APPENDIX C

ADDITIONAL
BLM-REQUIRED MITIGATION

The following additional mitigation measures were identified during the analysis (Chapter 4.0 of the EA) and will be applied by the BLM during the permitting process for individual components as deemed necessary to further reduce adverse impacts upon the environment. Furthermore, additional site-specific mitigation measures may be identified and applied during APD and ROW application reviews.

Implementation of these measures on state or private lands will be subject to state or landowner preferences and agreements with the operator. Lease stipulation will be enforced where applicable. Development activities on all lands will be conducted in accordance with all appropriate federal, state, and county, laws, rules and regulations.

Only those resource values where additional mitigations was identified during analysis are included.

4.1.3 Paleontology

- If necessary collection, identification, and curation of the fossil remains and potentially monitoring of on-going surface disturbance in the area of discovery will be performed.

- If fossil resources are uncovered as a result of survey of lands slated for disturbance associated with the Proposed Action or No Action Alternative, the project proponent and authorized personnel should immediately notify the BLM for consideration for further action.

- If such fossil resources are discovered during surface disturbance, work should cease immediately in the area of the discovery until the fossil remains can be evaluated for scientific significance by a BLM-permitted paleontologist.

- If fossil remains of significance are identified either during survey or during excavation then additional mitigation may be proposed as necessary.

4.2 Air Quality

- Warren will adhere to all applicable ambient air quality standards, permit requirements (including preconstruction, testing, and operating permits), motorized equipment and other regulations, as required by the State of Wyoming, Department of Environmental Quality, Air Quality Division (WDEQ-AQD).

- If air quality analysis indicates exceedances in NO_x, the following types of control measures could be implemented; the reduction of compression requirements, electric compression or the use of nonselective catalytic reduction (NCR), lean combustion, or selective catalytic reduction (SCR) control technologies.

NO_x Mitigation

- In the permitting of compressor engines, the WDEQ-AQD always requires application of the Best Available Control Technology (BACT) process. As a result of the BACT process, emissions rates for compressor engines 100 hp and greater average 1.0 g/hp-hr NO_x. With the application of non-selective catalytic reduction, NO_x emissions for some compressor engines can be reduced to 0.7 g/hp-hr.

- Compressors and well pump sources powered by electric motors could reduce NO_x emissions within the immediate project area. However, increased NO_x emissions are likely to result at the point of electrical generation.

- Proposed Action related NO_x emissions could be offset through the application of controls at non-project sources.

Particulate Matter Mitigation

- Roads and well locations constructed on soils susceptible to wind erosion could be appropriately surfaced to reduce the amount of fugitive dust generated by vehicle traffic.

- Water or other dust suppressants could be applied as necessary on unpaved roads and construction areas to reduce problem fugitive dust emissions.

- Warren should establish and enforce speed limits on all project related unpaved roads to reduce vehicle fugitive dust.

4.3 Soils

- Where possible, minimize disturbance to vegetated cuts and fills on existing roads that are improved.

- Selectively strip and salvage topsoil or the best suitable medium of plant growth from all disturbed area to a minimum depth of 6 inches on all well pads.

- Install runoff and erosion control measures such as water bars, berms, and interceptor ditches if needed.

- Install culverts for ephemeral and intermittent drainage crossings. Design all drainage crossings structures to carry the 25- to 50-year discharge event, or as otherwise directed by the BLM.

- Implement minor routing variations during access road layout to avoid steep slopes adjacent to ephemeral or intermittent drainage channels. Disturbance will not encroach within 500 feet of perennial surface water and 100 feet of the thalweg in ephemeral channels.

- Include adequate drainage control devices and measures in thee road design (e.g., road berms and drainage ditches, diversion ditches, cross drains, culverts, out-sloping, and energy dissipaters) at sufficient intervals and intensities to adequately

control and direct surface runoff above, below, and within the road environment to avoid erosive concentrated flows. In conjunction with surface runoff or drainage control measures, use erosion control devices and measures such as temporary barriers, ditch blocks, erosion stops, matter, mulches, and vegetative covers. Implement a revegetation program as soon as possible to re-establish the soil protection afforded by a vegetal cover.

- Where feasible, locate pipelines immediately adjacent to roads to avoid creating separate areas of disturbance and to reduce the total area of disturbance.

- Reduce the area of disturbance to the absolute minimum necessary for construction and produce operations while providing for safety of the operation.

- Upon completion of construction activities, restore topography to near pre-existing contours at the well sites, along access roads and pipelines, and other facilities sites; replace up to 6 inches of topsoil or suitable plant growth material over all disturbed surfaces; apply fertilizer as required; seed; and mulch.

4.4 Water Resource

- The BLM may deny the proposed surface disturbance within 500 feet of perennial surface water and/or wetland areas and/or within 100 feet of intermittent and ephemeral drainage channels.

- The BLM may deny activities in areas with high erosion potential and/or rugged topography.

- An exception to a mitigation measure and/or design feature may be approved on public land on a case-by-case basis when deemed appropriate by the BLM.

