impacts to grasses and forbs are anticipated in the same physical area as brush impacts (with the affected area constituting 4.9% of the overall acreage within the project boundary) but even shorter term in effect as grasses and forbs are not killed and would re-sprout from their established root systems. If project operations are conducted during the dry summer and fall seasons, the remaining grass in the vehicle paths may be broken off with re-growth not anticipated until next spring. Seasonal dry grass and forb loss within the impact area, however, is not expected to be complete. Overall, with side-by-side vehicle travel paths (see approval conditions for visual resources) limited to areas of less than 25% slope (see approval conditions for soils), SJ3D vehicle traffic impacts to the general vegetation are expected to be minimal for the following reasons: impacts are limited to species composition changes (not vegetation removal/dirtwork), species composition changes would occur on a maximum of only 4.9% of the project area, species composition shifts would involve only a proportion change among existing native plants (no introduced species), and species composition changes would be short term as new brushy plants begin to reoccupy the vehicle paths within a few years (also see impacts discussion for wildlife and cumulative effects).

Primary and Secondary Vegetation Types

- Veritas South Jonah 3D Project Boundary
- 90% Wyoming big sagebrush 10% Shrub-dominated riparian
- 90% Wyoming big sagebrush 10% Mixed grass prairie
- 90% Wyoming big sagebrush 10% Greasewood flats and flats
- 90% Wyoming big sagebrush 10% Desert shrub
- 80% Wyoming big sagebrush 20% Mixed grass prairie
- 80% Wyoming big sagebrush 20% Desert shrub
- 80% Desert shrub 20% Wyoming big sagebrush
- 70% Wyoming big sagebrush 30% Desert shrub
- 60% Wyoming big sagebrush 30% Greasewood flats and flats



VERITAS
South Jonah 3D
Seismic Project



Source: USGS, 1998

SPECIAL STATUS PLANTS

Affected Environment/No Action Alternative

The U.S. Fish and Wildlife Service identified one federally designated threatened, endangered, proposed or candidate plant species as potentially present in this region (USFWS, 5/20/02). Ute ladies'-tresses (*Spiranthes diluvialis*) is a federally threatened member of the orchid family that grows in moist soils along riparian edges, gravel bars, old oxbows, and wet meadows at elevations of 4,200 to 7,000 feet. No suitable habitat for this plant is known to occur in the SJ3D.

Six plant species potentially present in the PFO area and 15 plant species in the RSFO area have been accorded 'sensitive species' status in accordance with BLM Wyoming State Office Instruction Memorandum WY-2001-040. Five of these sensitive species occur in both field offices resulting in a total of 16 sensitive plant species potentially occurring in or near the affected area or generally in the field office areas. The Wyoming Rare Plant Field Guide (Fertig 1994) provides descriptions and other information for sensitive species found in the area.

Three sensitive species, Cedar Rim thistle, Tufted twinpod, and Beaver Rim phlox, have been documented within the SJ3D (James Glennon, BLM-RSFO, personal communication). Cedar Rim thistle (*Cirsium aridum*) is a small purple-flowered member of the sunflower family endemic to Sublette and Fremont Counties, growing up to a foot high on barren chalky hills, gravelly slopes, and fine-textured sandy-shaley draws between 6,700 and 7,200 feet (Fertig 1994). Tufted twinpod (*Physaria condensata*) is a small, silvery, flattened rosette-shaped member of the mustard family endemic to southwest Wyoming which grows on sparsely vegetated shale slopes and ridges between 6,500 and 7,000 feet (ibid.). Beaver Rim phlox (*Phlox pungens*) is a small, prickly-leaved bushy mat-like plant that grows on sparsely vegetated slopes on sandstone, siltstone, or limestone substrates between 6,000 and 7,400 feet (ibid.).

Habitat for two of the other sensitive plant species, Trelease's milkvetch and Large-fruited bladderpod, could be present within SJ3D project area. Trelease's milkvetch (*Astragalus racemosus treleasei*) is a member of the pea family that grows in sparsely vegetated sagebrush communities on shale or limestone outcrops and barren clay slopes between 6,500 and 8,200 feet. Large-fruited bladderpod (*Lesquerella macrocarpa*) is a nearly prostrate, silvery-gray, yellow-flowered member of the mustard family which grows on gypsum-clay hills and benches, clay flats, and barren hills between 7,200 and 7,700 feet.

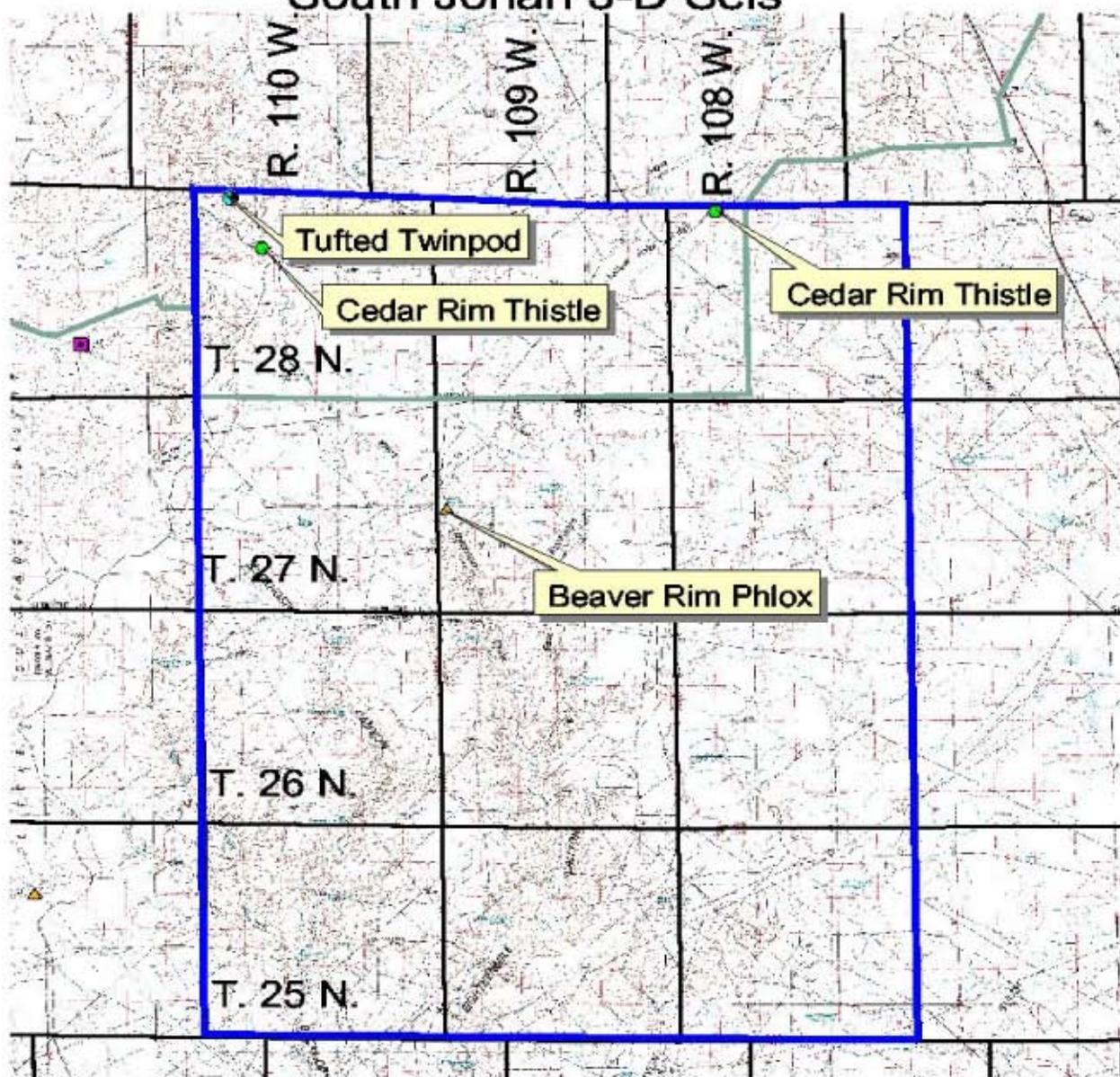
The location of documented colonies of BLM-designated sensitive species within and near the SJ3D project area is shown on a broad scale on Map 4.

Based on the documented environmental settings of the occurrence of the remaining 11 species identified by the BLM Instruction Memorandum (Meadow pussytoes, Small rockcress, Mystery wormwood, Nelson's milkvetch, Precocious milkvetch, Ownbey's thistle, Wyoming tansymustard, Stemless beardtongue, Green River greenthread, Uinta greenthread, and Cedar Mountain easter daisy), no potential habitat for these species is known to be present within the SJ3D project area.

Environmental Consequences of Alternative 1 and Alternative 2

Page 19 of the GRRMP requires that, "[a]ny management actions on potential habitat of special status plant species communities ... would require searches for the plant species prior to project ... implementation..." The SJ3D area has not been inventoried for sensitive plant species although those areas that contain known habitat have been inventoried.

South Jonah 3-D Seis



- ▲ BEAVER RIM PHLOX
- CEDAR RIM THISTLE
- LARGE-FRUITED BLADDERPOD
- TRELEASE'S RACEMOSE MILKVETCH
- TUFTED TWINPOD



- South Jonah Seis Boundary
- Field Office Boundary

Should vehicle traffic occur in areas where unknown sensitive species or their habitat exist, those species or their habitat could be destroyed or damaged. Two environmental conditions of particular concern to plant or plant habitat damage include steep slopes and unstable soil conditions. Steep slopes contain habitat for several of the sensitive plant species and are more susceptible to tire damage (via surface friction and subsequent wind and water erosion). Unstable soil conditions are similarly highly susceptible to tire damage via tire traction loss leading to surface disturbance and subsequent erosion. No areas of inherently unstable soils are identified in the SJ3D but unstable conditions can be created by precipitation or other moisture. However, with implementation of approval conditions including a restriction prohibiting operations during wet periods and in wet areas such as near reservoirs (also see approval conditions for soils), slope restrictions (see approval conditions for soils), and the spread-out vehicle pattern (see approval conditions for visual), the SJ3D project should not adversely affect the threatened Ute ladies'-tresses nor result in impacts to sensitive plant species.

Approval Conditions to be Applied

Known communities of sensitive species or their habitat shall be avoided (p. 19, GRRMP). Shall operations occur in areas where unknown habitat for sensitive species occurs, a survey for sensitive plant species will be conducted prior to operations (p. 19, GRRMP) or the habitat avoided.

To protect special status plants, no vehicle traffic is permitted within known sensitive plant communities (p. 19, GRRMP ROD). UTM coordinates for the 4 known locations are as follows (zone 12, NAD 83):

4,698,871mN	585,619mE
4,696,578mN	586,898mE
4,684,785mN	594,394mE
4,698,242mN	605,269mE

INVASIVE SPECIES

Affected Environment/No Action Alternative

A total of 22 noxious weeds including invasive species are of concern in Wyoming and 11 of these may be of concern in the project vicinity (pp. 3-17, 3-18, Jonah II DEIS and pp. 3.54-55, PAPA DEIS). These weeds include Canada thistle, Musk thistle, Black henbane, Dyer's woad, Halogeton, Spotted knapweed, Russian knapweed, Hoary cress (whiteweed), Perennial pepperweed (giant whiteweed), Leafy spurge, and Perennial sowthistle. Occurrence of these weed species has a much higher probability in areas of past disturbance and varies according to basic vegetative cover type. Because invasive and noxious plants are typically very aggressive, special management is required to prevent existing infestations from spreading (or to eradicate these infestations) and prevent the introduction of noxious weed seed from outside sources. Weed-control measures are required in connection with development activities in the Jonah Gas Field (pp. 2-26, Jonah II DEIS).

Environmental Consequences of Alternative 1 and Alternative 2

Noxious weeds could be introduced to the area by infested equipment. With implementation of the vehicle washing stipulation below no significant impact with regard to weeds is foreseen.

Weeds could also invade and take hold in areas of surface disturbance caused by project operations. Impact from invasive species is expected to be minimal provided reclamation and reseeding are undertaken promptly in any areas of unanticipated surface disturbance as prescribed below.

Approval Conditions to be Applied

To prevent the introduction of new weeds, Veritas shall thoroughly power-wash all field vehicles (buggy vibes, pick-ups, ATVs, etc.) before transporting them to the project area.

Veritas shall reclaim and reseed any areas where their operations have caused surface rutting or have otherwise removed all of the surface vegetation as directed by the Authorized Officer. Reclamation guidelines and seed mixtures are listed in Appendix C of this EA.

