

# **Marys River Oil and Gas Exploration Project Master Surface Use Plan of Operations**

**Elko County, Nevada**

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**Presented to:**

**Bureau of Land Management  
Wells Field Office  
3900 E. Idaho Street  
Elko, Nevada 89801**

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# Marys River Oil and Gas Exploration Project Master Surface Use Plan of Operations

## Introduction

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The following Exhibits are attached to this Master Surface Use Plan of Operations (MSUPO):

Exhibit "A"	Project Map
Exhibit "B"	List of Proposed Well Pads
Exhibit "C"	Transportation Plan
Exhibit "D"	Typical Drawings
Exhibit "E"	Fire Prevention Plan Measures
Exhibit "F"	Best Management Practices for Sage-Grouse
Exhibit "G"	Master Drilling Plan
Exhibit "H"	Narrative of Completion and Stimulation
Exhibit "I"	Field-Wide Stormwater Pollution Prevention Plan
Exhibit "J"	Wildlife Monitoring Report
Exhibit "K"	Memorandum of Understanding – Aqua Program
Exhibit "L"	Marys River Integrated Weed Management Plan
Exhibit "M"	Marys River Reclamation Plan

Noble Energy, Inc. (Noble) proposes to conduct an oil and gas exploratory drilling program in the Marys River Project Area which includes drilling, completion, production, and abandonment of a maximum of 20 wells on Bureau of Land Management (BLM) administered lands and private lands located approximately 4 miles northwest of the town of Wells in Elko County, Nevada. Livestock grazing is the primary existing surface use. Noble has identified 33 potential well pad locations; however, because this is an exploration program, no more than 20 well pads will be constructed over a two-year period or more.

During the first year, Noble proposes to either construct two well pads (each well pad with one production well and one seismic listening well) or four well pads with one production well on each pad. The remainder of the well pads and wells (up to 20 well pads and 20 wells) would be constructed during the following years. During the following years, up to four wells may be drilled as horizontal wells depending on the results of other well tests.

During the fall of 2012, Noble conducted a 3D Seismic program within the Marys River Project Area. Noble will use the results of the seismic program, previous 2D geothermal seismic programs, and previous well results from the Project Area to select locations that minimize the likelihood of encountering drilling hazards and increase the understanding of faults which may act as a conduit for fluids in the reservoir. The seismic data will also be used to select locations which allow for separation of the hydrocarbon bearing zones from any potential water resources of the state.

Noble anticipates that 12 wells could produce up to 250 barrels of oil per day and that 8 wells could produce up to 100 barrels of oil per day. A small amount of natural gas may be produced with the oil which will run the production equipment. Excess natural gas will be flared in accordance with NTL-4A (Royalty or Compensation for Oil and Gas Lost).

The lands include 13,410 acres (34.0 percent of the Project Area) of federal surface and federal minerals administered by the BLM Elko District, Wells Field Office, 2,606 acres (6.6 percent) of private surface with BLM-administered subsurface mineral rights, 15,335 acres (38.9 percent) of private lands and minerals, and 8,093 acres (20.5 percent) of federal surface with private minerals for a total of 39,444 acres. The project will comply with all applicable Federal Onshore Oil and Gas Orders. Noble is proposing several project design features, plans, and Best Management Practices (BMPs) to mitigate impacts to sensitive resources as provided in this MSUPO.

One drilling rig and one completion team will be required during the first year, and possibly two drilling rigs and one completion team may be required during the second year. A Master Drilling Plan is provided in Exhibit "G" and a Narrative of Completion and Stimulation is presented in Exhibit "H". Depending on the well pads selected for exploration, the proposal also includes possibly upgrading up to 20.5 miles of existing roads and possibly constructing up to 5.4 miles of new local roads and up to 7.2 miles of new resource roads.

### **Well Site Locations**

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The results of the Marys River Oil and Gas Exploration Program will determine whether economic quantities of oil can be produced in the Marys River Area. The targeted formations will be the Humboldt, Indian Well, and Elko formations. The range in depths is variable given the basin shape, subsurface dip, and faults as determined via 3D Seismic imaging as well as the multiple formations under investigation. The target zone for the wells is a true vertical depth of between 7,000 and 16,000 feet. Targets for possible horizontal wells will be determined by the results of the vertical/directional wells. Fewer wells may be drilled during exploration than are proposed due to well test results and geologic and market uncertainties. Well locations will be determined utilizing 3D Seismic data. Locations will be selected to minimize the likelihood of encountering faults and/or drilling hazards while still targeting suitably productive zones.

If drilling results in an unproductive well, the well will be plugged and abandoned in compliance with the Federal Onshore Oil and Gas Orders and the State of Nevada regulations within 90 days of well completion, weather permitting.

### **Surface Use Plan**

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#### **1. Existing Roads**

- A. The Marys River Area is accessed by several existing roads, including Interstate-80, U.S. highways 40 and 93, Nevada State Route (SR) 230 (Starr Valley Road), Elko County roads 753 (Deeth-O'Neil Road) and 754 (Metropolis Road), 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> streets and Humboldt Avenue in Wells, and unnamed BLM and private roads adjacent to and within the Project Area. A Transportation Plan identifying existing roads that will be used to access the Project Area is included as Exhibit "C."
- B. Existing roads will be maintained in conditions as good as or better than conditions that existed prior to commencement of the exploration program. All equipment and vehicles will be confined to the routes shown on Map 1 in Exhibit "A". Maintenance of the access roads will continue until abandonment and reclamation of the well pads are completed.

