

NEPA COMPLIANCE SURVEY #326

Project Information	
Project Title: Permanent Borehole Array	Date: 3/29/2011
DOE Code: 6730-020-51147	Contractor Code: 8067-803
Project Lead: Jeanette Buelt	
<p>Project Overview</p> <p>1. Brief project description [include anything that could impact the environment]</p> <p>2. Legal location</p> <p>3. Duration of the project</p> <p>4. Major equipment to be used</p>	<p>The purpose of this project is to test the effectiveness of ION Geophysical's newly designed seismic receivers. A 3rd Party Subcontract Seismic Rig will drill twelve (12) 4" open hole wellbores to a depth of 330' each in a 4 hole array at the following well locations, <u>disturbing no land outside the current drill pads: 38-61-SX-34, 25-SX-3 and 23-1-SX-2</u>. Each of these 12 holes will be loaded with a series of <u>down hole</u> seismic receivers <u>that will be cemented in place in the hole and will be plugged according to WOGCC guidelines</u>. An array of surface receivers will be arranged in a 1' trench between each of the boreholes and a <u>portable</u> data collection device, the trench will then get backfilled to secure the receivers. <u>These drill tailings</u> created during air drilling <u>will be immediately dispersed on location</u> using a rake <u>according to WOGCC guidelines</u>.</p> <p>Three (3) more 4" openhole wellbores will be drilled at the following existing well locations: 61-66-SX-3, 54-66-SX-3 and 22-1-STX-3. Two (2) of them will be drilled to 60', each loaded with 1.1 lb of explosives, then backfilled with a combination of cuttings and benonite <u>in accordance with WOGCC shot hole plugging guidelines (see Appendix 1)</u>. The third wellbore will be drilled to 80', loaded with two (2) 1.1 lb charges at 80' and 60', then backfilled <u>and plugged</u> same as above. These small charges will be used to calibrate the receiver arrays prior to the actual test. <u>Small piles of tailings will be created during the air drilling of the wells, the tailings will be immediately dispersed on location</u> using a rake according to WOGCC guidelines.</p> <p><u>All recording data will be collected through the use of wireless communications rather than surface cables.</u></p> <p>Existing well number 41-2-TPX-3 will be used as the source well for this test. A series of "String Shots" (explosives) will be set off at 5000', 4000', 3000', 2600' and 400' to create seismic events for the receiver and data collection testing phase. At the conclusion of this project, well number 41-2-TPX-3 will be scheduled for Plugging and Abandonment (P&A). <u>See Appendix 2 for client power point slides.</u></p> <p>41-2-TPX-3</p> <p>Approximately 12 days</p> <p>3rd party drilling rig, 3rd party wireline truck and <u>RMOTC</u> workover rig, crane, pump truck, water truck, forklift, <u>and</u> back hoe</p>

Comment [t1]: Who is overseeing this?
What are our ES&H requirements?

The table below is to be completed by the Project Lead and reviewed by the Environmental Specialist and the DOE NEPA Compliance Officer. **NOTE: If Change of Scope occurs, Project Lead must submit a new NEPA Compliance Survey and contact the Technical Assurance Department.**

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2. Legal location	41-2-TPX-3
3. Duration of the project	Approximately 12 days
4. Major equipment to be used	3 rd party drilling rig, 3 rd party wireline truck and <u>RMOTC</u> workover rig, crane, pump truck, water truck, forklift, <u>and</u> back hoe

Comment [11]: Who is overseeing this? What are our ES&H requirements?

Note: Two well locations have been changed from the original NCS.

- 38-61-SX-34 moved to 38-AX-34
- 23-1-SX-2 moved to 85-1-SX-3

Both of the new well locations are pre existing. All work on these well locations will be 50 feet from all power lines and underground piping. The work will also remain within 125 feet of the existing well head.

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Amanda
5.23.2011

Michael J Taylor 5/23/11

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Comment [1]: Who is overseeing this? What are our ES&H requirements?

