

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

2.1. Introduction

It is important for the reader to note that the BLM is authorized to approve actions on BLM-managed lands and federal minerals; however, analysis of the impacts to the human environment includes effects on all land ownership types. Any authorizations for the Moxa Arch Area Infill Gas Development Project must comply with the applicable Kemmerer RMP.

To develop alternatives, estimates of current disturbance in the MAA were necessary to establish baseline conditions. Total surface disturbance and oil and gas drilling and exploration disturbances were calculated. Existing disturbance associated with oil and gas drilling and exploration was estimated to be approximately 8,073 acres. This estimate was generated assuming that BLM's estimated 1,839 existing wells in the MAA have been reclaimed to 1.3 acres, that oil and gas service roads in the MAA have been reclaimed to a width of 28-30 feet, and that 70% of the disturbance associated with gathering lines has been reclaimed. These estimates do not consider disturbances associated with oil and gas activities such as major pipeline compressors or the Shute Creek gas plant. Those disturbances are included in the disturbance calculations for facilities sites (Table 2-1).

Total existing disturbance in the MAA was estimated to be approximately 13,149 acres. This includes the 8,073 acres estimated for oil and gas drilling and exploration activities added to the 5,076 acres of other disturbance [Table 2-1, from Table 2-6 of the Expanded Moxa Arch Natural Gas Development Project DEIS(BLM 1995a)].

Table 2-1. Summary of Estimated Existing Surface Disturbance in the MAA.

Disturbance Type	Acres	Percent of Disturbance	Percent of MAA
Oil and Gas Drilling and Exploration	8,073	61%	1.7%
Highways and Interstates	2,012	16%	0.4%
Railroad	1,550	12%	0.3%
Urban	94	<1%	<0.1%
Facilities Sites (including Shute Creek gas plant and major pipeline compressors)	1,420	11%	0.3%
Total MAA Disturbance	13,149	100%	2.8%

2.2. Alternative Development

The BLM identified a range of alternatives based on the issues, concerns, and opportunities identified from public scoping comments, interdisciplinary interaction between resource professionals, and collaboration with cooperating agencies as well as the requirements and recommendations of NEPA and agency policy.

While numerous alternatives and specific actions were considered, four alternatives are studied in detail: Moxa Operators' Proposed Action, Alternative A/No Action, Alternative B, and Alternative C. Alternatives and specific actions considered and eliminated from detailed study are discussed in Section 2.5. Because the No Action Alternative does not eliminate the potential for future development it serves two functions, as the no action and as a low development alternative. Table 2-2 provides a summary of the four alternatives analyzed in detail.

Table 2-2. Summary of Well Numbers, Infrastructure, Project Duration, and Surface Disturbance for the Four Alternatives Analyzed in Detail. Numbers are maximum values for each alternative. For the proposed action, Alternative A, and Alternative C the number of wells is the same as the number of well pads.

	Proposed Action	Alternative A- No Action	Alternative B ¹	Alternative C
Development Summary				
Total Number of New Wells	1,861	670	5,165	5,165
Total Miles of New Roads	931	335	2,583	2,583
Total Miles of New Gathering Pipelines	931	335	2,583	2,583
Total Number of New Compressor Facilities	4	0	7	7
Approximate Pace of Development				
New Wells per Year	186	96	205	205
Drilling Phase - Years	10	7	25	25
Production/Interim Reclamation Phase - Years	40	40	40	40
Final Reclamation Phase - Years	10	10	10	10
Life-of-Project (LOP) - Years	60	57	75	75
Summary of Surface Disturbance				
Total Short-term Surface Disturbance LOP- Acres	18,650	10,258	45,573	45,573
Total Acres of Interim Reclamation	12,653	7,410	42,725	30,216
Long-term Surface Disturbance - Acres	5,997	2,848	2,848	15,357
Existing Oil and Gas Disturbance in MAA - Acres	8,073	8,073	8,073	8,073
Disturbance Expected After Successful Interim Reclamation of Short-term Disturbances – Acres ²	14,070	10,921	10,921	23,430
Percent Oil and Gas Disturbance in MAA Over LOP	2.96%	2.30%	2.30%	4.92%
Total Surface Disturbance ³ -Acres	19,146	15,997	15,997	28,506
Percent Surface Disturbance in MAA	4.02%	3.36%	3.36%	5.99%

¹ Summary information for Alternative B is a combination of the No Action and Alternative C. Detailed descriptions of the components of this alternative are presented in Section 2.3.3. Values presented for Alternative B are maximum short-term disturbance values and might not be reflective of the actual short-term disturbance that could occur as a result of implementation of the alternative.

² Values presented for total disturbance after successful interim reclamation are reasonable estimates for the total disturbance that would be expected at any given time. This value would also be reflective of the total surface disturbance associated with oil and gas development over the LOP. For Alternative B the total disturbance at any time could not exceed 10,921 acres. For the Proposed Action and Alternatives A and C, the disturbance at any given time could be higher than the values presented.

³ Values are sum of existing non oil and gas disturbances (Table 2-1) and total oil and gas development disturbances.

