

**APPENDIX M. TRANSPORTATION PLAN**

---



## M.1 INTRODUCTION

Gasco Energy Inc. (Gasco) has proposed to the Bureau of Land Management (BLM) Vernal Field Office (Vernal FO) to develop oil and natural gas resources within the Monument Butte-Red Wash and West Tavaputs exploration and development areas (project area) in Uintah and Duchesne counties, Utah. Gasco operates most of the mineral lease rights underlying both the public and private lands in the project area. The project area encompasses approximately 206,826 acres of federal, state, and private lands. In addition to new road construction, Gasco's planned project development would rely on the use of a network of existing highways, county roads, and roads on private, state, and United States lands.

This transportation plan incorporates BLM Road Manual 9113 (BLM 1985) and the Surface Operating Standards for Oil and Gas Exploration and Development, The Gold Book, Fourth Edition—Revised 2007 (BLM and USFS 2007), hereafter referred to as the Gold Book. BLM Road Manual 9113 and the Gold Book provide Gasco with a combination of guidance and standards for ensuring compliance with agency policies and operating requirements. These reference documents serve as a basis for identifying appropriate road design, construction, and maintenance standards following site-specific analysis. This transportation plan outlines the construction and maintenance actions that Gasco would employ. If conditions warrant, Gasco would cooperate with the appropriate surface management agency or private surface owner to identify and apply additional measures.

## M.2 PURPOSE AND SCOPE

The objective of Gasco's transportation plan for the Gasco project area is to minimize resource conflicts and development costs within the project area through proper road design, construction, and maintenance activities. This plan describes Gasco's anticipated use of existing roads, as well as the construction and use of proposed access roads. In addition to this plan, BLM manuals, the Gold Book, and county transportation codes and standards would be used, as appropriate, in planning and design efforts for each new access road.

Gasco recognizes that, in addition to the BLM, existing roads to and in the Gasco project area are under the jurisdiction of other governmental agencies (e.g., Uintah and Duchesne counties) that may have specific design and maintenance requirements for roads under their jurisdiction. Construction standards and maintenance agreements for roads under private agreements may or may not exist. In these cases, Gasco would strive to implement road design, construction, and maintenance standards consistent with adjacent, jurisdictional government agencies, unless otherwise requested by private surface owners.

The transportation plan objectives consist of the following:

- Maximize use of the existing road system
- Identify roads not needed for operations
- Construct roads to the minimum standard necessary to accommodate anticipated traffic and weather
- Minimize the number of loop roads
- Minimize the crossing of side slopes greater than 40%

- Minimize profile grades
- Minimize drainage crossings, with emphasis placed on drainages with potentially large runoff flows and floodplains
- Meet the needs and requirements of Gasco, the BLM, Uintah and Duchesne counties, the State of Utah, and private surface owners
- Incorporate environmental and resource considerations
- Provide for inspection and maintenance activities

### **M.3 GENERAL LOCATION INFORMATION**

The Gasco project area is located approximately 20 miles south of Roosevelt, Utah, within Uintah and Duchesne counties. The project's main access routes are Sand Wash Road, Wells Draw Road, Eight Mile Flat Road, Pariette Bench Road, Four Mile Wash Road, Wrinkle Road, Gate Canyon Road, Nine Mile Canyon Road, and Franks Canyon Road (see Map 26, Main Transportation Routes). Additional developed access roads in the Gasco project area are owned or managed by Uintah or Duchesne counties, the BLM, the State of Utah, and private entities. Additionally, there are numerous undeveloped roads/routes in and adjacent to the project area.

Primary access to the Gasco project area is via Wells Draw Road or Sand Wash Road from State Highway 40. Access within the project area would be via the existing road network, which includes local roads and individual resource roads.

The Gasco project area (see Map 1) consists of approximately 187 sections located in Township 9 South, Ranges 18 and 19 East; Township 10 South, Ranges 14, 15, 16, 17, and 18 East; and Township 11 South, Ranges 14, 15, 16, 17, 18, and 19 East. The proposed wells would be drilled and facilities constructed within primarily 177,644 acres of BLM-administered lands, 25,451 acres of land administered by the State of Utah, and 3,731 privately owned acres of land. The project area includes lands within the restored boundary of the Uintah and Ouray reservation, but it does not include lands administered by the Ute Indian tribe or the Bureau of Indian Affairs (BIA).