Each 4 hole array (on existing well locations) will have a small (15-20 bbl) work over / cement pit. These pits are used regularly and are covered under C-EA 2 (CX B5.12).

Anne Theriault
5-11-2011

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Michael J. Taylor 5/13/11

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Water Quality	Impacts Anticipated?			If YES, then complete below
	Yes	No	NA	If the anticipated impact might be unacceptable, recommend mitigation measures:
Does the proposed project present potential for impacts on water resources or water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	These are all existing locations.
Does the project affect surface water quantity or quality under both normal operations and accident conditions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	These are all existing locations.
Does the proposed project affect groundwater quantity or quality under both normal operations and accident conditions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	These are all existing locations.
Will the project area include "Waters of the State?"	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Will the project area require a Corps of Engineers permit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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Geology & Soils	Impacts Anticipated?			If YES, then complete below.
	Yes	No	NA	If the anticipated impact might be unacceptable, recommend mitigation measures:
Does the proposed project present potential for impacts related to geology or soils?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	These are all existing well pad locations. All drilling and / or dirt work will be on existing well pads.
Does the proposed project alter, excavate or otherwise disturb land area consistent with other land use and habitat area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the proposed project likely to impact local seismicity?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	It will be used to verify local seismicity
If the project involved disturbance of surface soils, are erosion and storm water control measures addressed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All dirt work / drilling will be conducted on existing well pad locations. All wells that are drilled for the project will be plugged and abandoned according to WQGCC guidelines (see Appendix 1) .
Air Quality	Yes	No	NA	If the anticipated impact might be unacceptable, recommend mitigation measures:
Does the proposed action present potential for impacts on ambient air quality under both normal and accident conditions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>Tailings will be produced during air drilling which could lead to particulates in the immediate vicinity, however this would not raise particulate levels above normal oilfield operations.</i>
Are potential emissions (gases and/or airborne particulates including dust) outside of the normal scope for oil field operations?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>Tailings will be produced during air drilling which could lead to particulates in the immediate vicinity, however this would not raise particulate levels above normal oilfield operations.</i>
Does the project present risk to human health and the environment from exposure to radiation and hazardous chemicals in emissions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the project subject to New Source Performance Standards?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the project subject to National Emissions Standards for Hazardous Air Pollutants?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the project subject to emissions limitations in an Air Quality Control Region?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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	Impacts Anticipated?			If YES, then complete below.
	Yes	No	NA	If the anticipated impact might be unacceptable, recommend mitigation measures:
Wildlife and Habitat				
Does the proposed action present potential for impacts on wildlife or habitat?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Does the project impact state or federally listed threatened and endangered species?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Human Health Effects				
Does the proposed project present potential for effects on human health? e.g.: Hanta virus, radiological exposure, or chemical exposure (must provide MSDS)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Transportation				
Does the proposed project involve transportation of radiological sources or hazardous materials (including explosives)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Commonly used subsurface seismic and oilfield explosives will be used in this test. There will be no surface explosives. The shot hole rig and wireline companies will provide their standard SOPs for handling and disposal of explosive charges. RMOTC Explosives SOP will also be finalized and followed.
Waste Management and Waste Minimization				
Are pollution prevention and waste minimization practices needed in the proposed project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Does project plan establish procedures in compliance with local, state and/or federal laws and guidelines affecting the generation, transportation, treatment, storage or disposal of hazardous and other wastes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