## 2. New or Upgraded Access Roads

- A. The well pads selected for exploration will determine which existing roads will be upgraded and which new roads will be built. The Transportation Plan shows the locations of potential roads that will need to be upgraded or constructed to access the well pads (see Exhibit "C"). Upgrading of existing local roads and construction of new local roads will generally require a 39-foot width for construction with a final road width of 29 feet to include 5 feet for ditches (2.5 feet on either side) and a 24 foot running surface for the road (see Figure 1 in Exhibit "D"). Construction of new resource roads will generally require a 31-foot width for construction with a final road width of 21 feet with a 16 foot running surface for the road (see Figure 2 in Exhibit "D"). The roads will be crowned, ditched, and graveled in accordance with the Gold Book Standards and BLM Road Manual 9113. In addition, there are up to seven truck turnouts, each of which will require 0.14 acre.
- B. After well completion, traffic to each well site will depend on well production. Approximately two oil trucks and one water truck will visit each well producing 250 barrels of oil per day, and one oil truck per day and one produced water truck every other day will visit each well producing 100 barrels of oil per day. Additional traffic to each well site will include one pumper truck per day and one maintenance truck approximately 10 days per year. Well service trips could be rescheduled or postponed during periods of wet weather when vehicle travel could cause rutting.
- C. All equipment and vehicles will be confined to the travel routes laid out on Map 1 in Exhibit "A" unless otherwise approved by the BLM and applied for by Noble.
- D. Dust will be controlled as necessary on roads during construction and drilling through one or more of the following measures:
- Watering of disturbed areas and dirt roads on a regular basis;
  - Pre-watering of areas to be disturbed;
  - Graveling of roadways, storage areas, and staging areas;
  - Following posted speed limits and not exceeding 20 miles per hour where no speed limit is posted;
  - Applying water sprays on material storage piles on a regular basis;
  - Ceasing construction when high winds inhibit dust control;
  - Possibly using other dust suppressants such as DirtGlue, magnesium chloride, and tree sap. If used, magnesium chloride would not be applied within 100 feet of a riparian area; and
  - Re-vegetating reclaimed areas.

## 3. Location of Proposed Wells

All proposed wells will be on the proposed pads shown on Exhibit "A" and listed in Exhibit "B".

#### **4. Location of Proposed Production Facilities**

- A. The first six well pads will be up to 7 acres in size during drilling and completion (see Figure 3 in Exhibit “D”). The next 14 well pads will be up to 6 acres during drilling and completion (see Figure 7 in Exhibit “D”). After interim reclamation, production well pads will be up to 5 acres, with an average of 3.5 acres per pad (see Figures 5 and 9 in Exhibit “D”). All areas will be reclaimed and reseeded after operations are completed (final reclamation).
- B. Typical production pad drawings indicating the location of production facilities are shown on Figures 4 and 8 in Exhibit “D”.
- C. Equipment and facilities located on the production pad will include the wellhead, pumping unit, vertical treater, re-circulating pump, one gas flare, a 2-phase separator building, line heater, generator, four 400-bbl oil tanks, two 400-bbl water tanks, a fuel tank, and could include a water well. If two wells are located on a single well pad, production equipment will be shared to the greatest extent possible.
- D. Other than water well locations, no off-pad ancillary facilities are planned during the construction/drilling or operation/production phases.
- E. All facilities or structures will be painted a natural color in a non-reflective finish (or BLM Standard Environmental Color if specified by the BLM) that blends with the background landscape. In cases of split estate associated with federal minerals, the surface equipment will be painted in accordance with BLM requirements unless the private surface owner requests differently.
- F. Lighting during drilling and completions will be designed and operated in ways that reduce the effects of project-related light on the natural environment. As identified by the International Dark Sky Association, the following “dark sky” lighting practices will be used during project construction:
  - The use of low-glare lighting equipment;
  - Shielding security lighting so that the majority of light hits the target and does not cause glare;
  - Targeting lower lighting fixtures that face downward and away from adjacent areas; and
  - Hooded and shielded lighting fixtures that face downward and away from adjacent areas.
- G. Permanent lighting during operations will be manually operated by personnel and will include lighting for the valve building, treater house, and load rack area (if 24 hour oil hauling is necessary). Lighting during operations will adhere to the “dark-sky” lighting practices described above.

#### **5. Location and Types of Water Supply**

- A. Water wells will be drilled at well pad locations to provide water for drilling, completion, and dust control. Noble anticipates that on-site water wells will

provide approximately 70 percent of the water required for drilling, completion, and dust control. On-site water supply wells from one pad may be used to supply water for drilling, completion, and dust control on subsequent pads that are located in close proximity. Water wells will be drilled to an approximate depth of 500 feet, and will remain open until Noble determines that no additional wells will be drilled on the pad. Water supply wells on private land could be used by the landowner during Noble's activities and turned over to the landowner for agricultural use once Noble's activities conclude. All water uses will be permitted through the Nevada Division of Water Resources (NDWR) and/or Nevada Division of Environmental Protection (NDEP), as appropriate.

In order to provide the water required during construction of access roads and well pads, water wells may also be drilled on one or more of the proposed pad locations that are located along a collector road. If this occurs, water may be transferred from the pad with the water well to the pad under construction via a flexible fiber line similar to a fire hose. The line would run beside the road ditch between the water well and the drilling rig water storage tank. Pads with only a water well and storage tank would require approximately 1 acre of disturbance. The pad size would increase if the pad is selected for a production well. In either case, the pad would be one of the 20 well pads included as part of Noble's proposal.

Noble will permit ground water wells in accordance with applicable federal and state law for industrial use. Subsequent to use for industrial purposes, the landowner may seek to use the well for stock watering or other lawful agricultural beneficial use(s).