2.3. Alternative Descriptions

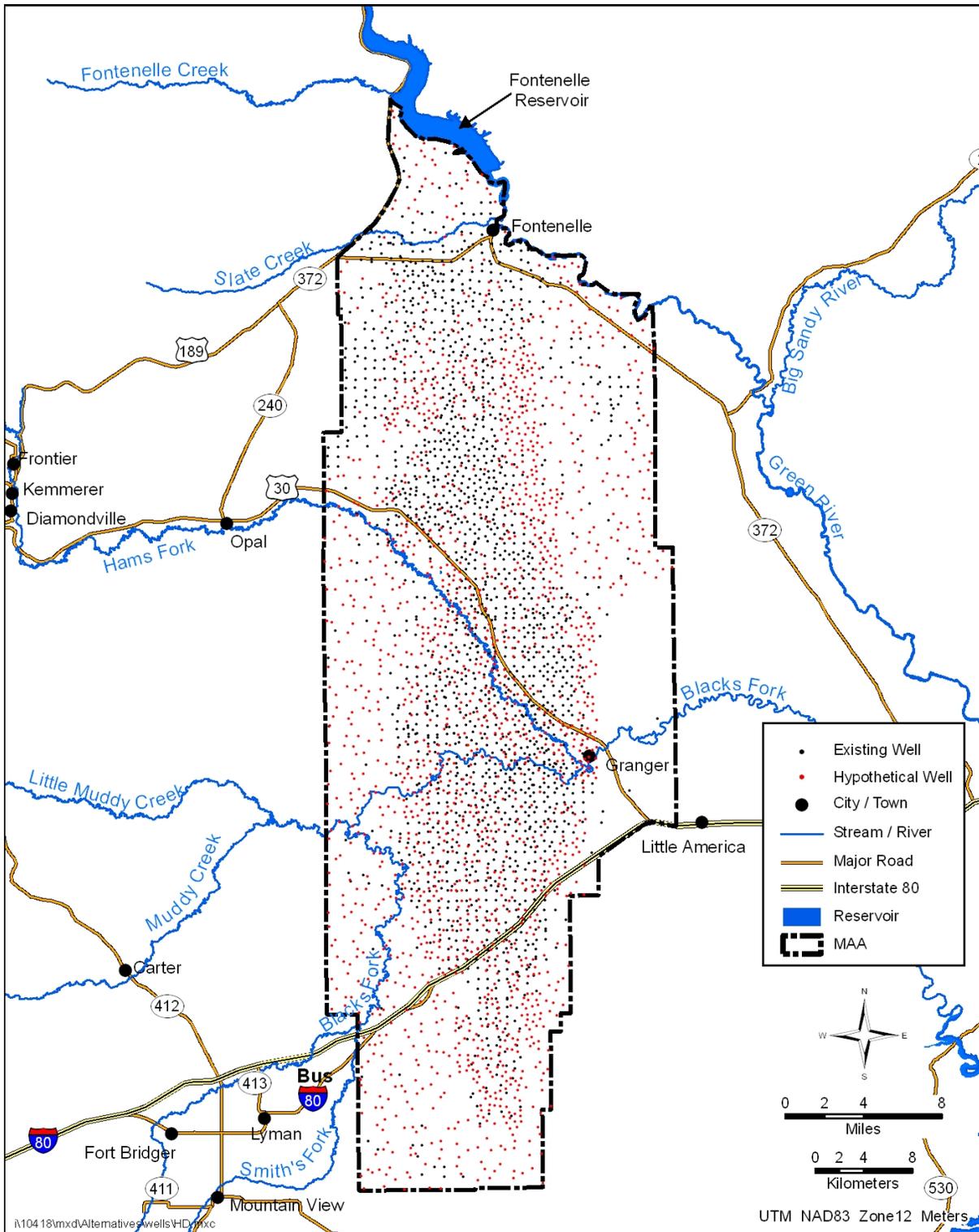
2.3.1. Moxa Operators' Proposed Action

Collectively, the Operators propose to drill 1,861 wells from 1,861 well pads to supplement existing production in the Project Area. Map 2-1 illustrates hypothetical locations of new well pads that would be developed as part of the operators' Proposed Action. The data presented in Map 2-1 are for illustrative purposes only and do not represent the actual location of wells that would be drilled. However, these randomly placed pad locations were used to assess potential direct and indirect impacts to resources analyzed in Chapter 4 of this document.

As a result of geologic information obtained through drilling conducted since the 1997 ROD, the proven production and flank areas were redefined from the areas considered in the 1996 EIS, such that the area currently proposed for more intense development ("core" area) would be reduced from the proven production area defined in 1996 (Map 1-3). The Operators estimate that approximately 1,226 additional wells would be drilled in the core area, and approximately 635 additional wells would be drilled in the flank area (Table 2-3). The Operators anticipate drilling infill wells to the Frontier and Dakota Formations at densities ranging from 4 to 12 well pads per section (approximately 160 to 53 acres per pad) in the core area and approximately 2 well pads per section in the flank area. Wells would be drilled conventionally (i.e., with vertical well bores from individual well pads). All proposed wells would be drilled during an approximate 10-year period after project approval. Although actual operations are subject to change as conditions warrant, the Operators' long-term development plan is to drill approximately 186 wells per year until the resource base is fully developed. The average life expectancy of a well is anticipated to be 40 years. Appendix B contains a summary of the operations used to develop wells in the MAA. These operations would be used for all alternatives unless otherwise noted.

Facilities associated with the project may include roads, gas pipelines, production facilities (separation, dehydration, metering, treating, fluid storage, compression), disposal well and/or surface disposal facilities, and equipment storage facilities. In general, gas will be transported via subsurface pipeline to centralized compression and treatment facilities, although some well site compression may be needed. Additional compression of the gathering system in the project area will likely be required and added to existing compression infrastructure over the 10-year development period. Additionally, it is estimated that 3 to 4 new compressors could be required to accommodate the maximum anticipated compression growth that would result from the Proposed Action. These additional compression facilities would likely be constructed on federal surface.

Current transmission pipelines in the MAA and throughout southwestern Wyoming would likely be sufficient to transport the recovered resources to market. For the Proposed Action and all project alternatives, if additional transmission pipelines are necessary to transport the gas recovered from the MAA, separate NEPA analysis would be required. Produced water will be transported by truck to water disposal wells or evaporation ponds. Project development will result in the construction of new roads and the use of roads previously constructed in the Project Area. New roads are expected to consist primarily of access roads. Existing arterial roads will provide the main access to the Project Area.



Map 2-1. Hypothetical Distribution of Wells and Well Pads in the MAA for the Operators' Proposed Action. Hypothetical well locations are for illustrative purposes only and do not reflect the actual locations of wells that would be drilled.

Table 2-3. Approximate Disturbance Estimates for New Wells that would be Drilled in the MAA under the Operators' Proposed Action.

Surface Ownership	BLM	USFWS	Reclamation	State of Wyoming	Private/Fee	Total	Percent of MAA
Total Acres - Core	103,893	268	4,299	8,297	96,157	212,914	44.75
Total Acres - Flank	127,825	1,339	22,660	5,028	106,042	262,894	55.25
Total Acres in MAA	231,718	1,607	26,959	13,325	202,199	475,808	100.00
Numbers of Well Pads for Proposed Action							
Core	300	2	8	78	838	1,226	---
Flank	318	3	64	10	240	635	---
Total Well Pads	618	5	72	88	1,078	1,861	---
Short-Term Disturbance - Acres of Disturbance Associated with Drilling and Completion Phases¹							
Core	3,040 ²	20	80	780	8,380	12,300	2.60
Flank	3,180	30	640	100	2,400	6,350	1.32
Total	6,220	50	720	880	10,780	18,650	3.92
Long-Term Disturbance - Acres of Disturbance After Interim Reclamation³							
Core	1,000	6	26	250	2,682	3,964	0.84
Flank	1,018	10	205	32	768	2,033	0.42
Total	2,018	16	231	282	3,450	5,997	1.26
Existing Oil And Gas Disturbance In Project Area						8,073	1.70
Total Projected Oil and Gas Disturbance After Interim Reclamation						14,070	2.96

¹ Surface disturbance associated with drilling and completion activities for each well pad. Disturbance calculations assume 10.00 acres per well for the Proposed Action: 2.75 acres per well pad, 3.0 acres for 0.5 mile of road per well pad, 3.0 acres for 0.5 mile of gathering pipeline per well pad, and 1.25 acres of additional disturbance to account for larger pads, increased roads and pipeline lengths, stock piles, diversion ditches, and additional cut and fill necessary on steeper slopes.