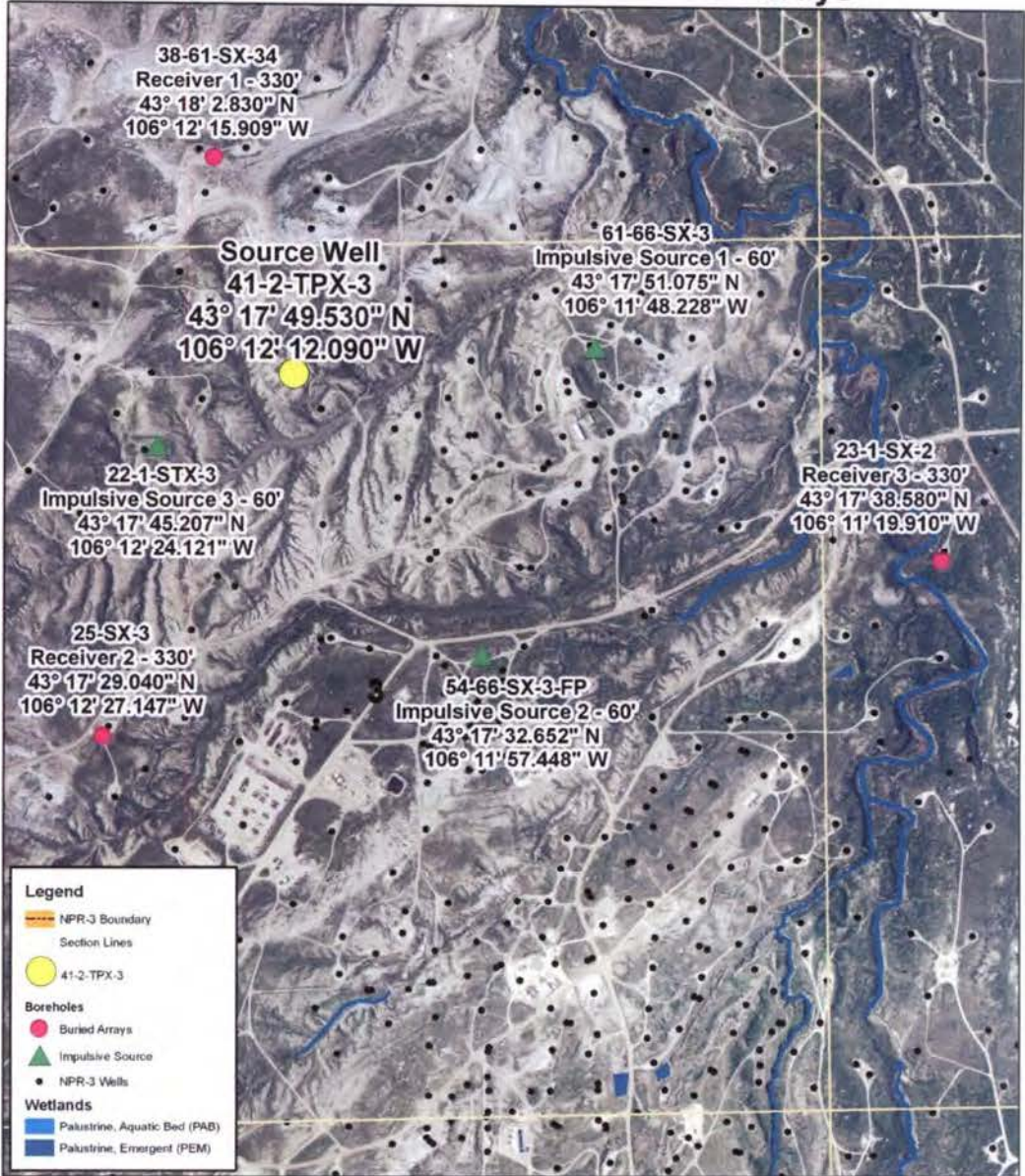
NEPA COMPLIANCE SURVEY

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	Impacts Anticipated?			If YES, then complete below.
	Yes	No	NA	If the anticipated impact might be unacceptable, recommend mitigation measures:
Cultural Impact				
Is there potential for impact on cultural (historic) resources?	<input type="checkbox"/>	X	<input type="checkbox"/>	All project areas are on existing locations
Community Impact				
Will the proposed project introduce significantly adverse auditory, visual, or other impact?	<input type="checkbox"/>	X	<input type="checkbox"/>	
Will the proposed project adversely affect the community's use of public land/resources?	<input type="checkbox"/>	X	<input type="checkbox"/>	
Will the proposed project adversely affect the community's access to private land?	<input type="checkbox"/>	X	<input type="checkbox"/>	
NOTE: Topography Map and Wetlands Map are required to be attached. Attach applicable SOPs for Risk Assessment Level 2 & 3 and specific test procedures.				
Are environmental permits required? If YES, list below:			Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Section below to be reviewed by Environmental Specialist and DOE NCO.				
Adequate Mitigation Measures Provided?		Adequate Mitigation Measures Provided?		
	Yes	No		Yes
Water Quality Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Transportation Impacts	<input checked="" type="checkbox"/>
Air Quality Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Waste Management Impacts	<input checked="" type="checkbox"/>
*Wildlife and Habitat Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cultural Impacts	<input checked="" type="checkbox"/>
Geology and Soils Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Community Impact	<input checked="" type="checkbox"/>
Human Health Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Categorical Exclusion	<input checked="" type="checkbox"/>
Approvals				
Comments and Conditions:	C-EA 2. Work on existing well locations (see B5.12) B5.12 Workover of existing oil/gas/geothermal well B3.11 Outdoor tests, experiments on materials and equipment components, no source, special nuclear, or byproduct materials involved B3.7 Siting/construction/operation of new infill exploratory, experimental oil/gas/geothermal wells			
Contractor ESS&H				Date 4/25/2011