LIVESTOCK/RANGE

Affected Environment/No Action Alternative

The proposed SJ3D project falls in portions of 7 grazing allotments: Alkali Draw, Sand Draw, South Desert Common, Figure Four, 18-Mile, Sublette, and Boundary. Utilized by cattle, these allotments have grazing scheduled in all four seasons so livestock are anticipated to be present in the area during project operations. Improvements associated with the BLM-administered allotments include 20 water wells and associated pipelines, several stock water ponds, and fences.

Environmental Consequences of Alternative 1 and Alternative 2

Project operations would involve numerous fence crossings. Leaving fences down or gates open when livestock are present may result in livestock moving between pastures, from private or State to public land or vice versa, and herd mixing. This could lead to unauthorized grazing, overgrazing, or increased livestock operator costs associated with sorting mixed herds. With implementation of the fence and lessee notification measures prescribed below, the project shall result in negligible impacts.

Seismic activities operations in close proximity to water wells and pipelines or water impoundments could result in casing failure or dam fissure and a subsequent loss of livestock water. With implementation of the water restrictions prescribed below, the project shall result in no impact. Other types of surface water are addressed under the Water section while pipelines are covered under the Oil & Gas section of this EA.

Heavy vehicle traffic could cause damage to existing cattleguards. With implementation of the facilities repair/replacement responsibility measures prescribed below, the project shall result in no impact.

The Proposed Action (as described in Alternative 1 or Alternative 2) would result in short-term vegetative effects on approximately 4.9% of the project area (see vegetation impacts). This disturbance would consist primarily of conversion of an estimated 60% of the mature shrubs and forbs in the tire paths to grass and also to younger, more succulent shrubs and forbs. While species and age make-up of plants in the tire paths would change, available palatable livestock forage would not be appreciably affected. With side-by-side vehicle travel paths (see approval conditions for visual resources), livestock forage impacts are anticipated to be negligible.

Approval Conditions to be Applied

Veritas shall notify grazing lessees prior to entering upon their allotments. Affected grazing lessees are listed in Appendix D.

Veritas shall make every effort to avoid disturbing or altering fences. Gates shall be used when possible. Gates must be closed immediately after passing through them. If a fence must be crossed, it shall be let down or cut (as determined by the grazing lessee or owner/operator), crossed, and immediately put back up. The wires shall be stretched to the original tension from the nearest brace or gate panel.

Vibroseis source points shall be located a minimum of 300 feet from all water wells and reservoirs.

Any and all facilities damaged, destroyed, or removed in connection with this geophysical exploration operation shall be immediately restored to original condition or replaced with a similar facility.

WILD HORSES

Affected Environment/No Action Alternative

The portion of the SJ3D project area that lies within the RSFO falls within the Little Colorado Wild Horse Management Area (pp. 23, 73, Map 37, GRRMP). The Desert herd management area, which lies in the PFO, has a management objective of zero (p. 26, PRMP). The target wild horse population for the Little Colorado herd is 69-100 horses (p. 23, GRRMP). No gathering or other horse management activities are planned for either herd in 2002 (Range Specialists, Kevin Lloyd BLM-RSFO and Doug Powell BLM-PFO, personal communication).

Environmental Consequences of Alternative 1 and Alternative 2

Wild horses, especially young colts and pregnant mares, could be affected by low flying helicopter operations, if conducted during the peak foaling period between April 1 and July 15. Otherwise, wild horses are generally very tolerant of human activity, and only short-term and highly localized displacement is anticipated. With application of the helicopter restriction prescribed below, no impact to wild horses is expected.

Approval Conditions to be Applied

Helicopter pilots shall take special care to avoid frightening or running wild horses during operations.

WILDLIFE and SPECIAL STATUS ANIMAL SPECIES

Affected Environment/No Action Alternative

The environment of the SJ3D supports an estimated 80-117 vertebrate species (see wildlife maps available via the internet at <http://www.sdvc.uwyo.edu/clearinghouse>). In addition to the species specifically discussed below, the project area provides habitat for mule deer, a variety of neo-tropical bird species, white-tailed jackrabbit, cottontail rabbit, coyote, red fox, Richardson ground squirrel, thirteen-lined ground squirrel, badger, and mice. Identified prominent wildlife activity sites in the project area include raptor nests, sage grouse leks (strutting/mating grounds) and nesting grounds, and prairie dog towns. Information regarding these and other prominent species is derived from BLM, WGFD, PIC Technologies, and TRC Mariah data, which has been compiled and is available via the BLM GIS computerized maps and mylar overlays.

The project area serves as part of the expansive habitat occupied by the Sublette Antelope Herd, the largest pronghorn herd in the world. Target population for this group is 48,000 individuals. Members of this herd range from summer habitat in Grand Teton National Park to as far as 150 miles southwest to winter ranges near I-80 (PAPA DEIS, p. 3-72). Telemetry studies yielded preliminary indications that in mild winters some antelope from the Jackson/Grand Teton area winter on the south end of the Mesa just north of the SJ3D (ibid).

The SJ3D project area, thus, lies within a general north-south seasonal migration corridor, and is inhabited year-round by the animals. Crucial winter range for Sublette Herd antelope has been identified at the very southeastern extreme of the SJ3D project area, and extending southeastward, as reflected on Map 5.

Special Status Animal Wildlife Species – Twelve federally designated threatened, endangered, proposed, or candidate animal species are considered potentially present in the project area (USFWS, 5/20/02). Status of these species with regard to the SJ3D project area is summarized in Table 2 below.

As reflected in Table 2, two federally designated species, black-footed ferret and mountain plover, are of concern in the SJ3D. There have been no confirmed sightings of live black-footed ferrets in recent decades in southwest Wyoming but a black-footed ferret skull was found in 2000, 10 miles east of the SJ3D and evidence of tunneling (possible ferret activity) was noted in that same area in 2001. White-tailed prairie dog colonies are present in the SJ3D project area and may provide ferret habitat. The general Farson-Boulder area is thought to be one of the areas most likely to support a natural ferret population, if one exists.

TABLE 2 - Federally Threatened, Endangered, Candidate, and Proposed Animal Species

Species	Status	Habitat	Status in Project Area / Comments
Bald eagle	T	Found statewide	No suitable nesting/roosting habitat. No additional information needed.
Grizzly bear	T	Montane forests	No suitable habitat in project area. No additional information needed.
Canada lynx	T	Montane forests	No suitable habitat in project area. No additional information needed.
Black-footed ferret	E	Prairie dog towns	None known. Inventory required.
Yellow-billed cuckoo	C	Riparian areas west of the Continental Divide	No suitable habitat in project area. No additional information needed.
Mountain Plover	P	Grasslands	Documented in project area. Inventory required if activity takes place between 4/10 – 7/10.
Whooping crane	X	Palustrine wetlands, wet meadows	No suitable habitat in project area. Experimental population. No additional information needed.
Gray wolf	X	Primarily montane forest	No suitable habitat in project area. Experimental population. No additional information needed.
Colorado River fish species: (bonytail chub, Colorado pikeminnow, humpback chub, razorback sucker	E	Downstream residents of the Green River system	No effect to stream flows. No additional information needed.

T - threatened E - endangered P - proposed for listing X - experimental population

Mountain plover breeding/nesting habitat is typified by short grass prairie and nearly barren areas, and is often associated with prairie dog towns (USFWS 2002). Pairs of this species are known to breed and rear young in the Alkali Creek drainage within the SJ3D project area.

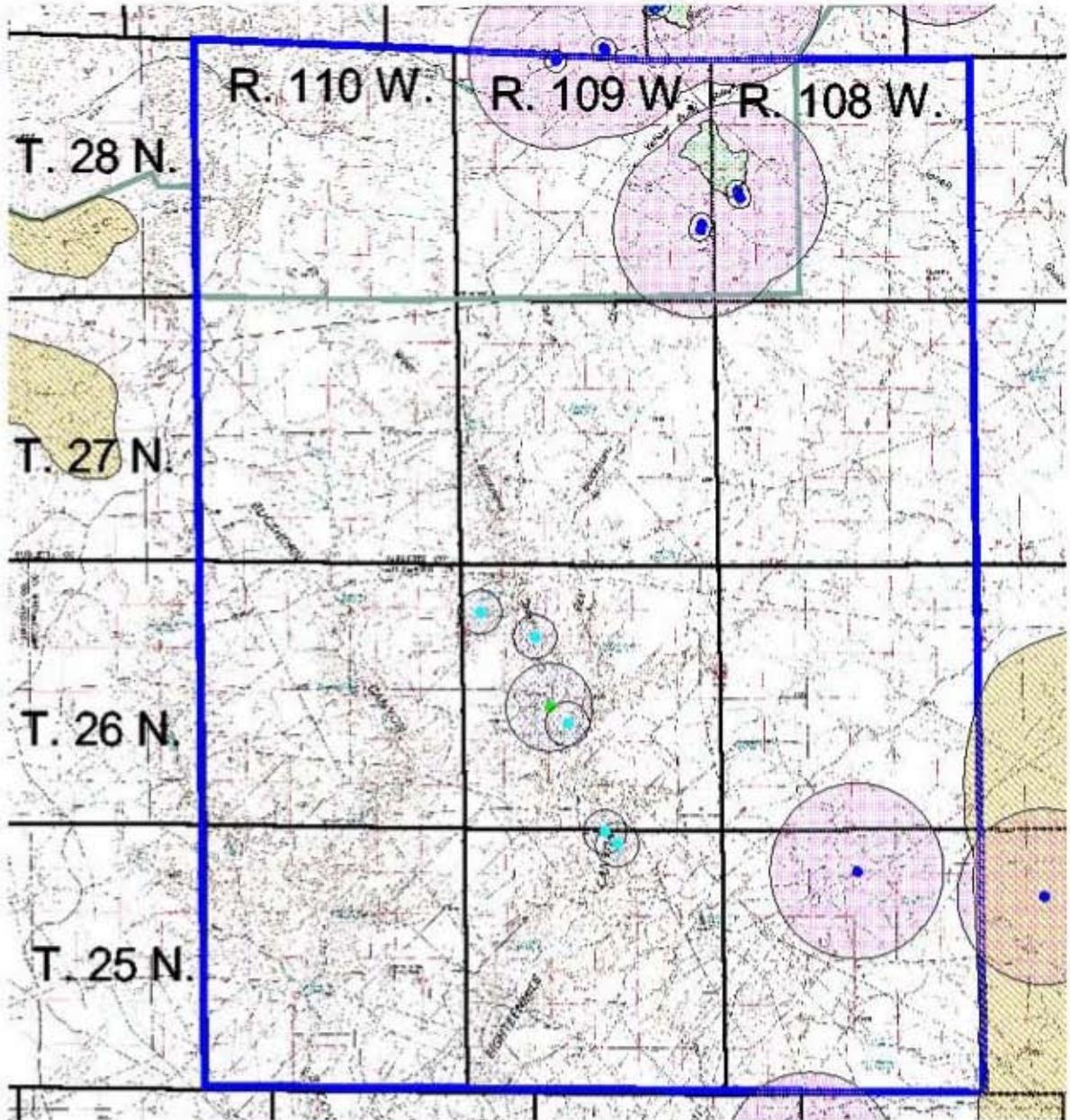
Twenty-eight animal species potentially present in the Rock Springs and Pinedale Field Offices have been accorded 'sensitive species' status in accordance with BLM Wyoming State Office Instruction Memorandum WY-2001-040. Inventory of sensitive species by BLM and WYNDD (Wyoming Natural Diversity Database) is ongoing. Among the sensitive species, raptors and sage grouse are notable in that they are protected via seasonal restrictions.

Raptor nest occupation inventories were conducted in June 2002 in the SJ3D area (James Dunder, Biologist, BLM-RSFO). Six active nests were found within the area of potential effect of the proposed project, as indicated on Map 5. No 'historical nesting area' complexes lie within the SJ3D.

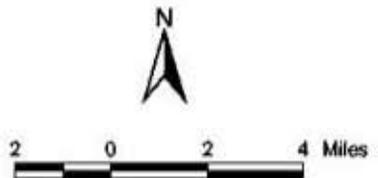
A number of sage grouse strutting areas (leks) are known to exist in the SJ3D vicinity and are depicted on Map 5.

Areas of tall (>2 feet) sagebrush growth along drainages serve as wildlife corridors, providing hiding cover from predators as well as thermal shelter for wintering wildlife. Stands of tall sagebrush occur in several areas within the SJ3D.