² Includes disturbance estimates for 4 additional 10-acre compression facilities

³ Disturbance associated with production activities after interim reclamation. Disturbance after interim reclamation would be 3.2 acres for the Proposed Action: 1.0 acre per well pad, 1.7 acres for roads, and 0.5 acre for gathering pipelines

The area of new surface disturbance associated with drilling and completion activities would be approximately 18,650 acres (Table 2-2). Most of the disturbance would occur on private lands. Approximately 3.9% of the Project Area would be affected by short-term disturbance during construction, drilling, and completion activities. Because of the 10-year drilling schedule associated with the Operators' Proposed Action, approximately 1,865 acres (0.39% of the MAA) of new disturbance would occur each year for 10 years. The Operators would commit to the following reclamation procedures as part of all oil and gas development activities in the MAA:

- The Operators commit to monitor interim and final reclamation operations by performing inspections using an independent third party contractor. The objective is to provide a uniform performance-based evaluation of reclamation efforts and success across the MAA, regardless of surface ownership or lease operator. Reclamation performance assessment methodology

will be based upon requirements of both the KFO and the State of Wyoming. The duties of the contractor would include:

- visiting all MAA locations to document the progress of interim and final reclamation efforts;
 - developing quantifiable documentation submitted to the BLM and State (agencies) on a periodic (TBD) basis (all other alternatives would require annual reports at a minimum per Appendix E);
 - providing location/lease/operator data to the agencies in geographic information systems (GIS) format; and
 - providing annual summary “progress” reports to the Operators by the contractor to track reclamation effectiveness.
- The Operators commit to engaging the services of reclamation professional/specialist to provide expertise/recommendations to the agencies and the operators. The goal would be to develop a workable written reclamation strategy specifically designed for the MAA that would be provided to the BLM and State of Wyoming. The strategy will incorporate the results of the ongoing monitoring effort and would be modified, if necessary, according to the reclamation monitoring results assessment. When monitoring results demonstrate that reclamation is being performed successfully, the strategy would be finalized as the “Moxa Area Reclamation Plan.” The reclamation specialist would be responsible for:
 - developing an Initial Reclamation Plan and periodic revisions, if monitoring results indicate the need to alter reclamation procedures;
 - evaluating reclamation techniques used by the mining/other industries, reclamation techniques used in other BLM Field Offices, and their applicability to oil and gas operations in MAA. The results of the evaluation would be included in the Initial Reclamation Plan; and
 - determining how/if reclamation should vary in different areas of the MAA according to:
 - timing (including initiation, evaluation of results, etc.);
 - species composition, considering habitat viability, BLM cover requirements, and stormwater permit requirements; and
 - best procedures for an arid environment/drought.
 - The Operators would provide funding for inspection and enforcement to augment and provide assistance to KFO inspection and enforcement personnel if determined necessary by the KFO. The need for funding and KFO support would be re-evaluated annually by the KFO and the Operators, concurrent with receipt of the annual reclamation monitoring progress report. The Operators would agree on method to provide funding for the activities contemplated on a yearly basis. The Operators would select a lead party to handle the billing process and to provide supervision of the third party contractors, professionals and specialists. The Operators would meet annually in the fourth quarter to approve a budget and selection of the personnel required herein.
 - Offsite mitigation would be considered by the Operators if necessary and reclamation monitoring indicates poor results. The objective of offsite mitigation would be in part to improve/restore habitat in areas that would provide the most benefit to wildlife and result in the fewest conflicts with oil and gas development, as identified in the EIS analysis. The Operators need interagency commitment that any such efforts would be recognized by the BLM and State of Wyoming as actions to enhance species viability across land jurisdictions.

After interim reclamation is completed, the new long-term disturbance associated with project development would be approximately 5,997 acres. It is expected that this level of disturbance would be present for the life of the wells that are drilled (approximately 50 years: 10 years of drilling and 40 years of production). The Operators would continue to limit long-term surface disturbance as much as possible through the implementation of a road network that minimizes the construction of new access roads and by reclaiming as much of the short-term disturbance associated with roads and locations as is reasonable without limiting the requirements for ongoing and future production operations. The Operators would adhere to all conditions included with their leases and to all federal and state laws and regulations. The Operators would also commit to performing the following measures for all new wells that are drilled, per the requirements in BLM IM No. 2007-021:

- Interim reclamation of well locations and access roads soon after the well is put into production.

The goal of this BMP is to minimize long-term loss of habitat, forage, visual resources, soils, and to prevent the introduction of invasive species. Portions of well pads and roads that would not be used during production operations would be recontoured, leaving only areas necessary for workovers and operations uncontroled. Salvaged topsoils would be spread across all disturbed areas except those that are needed to accommodate year-round traffic and operations. Well locations and reclaimed roads and gathering pipeline ROWs would be revegetated with a BLM-approved seed mixture. Where practical, road surfaces and turnarounds would also be revegetated. With low traffic roads, this would result in a hardpan, two-track road that is stable and requires less maintenance. To ensure continued energy production operations, the operator would be allowed to drive, park, and set up future workover and maintenance operations on newly revegetated areas. Where there is a moderate to high risk of wildfire, a small buffer area would be left around production facilities or grass would be mowed prior to workover setup. Where future wells are anticipated to be drilled from the same well location within two years, approval to delay interim reclamation may be granted.

- Painting of all new facilities a color that best allows the facility to blend with the background, typically a vegetated background.

The goal of this BMP is to minimize visual contrast by making production facilities less noticeable. Above-ground production facilities would be painted with colors that allow the facilities to blend into the background. The BLM and the Operators would identify the best colors to match the surrounding vegetation and soil types. The Operator may need to paint drill rig anchors and minor working tips and edges of production facilities that are subject to Occupational Safety and Health Administration (OSHA) safety requirements a red, yellow, or orange color. The Operator would not be required to paint wooden structures, including distribution power poles. To minimize contrast, Operators would avoid lighter colors, white doors or roofs, galvanized silver electrical boxes and guardrails, and signs with white backgrounds.