Comments and Conditions:	The action(s) listed in this NEPA Compliance Survey are classes of actions (categorical exclusions) that DOE has determined do not individually or cumulatively have a significant effect on the human environment. The activity fits within a class of actions that is listed in appendix A or B to 10 CFR Part 1021. Based on my review of information conveyed to me and in my possession (or attached) concerning the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1A), I have determined that the proposed action fits within the specified class of actions, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review. Based on my review of information conveyed to me and in my possession (or attached) concerning the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1A), I have determined that the proposed action fits within the specified class of actions, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.			
DOE NEPA Compliance Officer	CXS B3.7, B3.11, & B5.12 			Date 4/20/11

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4D Seismic Permanent Borehole Arrays



4D Seismic Permanent Borehole Arrays			
Author: J Buell	Project Manager: J Buell		
GIS-PRJ-6730 020 51147-2	Date: 03/21/2011	Rev Date:	
WY State Plane / East Central Zone / NAD27		Scale = 1:9,000	

0 500 1,000 2,000 Feet

RMOTC
907 N Paglar, Suite 150
Casper, WY 82601
307-233-4900

Data represented on this map is for planning purposes only. RMOTC makes no warranties as to its accuracy, reliability or completeness. Any use of this data is strictly the responsibility of the user. This is an uncontrolled RMOTC drawing.

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Appendix 1


WYOGCC Plugging and Abandoning Procedure for "Seismic Operations"
WOGCC Rule Book, Chapter 4, Section 6 (Geophysical/Seismic Operations), and Part g
(Plugging), Subsection v (drilling with air), and page 4-25:

(v) When drilling with air only, and in completely dry holes, plugging may be accomplished by returning the cuttings to the hole, tamping the returned cuttings to the above referenced depth of three feet (3'), and setting the non-metallic plug topped with more cuttings and soil as per subsection (v). Digging a second hole to fill the shot hole above the non-metallic plug, and scraping the surface top soil to fill the shot hole are prohibited. Scraping the surface to acquire cuttings to fill the shot hole is allowed. A small mound will be left over the hole for settling allowance.