- B. Noble expects that water sources located outside the Project Area will provide approximately 30 percent of the water needed for drilling, completion and dust control, and all of the water required by temporary on-site housing for drilling workers. Off-site water requirements will be supplied by a water utility; the cities of Wells and Elko have both declared their ability and willingness to sell water. Water will be transferred for use in drilling by tanker truck over existing roads.
- C. **Water Use During Construction.** Anticipated water use for drilling includes approximately 10,000 barrels of water to drill one vertical/directional well and approximately 30,000 barrels to drill one horizontal well. Well completion is expected to require approximately 20,000 barrels of water for each of the first four vertical/directional wells and approximately 200,000 barrels for one horizontal well. Based on knowledge gained during the first year of construction, Noble anticipates decreasing the water required to complete a vertical/directional well to 13,000 barrels with a goal of 6,000 barrels per well. Table 1 shows the estimated water requirements to drill and complete a single well. Actual water volumes used during drilling and completions will depend on the depth of the well, length of horizontal sections, and any losses that might occur.

**Table 1**  
**Estimated Water Requirements to Drill and Complete a Single Well**

<b>Construction Activity</b>	<b>Drilling (barrels)</b>	<b>Completion (barrels)</b>
Vertical/Directional Well	10,000	20,000
Horizontal Well	30,000	200,000

Dust control is expected to require 80 barrels of water per day per mile of unpaved road surface. Based on the estimated number of road miles required to access well pads being constructed, Noble expects that dust suppression will require approximately 973 barrels of water per day in the first year of construction and 3,891 barrels of water per day in the second year of construction. The actual volume of water required for dust control will depend on climatic conditions and will be lower if additional dust control methods such as those described above in Section 2.D. are used.

Noble will provide temporary on-site accommodations for 30 drilling workers on each well pad being drilled. Details of the temporary on-site accommodations are discussed below in Section 11. Noble expects that water use at the temporary on-site accommodations will average 50 gallons per worker per day. Because one drill rig is expected to be used in the first year of construction and two drill rigs are anticipated for the second year, water use at the temporary on-site accommodations will approximate 36 barrels per day during the first year and 72 barrels per day during the second year of construction.

Table 2 summarizes Noble's expected water use requirements during construction. Approximately 243,879 barrels are expected to be required during the first year of construction and approximately 1,773,015 barrels are expected to be required during the second year.

**Table 2**  
**Estimated Annual Water Requirements during Construction**

<b>Year and Project Activity</b>	<b>Total Water Required (Barrels)</b>
<b>Year 1</b>	
Drilling <sup>1</sup>	40,000
Completions <sup>1</sup>	80,000
Dust Control <sup>2</sup>	116,736
On-Site Worker Housing <sup>3</sup>	7,143
<b>Total Water Use – Year 1</b>	<b>243,879</b>
<b>Year 2</b>	
Drilling <sup>4</sup>	240,000
Completions <sup>4</sup>	1,040,000
Dust Control <sup>5</sup>	466,944
On-Site Worker Housing <sup>6</sup>	26,071
<b>Total Water Use – Year 2</b>	<b>1,773,015</b>
<sup>1</sup> Based on four vertical/directional wells drilled and completed in Year 1. <sup>2</sup> Based on 80 barrels of water per mile applied to 12 miles of unpaved roads (miles associated with construction of 4 wells) for 120 days. <sup>3</sup> Based on 35.7 barrels of water per day consumed at one drilling location for 200 days. <sup>4</sup> Based on 16 vertical/directional wells and four horizontal wells drilled and	

completed in Year 2.

<sup>5</sup> Based on 80 barrels of water per mile applied to 49 miles of unpaved roads (miles associated with drilling 16 wells) for 120 days.

<sup>6</sup> Based on 71.4 barrels of water per day consumed at two drilling locations for 365 days.

- D. **Water Use During Operations.** During the project's operational phase, water may be required for dust control, which will be conducted on an as-needed basis. The volume of water required for dust control will depend on annual climatic conditions. Based on the assumption that 80 barrels of water per mile per day would be applied to 61 miles of unpaved roads for 120 days, up to 583,680 barrels of water could be required per year for dust control. On-site water wells will provide 70 percent of the annual water requirements for dust control (408,576 barrels) and off-site water sources will provide 30 percent (175,104 barrels).
- E. Noble understands the importance of protecting water resources in Nevada. In alignment with this, Noble has entered into a Memorandum of Understanding (MOU) with the Nevada Division of Minerals (NDOM) and the NDEP to study groundwater and hydrologic systems in the Project Area. This Aquifer Quality Assessment Program (Aqua Program) will include a groundwater sampling study and will be conducted by a third party, the Desert Research Institute, a well-respected scientific organization affiliated with the Nevada System of Higher Education. This investigation will address aquifer and hydrologic characteristics, water quantity and quality parameters, and other appurtenant information relevant to the development, use and management of water resources in compliance with established principles and practices employed in hydrology and water resource engineering disciplines. Results will be made public through the NDWR and NDEP. Water well information is collected and managed by the NDWR. The MOU for the Aqua Program outlines the program and is attached as Exhibit "K."
- F. Traffic associated with water supply is described in the Transportation Plan (Exhibit "C").

## 6. Construction Activities

- A. Construction, reclamation, and/or routine maintenance will not be conducted during periods when the soil conditions for construction could lead to impacts to the surrounding environment, or when watershed damage is likely to occur as a result of these activities.
- B. Gravel used during construction will be purchased from a certified weed free commercial facility per BLM requirements.
- C. Approximately 3.5 acres of the 7-acre drilling pad (2.5 acres for 6-acre drilling pads) will be reclaimed and reseeded after drilling and completion.

## 7. Methods for Handling Waste

- A. **Cuttings.** Surface hole cuttings will be drilled with water-based mud and stacked on location during drilling for subsequent use in well pad reclamation. Production hole cuttings will also be drilled with water-based mud and stacked on location for the duration of drilling and completion activities.