VERITAS South Jonah 3D Seismic Project



- | | |
|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| ● Redtail Hawk nest | Prairie dog colony |
| 1/2 mile hawk buffer | Antelope crucial winter range |
| ● Golden Eagle nest | Jonah 3D seis boundary |
| 1 mile eagle buffer | Field Office boundary |
| ● Sagegrouse lek | |
| 2 mile sagegrouse buffer | |



Environmental Consequences of Alternative 1 and Alternative 2

Antelope use of the western fringe of their crucial winter range could be adversely affected if project activities were conducted between November 15 and April 30 and animals were present. The SJ3D is scheduled for completion before November 15; no conflict is foreseen. If the project schedule were delayed into the winter season, standard big game crucial winter range seasonal restrictions would apply. However, exceptions could be granted if conditions warrant. No impact to wintering antelope is foreseen. There could be some minor conflicts with antelope hunters during the hunting season for antelope between September 10 and October 30 but any conflict would be within the immediate area of seismic operations.

An inventory of prairie dog colonies/complexes is required. Potential black-footed ferret habitat is defined as any white-tailed prairie dog towns or complexes greater than 200 acres in size with a burrow density of greater than 20 burrows per hectare (8 burrows per acre). Those complexes that meet USFWS guidelines would be avoided if possible and those that cannot be avoided would be surveyed for black-footed ferrets by a qualified biologist in accordance with the guidelines. Mitigative measures identified below are required to avoid adverse effects to black-footed ferrets. If prairie dog colony avoidance by vibrators is accomplished through project redesign, or if the Black-Footed Ferret Survey Guidelines (USFWS 2001) are adhered to, Alternative 1 or Alternative 2 are not likely to adversely affect black-footed ferrets.

The proposed operations could adversely affect mountain plover nesting and rearing activities, if operations are conducted April 10 through July 10. Seismic operations are scheduled to begin after July 10; therefore, the Proposed Action is not likely to jeopardize mountain plover. However, if operations were allowed to occur from April 10 through July 10, surveys would be required in accordance with the Mountain Plover Survey Guidelines (USFWS 2002).

Important raptor nesting could be disturbed if the proposed project were conducted between February 1 and July 31 unless an exception is granted (Appendix E) based on existing conditions. With implementation of the raptor nest avoidance restriction below, however, no impact to nesting raptors is foreseen.

The proposed operations could adversely affect sage grouse strutting, nesting, and rearing activities if conducted between February 1 and July 31 (Table 8, Appendix 7, GRRMP and p. 10, PRMP) although an exception to seasonal restrictions may be granted should conditions allow (see Appendix E for criteria). With implementation of the sage grouse inventory and avoidance prescriptions below and the proposed timing of seismic operations, minimal impact to sage grouse strutting, nesting, or rearing activities is anticipated.

Buggy vibe operations through the taller stands of sagebrush could damage thermal and protective cover utilized by wildlife. With implementation of the tall sagebrush avoidance measure, no impacts to wintering wildlife or their cover are expected.

A broad-based but minor and short-term reduction in forage/sagebrush is anticipated as a result of vehicles crushing vegetation, potentially affecting big game forage and sage grouse nesting habitat. Approximately 4.9% of the project area would be subjected to vehicle tire impacts, and an estimated 60% of the sagebrush plants in these tire paths could be killed (see vegetation section of this EA). The geophysical project is expected to thin out woody plants (mostly old sagebrush) via tire impacts. Where forbs are killed, younger more succulent brush plants would reoccupy the travel paths within a few years. The linear sagebrush thinning caused by the buggy tires would result in a series of narrow (4-foot wide) breaks in the continuity of sagebrush stands occurring throughout the project area. These narrow swaths would disrupt the canopy continuity of the sagebrush but would not result in the complete removal of vegetation that is typically equated with habitat fragmentation. In addition to vegetation removal, another aspect of habitat fragmentation is continued activity along a disturbance corridor (e.g., vehicle traffic along a road). Considering vehicle use would be in a spread-out pattern, post-project use on the buggy vibe and ATV paths is not anticipated. Consequently, the buggy vibe and ATV operations are not expected to result in consequential levels of habitat fragmentation. The tire swaths could be detrimental to micro-habitats sought by species such as sage grouse (John Westbrook, BLM-PFO, personal communication). For example, sage grouse would be more exposed to ground and aerial based predators when they cross the 4-foot tire path. The effects of this are expected to be minimal since the swaths are narrow and the adjacent area would still provide uninterrupted cover in plant

diversity and the forb component of vegetation would be considered beneficial to sage grouse (p. 22, PRMP). When compared to the total acreage within the boundaries of the SJ3D area, the vegetative changes resulting from the proposal would be small and are not expected to have a consequential effect on the overall land cover community or to inhabiting wildlife species.

Although off-road vehicle speeds are necessarily relatively slow, injurious or fatal vehicle strikes of wildlife species could occur. Considering the mid-summer to fall timing of the project (when ground-nesting birds have fledged, etc.), impacts are expected to be negligible.

Geophone cable deployment and vehicle traffic may cause animals to flee the immediate area of human activity. This displacement of wildlife would be brief and localized, as small scale transitory activities are spread over multiple small sites within the project area. Overall, with implementation of the seasonal restrictions protecting wildlife during the more sensitive birthing/rearing season, minimal impact to wildlife is anticipated as a result of this activity.

More specifically, noise and vibrations caused by the proposed vibroseis operations may cause prairie dogs and other underground-dwellers to flee to their burrows while equipment is in close proximity. Due to the generally clay-like, loamy texture of soils in the project, vibroseis operations are not expected to result in burrow failure. However, should tunnel collapse occur, an animal within the tunnel could be crushed. Of interest, data suggest that within approximately 6 months of completion of a 3D vibroseis project, impacts associated with the geophysical activity appear to have had positive effects on new burrow construction, as loosened soil along vehicle travel paths is attractive to some burrowing rodents (Thomas 1995). In sum, accidental entombment, temporary displacement, and stress to small animals may occur, but impacts to small mammals are expected to be negligible. Concomitantly, impacts to small mammal predators, principally raptors, would also be negligible.

Approval Conditions to be Applied

No project activity is permitted November 15 through April 30 in the antelope crucial winter range depicted on EA Map 5 (p. 64, GRRMP) unless an exception is granted (Appendix E).

If project field activities are delayed until the period between February 1 and July 31, a raptor nest survey will be conducted. Between February 1 and May 31 (nest selection period), geophysical operations shall not be allowed on BLM-administered lands within a 0.5-mile radius of occupied raptor nests, except ferruginous hawk nests, for which the seasonal buffer is a 1.0-mile radius. A survey of nests was conducted in June 2002. Six active nests were found and activity within 0.5 to 1.0 miles (depending upon species) of an active nest will be subject to exception criteria. Exception criteria are provided in Appendix E.

Veritas shall provide BLM with a prairie dog town inventory report covering the entire SJ3D project. Recent prairie dog town survey data covering part of the SJ3D project area shall be utilized as much as possible, and is available at BLM. An approved wildlife biologist shall inspect areas not inventoried within the past one year. Based on the prairie dog town inventory report, the BLM shall determine whether any areas meet black-footed ferret habitat criteria.

For those areas that meet black-footed ferret habitat criteria (USFWS 2001), a ferret search will not be required if buggy vibes can avoid prairie dog colonies by a minimum of 50 meters (consultation with Pat Deibert, USFWS, Cheyenne). If ferret habitat avoidance is not feasible, Veritas shall use a qualified biologist to conduct a black-footed ferret search in the prairie dog colonies in the project area meeting ferret habitat criteria. Established ferret search procedures (USFWS 2001) will be followed. Daytime/snow searches for ferret sign may be conducted from December 1 to March 31 and nocturnal ferret searches may be conducted from July 1 to October 31 (USFWS 2001). If a black-footed ferret or its sign is found, all action potentially affecting the colony/complex shall cease, and any further action will be subject to USFWS guidance and/or restrictions (ibid.).

If project field activities are proposed for the period between April 10 and July 10, Veritas shall provide BLM with a current mountain plover survey report covering all areas to be affected during this period (USFWS

2002). Plover and plover habitat survey data addressing parts of the SJ3D project area shall be used as much as possible and are available at BLM.

If activities are proposed from February 1 through May 15, the geophysical operator will provide BLM with a sage grouse lek survey report covering all areas to be affected during this period (pp 9, 10, 59, PRMP, p. A-19, PAPA Record of Decision (ROD)). Current lek/nesting survey data addressing parts of the SJ3D project area will be utilized as much as possible and are available at both BLM field offices.

If activities are proposed for April 1 through July 31, the geophysical operator will provide BLM with a sage grouse nesting inventory, completed by a qualified biologist using pointers or setters (no retrieving dog breeds), covering all areas to be affected during this period (pp 9, 10, 59, PRMP, p. A-19, PAPA ROD).

From March 1 through July 31 in the PFO, no vehicles (ATV, pick-up, or buggy-vibe) are permitted off-road within a two-mile radius of active sage grouse leks (pp 9, 10, 59 PRMP, p. 24 GRRMP, and A-19 PAPA ROD). An exception may be granted if the geophysical contractor agrees to hire a BLM approved wildlife biologist to locate and mark avoidance routes around all occupied sage grouse nests along off-road vehicle routes. Shall an exception to this restriction be granted the following further conditions of approval will be implemented: a) geophysical operations will not be allowed within a one-half mile radius of active sage grouse leks from midnight to 9:00 A.M., between March 1 and May 15 (ibid.), and b) helicopter operations will not be allowed within a two-mile radius of active sage grouse leks from midnight to 9:00 A.M., between March 1 and May 15.

To protect wildlife cover, vehicle traffic shall avoid stands of tall sagebrush. Stands of tall sagebrush are defined as areas in which the majority (more than 50%) of sagebrush plants are 2 foot or taller.

VISUAL RESOURCES

Affected Environment/No Action Alternative

The entire SJ3D falls within VRM Class IV designation, the least protected visual resource management class. No special visual resources or high sensitivity have been identified within the project area according to Map 34 of the GRRMP (and p. 34, PRMP) although the Sublette Cutoff dissects the project area in the RSFO (Map 1). Based on BLM guidelines within Class IV areas (p. 21, GRRMP and p. 164, PRMP), surface disturbance can reach moderate to high levels; however, every attempt should be made to minimize the impacts of these activities through careful location and minimizing disturbance. The project area is not visible from any major viewing points such as highways or towns. Source points would occur 300 feet and beyond the historic trail ruts (p. 15, GRRMP); therefore, there is potential for source points and geophysical operations to be noticed by visitors to the trails. (Also see discussion of historic trails in the recreation portion of this EA.)

Environmental Consequences of Alternative 1 and Alternative 2

Off-road vehicle traffic by buggy vibes and repetitive passes by ATVs could cause linear obtrusions (i.e., two-track paths) across the landscape. To avoid linear visual obtrusions, to reduce soil compaction, and to reduce the degree of vegetation loss, BLM in Wyoming requires that geophysical operators offset their vehicle operations such that the tires of one vehicle do not follow in the path of another. This approach has been successful for other geophysical projects and linear two-tracks have not been created. With this vehicle offsetting system (see approval conditions below) and the prescribed slope restriction (see approval conditions for soils), visual impacts caused by the project are anticipated to be low level and short term.

Based on field review conducted June 17, 2002, source points have been relocated within the 0.25-mile corridor on either side of the trail so as these points are screened from view by visitors along the historic trails to the extent possible. It is likely that once geophysical operations move near the trail system, such operations would be visible temporarily.

Approval Conditions to be Applied

Veritas shall offset all off-road vehicle traffic over a 50-foot wide swath on either side of the staked seismic line, so that one vehicle does not drive the same path as another vehicle.

RECREATION

Affected Environment/No Action Alternative

Recreational use in the project area is light and centers primarily on hunting. Antelope and sage grouse are the predominant species hunted; however, some prairie dog, mule deer, and rabbit hunting also occur. Antelope rifle hunting in Area 90 runs from September 10 through October 30, mule deer rifle hunting in Area 138 runs from September 15 through October 31, elk rifle hunting in Area 98 runs from September 20 through January 31, 2003, and sage grouse hunting in the Upper Green River Basin runs from September 28 to October 6 (tentative). Statewide, cottontail rabbits can be hunted January 1 through March 1 and September 1 through December 31. Prairie dogs, jackrabbits, coyotes, and foxes can be hunted year-round.