- An exception would be approved only after a thorough, site-specific analysis determined that the resource or land use for which the measure was put in place is not present or would not be significantly impacted.

- Should any existing permitted groundwater rights (water wells) be adversely affected by the Proposed Action, Warren should rework, replace, or otherwise compensate the owner/permittee.

- Limit construction of all drainage crossing to no-flow periods or low-flow periods.

- Discharge all concentrated water flow within access road ROWs onto or through an energy dissipater structure (e.g. riprapped aprons and discharge point) and discharge into undisturbed vegetation.

- Develop and implement a pollution prevention plan (PPP) for storm water runoff at drill sites as required per Wyoming Department of Environmental Quality (WDEQ) storm water National Pollution Discharge Elimination Systems (NPDES) permit requirements. The WDEQ requires operators to obtain a field permit for fields of 20 wells or more.

- Maintain vegetation barriers occurring between construction activities and perennial, ephemeral and intermittent flow or channels, with the exception of approved right angle linear feature crossing, which, with the exception of the active travel path or a roadway, shall be reclaimed.

- Case wells during drilling, and case and cement all wells in accordance with Onshore Order No. 2 to protect all high quality water aquifers. High water aquifers with known water quality of 10,000 TDS or less. Include well casing and welding of sufficient integrity to contain all fluids under high pressure during drilling and well completion. Further, wells will adhere to the appropriate BLM cementing policy.

- Construct the reserve pits in cut rather than fill materials or compact and stabilize fill. Inspect the subsoil material of the pit to be constructed in order to asses soil stability and permeability and whether reinforcement and/or lining are required. If lining is required, as specified in the GRRMP Decision Record as approved 1997 (50 feet or less to ground water and permeability greater than 10^{-7} cm/hour), line the reserve pit with a reinforce synthetic liner at least 12 mils in thickness and a bursting strength of 175 x 175 pounds per inch (ASTMD 75179). Reserve pit lining requirements will be handled on a case-by-case basis during the APD process taking into consideration water quality, soil permeability, and depth to groundwater.

- Maintain two feet of freeboard on all reserve pits to ensure the reserve pits are not in danger or overflowing. Shut down drilling operations until the problem is corrected if leakage is found outside the pit.

- Discharge all water produced from the gas bearing formation(s) into tanks, pumps, pipelines, and existing injection wells to preclude contamination of surface water with high mineral content formation water.

- Extract hydrostatic test water used in conjunction with pipeline testing and all water used during construction activities from sources with sufficient quantities and through appropriation permits approved by the State of Wyoming.

- Discharge hydrostatic test water in a controlled manner onto an energy dissipater. The water is to be discharged onto undisturbed land that has vegetative cover, if possible, or into an established drainage channel. Prior to discharge, threat or filiter the water to reduce pollutant levels or to settle out suspended particles if necessary. If discharged into an established drainage channel, the rate of discharge will not exceed the capacity of the channel to safely convey the increased flow. And the hydrostatic test water quality will be equal to or better than the receiving waters. Coordinate all discharge of test water with the Wyoming State Engineer's Office (WSEO), Wyoming Department of Environmental Quality/Water Quality Division (WDEQ/WQD), and the BLM.

- Coordinate all crossings or encroachments of waters of the U.S. with the U.S. Army Corps of Engineers (COR).

- Shall existing water wells be adversely affected by the project, the company shall rework, replaced, or otherwise compensate the well owner.

4.6 Rangeland Resources

- The BLM will recommend that the Warren establish speed limits in the PRPA.

- Warren should coordinate with the affected livestock operators to minimize disruption during livestock operations, including calving season.

4.7 Wildlife

- Limit construction activities as per BLM authorizations within big game crucial winter range from November 15 to April 30.

- Prohibit unnecessary off-site activities of operational personnel in the vicinity of the drill sites. Inform all project employees of applicable wildlife laws and penalties associated with unlawful take and harassment.

- Complete a raptor survey of the PRPA prior to construction to ensure that well sites are located away from potential conflict area.

- If "active" raptors nest are identified from survey, clear well sites within one mile of raptor nest identified prior to the commencement of drilling and construction during the raptor nesting period (February 1 through July 31).

- No permanent above ground structures will be constructed within 825 feet of an active raptor nest (NSO).

- During reclamation, establish a variety if forage species that are useful to resident herbivores.

4.8 Special Status Wildlife, Fish and Plant Species

- The BLM may deny all project development actions within area where threatened, endangered, proposed, candidate, and other sensitive plant and animal species are found or are likely to occur.

- No fisheries mitigation is needed beyond that indicated under Water Resources and Special Status Species.

- Implement measures discussed in Chapter 4 (Sec. 4.8) in compliance with the Endangered Species Act (ESA).

- BLM may require that noise level increases be limited to no more than 10dBA above background levels at Greater sage-grouse leks. To provide additional protection for sage-grouse and other area wildlife, the BLM may require powerlines to be buried.

- Do not perform construction activities within 0.25 miles of existing sage-grouse leks at any time except as authorized in writing by exception, including documented supporting analysis by the Authorizing Officer. All surface

disturbances will abide by sage-grouse stipulations as detailed in the GRRMP Decision Record as approved 1997.