### **M.4 EXISTING DEVELOPMENT**

Based on Utah Department of Oil, Gas, and Mining (DOGM 2010) information for existing oil and gas infrastructure in the Gasco project area, there are 550 wells in the Gasco project area. Refer to Section 4.18.2.1.1 of the EIS for additional information.

### **M.5 SUMMARY OF PROPOSED DEVELOPMENT**

Gasco proposes to drill additional wells at an average rate of approximately 100 wells per year until the resource base is fully developed, with a maximum total of 1,491 wellbores. Gasco estimates that 325 miles of new roads would be constructed to access the proposed wells (see Map 3).

The ultimate pace, location, timing, and total number of wells developed within the Gasco project area may be affected by factors outside Gasco's control, such as permit approvals, production success, geology, engineering technology, economic factors, commodity prices, rig availability, and lease stipulations. Because of this uncertainty, future transportation routes

would be developed incrementally as wells are developed and additional information becomes available. Gasco would coordinate with government agencies (that have jurisdiction over transportation routes) to accomplish the goals of this plan. The productive life of each well is estimated to be approximately 30 years.

## **M.6 ACCESS ROAD CONSTRUCTION AND MAINTENANCE OVERVIEW**

### **M.6.1 EVALUATION OF EXISTING ROADS**

The existing road network within the Gasco project area is discussed in more detail in Chapter 3.0, Affected Environment. Gasco would upgrade, reconstruct, and/or maintain existing roads using standards consistent with those of the appropriate surface management agency or private surface owner on which the road occurs. Upgrading, reconstruction, and maintenance may include some or all of the procedures, as identified below in Section M.7, Access Road Construction and Maintenance Practices and Procedures.

Existing roads requiring upgrading would meet standards appropriate to the anticipated traffic flow and all weather road requirements. Construction or upgrading would not occur during muddy conditions.

#### **M.6.1.1 ROAD TYPES**

The BLM recognizes several functional classifications for roads in Road Manual 9113. They are as follows:

1. **Collector Roads.** These roads normally provide primary access to large blocks of land and connect with or are extensions of a public road system. Collector roads accommodate mixed traffic and serve many uses. They generally receive the highest traffic volume of all the roads in the BLM road system. User cost, safety, comfort, and travel time are primary road management considerations. Collector roads usually require application of the highest standards used by the BLM.
2. **Local Roads.** These roads normally serve a smaller area than collectors, and connect to collectors or public road systems. Local roads receive lower volumes, carry fewer traffic types, and generally serve fewer uses. User cost, comfort, and travel time are secondary to construction and maintenance cost considerations. Low-volume roads in mountainous terrain may be single-lane roads with turnouts.
3. **Resource Roads.** These are normally spur roads that provide point access and connect to local or collector roads. They carry very low volume and accommodate only one or two types of use. Use restrictions are applied to prevent conflicts between users needing the road and users attracted to the road. The design of these roads is governed by environmental compatibility and minimizing BLM costs, with minimal consideration for user cost, comfort, or travel time. Roads servicing individual oil/gas exploration and production locations fall within this classification, and they are often referred to as well access roads.

### **M.6.1.2 ROAD CONSTRUCTION PLANNING**

Terrain, well spacing, surface use restriction, and other constraints may prevent Gasco from locating future well sites adjacent to or nearby existing roads. However, most new road construction would likely consist of short segments to connect proposed well sites to existing access routes. New roads would be built and maintained to provide year-round access.

Gasco, in cooperation with the appropriate surface management agency and/or private surface owner, would conduct field evaluations to select routes to best serve the respective management needs of the approving entity. Access roads would be designed to accommodate the anticipated use (e.g., light vehicles and/or heavy truck). Design criteria include, but may not be limited to, roadway structure, travel-way width, shoulders, slopes, curve radius, safety, traffic requirements, vehicle characteristics, maintenance costs, snow removal, sight distances, and environmental and resource considerations. Vehicle speeds would be limited to be consistent with the road's intended designed use (BLM Road Manual 9113).

The location access roads would be planned to the extent practicable to avoid sensitive areas and minimize impacts to water, soil, vegetation, sensitive species, wildlife habitat, and land management prescriptions. When sensitive areas cannot be avoided, Gasco would strive to employ practices to prevent, reduce, or mitigate all potential adverse effects caused by construction and use of the road.