BLM has authorized commercial big game outfitting in this area, primarily for antelope. Other dispersed recreational activities that may take place in the SJ3D include driving on the Sublette Cutoff of the Oregon Trail, off-road vehicle (ORV) use, mountain biking, hiking, wildlife viewing, and sightseeing. No developed recreation sites (campgrounds, etc.), recreation use areas, or special recreation management areas exist in the SJ3D project area (p. 38, PRMP, pp. 16-17, Maps 21 and 22, GRRMP). A formalized tour of the Sublette Cutoff has been proposed for July 13 and 14, 2002, prior to the start of geophysical activity.

BLM lands in the PFO portion of the proposed SJ3D project area are open to ORV/ATV use both on and off-road year-round, providing that off-road/off-trail activity does not result in resource damage (p. 36, PRMP). BLM lands in the RSFO portion of the project area are limited to existing roads (Map 30, GRRMP). ORV management calls for motorized vehicles to stay on existing roads and trails, unless permitted or otherwise allowed an exception by the Authorized Officer (pp. 15-16, GRRMP). Geophysical operations are routinely granted exceptions with appropriate limitations.

Environmental Consequences of Alternative 1 and Alternative 2

Project operations could disrupt recreation activities by visibly and audibly intruding on recreationists and by temporarily displacing game, which would inconvenience hunters should project operations overlap with hunting seasons. Some visitors to the Sublette Cutoff could be inconvenienced by geophysical operations. Considering the size of the active project operations area as compared to the size of surrounding big game and sage grouse habitat and hunting area boundaries, project impact to hunting is expected to be minimal. Similarly, in view of the low known levels of other recreation use in the SJ3D and considering the vastness of nearby public lands not temporarily occupied by geophysical project activity, project effects to dispersed recreation are anticipated to be minimal. No impacts to recreation would occur following completion of the project. Overall, impacts to recreation are considered minimal.

In the BLM-RSFO, temporary 'casual' off-road vehicle use is permitted on a case-by-case basis for the performance of tasks in support of formally permitted actions. Casual use in such instances is defined as the single pass of vehicles under 10,000 lbs GVW off-road, subject to the 25% slope restriction (in conformance with BLM Manual 3150, part 3.1.B.5). Surveyors, biologists, and archeologists working on project planning and inventories operate under this exception. With the ORV use limitations stipulated below, no resource damage is anticipated due to ORV casual use authorization.

Approval Conditions to be Applied

Off-road vehicle use in advance of issuance of project approval is limited to the single pass (no overlapping tire tracks) of vehicles under 10,000 lbs GVW (ATVs and ½ ton pick-ups or the equivalent in conformance with BLM Manual 3150, part 3.1.B.5). The 25% slope restriction, saturated soil restriction, and seasonal sage grouse nesting seasonal restrictions still apply.

SOCIOECONOMIC CONSIDERATIONS

Affected Environment/No Action Alternative

The SJ3D project is located between Rock Springs and Pinedale and between LaBarge and Farson. The local economy is heavily dependent on oil and gas exploration and development. A discussion of recent socio-economic conditions and trends for the area is given in the Jonah II DEIS (pp. 3.25-32) and the PAPA DEIS (pp. 3.2-12). Information in these documents is incorporated by reference. Please refer to these documents for information on the current status of local socio-economic conditions.

Environmental Consequences of Alternative 1 and Alternative 2

Peak workforce at any one time for the SJ3D project is expected to be approximately 60 persons and total time to complete the project is estimated at 4½ months. Seismic crews would likely be headquartered in Rock Springs, Wyoming. Crews would be transported to the project area and back to Rock Springs on a daily basis. Most of the workers have permanent residences elsewhere, consequently the project is not expected to place any demands on schools or other similar facilities.

It is unlikely that project activities would generate high levels of concern, opposition, or dissatisfaction among local residents. Residents of local communities are accustomed to and generally accepting of oil and gas related activities, including seismic operations. They are unlikely to view this project as problematic, particularly since it is located adjacent to areas where previous oil and gas related activities have occurred.

The project would provide monetary inflows of approximately \$750,000 to the local economy through access fees, room and board, fuel, and other incidental purchases.

An indirect economic benefit would be new producing gas wells in hydrocarbon-bearing strata identified through the geophysical data. The level of benefit associated with new wells would be similar to those described in the Jonah II (1997) and PAPA EIS (1999) documents.

Approval Conditions to be Applied

No approval conditions have been identified.

CULTURAL/HISTORICAL RESOURCES/HISTORIC TRAIL

Affected Environment/No Action Alternative

The SJ3D project files search area (432 Sections) contains approximately 400 known cultural resource sites, with most of the area still un-inventoried for cultural resources. A Class III cultural resource inventory of the project area is needed to evaluate potential impacts of the SJ3D project. Following standard procedure, geophysical operations would be re-designed to avoid cultural resource sites eligible or unevaluated for the National Register of Historic Places (Wyoming SHPO-BLM protocol). Sites would be evaluated according to Section 106 of the NHPA through the Wyoming State Protocol Agreement. Sites avoided by project re-design need not be evaluated.

Of note, the Sublette Cutoff of the Oregon Trail (48SW1841) runs roughly east-west through the central portion of the project area within the RSFO jurisdictional area. One stone circle site (48SW5403) has been recorded within the SJ3D. No other sites requiring unusual avoidance measures are presently known within the project boundary.

The majority of sites found (and which may be anticipated) in the area are prehistoric camps exhibiting chipped stone artifacts and fire-cracked rock on their surface. Occasionally hearth stains are also visible on the site surfaces. Burnt bone, groundstone, and prehistoric ceramics could be present in the area, and potential exists for site complexes surrounding playa lakes. Prehistoric stone circles, rock alignments, and

cairns also occur in the region but with far less frequency. Historic-era cairns and tin can scatters also could be found, and would not be unexpected. History and prehistory of the area, and notable local sites are summarized at greater length in the GRRR RMP DEIS (pp. 314-317) and Jonah II DEIS (pp. 3.23-25) and are incorporated by reference.

Environmental Consequences of Alternative 1 and Alternative 2

The proposed seismic exploration could cause effects to sites eligible for the NRHP. An effect is defined as an alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register of Historic Places (43 CFR 800.16(i)). These effects could be in the form of direct, indirect, or cumulative impacts. Direct impacts are physical and can adversely affect the site or its setting. Direct impacts could occur from vehicle traffic through sites during geophysical field operations, creating two-tracks, surface soil displacement, and/or soil compaction. If exploration activities are carried out in wet weather, rutting could also occur within sites. The new trails themselves, a direct impact, could also affect the setting of sites for which viewshed is a component of site significance, such as for the Sublette Cutoff (see discussion below). Indirect effects to sites could occur through creation of trails which subsequently might be used by recreationists or stimulate erosion. By providing access into areas containing sites these paths could be used by the public and facilitate illicit artifact collection which could radically change site interpretations and result in the loss of important scientific information. Cumulative effects would consist of a gradual degradation of the cultural landscape through erosion and illicit artifact collection, as well as the aggregate effects of possible development and use in an area which affects the surface. With the implementation of the spread out vehicle pattern (see vegetation section) and the standard cultural resource procedures prescribed below, no effect to cultural resources is foreseen.

Vehicular traffic on the Sublette Cutoff Trail could affect its integrity of design, workmanship, and feeling. Off-road vehicle traffic within the setting of the Sublette Cutoff could affect its integrity of setting and feeling. With implementation of the Trail setting traffic restrictions prescribed below, effects to the Sublette Cutoff would not be adverse.

Approval Conditions to be Applied

Veritas shall provide a Class III cultural resource inventory for all public lands where off-road vehicle traffic would occur. The inventory shall cover 50 feet either side of the flagged centerline of off-road travel routes, for a total inventory coverage of 100 feet. Such inventory would not be required for areas covered by previous inventories, provided those inventories meet current standards. The cultural resource inventory would be designed to locate and prescribe avoidance routes or other mitigation for all eligible sites, previously recorded as well as newly discovered. Standard site avoidance entails a 30-meter (100 foot) or more buffer zone around all eligible and unevaluated sites. Sites of potential Native American concern are subject to special measures, as specified below. Sites previously determined to be ineligible for nomination to the NRHP require no further action. The Class III report may be submitted in multiple increments.

Veritas shall provide a cultural resource inventory report(s) addressing that portion of the project located within the area of potential effect of the Sublette Cutoff. The report, including recommendations, shall be submitted to BLM who, in consultation with the Wyoming SHPO, would determine effects of the proposed project. Geophysical activities would not be permitted to create visual intrusions or adverse effects to the Sublette Cutoff (GRRMP ROD, p.4). Based on determination of effect, BLM-RSFO would issue project authorization for operations in this area with appropriate conditions.

Vibroseis (source) points must be at least 300 feet from the Sublette Cutoff (p. 4, GRRMP).

No project-related vehicle traffic (industrial access) is permitted on the Sublette Cutoff itself (p. 4, GRRMP).

The Sublette Cutoff may be crossed only at existing disturbances or in areas previously determined to be non-contributing.

Veritas' archeological consultant shall obtain a cultural resource files search printout from the SHPO Cultural Records Office shortly before commencing fieldwork. Based on this, the consultant would identify eligible and unevaluated previously recorded cultural resource sites on federal and non-federal lands in the project area. Using site form copies obtained from SHPO, the consultant would plot these sites onto the SJ3D project map for Veritas, who is requested to arrange avoidance for these properties.

All off-road vehicular traffic on BLM land shall be confined to a corridor 100 feet wide (50 feet either side of the flagged centerline) along lines that have been inventoried for cultural resources.

NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment/No Action Alternative

No Indian Sacred Sites, as defined and protected by Executive Order 13007, are known to occur in the project area (BLM or the Wyoming SHPO-CRO). Also, no sites potentially eligible for the National Register as Traditional Cultural Properties are of record with these agencies. Veritas hosted representatives to the area on June 23 (Northern Utes) and July 1 (Eastern Shoeshone) who approved the offset of the one site (cairn) of interest to them.

Native American groups historically associated with this area consider prehistoric rock alignment, cairn, stone circle, rock art, and potential funerary sites highly sensitive. These sites are specially managed by BLM via the use of extended buffer zones. One previously recorded stone circle site was identified by the review of SHPO site records. Required project-related cultural resource inventory may identify additional sites of these types within the SJ3D project area, particularly cairns and stone circle sites.

Environmental Consequences of Alternative 1 and Alternative 2

Previously recorded and yet unidentified sites of Native American concern could suffer impacts by adversely affecting their physical integrity or by interfering with their ceremonial use. With implementation of the following mitigation measure, however, the project should cause no impact in this regard.

Approval Conditions to be Applied

If any sites of potential Native American religious concern (e.g., rock art, vision quest structures, human burial sites, prehistoric cairns, stone circles, stone alignments, altars, medicine wheels) are identified by Veritas personnel or subcontractors within the project boundary but outside the cultural resource inventory (vibe line) corridors, the BLM RSFO and PFO Archeologists shall be promptly notified. The BLM RSFO and/or the PFO shall determine the need for special mitigative measures and/or Native American consultation. This stipulation applies to both federal and non-federal lands.

Sites identified by the cultural resource consultant (via records search and field inventory) which contain prehistoric cairns, stone circles, rock alignments, Indian Trails, graves, petroglyphs, herb gathering areas, or other features of Native American concern would be promptly reported to the BLM Archaeologist at PFO and/or RSFO as appropriate. The BLM archeologist shall determine what measures would be appropriate. Decisions concerning treatment (including avoidance) of these sites would be made through the process outlined in BLM Manual H-8160-1. This stipulation applies to both federal and non-federal lands.

AIR QUALITY

Affected Environment/No Action Alternative

Existing air quality for the SJ3D area is generally considered excellent, and is essentially the same as that described in the Jonah II DEIS (pp. 3.2-6) and PAPA DEIS (pp. 3.36-40). The information provided in those documents is incorporated by reference. Please refer to these documents and the GRRMP Final EIS (pp. 313-314, 364, and associated Figures) for information on current air quality conditions. Of note between

January 1, 1996, and June 30, 1999, there has been a net decrease of 9,951.92 tpy in permitted potential NOx emissions as a result of a PacifiCorp operations modification permit at the Naughton Station. Air quality is administered by the Wyoming Department of Environmental Quality.

Environmental Consequences of Alternative 1 and Alternative 2

Anticipated impact to air quality would occur from the exhaust emitted by the vibroseis buggies, a helicopter, and miscellaneous support vehicles. The maximum number of vehicles operating at a given time would be 6 buggy vibes, 1 helicopter, and 24 support vehicles. Average exhaust emission would be similar to 18 diesel-powered semi-trucks and 6 gasoline-powered pickups. The emission would be present during the 4½-month life of proposed operations. Impacts resulting from exhaust emissions are expected to be negligible.