- Provide for sage-grouse lek protection during the breeding, egg-laying and incubation period (March 1 - June 30) by restricting construction activities within a two-mile radius of active leks. Exception maybe granted if the activity will occur in unsuitable nesting habitat.

- Monitor and control noxious weeds.

- Warren and operators are to comply with Section 404(b)(1) guidelines of the federal Clear Water Act (CWA).

4.10 Visual Resources

- Utilize existing topography, vegetation, and color that mimic the existing environment to screen roads, pipeline corridors, drill rigs, well heads, and production facilities from view.

- Paint well and central facilities site structures with flat colors that blends with the adjacent surrounding undisturbed terrain, except from structures that require safety coloration in accordance with Occupational Safety and Health Administration (OSHA) requirements.

4.11 Cultural Resources

- Impacts to cultural resources would be mitigated following procedures as specified in 36 CFR 800 and/or the national programmatic agreement for cultural resources and statewide protocol.

- Mitigation procedures will be implemented if a site considered eligible (under "Criterion d" only) or listed on the National Register is impacted.

- If unanticipated or previously unknown cultural resources are discovered at any time during construction, all construction activities will halt and the BLM Authorized Officer (AO) will be immediately notified. Work will not resume until a Notice to Proceed is issued by the BLM AO.

- All resources identified during these inventories would be evaluated for eligibility for the National Register of Historic Places (NRHP) by BLM, and the State Historic Preservation Office (SHPO) would be consulted as necessary under the statewide protocol.

- Avoidance is preferred and is achieved through redesign of a project, elimination of the project, or minimizing impacts. However, these means are not always possible.

- Mitigation of adverse effects to properties would be accomplished by the documentation of physical remains.

- Mitigation would include data recovery of prehistoric and historic sites and could include documentation through detailed drawings and photographs of standing structures.

- Data recovery plans are subject to review and approval by the BLM, SHPO, and the Advisory Council on Historic Preservation.

4.12 Socioeconomics

- Warren should ensure that its non-local contractors have secured adequate temporary housing for employees.

- Warren should ensure that all purchases of tangible goods are properly credited to Sweetwater County for sales and use tax purposes.

- Warren should coordinate emergency response planning with the Sweetwater County Emergency Management Agency.

- The property and sales and use taxes associated with the Proposed Action would provide revenues to local governments in Sweetwater County to offset the anticipated minimal Proposed Action-related demand for law enforcement and emergency response services. However, there would be a lag between the time development begins and the time substantial project-related tax revenues flow to the county.

4.13 Transportation

- Existing roads shall be used as collectors and local roads whenever possible. Standards for road design shall be consistent with BLM Road Standards Manual Section 9113.

- Roads not required for routine operation and maintenance of producing wills and ancillary facilities will be permanently blocked, reclaimed, and revegetated.

- Areas with important resource values, steep slopes and fragile soils shall be avoided where possible in planning new roads.

Mitigation for impacts on State highways would include:

- Warren is responsible in obtaining all required WYDOT permits and approvals for constructing or improving road access to WYO 430.

- Coordination with WYDOT and the Sweetwater Road and Bridge Department to ensure that all approaches to WYO 430 are adequate to handle tractor trailer combinations.

- Coordination with WYDOT and the Sweetwater Road and Bridge Department to ensure that all approaches to WYO 430 are paved or otherwise treated to allow trucks to shed mud gravel before entering the highway.

Mitigation for County Roads would include:

- Warren will obtain access permits and/or licenses from the Sweetwater County Engineer's Department for any crossings, access to or utilization through Sweetwater County road rights of way.

- Warren is encouraged to participation in the Wamsutter – Continental Divide Transportation Planning Committee, if appropriate.

- There will be an operator and contractor policies to reinforce speed limits and other traffic safety laws on county and operator-maintained roads within the PRPA.

- Warren will provide assistance to the Sweetwater Road and Bridge Department in obtaining gravel, water and dust suppressant for application on affected county roads.

4.14 Health and Safety

- Warren should coordinate emergency response planning with the Sweetwater County Emergency Management Agency and provide documentation regarding compliance with Federal Hazardous Material Regulations and the Uniform Fire Code.

- If hazardous materials are present within fracturing fluids, the BLM may deny the discharge of these fluids to reserve pits.

- Exercise stringent precautions against pipeline breaks and other potential accidental discharges of toxic chemicals into adjacent streams. If liquid petroleum products are stored on-site in sufficient quantities (per criteria contained in 40 CFR Part 112), a Spill Prevention Control and Countermeasures (SPCC) plan will be developed in accordance with 40 CFR Part 112, dated December 1973.

4.15 Noise

- In addition to measures described in Section 2.2.11.2.12, measures to mitigate noise impacts would include the following:

- In any area of operations (drill site, compressor site, etc.) where noise levels may exceed federal OSHA safe limits, The Operators and contractors would provide and require the use of proper personnel protective equipment by employees.

- BLM may require that noise levels be limited to no more than 10dBA above background levels at Greater sage-grouse leks.