- Design and construction of all new roads to a safe and appropriate standard, “no higher than necessary” to accommodate their intended use.

The goal of this BMP is to minimize long-term loss of habitat, vegetation, soil, and visual resources. All roads would be designed and constructed to an appropriate standard that is no higher than necessary to adequately accommodate their intended function. Design, construction, and maintenance activities would be consistent with national policies for safety and resource protection. Operators would consider the anticipated average daily traffic, vehicle loads, vehicle speeds, potential for use by the public, soil types, season of use, and topography. In some cases, overland travel within a defined corridor or via two-track roads during dry conditions would be preferable to construction of all-weather access roads. On a

case-by-case basis, overland travel or two-track roads may be appropriate for exploratory wells or for wells where year-round access needs have been reduced. Where practical, roads should follow the contours of the land to minimize cuts and fills and visually obtrusive lines in the landscape. Overland or two-track roads would not be used in sensitive soil types or during saturated soil conditions.

- Final reclamation and recontouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography.

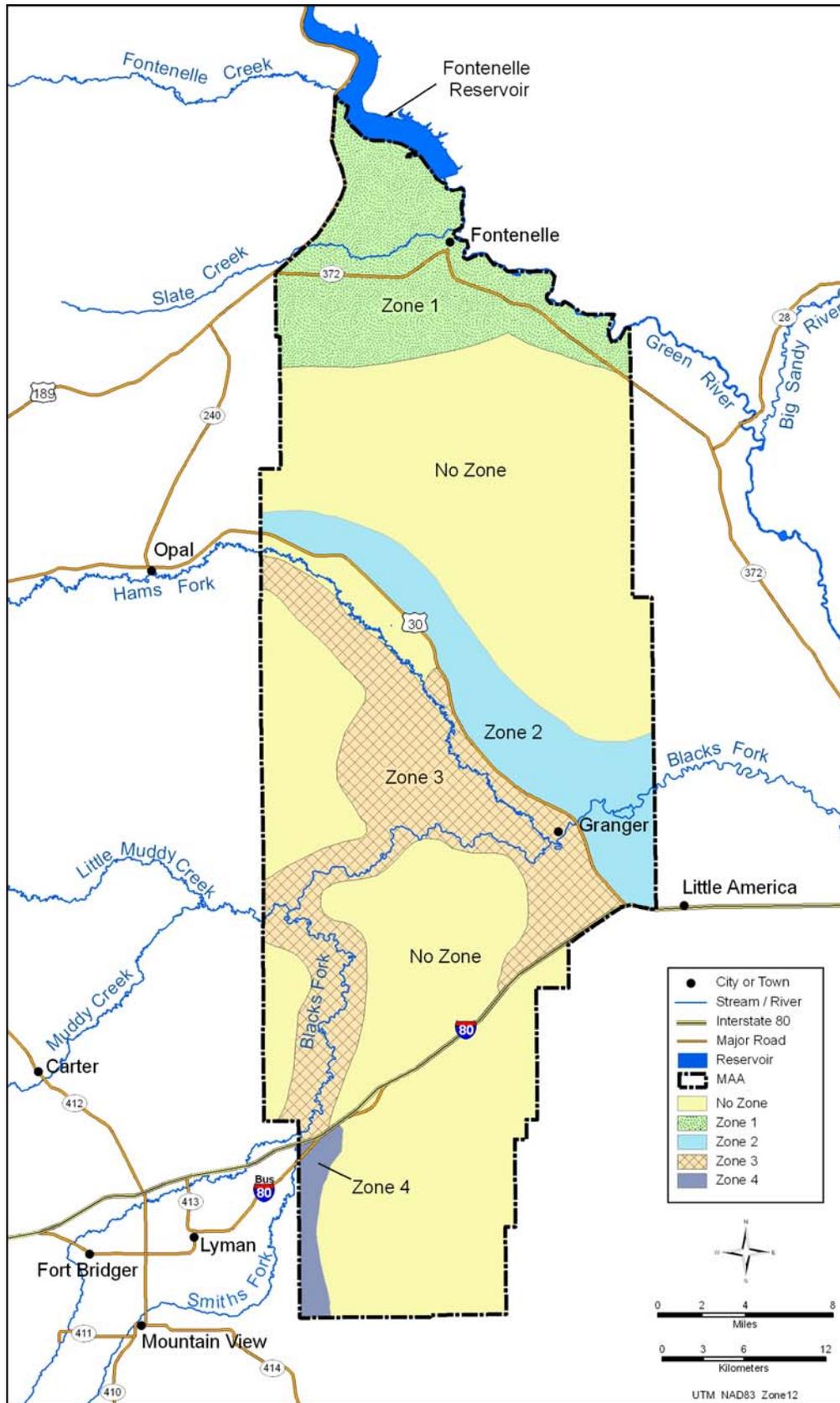
The goal of this BMP is to restore the landform, vegetation, habitat, soil, and visual resources to the same conditions that occurred prior to well development. Topsoil will be stripped from areas that have not already been recontoured and redistributed uniformly over all disturbed areas. BLM-approved fertilizers will be used where applicable to encourage rapid regrowth of BLM-approved seed mixtures. Revegetation could result in color contrast initially that will decrease as native plants and shrubs recolonize. Nearly all roads would be recontoured to ensure that they blend into the surrounding landscape.