Air quality contributions would also include fugitive dust resulting from vehicle travel on existing roads and trails, and to a much lesser extent, dust from cross-country vehicular travel. Helicopters and ATVs, rather than trucks, would be used to transport recording cables and boxes off road, thus minimizing dust creation. On roads, all vehicles would adhere to posted speed limits. Overall, fugitive dust contributions are expected to be minimal and short term.

Approval Conditions to be Applied

No special conditions are warranted.

NOISE, WASTE, and SAFETY

Affected Environment/No Action Alternative

Major sources of noise within the project area are occasional jet aircraft overflights at high altitudes, localized vehicular and light industry activity on local resource roads, drilling rigs, and occasional blow-down sounds at existing wells within the project area. These noise sources currently create variably but generally modest sound disturbances within the area.

No 'contaminated sites' are present in the SJ3D area according to Wyoming Department of Environmental Quality Solid and Hazardous Waste sites data available via the internet at <http://deq.state.wy.us>.

As may be expected, hazardous materials are present in the project area in the form of well drilling reserve pits, natural gas/oil pipelines, material transport containers on passing trucks, above ground fluid tanks at producing well locations, and fuel tanks in parked and moving vehicles. These materials, however, are contained and readily recognizable and merit no further consideration. Hazardous materials associated with oil and gas exploration and production activities are listed in the PAPA ROD (Appendix D). Material Safety Data Sheets (MSDS's) for all hazardous materials associated with the proposed SJ3D geophysical operations are maintained by Veritas Crew #23 Safety Officer Steve Ham (cell phone 281.468.1929) and are available for review upon request.

No H2S or other unusual safety hazards are known for the project area.

Environmental Consequences of Alternative 1 and Alternative 2

Seismic-related activities, including buggy vibe engine noise, the sound of vibration at source points, helicopters, and support traffic would create sound disturbance within the project area of 90-112 dBa. These impacts would be transient as the project recording operations proceed across the 411square mile area and would occur for the duration of the project. Because of the remote location of the proposed activity, perception of the added noise would be primarily by wildlife and livestock, as human presence in the project and surrounding area is at very low levels (project employees notwithstanding), except in the active oilfield where noise levels are already elevated. No occupied dwellings are known within the project boundary. Noise-related effects, consisting of temporary wildlife displacement and annoyance to some recreationists present

are expected to be minor (also see wildlife and recreation sections of this EA). Overall, project noise elevation is anticipated to be of moderate level, localized, and transient. Thus, no approval conditions are proposed.

Project markers in the form of wooden lath, ribbon flagging, pin-flags, and spray paint could contribute litter/solid waste in the project area. However, Veritas has made an operational commitment in their Proposed Action to remove project lath and flagging as recording operations progress, so no debris should remain behind the project as planned. No impact in this regard is foreseen and no approval conditions are recommended.

Hazardous substances such as gasoline, diesel, and vehicle lubricating and hydraulic oil used in the field during project operations could contaminate natural resources, if spilled. With implementation of the waste disposal prescription below, however, no impact is foreseen. Fires could be lit, causing serious safety hazards and loss of or damage to property.

Approval Conditions to be Applied

Veritas shall clean up all oil, diesel, or hydraulic fuel spills, including contaminated soils. All spill-related material shall be hauled to a Wyoming DEQ approved disposal site. Spills resulting from ruptured pipelines or well casings shall be cleaned up as directed by DEQ and the facility owner/operator.

Veritas shall prepare an Emergency Response Plan addressing fire and submit it to the Authorized Officer for review at least one week prior to any project field operations.

Veritas shall coordinate with the nearest paramedic providers (possibly in Casper for life-flight and Marbleton for ambulance) to establish Landing Zones across the project. These zones would be used in case of serious injury to workers needing immediate evacuation.

Veritas shall place all tanks holding bulk liquids in lined and bermed areas. Capacity of the bermed area shall be 110% of the largest tank. Bulk liquids contained in tanker semi-trailers may be parked in a safe location on the staging area. Fueling of equipment or maintenance of equipment shall be done away from riparian or other open water areas.

DIFFERENCE BETWEEN ALTERNATIVE 1 AND ALTERNATIVE 2

The difference between Alternative 1 and Alternative 2 is buggy vibe operations would be dropped from 14 square miles in the SWJGF overlap area. This equates to 1,558 fewer source points and 346 fewer acres affected by buggy operations. Geophone lines would still be placed in 10 of the 22 square miles. The total length of geophone lines in the SWJGF overlap area would occur on approximately 50 acres, or less than 1% of the surface area. Operations described in Alternative 1 would be conducted on the remaining 389 square miles under Alternative 2. The primary difference is that Alternative 2 would result in very little new vegetative disturbance in the already impacted SWJGF overlap area whereas Alternative 1 would increase the vegetative disturbance by 5% in the SWJGF overlap area, a reduction of 4% in vegetation disturbance in the SWJGF overlap area.

CUMULATIVE IMPACTS

Pursuant to NEPA, the BLM must consider the cumulative effects of the Proposed Action in conjunction with other activities. Cumulative impacts are those impacts on the environment that result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. Cumulative effects may be both additive and interactive.

The proposed 3D project is designed to facilitate future oil and gas well drilling. Well drilling, therefore, is an impact in the foreseeable future. However, analysis of any impacts related to future well drilling must be addressed at a future date should drilling be proposed. Drilling in nearby and slightly overlapping areas (i.e., the Jonah Gas Field and the PAPA) has been analyzed via past EISs. Should extensive drilling be foreseen in

the portion of the SJ3D area not covered by existing EIS documents, another EIS would likely be prepared.

Alternative 1 (Proposed Action)

Considering the Approval Conditions to be Applied as identified earlier in this EA, the primary anticipated impact of the Proposed Action would be that of directly affecting 4.9% of the 411-square-mile project surface area via tire and vibe pad impacts. As explicated in the vegetation section of this EA, it is estimated that the Proposed Action could kill up to approximately 2.9% of the sagebrush in the project area, could damage but not kill an additional 1% of the sagebrush in the project area, and could have a 'drive-over' impact but not visibly damage some 1% of the sagebrush in the project area. These vegetation-crushing effects have ramifications primarily for visual resources, vegetation, and wildlife habitat. These three resources are examined in some detail here with regard to cumulative effects. No cumulative impacts to Native American Religious Concerns, cultural/ historical resources, special status plant or animal species, soils, livestock grazing/range resources, wild horses, water, socio-economic, invasive species, fluid minerals, air quality, noise, waste, safety, recreation resources, or paleontological resources are foreseen with application of approval conditions.

To address overall cumulative effects, a brief review of pertinent existing conditions is presented here. Existing disturbances in the SJ3D are broken into two major categories: 1) *vegetation-removing* disturbances, comprised of roads, pipelines, and well pads, and 2) *vegetation-altering* disturbances, consisting of past 3D seismic projects. Buried pipelines are included in the vegetation-removing category inasmuch as plants and topsoil are totally removed, then replaced, and a number of years is required after reseeding for the area to become thickly re-vegetated.

Existing vegetation-removing disturbances within the SJ3D boundary are summarized on Table 3 and depicted on Map 6. Data for the map and table regarding wells, roads and pipelines are derived from BLM-GIS files. This is the best readily available information but undoubtedly some disturbances may not be reflected.

TABLE 3 - Past Vegetation-Removal Projects in SJ3D

Project Type	Calculations	Estimated Acres of Vegetation Removed
Road-ways	306 linear miles @ 25 feet wide disturbance corridor	127
Pipelines	15 linear miles @ 70 feet wide disturbance corridor	127
Well pads	204 well pads @ 3.7 ac of disturbance*	755
Total area disturbed by past vegetation removal projects:		1,809
Percent of area disturbed by past vegetation removal projects:		0.7%

* Well pads typically create 3 to 5 acres of surface disturbance. For consistency, and in the absence of specific information regarding the size of well pads in the project area, the well pad disturbance figure (3.7 acres) used in the PAPA DEIS (p. 2-17) is utilized here.

As can be seen on Map 6, two areas of past construction disturbance in the SJ3D are notable: a small but dense area of wells, access roads, and pipelines which constitute the southwestern extreme of the Jonah Gas Field, and the somewhat larger but more dispersed well field development of the Blue Forest Unit.

Past vegetation-altering projects located within the SJ3D consist of 7 recent seismic projects in the northern portion of the analysis area, with the SJ3D to be the eighth such undertaking. As with the SJ3D project, the primary impact of the past 3D projects is the thinning of brush along their drive paths, a form of vegetation composition conversion. Overlaps between these past projects with each other and with the SJ3D are summarized in Table 4 and depicted on Map 7. Data for the map and table was derived from the BLM project analyses and case files. Specifically, figures for the percent subjected to tire impacts and the predicted percent of sagebrush kill within those past impact areas were taken directly from the respective project environmental assessment. The predicted kill rates have not been verified by follow-up field studies and they are suspected to be generally on the high (conservative) side.

TABLE 4 - Past and Proposed Vegetation-Altering Projects in SJ3D

Year Conducted	Project Name	Acres of Overlap Into SJ3D	Percent Subjected to Tire Impacts	Acres Trod By Project	Acres of Killed Brush
1997	Veritas Amoco Jonah 3D	12,162	1.3 (30% kill)	158	47
1999	GECO Jebco Southeast Jonah 3D	13,500	2.0 (30% kill)	270	81
1999	Veritas Blue Forest 3D	8,972	2.5 (30% kill)	224	67
2000	Trace Ventures/Forest Oil Elm 3D	6,459	4.0 (30% kill)	258	78
2001	WesternGeco West Pinedale 3D	8,935	2.9 (30% kill)	259	78
2001	Solid State/Cabot Oil Yellow Point 3D	9,755	4.0 (50% kill)	390	195
2001	Solid State/Alberta Energy VSP 3D	12,472	0.8 (50% kill)	100	50
Total area in SJ3D affected by past seismic projects:				1,659	596
2002	Veritas South Jonah 3D	262,400	4.9 (60% kill)	12,836	7,610
Total area in SJ3D to be affected by seismic projects, past & proposed:				14,495	8,206
Percent of SJ3D to be affected by seismic projects, past & proposed:				5.5%	3.1%

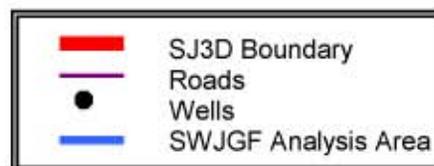
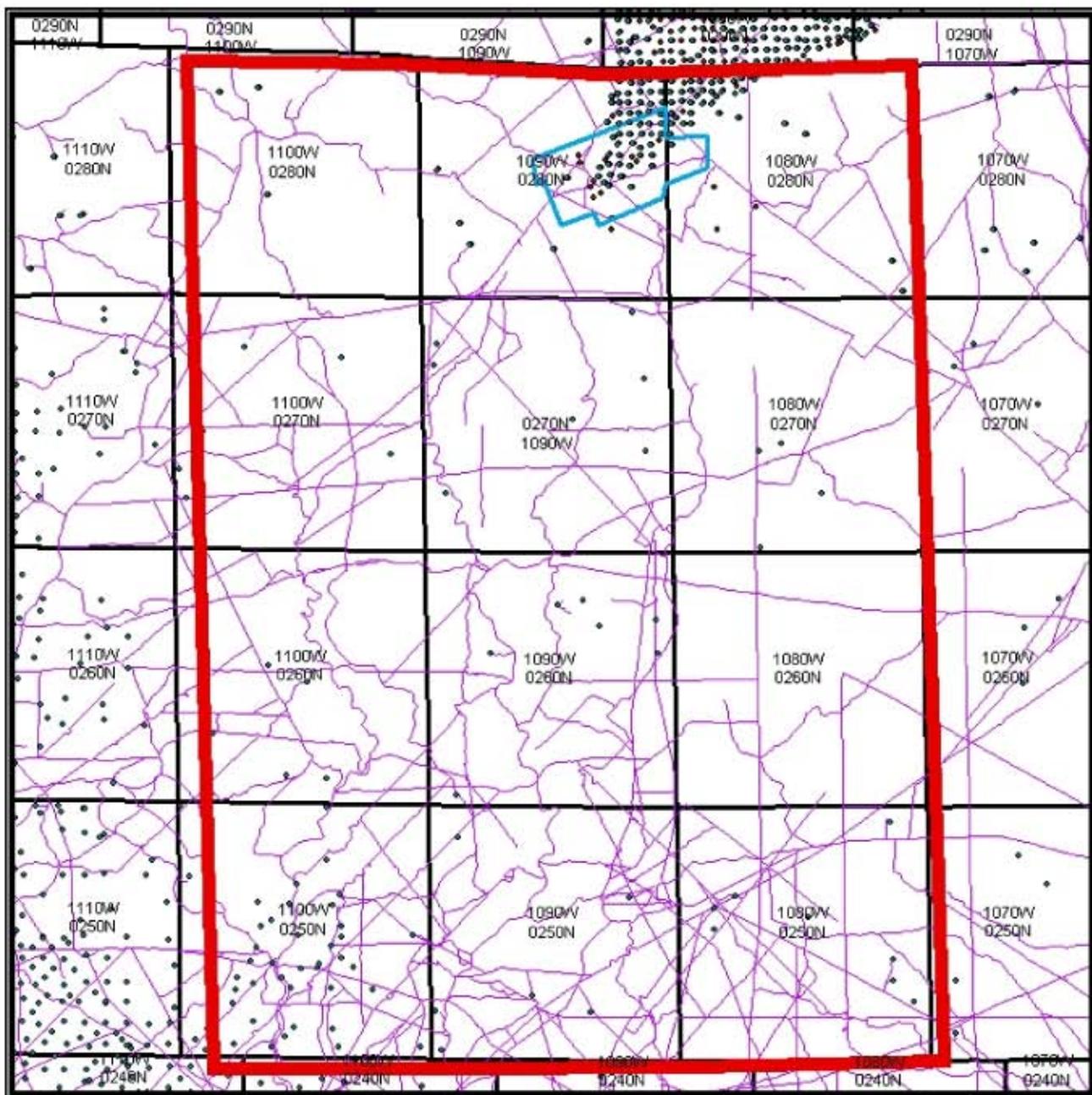
Thus, surface traffic by the past and proposed vegetation-altering impacts is estimated to sum to 5.5% (14,495 acres). Actual sagebrush kill resulting from past 3D projects and the proposed SJ3D would total about 3.1% (8,206 acres) of the 262,400-acre project area.