### **M.6.1.3 ROAD CONSTRUCTION PROCEDURES**

On BLM-managed lands, Gasco proposes to construct required new access roads across public lands in accordance with BLM Road Manual 9113 and the Gold Book standards and as appropriate for site-specific conditions. The BLM has the option of determining whether professional engineering design and construction oversight is necessary or whether the road can be constructed by the operator consistent with site-specific standards and approved road design. The need for professional engineering design and oversight would be based on factors such as topography, soils, hydrology, safety, and levels and types of use by the operator and general public.

Based on pre-construction, on-site reviews that may include surface owner representatives and cooperating agencies, roads would be located to minimize disturbances and maximize transportation efficiency. New well site access roads would be designed and constructed to resource road standards to facilitate reclamation should the well be a dry hole. Roads located on private lands would be constructed in accordance with standards imposed by the private land owner. The number of roads would be limited to decrease potential impacts by discouraging development of looped roads and accessing wells from short resource roads off the local roads. Roads would be designed to minimize disturbance and would be built and maintained as specified by the BLM to provide safe operating conditions at all times. Surface disturbance would be contained within the road right of way (ROW).

Construction equipment and techniques used by Gasco would be to the standards found in the BLM Road Manual 9113 (e.g., crown-and-ditch method). Should soft spots develop on the roadway during construction or drilling operations, they would be immediately covered with crushed rock or gravel. Where identified during on-site review by the BLM, problem areas on access roads to producing well sites would be graveled to a depth of 4–6 inches to reduce erosion and sedimentation. Graveling would be accomplished within a time period specified by the

BLM. Surfacing and base course materials would be obtained from existing, operational gravel pits located on private or federal lands near the project area. Topsoil would be spread, vegetation would be windrowed to the side slopes of the newly constructed access roads, and revegetation would begin the first appropriate season following the well going into production.

Small drainage crossings on access routes in the project area would use culverts sized to accommodate a 25-year storm event. Low water crossings also may be used in shallow channel crossings. Low water crossings of channels would consist of excavating an area approximately 4 feet deep under the travel way and filling it with rock and gravel to the level of the drainage bottom. Channel banks on either side of such crossings would be cut down to reduce grade, where necessary. Generally, culverts would be installed on smaller, steeper channel crossings. Topsoil would be saved before channel-crossing construction occurs. Also, the total area to be disturbed would be flagged on the ground before construction begins.

In the event drilling is non-productive, all disturbed areas, including the well site and new access road, would be reclaimed to the approximate landform that existed prior to construction. Reclamation and site-stabilization techniques (e.g., topsoil application and seed mixture) would be implemented as specified in the application for permit to drill (APD) surface use plan or the ROW plan of development (POD). If drilling is productive, all access roads to the well site would remain in place for well servicing activities (e.g., maintenance, improvements). Partial reclamation would be completed on segments of the well pad and access road ROW no longer needed. Reclamation of resource roads would be implemented the first growing season after well abandonment.

#### **M.6.1.4 VEHICLE USE AND ROAD MAINTENANCE**

Monitoring road use plays an important role in a maintenance plan. Gasco would conduct regular inspections to identify road problems such as ruts, holes, crown-and-ditch elements, standing water on the road surface, surfacing materials, blockage of water into and from culverts, interim reclamation, and control of noxious and invasive weeds. Inspections would be routinely conducted following rapid snowmelt and prolonged rain events. Maintenance activities could include but not be limited to blading, resurfacing, dust abatement, spot repairs, culvert cleaning, noxious and invasive weed control, reseeding, regrading, and snow removal. The road surface and shoulders would be kept in a safe and usable condition and would be maintained in accordance with the original construction standards. All drainage ditches and culverts would be kept clear and free flowing and would be maintained according to original construction standards. The approved use-authorization route for the access road would be kept free of trash during operations.

#### **M.6.2 RECLAMATION AND ABANDONMENT**

When the Gasco project area or portions thereof are ready to be abandoned (estimated at up to 45 years), final disposition of the access roads would be determined. Gasco's preference would be to abandon and reclaim all resource roads; however, management needs of surface management agencies and/or private surface owners may dictate otherwise. Anticipated future uses could include access to accommodate ranching and livestock operations, recreation, or administrative needs. Reclamation protocols are described in Appendix G of the EIS.

Gasco anticipates that county roads would likely be retained in an upgraded status (local/collector roads), as would improvements to surface management agency designated roads. Resource roads developed as access to individual well sites are likely to be reclaimed and returned to conditions similar to those existing prior to natural gas development activities. If Gasco has assumed any maintenance responsibilities for roads that would be retained, those responsibilities would revert to Uintah County or Duchesne County, the surface management agency, and/or the private surface owner as appropriate.