Prior to burial and/or incorporation, composite samples per 100 cubic yards of cuttings will be collected and analyzed for BTEX, TPH (GRO/DRO), EC, SAR, pH, PAHs and Metals (As, Ba, Cd, Cr (III), Cr (VI), Cu, Pb, Hg, Ni, Se, Ag, Zn). The results of the analysis will be compared to NDEP soil cleanup standards to determine whether the cuttings can be buried/reincorporated or if further remediation and/or off-site disposal is warranted. Sampling will include potentially acid generating materials. If concentrations exceed NDEP soil cleanup standards and/or background concentrations the cuttings will be transported to an approved waste disposal facility (Clean Harbors located between Wendover, Nevada and Salt Lake City, Utah).

If approved for burial/incorporation, cuttings will be buried on-site at depths greater than 3 feet to avoid potential impacts to plant root zones. Drill cuttings from each well bore are exempt from regulation under Subtitle C of the Resource Conservation and Recovery Act (RCRA) but are still subject to other portions of the Rule.

- B. **Drilling fluids.** Salts and/or chemicals used in the mud system and other drilling fluids will be recycled and reused in the drilling mud system. Noble will utilize pitless or closed loop drilling systems and will not construct reserve pits (see Figures 14 through 16 in Exhibit "D"). Any non-recycled drilling fluids will be land-farmed with the drill cuttings or disposed at an approved facility (Clean Harbors) located between Wendover, Nevada and Salt Lake City, Utah.
- C. **Produced Fluids.** Liquid hydrocarbons and other fluids produced during well completion will be placed in steel tanks on the well location. Any unintentional release of oil, gas, salt water, or other potentially hazardous substances will be cleaned immediately and removed to an approved disposal site (Clean Harbors) located between Wendover, Nevada and Salt Lake City, Utah. Noble may drill a disposal well on one of the 20 selected pads and if so, produced water from the exploration wells would be disposed of in this well. The injection well would be one of the 20 wells included in Noble's proposal. The disposal well will be permitted through the Nevada State Engineer's Office and the NDEP. Produced water, drilling fluids, and all waste associated with exploration and production of crude oil, natural gas or geothermal energy is exempted from RCRA and therefore, the standard RCRA evaluation is not required.
- D. **Sewage.** Portable, self-contained chemical toilets will be sited near the drill rig for human waste disposal. Sewage and gray water from the temporary on-site accommodations will be stored in three 4,000 gallon domestic wastewater holding tanks sited near the modular buildings. Portable toilet and domestic wastewater holding tanks will be pumped and the contents hauled away for disposal at an approved sewage disposal facility on a timely basis. Sewage disposal will be in strict accordance with NDEP rules and regulations regarding sewage treatment and disposal.
- E. **Garbage and Other Waste Materials.** All garbage and non-flammable waste materials will be contained in a self-contained, portable dumpster or trash cage, especially to eliminate attracting ravens to the project site for sage-grouse predator control as described in the Best Management Practices (BMPs) (Exhibit

“F”). At the end of drilling and completion, or as needed, the accumulated trash will be hauled off-site to a NDEP approved sanitary landfill.

F. **Debris.** Immediately after removal of the drilling rig, all debris and other waste materials not contained in the trash cage will be cleaned and removed from the well location. No potentially adverse materials or substances will be left on location.

G. **Hazardous Materials Management.**

1. All drilling wastes identified as hazardous substances by the Comprehensive Environmental Response Compensation Liability Act (CERCLA) will be removed from the drilling location and not reused at another location. Any such hazardous substances will be disposed at a hazardous waste facility approved by the U.S. Environmental Protection Agency (EPA).
2. Noble and its contractors will comply with all applicable Federal, State, and local laws and regulations, existing or hereafter enacted or promulgated, with regard to any hazardous material, as defined in this paragraph, that will be used, produced, transported or stored on the oil and gas lease, “Hazardous material” means any substance, pollutant or contaminant that is listed as hazardous under the *CERCLA of 1980*, as amended, 42 U.S.C. 9601 et seq., and its regulation. The definition of hazardous substances under CERCLA includes any “hazardous waste” as defined in the *Resource Conservation and Recovery Act (RCRA) of 1976*, as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous material also includes any nuclear or nuclear by-product material as defined by the *Atomic Energy Act of 1954*, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101 (14), 42 U.S.C. 9601 (14) nor does the term include natural gas.
3. No hazardous substances or wastes will be stored on the location after completion of the well.
4. Chemicals brought to location will be on the Toxic Substance Control Act (TSCA) approved inventory list.
5. All hazardous substances brought to the location will have a Material Safety Data Sheet (MSDS), and will be properly handled so as to not cause harm to people or the environment.
6. All MSDSs will be kept on location until the hazardous material is properly disposed of in accordance with federal law.
7. Noble will maintain a file, per 29 CFR 1910.1200 (g) containing current MSDSs for all chemicals, compounds, and/or substances which will be used during the course of construction, drilling, completion, and production operations for this project. Hazardous materials (substances)

which may be found at the site may include drilling mud and cementing products which are primarily inhalation hazards, fuels (flammable and/or combustible), materials that may be necessary for well completion/stimulation activities such as flammable or combustible substances and acids/gels (corrosives). The opportunity for Superfund Amendments and Reauthorization Act (SARA) listed Extremely Hazardous Substances (EHS) at the site is generally limited to proprietary treating chemicals. All hazardous and Extremely Hazardous Substances and commercial preparations will be handled in an appropriate manner to minimize the potential for leaks or spills to the environment.