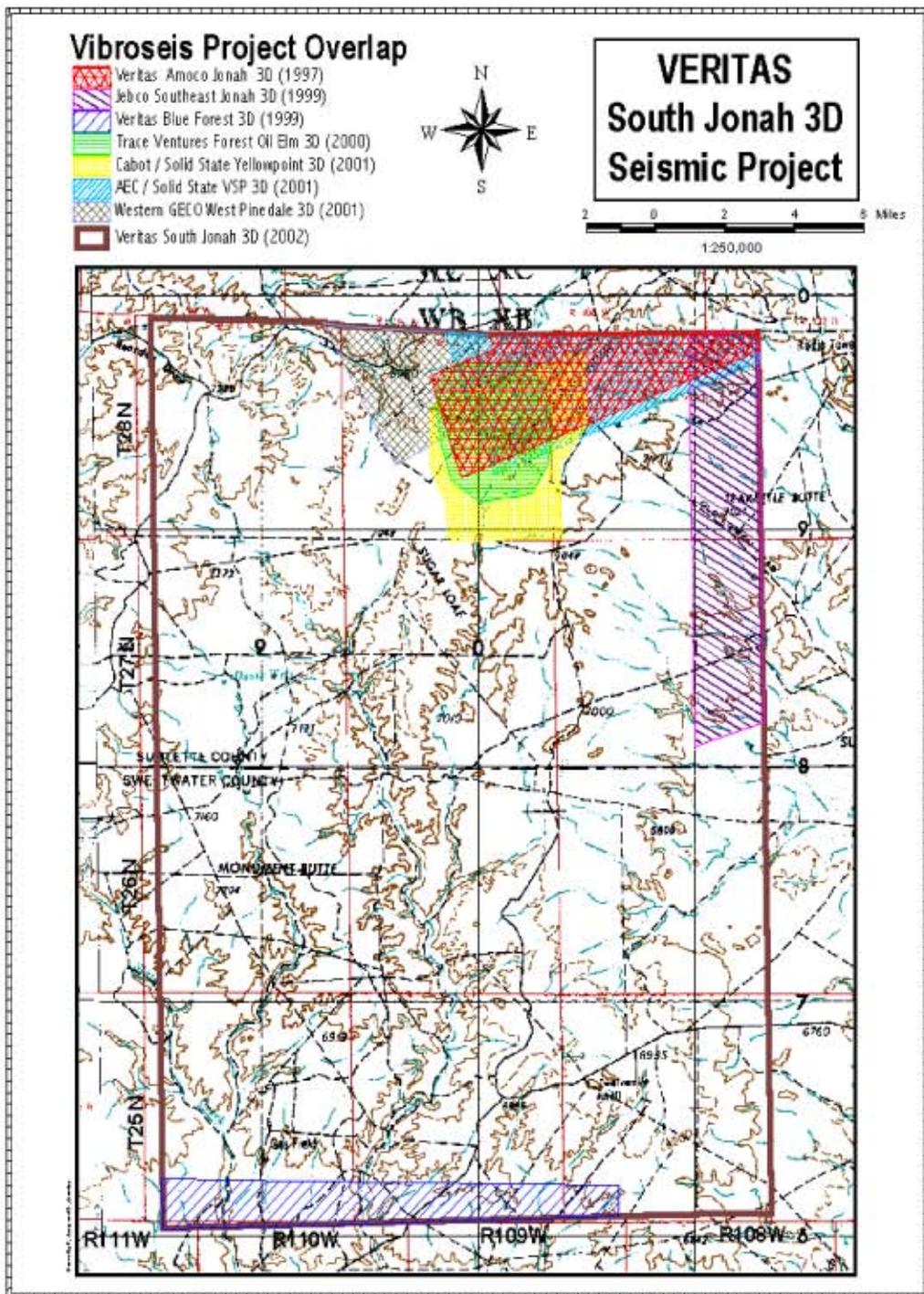
The center of the extreme northern portion of the proposed project area has experienced multiple recent 3D geophysical projects and in a sizeable area, the SJ3D would be the sixth overlapping project. Not surprisingly, this area of the heaviest past geophysical activity generally coincides with the southwestern portion of the Jonah Gas Field, where well field development within the SJ3D is highest. The total (cumulative) impacts to vegetation in the SJ3D, including both past and proposed vegetation-removing and vegetation-altering impacts are summarized in Table 5.

TABLE 5 - Cumulative Vegetation Impacts in Overall SJ3D
(262,400 acres)

Project Type	Area Impacted/ Trod Upon	Acres of Brush Killed
Past vegetation removal projects (Table 3)	1,809	1809
Past 3D seismic projects (Table 4)	1,659	596
Proposed SJ3D (Table 4)	12,836	7610
Cumulative effects (acres):	16,304	10,015
Cumulative effects (percent):	6.2%	3.8%

MAP 6 - Existing Roads and Wells in the South Jonah 3D Project





To recap, approximately 1.3% (3,468 acres) of the overall SJ3D project area has experienced some form of surface disturbance (vegetation conversion or vegetation removal) in the past. Alternative 1 would subject the project area to an additional 4.9% (12,836 acres) of surface impacts. The total disturbed area in the SJ3D project area would then be about 6.2% (16,304 acres) of the overall 262,400-acre SJ3D project area.

In and of itself, a cumulative vegetative impact of approximately 6% within the overall project area is well within existing management prescriptions and is considered less than a significant cumulative impact. Cumulative effects to the SWJGF overlap area of the SJ3D, however, are considerably higher, not being diluted by the largely undeveloped expanses that dominate the project area. Cumulative impacts to this area were therefore analyzed separately.

The boundary of the SWJGF analysis area was drawn to coincide with the SJ3D's overlap with five past 3D seismic projects. This 4,320-acre area is not absolutely the most heavily disturbed one present in the project area (a single well pad or road would qualify as most disturbed). However, this analysis area is deemed both large enough and small enough to give a reasonable indication of cumulative impacts in the generally most heavily disturbed portion of the SJ3D. Paralleling previous discussion of cumulative impacts in the SJ3D, existing and proposed impacts in the SWJGF analysis area are summarized in Tables 6, 7, and 8 and shown on Map 8.

TABLE 6 - Past Vegetation-Removal Projects in (4,320 acres) Southwest Jonah Gas Field

Project Type	Calculations	Estimated Acres Of Vegetation Removed
Road-ways	32 linear miles @ avg. 60 feet wide disturbance corridor including 21 miles of road / pipeline combination	233
Well pads	46 well pads @ 3.7 ac of disturbance	170
Total area disturbed by past vegetation-removal projects:		403
Percent of area disturbed by past vegetation-removal projects:		9%

TABLE 7 - Past and Proposed Vegetation-Altering Projects in (4,320 acres) Southwest Jonah Gas Field

Year Conducted	Project Name	Acres Overlap into SWJGF	Acres Subjected to Tire Impacts	Acres Trod by Project	Acres of Brush Killed
1997	Veritas Amoco Jonah 3D	3700	1.3 (30% kill)	48	14
2000	Trace Ventures/Forest Oil Elm 3D	3620	4.0 (30% kill)	145	43
2001	WesternGeco West Pinedale 3D	760	2.9 (30% kill)	22	7
2001	Solid State/Cabot Oil Yellow Point 3D	4320	4.0 (50% kill)	173	86
2001	Solid State/Alberta Energy VSP 3D	3320	0.8 (50% kill)	27	13
Total area in SWJGF affected by past seismic projects:				415	163
2002	Veritas South Jonah 3D	4320	4.9 (60% kill)	212	127
Total area in SWJGF to be affected by seismic projects, past & proposed:				627	290
Percent of SWJGF to be affected by seismic projects, past & proposed:				15%	7%

TABLE 8 - Cumulative Vegetation Impacts in (4,320 acres) Southwest Jonah Gas Field

Project Type	Acres Impacted/ Trod Upon	Acres of Brush Killed
Past vegetation removal projects	403	403
Past 3D seismic projects	415	415
Past projects total effects (acres):	818	566
Past projects total effects (percent):	19%	13%
Proposed SJ3D	212	127
Cumulative effects (acres):	1030	693
Cumulative effects (percent):	24%	16%

As reflected in Table 8, approval of the proposed SJ3D project as planned would bring estimated ground surface disturbance in the SWJGF to 24% of surface area, with 16% of the sagebrush in the SWJGF killed or removed by those disturbances. As stated earlier, because impacts of the Proposed Action would most affect visual resources, general vegetation, and wildlife habitat, these three resources were chosen for examination with regard to cumulative effects.

Visual resources within some parts of the SJ3D project area have been altered from their natural state by past human activity, most noticeably by gas field development in the Jonah Gas Field and Blue Forest Unit. Past development on BLM land has been within established VRM objectives, which allow for high level of change to the landscape on Class IV lands. The visual impacts of the proposed SJ3D project are anticipated to be minor in comparison to the existing gas field developments. Of note, the seven past 3D projects that overlap with the SJ3D (mostly in the SWJGF area) have been field inspected by BLM PFO and RSFO personnel and these inspections indicated that, given appropriate protective measures, the 3D seismic projects do not leave high visual impacts. The cumulative effect of another similar 3D vibroseis project on visual resources in the overall SJ3D project area, as well as in the Southwest Jonah Gas Field analysis area in particular, are projected to be less than significant and certainly within VRM objectives established via Resource Management Plans.

Even within the area of heaviest impact by past projects (the 4,320-acre Southwest Jonah Gas Field analysis area) brush removal/kill by projects including the proposed SJ3D would cumulatively total 16%. It is concluded that cumulative effects to general vegetation would be less than significant and native vegetation would remain present in the SJ3D project area with only a short-term shift in species composition.

Roads and other existing developments have fragmented the SJ3D landscape into separated "islands" of wildlife habitat, particularly in the developed well field areas. Traffic and human activities associated with these roads and developments force wildlife to concentrate in the smaller islands of native habitat to avoid or to minimize contact with humans. Primarily at issue is the human activity rather than the physical condition of the ground surface. With regard to the SJ3D project, even though buggy vib operations would crush brush along travel paths, the proposed project would not create major breaks in the vegetative continuity, only linear strips several feet wide with a temporarily higher proportion of the natural grasses and forbs.

Changes to sage grouse habitat have occurred in the project area, particularly in the SWJGF analysis area due to the Jonah Gas Field development and past geophysical projects summarized above. The SJ3D would add to the changes caused by past activity via the thinning of woody plants, mainly sagebrush, that occurs from off-road geophysical operations. Cumulative impacts due to a reduction of sagebrush would accrue in the SWJGF area. The sagebrush loss in the SWJGF is not expected to exceed the criteria for sagebrush retention within the two-mile radius of sage grouse leks (p. 22, PRMP).