2.3.2. Alternative A

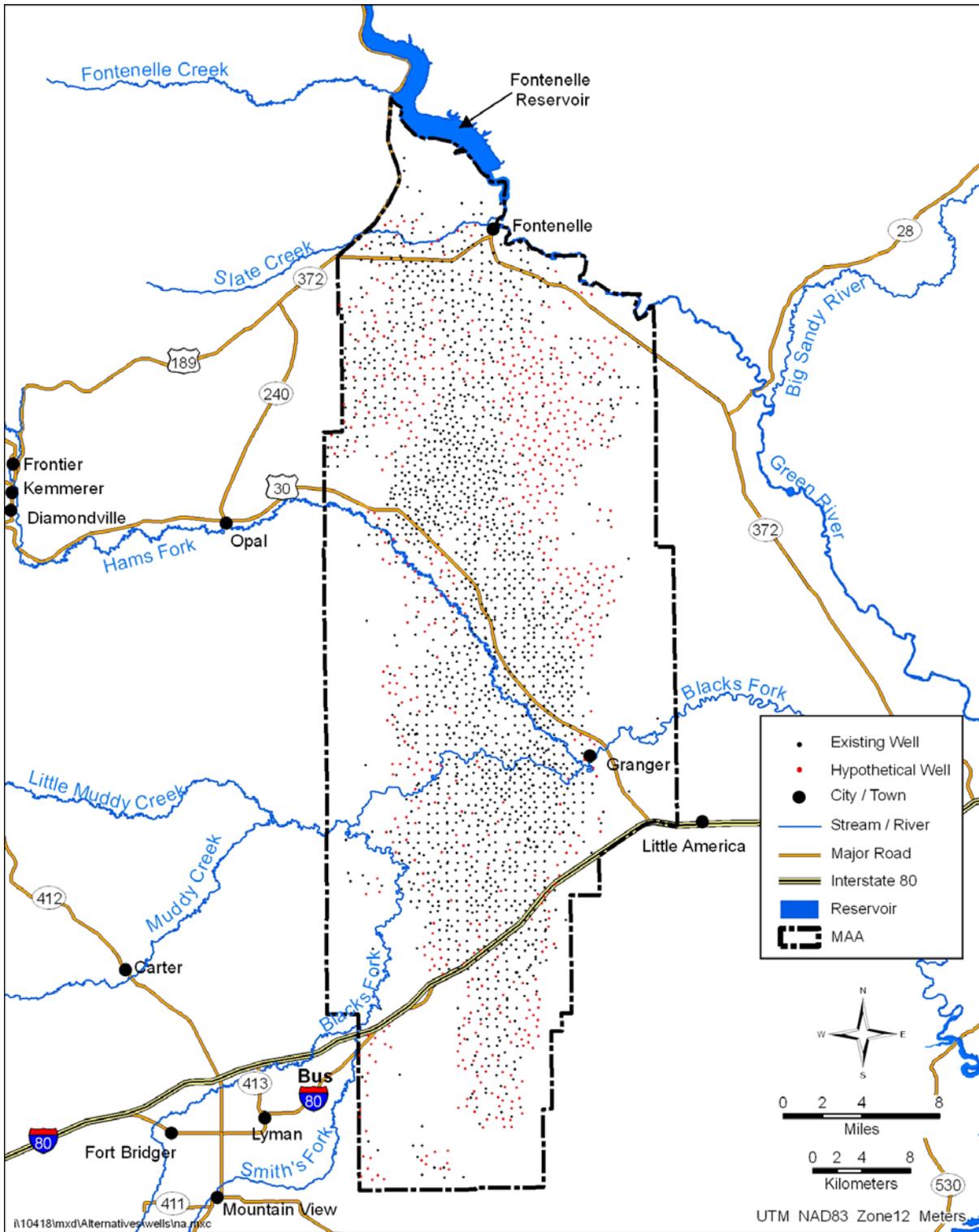
Alternative A is the No Action Alternative. As part of Alternative A, the BLM would reject the Operators' proposal and continue with implementation of the 1997 ROD (BLM 1997a). Authorizations for and impacts from previously approved development and surface disturbance would continue.

The 1996 EIS and the 1997 ROD analyzed the impacts of drilling 1,325 wells from the same number of pads (729 wells on federally administered lands and minerals) in the MAA in addition to the 1,119 approved or completed wells existing during the development of the 1996 EIS. The Record of Decision identified four zones corresponding to big game crucial habitat and one none-zone area in which drilling activities could occur (Map 2-2). In each zone a cumulative total number of wells was authorized to limit future development in these areas; 245 were authorized for Zone 1; 242 were authorized for Zone 2; 393 were authorized for Zone 3; and 23 were authorized for Zone 4. The remaining wells were authorized for non-zone area. The zones in Map 2-2 were defined in the 1997 ROD and unless stated otherwise are not part of any of the action alternatives for the current EIS. The operators previously committed to extensive reclamation and revegetation that has not been successful for a variety of reasons including poor practices, low reclamation success, drought, etc. The 1997 ROD specified that 3.7 acres of disturbance per well pad and associated roads and pipelines was acceptable. Current estimates indicate that actual reclamation success is closer to 4.3 acres per well pad and associated infrastructure (a difference of 0.6 acres). This has resulted in approximately 240 acres more disturbance than what was anticipated as part of the ROD. If all of the 1,325 well pads authorized for the No Action are drilled the total disturbance associated would be approximately 800 acres greater than authorized by the 1997 ROD.

According to WOGCC and BLM records, as of June 2007, of the 1,325 well pads authorized in the 1997 ROD, approximately 655 have been constructed and are in production or have not met the BLM requirements for bond release. Of the 670 wells that could still be drilled the majority would be drilled in non-zone areas. No additional wells would be drilled in Zone 2, and very few wells would be drilled in any of the other zones. At current drilling rates, approximately 6 years would be required to drill the remaining wells in the MAA. However, this would be beyond the 10-year drilling phase that was evaluated under the prior EIS. At the time of publication of this DEIS, it is likely that the number of remaining wells in each zone will be lower than the number reported as of June 2007. However, the June 2007 numbers will be used to compare the magnitude of impacts that would occur under the No Action Alternative with those that would occur under the Proposed Action or any other project alternative. Map 2-3 illustrates the hypothetical locations of wells that could be drilled as part of Alternative A/No Action.



Map 2-2. Zones Defined in the 1997 ROD (BLM 1997a).



Map 2-3. Hypothetical Distribution of Wells and Well Pads in the MAA for Alternative A/No Action. Hypothetical well locations are for illustrative purposes only and do not reflect the actual locations of wells that would be drilled.

New, short-term construction-related surface disturbance under the No Action Alternative would be approximately 10,258 acres. The area of long-term surface disturbance associated with the No Action Alternative would drop to approximately 2,848 acres after interim reclamation (Table 2-3). This would increase total surface disturbance in the MAA to approximately 2.3%. Because of the 6-year drilling schedule anticipated for the No Action Alternative, approximately 1,710 acres (0.35% of the MAA) of new disturbance would occur each year for 6 years. Estimates for state and private/fee lands might be underestimated. BLM cannot approve or deny development on state and private lands and industry might develop these lands at a pace and density similar to the Proposed Action. However, because of the uncertainty in the number of wells that would be drilled, disturbance estimates are based on what was authorized in the 1997 ROD, not what could be drilled in the future. Additionally, in the 1997 ROD, the Operators committed to reclaiming drilling sites (well pads) to 0.7 acres of disturbance. However, because of drought conditions, poor reclamation success, and other factors, the actual acres disturbed per well pad across the MAA are estimated to be approximately 1.3 acres. Because of uncertainty in the actual reclamation success across the Moxa, to be conservative, calculations of potential disturbance that might result from continued implementation of the 1997 ROD use the 2.1 acre estimate that was used in the 1996 DEIS (Table 2-4).