8. All undesirable events (fires, accidents, blowouts, spills, discharges) as specified in Notice to Lessees (NTL) 3A will be reported to the BLM Wells Field Office. Major events will be reported verbally within 24 hours, followed by a written report within 15 days of their occurrence. "Other than Major Events" will be reported in writing within 15 days. "Minor Events" will be reported on the Monthly Report of Operations and Production (Form 3160-6).
9. All installed production facilities with the potential to leak or spill oil, condensate, produced water, glycol, or other fluid which might be a hazard to public health or safety will be placed within an appropriate impervious secondary containment structure that will hold 110 percent of the capacity of the largest single container for 72 hours. Secondary containment will consist of corrugated steel containment berms or earthen berms. Compaction and construction of earthen berms will be performed to prevent lateral movement of fluids through the utilized materials. All loading lines will be placed inside the containment berm.
10. Hydrogen Sulfide (H<sub>2</sub>S) is not expected to be present or released. Noble drilled two wells on private land in Elko County and no detectable H<sub>2</sub>S down to 30 ppm (limit of mass spectrometer analysis of mud gas) was found in either well. Based on a review of well histories and logs (Tuano Draw well and the Jiggs federal wells) in Elko County, there is no indication of H<sub>2</sub>S. Gas chromatograph results of drilling mud from the isotube detected no H<sub>2</sub>S. Any natural gas produced will be tested for H<sub>2</sub>S content.

## **8. Well Site Layout**

Typical drilling pad drawings are shown in Figures 3 and 7 in Exhibit "D" for a 7-acre pad and 6-acre pad, respectively. The 7 acre pads will be approximately 535 feet by 555 feet and the 6 acres pads will be approximately 500 feet by 510 feet. The estimated size for the well pads will accommodate cuts and fills, topsoil storage, stormwater control BMPs, and a water well.

## **9. Plans for Surface Reclamation**

- A. Rat and mouse holes will be backfilled and compacted from bottom to top immediately upon release of the completion rig from the location.

B. Producing Operations:

1. Backfilling, leveling, and re-contouring are planned as soon as possible after cessation of drilling and completion. Waste and spoil materials will be disposed immediately upon cessation of drilling and completion.
2. For production, fill slopes will be reduced from a 1.5:1 slope to a 3:1 slope and cut slopes will be reduced from a 2:1 slope to a 3:1 slope by pushing the fill material back up into the cut (see Figures 5 and 90 in Exhibit "D").
3. Upon completion of backfilling, leveling, and re-contouring, all disturbed surfaces not needed for future operations will be scarified to a depth of one (1) foot and the stockpiled topsoil will be evenly distributed to a depth of six (6) inches over the reclaimed area(s).
4. Prior to commencement of seeding, the seedbed will be prepared by disking on the contour to a depth of four (4) to six (6) inches, leaving no depressions that would trap water or form ponds.
5. If conditions permit, the restored portions will be left rough and broadcast seeded. All disturbed surfaces (including the access road and well pad areas) will be re-seeded using a seed mixture recommended by the BLM or surface owner.
6. If the drilling method of seeding is utilized, it will be drilled on the contour with a seed drill equipped with a depth regulator in order to ensure even depths of planting. Seed will be planted between one-quarter (1/4) and one-half (1/2) inch deep, with shrub seeds planted in rows separate from the grass seeds. In this case, the bins on the outside rows of the drill will be utilized for shrub seeds.

The broadcast method may be used instead of the drilling methods. If this is the case, the surface will be left in a rough condition and the seed mixtures will be doubled. The preferred method will be approved by the BLM at the time of reclamation.

7. Fall seeding will be completed after September 1 and prior to ground frost. If applicable, spring seeding will be completed after the frost has left the ground and prior to May 15. The seeding will be repeated until the BLM Authorized Officer (AO) determines that a satisfactory stand is achieved. The first evaluation of growth will be made following the completion of the first growing season. Re-seeding activities are considered best in the fall, unless requested otherwise by the BLM AO or surface owner.
8. Mulching may be required on soils with low reclamation potential; where mulching is deemed necessary, a certified weed free straw or hay mulch will be crimped into the soil at an application rate of 2 to 4 tons per acre. Mulch may be applied by blowers, spreaders, or by hand. The mulch strand lengths will be long enough to be anchored by crimping. The

mulch will be crimped to a depth of 2 to 3 inches. The mulch will be spread uniformly over the area so that at least 75 percent of the surface is covered.

C. Abandoned Well Locations

1. Upon final abandonment of the well location, gravel will be removed from the access road surface and well location (as directed by the BLM AO), water diversion installed as needed, and both the access road and well location will be restored to approximately the original ground contour(s) by pushing the fill material back into the cut and up over the backslope.
2. No depressions will be left that would trap water or form ponds. All disturbed surfaces (including the access road and well pad areas) will be re-seeded and re-vegetated sites will be monitored to ensure that desired species are thriving and invasive/noxious weeds are not present.

## 10. Surface Ownership

Within the Marys River Project Area, 54.5 percent of the surface is under the administrative jurisdiction of the BLM and 45.5 percent of the surface is under private ownership (see Map 1 in Exhibit "A").

## 11. Other Information

### Land Surveys

- Well pad locations have been staked. A survey of the proposed access roads and well pad locations will be completed by a registered professional land surveyor. A preliminary center stake survey with access roads by a professional land surveyor has already been completed on federal lands and private lands with federal minerals.

### Cultural Resources

- A cultural resource inventory was conducted in accordance with applicable state and federal requirements on lands administered by the BLM and on private lands where landowner permission was obtained. A Class III Cultural Inventory Report was submitted to the BLM on December 12, 2012 with a recommendation of no historic properties affected for the Marys River Oil and Gas Exploration Project.
- If unknown cultural resources are found during operations, Noble will implement an Unanticipated Discovery Plan for Cultural Resources, which includes immediate stoppage of all work within thirty (30) meters of the discovery as directed by the BLM and immediate notification of the BLM AO.
- Prior to commencement of operations, Noble will inform all employees and contractors through job site safety orientations about compliance requirements associated with the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, the Paleontological Resources Preservation Act, and the National Historic Preservation Act.
- Noble will suspend all operations that disturb such materials and immediately contact the BLM AO. Operations will not resume until the BLM AO issues authorization to proceed.