The PRMP asserts that high priority would be given to improvement of wildlife habitat through vegetation manipulation and that sage grouse would benefit by an increase in plant diversity and in the forb component on summer range (p. 22, PRMP). A vibroseis project utilizing the spread-out vehicle pattern theoretically results in forb and grass growth to help meet this habitat improvement guideline. This guidance suggests that a maximum of 20 percent of sagebrush type vegetation undergo brush control treatment at one time in sage grouse 1) nesting complexes, 2) winter habitat, 3) winter/yearlong habitat, or 4) summer habitat areas (PRA

RMP ROD, p. 23). Completion of the proposed project would bring cumulative sagebrush kill in the SWJGF area (sage grouse nesting habitat) to 16% approaching the 20% threshold.

Sage grouse have been experiencing a decline throughout their range. The reasons are not well understood. Consequently, projects that approach or exceed a threshold like the 20% criteria discussed above should be modified or otherwise mitigated.

Sage grouse are known to breed and nest in the SWJGF area and loyalty to their birthing site is very high (John Westbrook, BLM-PFO, personal communication). Maintaining or enhancing sage grouse habitat even within areas like the SWJGF is extremely important. To reduce sagebrush impact in the SWJGF, Veritas agrees to restrict traffic to existing disturbed areas where possible to reduce impact in the SWJGF area.

Given the relatively low level and short-term nature of impacts associated with vibroseis projects and the implementation of the mitigative measures described herein, the proposed SJ3D project, together with other federal actions and local commercial and recreational activities, is not expected to appreciably affect critical elements of the human environment. No significant short- or long-term cumulative impact is expected to result from the proposed seismic operation. However, should recoverable oil and gas reserves be found, there is potential that exploration and development wells could be proposed. Any proposed oil and gas exploration or development would be subject to the appropriate level of NEPA analysis and possible amendment to the land use plan/s if appropriate.

Approval Conditions to be Applied

Due to the level of impact from previous geophysical operations within the SWJGF area, particularly the area fully covered by the previous 7 geophysical projects should be an avoidance area for source points (vibes). Laying receiver points across the certain areas could be allowed. Based upon the cumulative impact analysis, this measure has been analyzed as an alternative (Alternative 2) to Alternative 1.

To protect sage grouse nesting habitat in the SWJGF area, Veritas shall restrict vehicular traffic to existing disturbed areas where possible. Otherwise, sage grouse nesting habitat will be surveyed, and taller sagebrush and occupied nests will be avoided.

Veritas agrees to restrict traffic to existing disturbed areas where possible to reduce impact in the SWJGF area.

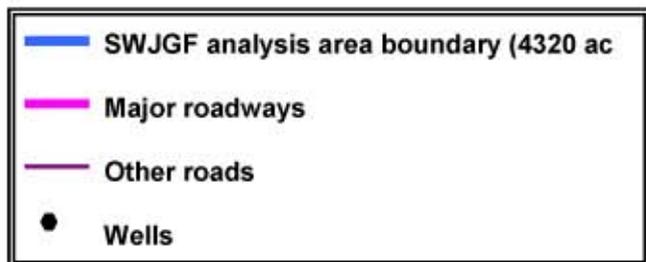
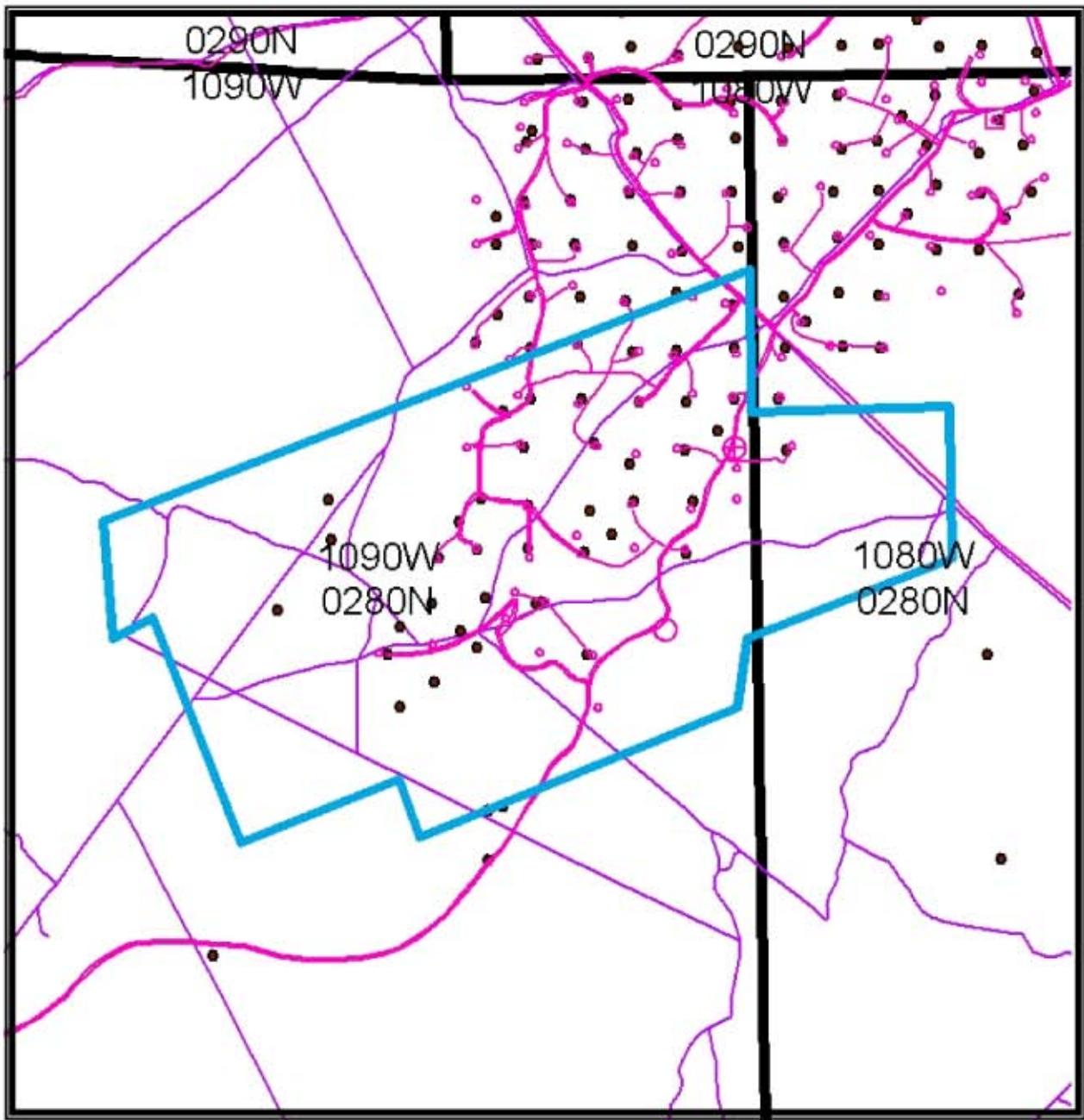
Alternative 2

The cumulative impacts associated with Alternative 2 would be similar to Alternative 1 except that buggy vibre operations would impact 346 fewer acres. More importantly, implementation of Veritas' commitment to use existing roads where feasible in the SWJGF and implementation of conditions of approval (e.g., spread vehicle traffic off-road, avoidance of taller sagebrush, etc.) as outlined throughout this assessment, Alternative 2 would not add to the existing level of cumulative impacts in the SWJGF area. Cumulative impacts for the remaining 389 square miles outside of the SWJGF would be the same as those described under Alternative 1.

No Action Alternative

Other than surface disturbance associated with exploratory drilling of an undetermined number of "dry holes" along with ongoing infill drilling in the two producing gas fields, the No Action alternative would not add to the current level of activity.

MAP 8 - Existing Roads and Wells in the Southwest Jonah Gas Field
(area of heaviest past impacts)



RESIDUAL IMPACTS

Mitigation measures developed through this EA addressing potential environmental impacts under this alternative would be included as Terms and Conditions attendant to approval of the NOI. As the mitigation measures would avoid or minimize impacts, no residual effects are foreseen.

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George Schoenfeld	Physical Scientist	RSFO
Bill Lanning	Natural Resource Specialist	PFO
Jim Dunder	Wildlife Biologist	RSFO
John Westbrook	Wildlife Biologist	PFO
Jim Glennon	Botanist	RSFO
Steve Laster	Plant Specialist	PFO
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John Henderson	Fisheries Biologist	RSFO
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Carmel Kail	Consultant	Kail Consulting
Richard Kail	Consultant	Kail Consulting
Jere Krawkow	Superintendent – Long Distance Trails	NPS
Dave Welch	National Preservation Officer	Oregon-California Trail Association

Informational notices regarding the proposed project were published in the Rock Springs Rocket-Miner (5/3/02) and the Casper Star Tribune (5/10/02), indicating that any comments and concerns be submitted to the BLM RSFO by May 30, 2002. This same notice/press release was posted at the BLM Rock Springs and Pinedale Field Offices, with copies available for the public. An electronic copy of the same notice/press release was also posted on the BLM Wyoming website at http://www.wy.blm.gov/rsfo/rs_index.htm. In addition, notices were mailed to several environmental groups and to the Wyoming State public lands clearinghouse.

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APPENDIX A
Comment Letters and BLM's Response

BLM received seven letters in response to a news release seeking public comment on the proposed South Jonah 3D vibroseis project. Comments are summarized in italic font; BLM's response follows the comment letter. All comments brought forth during the public comment period have been considered and addressed as appropriate.

Dru Bower, Petroleum Association of Wyoming

The Applicant is bound by the Resource Management Plan (RMP), which allows for geophysical activity in the proposed project area. The activity will create minimal surface disturbance and the mandatory mitigation in effect through the RMPs is more than adequate to protect resources for this proposed action and additional concerns can and will be analyzed in the Environmental Assessment (EA) and the site-specific analysis. Currently there is nothing present to indicate that an Environmental Impact Statement is necessary; therefore, the EA should be expedited for this environmentally sound project.

The detailed image of the subsurface that 3-D seismic allows the operator to target the most promising areas while avoiding areas that will otherwise require exploratory drilling. This procedure is much less intrusive than exploratory drilling, which must be analyzed as an alternative to seismic activity. This technology is a short term, temporary disturbance and it does not require the construction of surface facilities or roads. The impact to vegetation and soils is temporary and will be eliminated after one growing season. The short term and dispersed nature of 3-D seismic and its minimal need for vehicles will not create a significant disturbance to other resources (i.e., wildlife, cultural, etc.) and the EA should be prepared and the project approved without delay.

Analysis should be included in the EA addressing socio-economics and the positive effects the project would have on the surrounding communities. PAW recognizes that this proposed action may not stimulate tremendous growth in the economy immediately, but residents of Wyoming and the participating counties would benefit by directly creating new jobs and additional revenue particularly if further development is determined to be economically feasible after the project is completed.

Seismic technology provides the necessary information that can significantly reduce the number of unsuccessful exploration and development of wells drilled; thereby, significantly minimizing surface disturbance. Geophysical activity is consistent with the President's National Energy Policy and the Secretary of Interior's "4C's" philosophy to promote conservation practices with energy development and should be encouraged by BLM. BLM must consider and provide adequate access to areas in order to obtain the valuable information that seismic activity provides.

Thank you for your comments. Issues you have brought forth including socio-economics, access, exploratory drilling alternative, unnecessary surface disturbance, and the President's National Energy Policy have been considered in the analysis.

Carol Kruse, Office of Federal Land Policy

On behalf of the State of Wyoming, this Office also distributed the scoping statement to affected State agencies for their review, in accordance with State Clearinghouse procedures. Attached are comments from the Wyoming Game & Fish Department, Office of State Lands & Investments, and the State Historic Preservation Office, based on their reviews. State agency comments are specific to their respective agency missions. While the State defers to its agencies' technical expertise in developing the State's position, the

responsibility to articulate the official, unified State policies and positions lies with the Governor or the Office of Federal Land Policy.

Please address any impacts to sage grouse lek/nesting habitat and any hunting season conflicts during the impact analysis and resultant NEPA documentation. We have no cultural concerns provided BLM and the geophysical company follows established cultural resource procedures. Note the company's requirement to acquire necessary authority prior to conducting operations on any State lands in this area. The attached letters provide more specific information.

Unless provided electronically to the Office of Federal Land Policy (OFLP@state.wv.us), this Office will need six copies of future information and documents regarding this project for distribution to affected State agencies.

Thank you for your comments. Issues raised by State of Wyoming agencies have been considered and incorporated into the analysis.