Table 2-4. Approximate Disturbance Estimates for New Wells that would be Drilled in the MAA under Alternative A/No Action.

Surface Ownership	BLM	USFWS	Reclamation	State of Wyoming	Private/ Fee	Total	Percent of MAA
Total Acres - Core	103,893	268	4,299	8,297	96,157	212,914	44.75
Total Acres - Flank	127,825	1,339	22,660	5,028	106,042	262,894	55.25
Total Acres in MAA	231,718	1,607	26,959	13,325	202,199	475,808	100.00
Numbers of Well Pads for No Action Alternative							
Core	198	0	2	14	176	390	---
Flank	123	0	12	2	143	280	---
Total Well Pads	321	0	14	16	319	670	---
Short-Term Disturbance - Acres of Disturbance Associated with Drilling and Completion Phases¹							
Core	3,031	0	31	214	2,695	5,971	1.25
Flank	1,883	0	184	31	2,189	4,287	0.90
Total	4,915	0	214	245	4,884	10,258	2.16
Long-Term Disturbance - Acres of Disturbance After Interim Reclamation²							
Core	842	0	9	60	748	1,658	0.35
Flank	523	0	51	9	608	1,190	0.25
Total	1,364	0	60	68	1,356	2,848	0.60
Existing Oil And Gas Disturbance In Project Area						8,073	1.70
Total Projected Oil and Gas Disturbance After Interim Reclamation						10,921	2.30

¹ Surface disturbance associated with drilling and completion activities for each well pad. Based on the 1996 EIS, disturbance calculations were 15.31 acres for the No Action: 5.00 acres per well pad, 3.64 acres roads per well, and 6.67 acres gathering pipeline per well.

² Disturbance associated with production activities after interim reclamation. Based on the 1996 EIS, disturbance after interim reclamation would be 4.25 acres for the No Action: 2.1 acres per well pad, 2.15 acres for roads, and 0 acres for gathering pipelines.

2.3.3. Alternative B

Alternative B would place a limit on the amount of active surface disturbance in the MAA. The intent of this alternative is to allow the Operators to fully develop the MAA while conserving the key resource values identified during scoping and outreach to cooperating agencies as discussed in Chapter 1, section 1.6 in addition to meeting the objectives of the RMP and BLM's multiple use management goals.

Alternative B would allow for full field development under a scenario with the same surface disturbance allowed for Alternative A/No Action. Alternative B would allow for the drilling of up to 5,165 additional wells across all lands in the MAA (see Alternative C, section 2.3.4) over a 25 year period as long as active, un-reclaimed surface disturbance associated with oil and gas drilling and exploration activities across the MAA is less than the 10,921 acres (2.3% of the MAA) as projected for Alternative A/No Action (Table 2-3). Within 1-year of the signature of the record of decision for this project, the operators would provide BLM with a baseline calculation of disturbance with geospatial data layers supporting that calculation. That baseline would become the baseline from which all new disturbance would be measured and from which successfully reclaimed acreages would be subtracted.

As much as 45,547 acres could be disturbed over the life of the project if all wells are drilled from new well pads per the estimates for Alternative C, Table 2-5. However, if at any one time, active oil and gas related disturbance in the MAA exceeds 10,921 acres, no new wells would be approved for federal lands or the federal mineral estate until reclamation reduces disturbance below the threshold.

Per the reclamation plan committed to by the operators and described for the Proposed Action, the operators would submit quantifiable documentation and summary reports to the BLM to determine how many acres are available under the surface disturbance limit (the details of the reclamation plan that would be implemented as part of Alternative B is detailed in Appendix E). The operators would also provide an annual drilling plan that would outline the numbers of wells to be drilled, the estimated disturbance associated with those wells, and the location of the wells. Operators could drill up to 205 wells per year in the MAA as specified for Alternative C. However, the number of wells actually drilled per year would depend on the acreage available under the 10,921 acre cap and the estimated acres of disturbance for new wells proposed in the Operators' drilling plan. Those areas not meeting the 80% of pre-disturbance vegetative cover performance standard for interim reclamation (Appendix E) would be considered disturbed until evidence is provided that reclamation standards have been met. Once that evidence is provided, the successfully reclaimed acreage would be subtracted from the 10,921 acre cap and new wells could be authorized.

As stated in the Operators committed reclamation procedures and BMPs for the Proposed Action, numerous development and operating practices are available to reduce disturbance while still allowing development of the gas resources in the MAA. These include the optional practices identified in the following list. However, other options are available to minimize disturbance and operators would be encouraged to utilize newly available technologies, reclamation techniques, and drilling and operations processes to reduce surface disturbance. The techniques identified in the following list are not required under this alternative but will be analyzed in greater detail to provide a comparison between the other project alternatives. Any of these techniques may be utilized by the Operators to maintain surface disturbance below the maximum threshold of 10,921 acres.

- Burying of gathering pipelines in or adjacent to access roads and use of common ROWs and utility corridors. Burying gathering lines in or adjacent to the road or in common ROWs with existing surface disturbance decreases surface disturbance. Any co-location of pipelines with County roads would be coordinated with local government entities.
- Centralizing production facilities.

- Minimizing topsoil removal during drilling activities using techniques such as mat drilling, vegetation mowing, brush beating, or other operator identified and BLM approved technique.
- Drilling multiple wells from a single pad. Wells drilled from existing well pads would reduce surface disturbance per well by as much as 8.5 acres per well.

Table 2-5. Approximate Disturbance Estimates for New Wells that would be Drilled in the MAA under Alternative C.