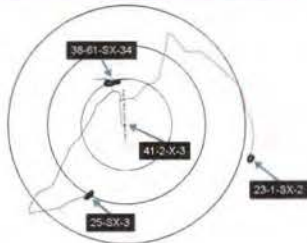
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Appendix 2

Proposed Locations
Receiver Boreholes, Impulsive Sources
RMOTC Test Site
March 16, 2011, V2



Preferred Locations for Buried Arrays



ION

Near Offset Borehole Candidate



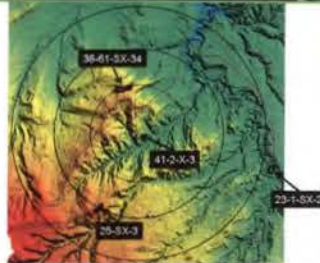
ION

Mid Offset Borehole Candidate



ION

Preferred Locations for Buried Arrays



ION

Near Offset Borehole Candidate

- Well Name=38-61-SX-34
- Geometry=Point location: 800524.40 961865.30 (Lat/Lon: 43° 18' 2.8298" N, 106° 12' 15.9090" W)
- Total Depth=669
- API Number=490251116700
- Location=TWP: 38 N - Range: 78 W - Sec. 34
- Road Distance to 41-2-X-3: 1576 ft

ION

Mid Offset Borehole Candidate

- Well Name=25-SX-3
- Geometry=Point location: 799739.50 958433.10 (Lat/Lon: 43° 17' 29.0399" N, 106° 12' 27.1468" W)
- Total Depth=616
- API Number=490251068900
- Location=TWP: 38 N - Range: 78 W - Sec. 3
- Road Distance to 41-2-X-3: 8068 feet

ION

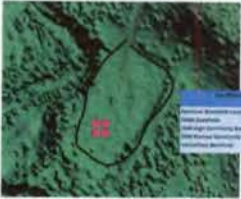
Far Offset Borehole Candidate

- Well Name=23-1-SX-2
- Geometry=Point location: 804699.00 959466.50 (Lat/Lon: 43° 17' 38.5797" N, 106° 11' 19.9098" W)
- Total Depth=2831
- API Number=490252264200
- Location=TWP: 38 N - Range: 78 W - Sec. 2
- Road Distance to 41-2-X-3: 8970 feet

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Far Offset Borehole Candidate



Well Name	AP#	AP#
61-66-SX-3	490251127600	490251127600
54-66-SX-3-PP	490251081400	490251081400
22-1-STX-3	490251101100	490251101100

ion

Impulsive Sources

Impulsive Source Location 1

- * Nearby Well:
 - Well Name=61-66-SX-3
 - Geometry=Point location: 802567.50 960703.00 (Lat/Lon: 43° 17' 51.0753" N, 106° 11' 48.2282" W)
 - API Number=490251127600
 - Location=TWP: 38 N - Range: 78 W - Sec: 3

ion

Impulsive Sources

Impulsive Source Location 2

- * Nearby well:
 - Well Name=54-66-SX-3-PP
 - Geometry=Point location: 801931.00 959828.50 (Lat/Lon: 43° 17' 32.6520" N, 106° 11' 57.4481" W)
 - API Number=490251081400
 - Location=TWP: 38 N - Range: 78 W - Sec: 3

ion

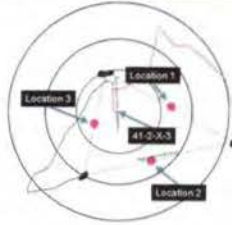
Impulsive Sources

Impulsive Source Location 3

- * Nearby well:
 - Well Name=22-1-STX-3
 - Geometry=Point location: 799941.20 960072.90 (Lat/Lon: 43° 17' 45.2068" N, 106° 12' 24.1212" W)
 - API Number=490251101100
 - Location=TWP: 38 N - Range: 78 W - Sec: 3

ion

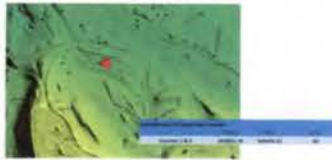
Preferred Locations for Impulsive Sources



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Impulsive Sources

Impulsive Source Location 1



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Impulsive Sources

Impulsive Source Location 2



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Impulsive Sources

Impulsive Source Location 3



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