### Weed Control

- Noble will be responsible for weed control on disturbed areas within the exterior limits of the Project Area and will consult with the BLM AO and/or local authorities for acceptable weed control measures. Noble will follow the Marys River Integrated Weed Management Plan which includes measures for prevention, monitoring, and treatment of noxious weeds. (Exhibit "L"). A weed control plan for individual well pads will be submitted with each Application for Permit-to-Drill (APD).

## Wildlife

- Block surveys for wildlife and vegetation were completed from March 1 to April 15, 2012 throughout the entire Project Area. The Wildlife Monitoring Report for Exploration Activity in the Mary's River Project Area was submitted to the BLM for review and comment on November 1, 2012 (Exhibit "J"). Greater sage-grouse winter concentration surveys and lek attendance surveys were conducted in 2013.
- Baseline data for bat species within the Project Area were collected in August 2013 for the purpose of incorporation into Noble's Bird and Bat Conservation Strategy. The survey area for the baseline acoustic bat survey included approximately 39,444 acres of BLM-administered and private lands in the Marys River Project Area.
- Pygmy rabbit surveys were conducted on BLM-administered lands. Vegetation types, wetlands, large game species, raptors, and general wildlife observations were also recorded. The results of the biological surveys were utilized to adjust proposed well pad locations to minimize effects to pygmy rabbits.
- Where proposed disturbance is within 100 feet of a pygmy rabbit burrows, the area will be brush-hogged or mowed within 72 hours of ground disturbance to encourage pygmy rabbits to leave the area.
- The Wildlife Monitoring Report for Exploration Activity in the Marys River Project Area was submitted to the BLM for review and comment on November 1, 2012.
- Noble will inform employees and contractors through job site safety orientations that harassing (including feeding, approaching, pursuing, or otherwise intentionally disturbing) or shooting wildlife will not be permitted; dogs may not be brought to the Project Area; no firearms will be allowed on-site; and there will be no littering, including trash that was not secured properly and has been dispersed by wind.

## Noise

- Background sound level measurements were conducted for 7 days between April and mid-May, 2013 at each of three greater sage-grouse leks in the Project Area to collect a full spectrum of natural and human-caused noise.
- Noise measurements were collected in the Lamoille Valley in September 2013 for the drilling rig to be used in the Marys River Project Area. The noise measurements were used to develop noise contours indicating potential noise levels at each proposed well pad and extension of the noise contour at greater sage-grouse leks in the Marys River Project Area.

## Visual and Auditory

- A visual and auditory assessment of the California National Historic Trail (CNHT) and a visual assessment of the Central and Southern Pacific Railroad (CSPRR)

were conducted within the Project Area to identify potential adverse visual and auditory impacts to the CNHT and potential visual impacts to the CSPRR and to make recommendations regarding mitigation of adverse effects or adverse impacts.

#### Soils and Revegetation

- No truck traffic will be operated during periods of, or in areas of, saturated ground when surface rutting could occur.
- Noble will follow the Marys River Reclamation Plan (Exhibit "M"). Noble will also implement a baseline ecosite vegetation and weed survey for each well pad prior to construction to ensure proper seed mix design which is applicable to ecosites already existing at the location and to ensure protection from erosion due to cattle grazing during interim reclamation.

#### Water Quality

- Noble has prepared a Field-Wide Stormwater Pollution Prevention Plan (SWPPP) in accordance with state regulations and BLM approval (see Exhibit "I"). Noble will also prepare, implement, and follow a Spill Prevention Plan.
- All installed production facilities with the potential to leak or spill oil, condensate, produced water, glycol, or other fluid which might be a hazard to public health or safety will be surrounded by secondary containment adequate to retain at least 110 percent of the volume of the largest vessel with sufficient freeboard/storage for precipitation in the containment area in the event of a release.
- Wellheads, above-ground flowlines, valves, fittings, vessels, and storage tanks will be inspected on a regular basis for any signs of potential failure. Noble maintains a flowline maintenance program for its flowlines.
- Containment areas will be maintained as dry as possible to reduce corrosion on tanks and to maintain maximum containment capacity.
- A system of earthen dikes with crushed rock will be used to control and contain oil spills to prevent escape before cleanup.
- Noble will drill and case wells with multiple stages of cement and steel pipe to protect groundwater resources in accordance with American Petroleum Institute standards (see Figures 11 and 12 in Exhibit "D").
- Noble will clean up diesel, hydraulic fuel, or other spills, including contaminated soils. All spill-related material will be hauled to an approved disposal site.
- Project disturbance will avoid streams, creeks, springs, and wetland areas by 400 feet.
- Fueling will not occur within 400 feet of any riparian areas or standing or flowing surface water including streams, ponds, springs, seeps and stock reservoirs.

#### Fire Prevention Measures

- Fire prevention measures are included as Exhibit "E".

Sage Grouse BMPs

- Best Management Practices for Sage Grouse are included as Exhibit “F”.

Workforce

- Noble estimates that the peak construction workforce will include 130 workers, assuming that two drill rigs and one completion team are in operation. The peak workforce will occur during the second year as well pads and access roads are constructed, water wells are drilled, and production wells are drilled and completed (see Table 3). Noble will provide on-site (well pad) accommodations for drilling workers (see Figures 3 and 7 in Exhibit “D”). This will reduce traffic, minor source emissions, dust, and impacts on wildlife, and increase safety. Once all wells are drilled and completed, the operations workforce will include one pumper, one maintenance worker, one water truck driver for dust control, and up to 19 oil truck drivers and 13 produced water truck drivers, for a peak operational workforce of 35 workers. The actual number of truck drivers will depend on the amount of oil and water produced per well, and the location of produced water disposal (either off-site or in an on-site injection well).