Surface Ownership	BLM	USFWS	Reclamation	State of Wyoming	Private/Fee	Total	Percent of MAA
Total Acres - Core	103,893	268	4,299	8,297	96,157	212,914	44.75
Total Acres - Flank	127,825	1,339	22,660	5,028	106,042	262,894	55.25
Total Acres in MAA	231,718	1,607	26,959	13,325	202,199	475,808	100.00
Numbers of Well Pads for Alternative C							
Core	1,906	0	89	137	1,631	3,763	---
Flank	676	0	115	25	586	1,402	---
Total Well Pads	2,582	0	204	162	2,217	5,165	---
Short-Term Disturbance - Acres of Disturbance Associated with Drilling and Completion Phases¹							
Core	16,893 ²	0	783	1,206	14,353	33,235	6.98
Flank	5,949	0	1,012	220	5,157	12,338	2.59
Total	22,842	0	1,795	1,426	19,510	45,573	9.58
Long-Term Disturbance - Acres of Disturbance After Interim Reclamation³							
Core	5,743	0	263	404	4,811	11,221	2.36
Flank	1,994	0	339	74	1,729	4,136	0.87
Total	7,737	0	602	478	6,540	15,357	3.23
Existing Oil And Gas Disturbance In Project Area						8,073	1.70
Total Projected Oil and Gas Disturbance After Interim Reclamation						23,430	4.92

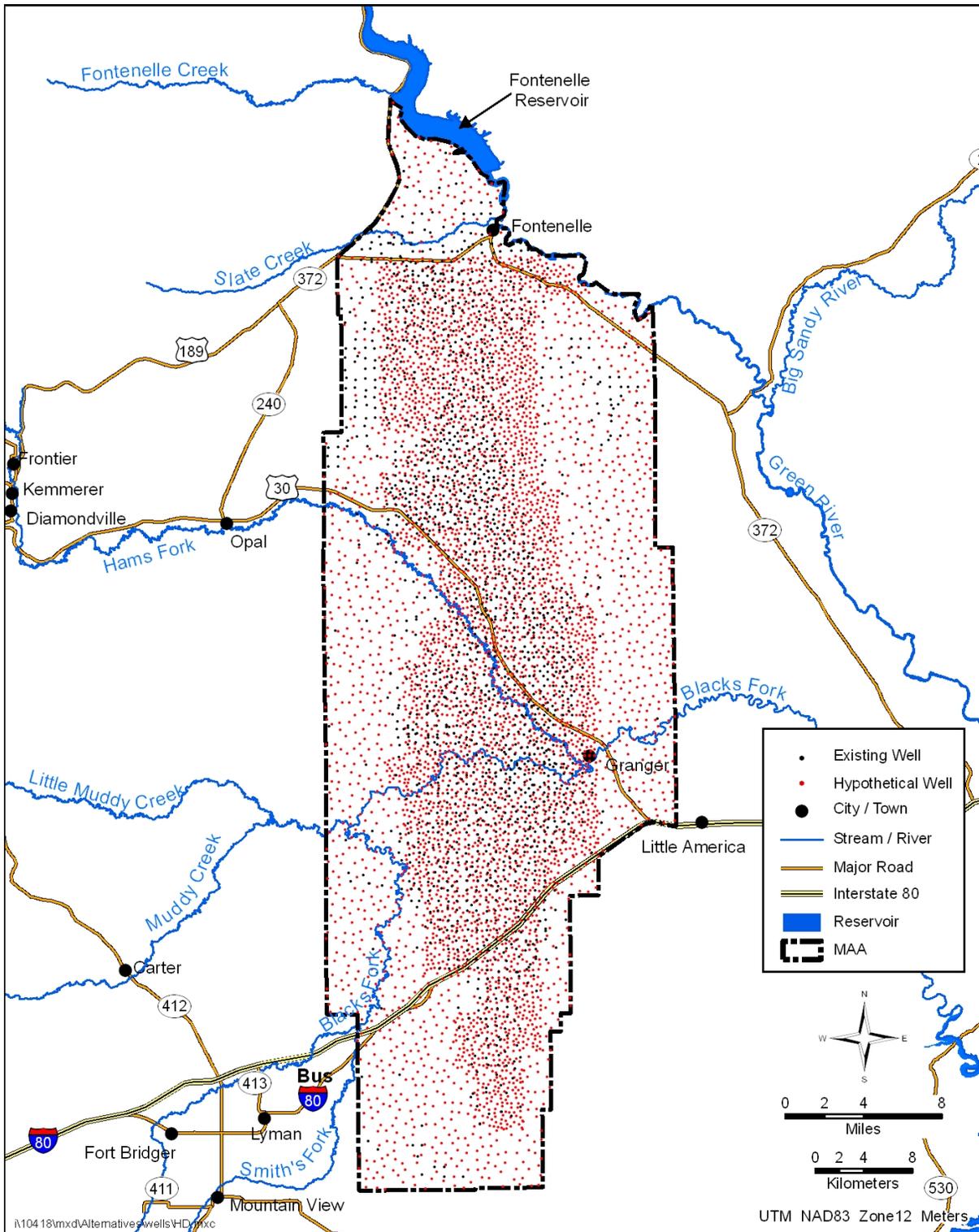
¹ Surface disturbance associated with drilling and completion activities for each well pad. Disturbance calculations assume 8.80 acres per well for Alternative C: 2.75 acres per well pad, 4.8 acres for 0.5 mile of collocated roads and gathering pipelines per well pad, and 1.25 acres of additional disturbance to account for pads, roads, and pipelines that require additional cut and fill.

² Includes disturbance estimates for 12 new 10-acre compression facilities on federal lands.

³ Disturbance associated with production activities after interim reclamation. Disturbance after interim reclamation would be 2.95 acres for Alternative C: 1.0 acre per well pad and 1.95 acres for collocated roads and gathering pipelines.

2.3.4. Alternative C

Alternative C would allow the drilling of up to 16 well pads per square mile across the core of the MAA, and 4 well pads per square mile in the flank of the MAA. Based on data provided by the Operators in the MAA, this spacing is a conservative estimate of what would be required to maximize resource extraction in the core and allow for full definition of resource potential in the flank area. This spacing is already being observed on private lands in the MAA. Infill drilling as part of Alternative C would consist of approximately 5,165 new wells across the MAA (Table 2-4, Map 2-4).



Map 2-4. Hypothetical Distribution of Wells in the MAA for Alternative C. Hypothetical well locations are for illustrative purposes only and do not reflect the actual locations of wells that would be drilled.

Based on current drilling rig availability estimates, if wells are drilled at a rate of approximately 205 per year, all wells would be drilled during an approximate 25-year period after project approval. To reduce disturbance, roads and gathering pipelines would be collocated for all well pads. An estimated 7 to 12 new compressors could be required to accommodate the additional gas produced.

The area of surface disturbance associated with drilling and completion activities would be approximately 45,573 acres (Table 2-5). Most of the disturbance would occur on BLM-administered lands. Approximately 9.6% of the Project Area would be affected by short-term disturbance. Because of the 25-year drilling schedule associated with Alternative C, approximately 1,823 acres (0.38% of the MAA) of new disturbance would occur each year for 25 years.