Ron Arnold, Office of State Lands and Investments

The Office of State Lands and Investments has reviewed the referenced scoping statement. Our comments regarding the proposed action are specific to this agency's statutory mission within State government which is to provide timely, accurate and cost effective service to the Board of Land Commissioners, the State Loan and Investment Board, policymakers and the citizens of Wyoming to facilitate wise and reasonably analytical decision making that will maximize the State's assets and resources in accordance with mandated authorities. In that regard, these comments are meant to, in association with all other agency comments, assist in defining the Official State Position. These comments defer to and are subordinate to the Official State Position.

Although our office has no objection to the proposed action at this time, we would like to take this opportunity to point out that in accordance with Chapter 4, Section 13 of the rules of the Board of Land Commissioners, the Board of Land Commissioners require that Veritas DOC Land, Inc. secure the necessary authority prior to conducting operations on any state land within tile designated area.

Thank you for your comments. State managed lands are found within the project area. Veritas would be required to obtain all necessary permits from state and local governments.

Gregg Arthur, Wyoming Game and Fish Department

The Veritas 3-D Seismic Project is located immediately south of the Jonah Field. The only potential conflict with wildlife may be with some sage grouse leks and/or grouse nesting habitat. There is no designated big game winter range in the project area. Sage grouse may use the area in the winter months. The environmental assessment for this project should address timing of the activity to minimize impacts to wildlife, including seasonal restrictions, if appropriate. The document should also address potential conflicts with the pronghorn hunting season (September 10 to October 30).

Thank you for your comments. Your concerns have been considered in the analysis.

Judy Wolf, State Historic Preservation Office

Management of cultural resources on Bureau of Land Management projects is conducted in accordance with Section 106 of the National Historic Preservation Act, the BLM National Cultural Programmatic Agreement,

and the Wyoming State Protocol Agreement. These call for survey, evaluation, and protection of significant historic and archeological sites prior to any disturbance.

Provided the BLM follows the established procedures, we have no objections to the project. Specific comments on the project's effect on cultural resource sites will be provided to the BLM when we review the cultural resource documentation submitted to us.

Please refer to SHPO project control number 0502SPP022 on any future correspondence dealing with this project.

BLM would comply with the programmatic agreement and the Wyoming State Protocol Agreement.

Dave Welch, Oregon-California Trail Association

The proposed activity would be conducted in a relatively pristine area straddling the Sublette Cutoff. From a purely trail preservation perspective, we would prefer that this activity did not take place. Given that the project would proceed, I would like to encourage the BLM to insist on maximum protection of the trail resource.

It appears that the technology is low impact, but much depends upon the actual field implementation. The field contractor should be made aware of the trail location and what and what not may be done on and near the trail. I assume the prohibition on "no surface disturbance" within 0.25 miles on each side of the trail applies.

Thank you for your comments. The Green River Resource Management Plan allows for geophysical activity 300 feet and beyond from trail ruts provided visual integrity is maintained. BLM's Archeologist met with company representatives on June 17, 2002 to locate source (vibe) points so that they are screened from view by visitors along the trail. Geophysical activity is not considered surface disturbing; however, the source points within 0.25 miles of either side of the trail have been located in such a manner to minimize impacts to the historic trail setting.

Jere Krakow, Long Distance Trails Office, National Park Service

Our ongoing concern is that measures be taken to protect national historic trail resources in the project area. We understand that geophysical investigations are done in a manner mindful of resource degradation. It is extremely important to achieve protection of trail resources as this occurs.

Due to the length of time 4-5 months for this project, it is likely that fieldwork would be ongoing during the period that those interested in following the trails are themselves in the field. Is there a way to coordinate fieldwork to minimize activity when you are aware of groups out following the trail? It would improve the experience considerably for the travelers.

Thank you for your comments. BLM is aware of an organized tour of the Sublette Cutoff on July 13 and 14, 2002. This tour will occur prior to start of seismic operations scheduled to begin on July 16, 2002. The geophysical work is scheduled to start at the northern part of the project area, approximately 10 to 12 miles away from the trail, and work southward. Since Veritas would start at the northern end of the project area, it would take anywhere from 7 to 10 weeks to reach the vicinity of the trail. If there are visitors to the trail at the time seismic work is proceeding within the vicinity of the trail, some of these visitors could be inconvenienced if they are bothered by such activity. This potential impact is recognized in the analysis.

APPENDIX B
Veritas Letter

June 26, 2002

Bureau of Land Management
280 Highway 191 North
Rock Springs, WY 82901

Attention: Teri Deakins

Re: South Jonah 3D

Dear Teri:

Veritas Land Surveys has considered the option to record the South Jonah 3D using an explosive shot hole source as opposed to the vibroseis method. The use of helicopter transported drills was also considered. The helicopter transported drill method would reduce the need for truck mounted or buggy mounted drill rigs. Our analysis included three criteria including time, cost and impact to BLM mineral lessees.

There are approximately 33,845 shot hole locations within the 411 square mile South Jonah 3D. We plan to have approximately 82 source locations per square mile. We considered 30 pounds of explosives loaded in an eighty (80') foot shot hole.

Each shot hole would take approximately one to two hours to drill including transportation to and from each shot hole. The smaller and lighter heli-drills may average five shot holes per day. Using ten heli-drills, production could average fifty holes per day. It would require over twenty-two months of continuous drilling with no weather days or other downtime to complete the drilling phase. Twenty drills would reduce this drilling window by fifty percent if twenty heli-drills could be found. The recording phase will be completed in five months. The disturbance to wildlife would last much longer (11 to 22 months) if the shot hole method were required.

Shot holes drilled by helicopter transported drills cost \$1200 per shot hole. The shot hole method with helicopter transported drills will cost over \$40,000,000. The vibroseis method will cost \$10,275,000.

Adverse impacts to BLM lessees are both temporal and monetary. Heli-drilling will delay the completion of this project until 2004 at a minimum and realistically until 2005 or 2006 when factoring wildlife issues for the period between March 1 and July 15. The significant increase in costs will change the economic viability for this project. Oil & gas drilling will be delayed or continued without the benefit of 3D geophysical data. Dry holes will be needlessly drilled at a significant impact to BLM lands. Oil & gas drilling success at Jonah reflects the value of 3D geophysical data. The positive financial income for both the State and Federal governments is publicly available. Ninety-nine percent of the BLM and State minerals within our 3D are leased to exploration companies who have paid for the right to evaluate their leases. This 3D project is non-exclusive and will be available to all explorations companies thereby eliminating the need for multiple 3Ds over the same area.

In conclusion, while Veritas Land Surveys believes helicopter transported drilling is possible, we do not believe the impact to BLM or State lands will be reduced. In fact more equipment will spend more time on BLM land as a result of not using the vibroseis method. Heli-drilling will quadruple costs and render this project non economic. Our participants will not bear the additional costs and therefore the project will be terminated. Veritas would lose over \$1,000,000 already invested in surveying and archeology over approximately 144 square miles to date.

Regards,

Richard L. Trevino
Veritas Land Surveys

APPENDIX C
Project Reclamation and Reseeding Guidelines

Areas disturbed by seismic activities would be evaluated in the field by the BLM Authorized Officer and a Veritas representative to determine the need for restorative re-vegetation at the earliest mutual convenience, upon completion of the project.

In general (based on PAPA EIS ROD guidelines, pp. A.27-30):

Disturbed areas where major compaction has occurred would require scarification or disking to loosen subsoil.

Certified weed-free straw or other mulch may be applicable where erosion potential is deemed likely.

Planting would occur between September 15 and the time of ground freeze or snow cover, or in the Spring prior to May 30. Seed must be certified weed-free. Pounds of seed specified in the mix are based on weight of pure live seed (PLS). The total 34 pounds of mixed pure live seed are to be applied to one acre. This application rate is double that for drilled seed, based on the assumption that the seed would be broadcast and raked in by hand.

The basic seed mix below would be used or modified as directed by the Authorized Officer. Native species which would be considered include bluebunch wheatgrass, streambank wheatgrass, bottlebrush squirreltail, needle-and-threadgrass, and big sagebrush. The WGFD recommends that shrub species be considered in seed mixtures (ibid.).

Seed should be broadcast as uniformly as possible, and incorporated in the soil to an optimum depth of 0.5 inch with hand rakes.

RECOMMENDED GENERAL SEED MIXTURE:

<u>Species</u>	<u>lbs PLS per ac</u>
Critana thickspike wheatgrass	8
Rosanna western wheatgrass	8
Indian ricegrass	8
Bitterbrush	2
Scarlet globe mallow	2
Winterfat	4
Four-wing saltbush	2
 TOTAL	 34

APPENDIX D
Affected Grazing Permittees

Pinedale Field Office

South Desert Allotment

Tolton, Tim & Taran

William Mayo
Rees, Gary & Jennifer
C and D Enterprises, LLC
Miller L. & L. Co.

Sand Draw Allotment

Gros Ventre Investment Co.

William Mayo
Rick Ditton

Alkali Draw Allotment

Wardell, Martin JR., et al.

Wardell, Martin and Son

Rock Springs Field Office

Eighteen Mile Allotment

Big Sandy and Green River
Livestock Co.

Sublette Allotment

G&E Livestock Co.

Figure Four Allotment

Frank Fear Cattle Co

Midland Dunton Sheep Company

Jones, Bruce and Margret

Julian Land & LVST. Corp.
Roberts Ranch Partnership
Jon Child
W & M Thoman Ranches, LLC
Argyles' Ranch, Inc.

Grey's River Livestock Company

Midland Dunton Sheep Company

C&D Enterprises, LLC

APPENDIX E
Raptor/Sage Grouse and Big Game Exception Criteria

Criteria to Consider for Exceptions to Seasonal Restrictions for Raptors/Sage Grouse

REQUESTER: _____ DATE OF REQUEST: _____		
PROJECT NAME: _____		
REQUESTED DATE(S) OF EXCEPTION: _____		
ACTIVITY PROPOSED: _____		
LAST DATE OF FIELD EXAM: _____ GIS/ARCVIEW MAP REVIEWED: <u>YES</u> <u>NO</u>		
General Considerations - Requests for Exceptions		Comments
Are factors leading to inclusion of the sage grouse/raptor seasonal restriction still valid?		
What action is the request for an exception for?		
Dates of the proposed exception?		
Criteria for Lek or Nesting Habitat/Location/Topography		Comments
Birds and type	present or absent	
Wintering Areas	yes, no	
Nest or lek location		
Topographical features		
Nest or Lek Active	yes, no, unknown	
Nest chronology of species		
Timing		Comments
Early or late in breeding/nesting season		
Kind of and length of disruptive activity		

RECOMMENDED ACTION: Based on the above analysis, I recommend the exception be:

Approved: _____

Denied: _____

Wildlife Biologist

Date: _____

The exception is: Approved: _____

Denied: _____

Authorized Officer

Date: _____

Criteria to Consider for Big Game Exceptions to Seasonal Restrictions

REQUESTER: _____ DATE OF REQUEST: _____	
PROJECT NAME: _____	
REQUESTED DATE(S) OF EXCEPTION: _____	
ACTIVITY PROPOSED: _____	
LAST DATE OF FIELD EXAM: _____ GIS/ARCVIEW MAP REVIEWED: <u>YES</u> <u>NO</u>	
General Considerations - Requests for Exceptions	
	Comments
Are factors leading to inclusion of the wildlife restriction still valid?	
What action is the request for an exception for?	
Dates of the proposed exception?	
Criteria for Winter Ranges	Comments
Animal	present or absent
Animal Condition	good, fair, poor
Weather Severity	Comments
Snow Conditions	depth, crusting, longevity
Weather patterns	
Wind chill factors (indication of animal energy use)	
Air temperatures/ variation	
Duration of condition	
Short and long range forecast	
Habitat Condition	Comments
Animal density	low or high
Forage condition	good or poor
Forage Availability	yes or no
Competition with livestock or other wildlife	
Amount of forage - Has livestock use decreased forage	

Suitable/ample forage available and accessible nearby	yes or no	
Site Location		Comments
Likelihood of animal habituating to activity	yes or no	
Presence of thermal, wind cover		
Proportion of winter range affected (ac or %)		
Where site is located within the winter range		
Other activity and effect on the animals		
Timing		Comments
Early or late in winter season		
Kind of and length of disruptive activity		
How much winter is remaining		

RECOMMENDED ACTION: Based on the above analysis, I recommend the exception be:

Approved: _____

Denied: _____

Wildlife Biologist

Date: _____

The exception is: Approved: _____

Denied: _____

Authorized Officer

Date: _____