**Table 3  
Estimated Peak Construction and Operations Workforces**

<b>Workforce Category</b>	<b>Peak Number of Workers</b>
<b>Construction</b>	
Well Pad and Road Construction	7
Water Well	4
Drilling <sup>1</sup>	60
Completion <sup>2</sup>	50
Water Truck Drivers <sup>3</sup>	6
Dust Control <sup>4</sup>	1
Interim Reclamation	2
<b>Total Peak Construction Workforce</b>	<b>130</b>
<b>Operations</b>	
Pumper	1
Maintenance Worker	1
Oil Truck Drivers <sup>5</sup>	19
Produced Water Truck Drivers <sup>6</sup>	13
<b>Dust Control<sup>4</sup></b>	<b>1</b>
<b>Total Peak Operations Workforce</b>	<b>35</b>
<sup>1</sup> Based on two drill rigs in operation with two eight-man drilling crews per rig. Additional drilling personnel include site managers, well site consultants, mudloggers, mud engineers, solids control, directional driller, MWD, and active system aeration. <sup>2</sup> Based on one completion rig with 50 workers during hydraulic fracturing. <sup>3</sup> Based on 30 percent of the water used for drilling and completion being delivered in 120 barrel trucks, and 1.5 hours to complete a round-trip for trucks hauling water to the Project Area. <sup>4</sup> Based on 80 barrels of water per mile sprayed from 100 barrel capacity trucks. <sup>5</sup> Based on oil production of 250 barrels per day per well from 12 wells and 100 barrels per day from 8 wells transported in 200 barrel trucks. <sup>6</sup> Based on 100 barrels of produced water per day from wells producing 250 barrels of oil per day and 40 barrels of produced water per day from wells producing 100 barrels of oil per day transported by truck (120 barrel capacity) to Clean Harbors in Utah. As few as four drivers could be required if produced water is disposed in an on-site injection well.	

- Noble estimates that drilling and completion crews (approximately 90 percent of the construction workforce) will consist of non-local workers and that the remainder (approximately 10 percent) of the construction workforce will be local. During operations, Noble expects that the pumper, maintenance worker, and produced water truck drivers will come from the local area. Oil truck drivers are expected to be non-local workers employed by crude oil transportation companies based outside of Elko County. If produced water is trucked off-site for disposal, Noble expects that approximately 45 percent of the operations workforce will be local and that 55 percent will be non-local. If produced water is disposed in an on-site injection/disposal well, approximately 25 percent of the workforce will be local and 75 percent will be non-local.

#### Temporary On-Site Accommodations

- Noble will place 12 self-contained mobile modular buildings that require no foundation or construction on each well pad where a well is being drilled to accommodate well site support services and house approximately 30 drilling workers. Drilling workers will stay in the on-site temporary housing and will not be allowed to leave the Project Area during drilling. This will reduce traffic, minor source emissions, dust, and impacts on wildlife, and increase safety. Without on-site accommodations, peak traffic estimates could include up to 30 additional light vehicles per day per drilling location. The modular buildings will be removed once drilling is complete. Water use at the on-site accommodations will require no water withdrawal or discharge into the Project Area. Noble will obtain a permit from the NDEP Bureau of Water Pollution Control to install three 4,000 gallon domestic wastewater holding tanks. Noble will also obtain a permit from the NDEP Bureau of Safe Drinking Water to operate a public water system, to include five booster pump stations, three 3,135 gallon storage tanks and a distribution system.
- The water systems will provide water for showers, laundry, inside toilets, laboratories, and cooking. Noble will contract with an approved water hauler in the state of Nevada to haul potable water to the storage tanks on the well site and haul wastewater from the pad locations to an approved disposal facility. Drinking water will be brought to the site in 5 gallon containers.

#### BMPs for Erosion and Sediment Control

- BMPs for sediment and erosion control will be accomplished through a combination of construction techniques, vegetation and re-vegetation, and structural features. Construction of a well pad requires the removal of vegetative cover and topsoil that increases peak flood flows, water velocity, and the volume of stormwater runoff. An increase in water runoff volume and velocity results in increased erosion. Erosion reduction and control will be accomplished by using the following erosion control methods. These methods include but are not limited to:
  - Diversion and control of runoff water;
  - Vegetation planting and maintenance;

- Application and maintenance of mulches, blankets, tackifiers, tracking and contouring; and
  - Proper grading techniques.
- Runoff control procedures that will be used to mitigate and reduce the erosive transport forces of stormwater during and after construction of a pad will include but not be limited to the following:
  - Check dams;
  - Earth berms;
  - Culvert protection;
  - Diversion ditches;
  - Slope drains;
  - Rock lined ditch;
  - Mulches, with or without a tackifier;
  - Geotextiles; and
  - Erosion Control Blanket/Turf Reinforcement Matting.
- The control and reduction of sediment contained in stormwater runoff will be accomplished by the use of sediment containment systems. Sediment containment systems are hydraulic controls that allow the deposition of suspended particles by gravity. Sediment controls that will be used to mitigate and control sediments generated from the erosive transport forces of stormwater during and after construction of a pad will include but not be limited to the following:
  - Silt Fence;
  - Straw Bale Dikes/Traps;
  - Straw Wattles;
  - Sediment Traps/Basins;
  - Vehicle Tracking Pads;
  - Continuous Berms;
  - Continuous Berms with Rock Filter, and
  - Slash Berm.

### Hydraulic Fracturing

- Noble will comply with BLM's proposed rule to regulate hydraulic fracturing on public and Indian land. The proposed rule provides for public disclosure of chemicals used in hydraulic fracturing on public and Indian land, strengthen regulations related to well-bore integrity, and addresses issues related to flowback water. The rule has been proposed to provide useful information to the public and to assure that hydraulic fracturing is conducted in a way that adequately protects the environment.
- Noble will participate in FracFocus which is a national hydraulic fracturing chemical registry. It is managed by the Ground Water Protection Council and Interstate Oil and Gas Compact Commission, two organizations whose missions both revolve around conservation and environmental protection. The primary

purpose of the registry is to provide factual information concerning hydraulic fracturing and groundwater protection.