### ***M.7 ACCESS ROAD CONSTRUCTION AND MAINTENANCE PRACTICES AND PROCEDURES***

Gasco would employ the following as part of its transportation planning:

- The location of each well and access road for each well would be shown on maps and described in the site-specific APD and/or ROW. The access road would be centerline flagged during the time of staking.
- All improvements requested for existing access roads would be described in the site-specific APD and/or ROW.
- All existing roads would be maintained and kept in good repair during all drilling and completion operations associated with each well.
- Access roads and surface-disturbing activities would conform to standards outlined in the BLM Gold Book.
- On private and/or state surface, access roads would be constructed according to the surface owner's specifications.
- New access roads on BLM surface would be crowned (2%–3%), ditched, and constructed with a running surface of 18 feet and a maximum disturbed width of 45 feet.
- The disturbed width may be wider than 45 feet when approved by the appropriate authorized officer to accommodate large equipment or allow for intersections, sharp curves, steep grades, or other safe road construction and maintenance practices. These situations would be discussed and a decision made at the on-site field review. Site-specific proposals would be included in the APD and/or ROW.
- Graveling or capping the roadbed would be performed, as necessary, to provide a well-constructed, safe road.
- Prior to construction or upgrading, the proposed road would be cleared of any snow and allowed to dry completely.
- Unless specified in the site-specific APD and/or ROW, the following specifications would apply:
  - No pipelines would be crossed with the new construction.
  - The maximum grade would be less than 8%.
  - There would be no turnouts.
  - If it becomes necessary to install a culvert, it would be specified in the APD or the BLM would be notified of the installation via Sundry Notice.
  - Appropriate water control features would be constructed to control erosion.
  - There would be no gates, cattle guards, fence cuts, or modifications to existing facilities.

- Surfacing material may be necessary, depending on weather conditions.
- Surface disturbance and vehicular traffic would be limited to the approved location and approved access route and travel surface. Any additional area needed would be approved in advance.
- Road drainage crossings would be of the typical dry creek drainage crossing type. Crossings would be designed so they would not cause siltation or accumulation of debris in the drainage crossing nor would the roadbed block the drainage.
- Erosion of drainage ditches by runoff water would be prevented by diverting water off at frequent intervals by means of cutouts.
- Should mud holes develop, they would be filled in and detours around them avoided.
- When snow is removed from the road during the winter months, the snow would be pushed outside the borrow ditches, and the cutouts kept clear so that snowmelt would be channeled away from the road.
- The use of topsoil for construction activities would not be allowed.
- Surface and subsoil materials in the immediate area would be used.
- Any gravel would be obtained from a commercial source.

The use of materials under BLM jurisdiction would conform to 43 Code of Federal Regulations (CFR) 3602.33. Mineral materials displaced in the ordinary course of conducting operations and/or construction activities may be used for oil and gas development purposes within the subject lease in accordance with BLM-approved actions. Mineral materials also may be obtained by preparing an application for a mineral material sale under the provisions of 43 CFR Subpart 3602, Mineral Materials Sales.

## **References**

BLM 1985. Road Manual 9113 June. Available at:

[http://www.blm.gov/pgdata/etc/medialib/blm/mt/blm\\_programs/energy/oil\\_and\\_gas/operations/gold\\_book.Par.10040.File.dat/9113.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/mt/blm_programs/energy/oil_and_gas/operations/gold_book.Par.10040.File.dat/9113.pdf). Accessed June 28, 2011.

BLM and USFS 2007. Surface Operating Standards for Oil and Gas Exploration and Development, The Gold Book, Fourth Edition—Revised 2007. Available at:

[http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS\\_\\_REALTY\\_\\_AND\\_RESOURCE\\_PROTECTION\\_/energy/oil\\_and\\_gas.Par.18714.File.dat/OILgas.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/energy/oil_and_gas.Par.18714.File.dat/OILgas.pdf). Accessed June 28, 2011.

Utah Department of Oil, Gas, and Mining (DOG M) 2010. Available at :

[ftp://ftp.agrc.utah.gov/SGID93\\_Vector/NAD83/MetadataHTML/SGID93\\_ENERGY\\_DNROilGasWells.html](ftp://ftp.agrc.utah.gov/SGID93_Vector/NAD83/MetadataHTML/SGID93_ENERGY_DNROilGasWells.html). Accessed June 28, 2011.