### Drilling and Completion Fluid Additives

- Drilling and completion fluids are custom-engineered to accomplish various objectives, including:
  - Cooling of the bit;
  - Suspension of rock cuttings so they can be circulated out of the boring as it is drilled;
  - Maintaining fluid pressure on intercepted formations to control formation fluids;
  - Pressuring the formation in open hole sections or through casing perforations to generate rock fractures, opening up the connection of formation to the well;
  - Carrying “proppant” particulates, sand, ceramic or plastic, to prop fractures open when the pressure is released, and small rubber balls to block perforations and hold injected fluids outside the casing for a short time; and
  - Carrying other chemicals to “break” the gel suspending the proppant, disinfect the hydraulically fractured zone and retard microbial growth which can sour the well, and flush general chemical residuals.
- Drilling is typically performed with a bentonite mud base, with various viscosity and density-adjusters (such as polymers and barite). Drilling mud will be entirely contained in (“pitless”) tanks at the surface, and fluid and cuttings will be segregated for re-use and disposal. Drilling mud will be displaced from the boring by each separate casing cementing.
- Table 4 provides a tentative list of materials that may be used as completion fluid additives. Option 3 in the table may be used later in exploration if directional wells are drilled. Note that the list of materials does not contain diesel, which was common in fracturing fluids 10 years ago. The only constituent not fully disclosed is a proprietary amine polymer formulation (“KCl substitute”) added in small quantities to augment clay stabilization. All of these constituents are either consumed in the treatment (acid, pH buffers), inert (sand), or biodegradable. Biocide retards microbes which would otherwise grow rapidly in the guar starch, until such time as the fluid can be produced in “flowback” water or displaced and plugged off in a well that is abandoned.

**Table 4  
Tentative List of Materials for Stimulations**

<b>Material</b>	<b>Volume</b>	<b>Description</b>	<b>Purpose</b>	<b>Fate</b>
<b>Option #1: Cross-Linked Gel Sand Frac for Vertical Wells: 5 Stages of 150,000 lbs.</b>				
Water	425,000 gal.	Fresh Water	Fluid basis	Flowback
Sand	35,000 lbs.	100 mesh	Very fine proppant	Inert
Sand	750,000 lbs.	Premium White Sand	Proppant	Inert
Labeled ceramic		Radioactive tracer	Ceramic proppant with trace radioactivity	Low radioactivity
LGC	5 gal/1000g	Liquid Gel Concentrate	Guar (legume) starch	Biodegradable
Breaker	2.5 gal/1000g	Gel Breaker	Encapsulated ammonium persulfate oxidizer	Chemically degradable
HCl	1000 gal.	15% Hydrochloric Acid	Muriatic acid, cleaner and breaker	Neutralized by rock
Corrosion inhibitor	0.5 gal/1000g	In acid solution only	Retards acid attack on steel	Adheres to steel
Citric Acid	50 lbs/1000g	In acid solution only	Sequesters dissolved iron and prevents rust coat	Biodegradable
Ball Sealers	1000 ea.	5/8" diam rubber balls	After frack, plug perfs and hold well pressure	Inert
KCl	2% in Water	Potassium Chloride	Formation clay stabilizer	Sorbed to borehole wall clay
"KCl Substitute"	1 gal/1000g	Proprietary polymer	Clay stabilizer	Biodegradable, and sorbed
Biocide	0.2 gal/1000g	Dibutyl normal propanamine	Disinfectant	Biodegradable
Cross Linker	2.25 gal/1000g	Borate X-linker with caustic	Forms gel in guar starch	Disperses at neutral pH
Buffer	0.5 gal/1000g	Formic Acid	Weak acid, pH regulator	Biodegradable
Non-emulsifier	1.0 gal/1000g		Soap	Flowback
<b>Option #2: Large Acid Job for Vertical Wells: Single Stage with Diversion</b>				
Water	13,000 gal.	Fresh Water	Fluid basis	Flowback
HCl	100,000 gal.	15% Hydrochloric Acid	Muriatic acid, cleaner and breaker	Neutralized by rock
Ball Sealers	1000 ea.	5/8" diam. RCN Ball Sealers	After fracturing, plug perfs and hold well pressure	Inert
Citric Acid	50 lbs/1000g	Iron Sequestrant	Sequesters dissolved iron and prevents rust coat	Biodegradable
Surfactant	2 gal/1000g	Friction Reducer		
Demulsifier	1.0 gal/1000g			
Biocide	0.2 gal/1000g	Dibutyl normal propanamine	Disinfectant	Biodegradable
Corrosion inhibitor	0.5 gal/1000g		Retards acid attack on steel	Adheres to steel
KCl	2% in Water	Potassium Chloride	Formation clay stabilizer	Sorbed to borehole wall clay
<b>Option #3*: Cross-Linked Gel Sand Frac for Directional Wells: 10 Stages of 150,000 lbs.</b>				
(Double all volumes of Option #1)				
(Large Acid Job Option not recommended for Directional Wells)				
*May be used later in exploration.				

**12. Lessee or Operator's Certification**

Noble Energy, Inc. hereby certifies that said company is authorized to conduct operations on the above-described land under the terms and conditions of Federal Oil and Gas Leases \_\_\_\_\_. Bond coverage, as required by 43 CFR 3104 is provided by Noble Oil, Inc. The applicable bond number is NV-\_\_\_\_\_, a statewide oil and gas lease bond in the amount of \$\_\_\_\_\_.

I hereby certify that I, or persons under my direct supervision, have inspected the area and are familiar with the general area of the proposed drill site locations and access roads; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct and that the work associated with the operations proposed herein will be performed by Noble Energy, Inc., its agents, contractors, and subcontractors in conformity with the plan and the terms and conditions under which it is approved.

Noble Energy, Inc.

Name: \_\_\_\_\_  
Kevin Vorhaben, Rocky Mountain Business Unit Manager

Date: \_\_\_\_\_