After interim reclamation is completed, the area of long-term disturbance associated with project development would be approximately 15,357 acres. It is expected that this level of disturbance would be present for the life of the wells that are drilled (approximately 65 years; 25 years for drilling and 40 years for operations). Operators would adhere to the necessary site-specific BMPs presented for Alternative B.

2.4. Features Common to All Alternatives

Operational considerations and field development methods would be the same for all action alternatives. Unless otherwise noted in the description of the Proposed Action or each project alternative, Appendix B describes the proposed operations in the MAA. Operations for Alternative A/No Action would follow the descriptions provided in the 1997 ROD (BLM 1997a).

BMPs would be applied on a site-specific basis as necessary to reduce impacts associated with construction, drilling, operation, or reclamation activities. BLM's policies require that Field Offices use appropriate environmental BMPs for mitigating anticipated impacts to surface and subsurface resources. Environmental BMPs are state-of-the-art mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse environmental or social impacts. Their application can "aid in achieving desired outcomes for safe, environmentally sound resource development, by preventing, minimizing, or mitigating adverse impacts and reducing conflicts."

In addition to the operator committed BMPs identified in the description of the Proposed Action, the following BMPs are identified in IM 2007-021 as those that should be considered on a case-by-case basis:

- Installation of raptor perch avoidance;
- Burying of distribution power lines and/or flow lines in or adjacent to access roads;
- Centralizing production facilities;
- Submersible pumps;
- Belowground wellheads;
- Drilling multiple wells from a single pad;
- Noise reduction techniques and designs;
- Wildlife monitoring;
- Placing seasonal restriction of public vehicular access;
- Avoiding placement of production facilities on hilltops and ridgelines;
- Screening facilities from view;
- Bioremediation of oil field wastes and spills; and
- Use of common utility or right-of-way corridors.

The above list is an example of what BMPs should be considered and is not a comprehensive list of potential BMPs that could be applied.

The operators' committed reclamation procedures described for the Proposed Action would be applied to alternatives B and C. These procedures would be added to the reclamation processes specified in Appendix E and would be required to comply with reclamation guidance provided in Onshore Oil and Gas Order Number 1.

2.5. Alternatives Considered and Eliminated from Detailed Study

Four alternatives were considered and eliminated from detailed study. These alternatives and the reasons for their elimination from further analysis are briefly described below.

2.5.1. 2,730 Wells Drilled Using Maximum Rig Availability

This alternative considered the possibility that the number of wells drilled would be based on maximum rig availability. Assuming 15 rigs, per the Operators' Proposed Action, and 20 days per well, approximately 273 wells could be drilled per year for 10 years, producing a total of 2,730 wells.

This alternative was removed from further consideration because it is anticipated that 15 rigs would not be available over the life of the project. Currently, 9 to 10 rigs operate in the MAA; additional rigs are unavailable due to development in other fields throughout southwestern Wyoming.

2.5.2. Shortened Drilling Phase Alternative

This alternative assumed that wells would be drilled based on maximum rig availability. Assuming 15 rigs, per the Operators' Proposed Action and 20 days per well, approximately that 273 wells could be drilled per year. However, instead of drilling more wells during a 10-year period due to maximum rig availability, this alternative focused on decreasing the drilling period to 7 years by increasing the wells drilled per year.

This alternative was removed from further consideration for the same reason as the previous alternative. Additionally, because this alternative produced the same amount of disturbance as the Operators' Proposed Action, it was reasoned that the intensity of disturbance and impacts on certain resources (biological and physical) would be increased by shortening the drilling phase.

2.5.3. 9 to 12 Wells per Square Mile across Entire MAA

This alternative involved drilling 9 to 12 wells per square mile across the entire Project Area. This well density was developed using data from the BLM Wyoming's Reservoir Management Group (RMG), which indicated that the MAA would be most optimally drained at an average spacing of approximately 9 wells per square mile. However, the RMG recognized that in some cases, optimal resource recovery would require higher densities of infill drilling and that in some areas well density could not be estimated because of the unknown nature of the gas reserves (especially in unproven areas of the flank). It was also determined that certain areas may require more intensive development (such as proven areas in the core), and other areas may require fewer wells to fully develop the resource potential (such as flank areas). Additionally, in many areas drilling 9 to 12 wells per square mile would not be economically feasible, as the gas return from an individual well might not offset the costs of drilling. More detailed data from the Operators allowed BLM to develop Alternative C, which analyzes the impacts of a High Field Development Alternative.

2.5.4. Spatial and Temporal Phasing of Field Development

This Phased Development Alternative would include the same level of development as the Operators' Proposed Action, but the drilling would be phased by lease, section, or other factor. The intent of phased development was to decrease the impacts to the surface and resources in the MAA by allowing

only selected areas or selected numbers of wells to be drilled each year. Several options were considered for this alternative, and both temporal and spatial phased development scenarios were evaluated. Possible phased development alternatives included:

- **Drilling certain percentages of wells every year over the period of the drilling phase**

The Operators Proposed Action and Alternative C already specify a temporally phased approach for drilling. The Proposed Action would have approximately 10% of proposed wells drilled every year for 10 years. Alternative C would have approximately 4% of 5,165 wells drilled every year for 25 years.

- **Drilling only on selected leases each year where some leases would be allowed to drill and others would not or, drilling certain percentages of a lease per year.**

Because of the number of leaseholders (Map 1-3), the spatial complexity of the leases, the multiple operators, the variable size of the leases, and the checkerboard land ownership pattern, it would be very difficult to phase development by lease. Leases in the MAA were offered over a period of decades and the specific stipulations on how they can be developed and their expiration date varies substantially. Some leases are held by production, others are unitized, and others are neither. Additionally, the MAA is an existing gas field and most of the leased acreage has already had some level of development and disallowing drilling could constitute the taking of a lease right. Because of the varying size of the leases (Map 1-3) it would be difficult to specify a percentage of a lease or a minimum acreage threshold for development. By specifying a disturbance threshold by lease, it is likely that some smaller leaseholders and operators could be disadvantaged while others with larger leases and more opportunity for development would be unjustly advantaged. Because of these complexities, the decision on which leases to drill on each year or how much disturbance could occur on each lease would likely be arbitrary and not supportable.

The checkerboard land ownership pattern also does not provide an opportunity to achieve the goals of phased development. If BLM phased the drilling on federal lands and minerals in the checkerboard, nothing would prevent the operators from drilling on the private and state lands. This drilling would still cause impacts to the wildlife species that inhabit the checkerboard lands and would still impact resources such as water, air, socioeconomics, visual resources, and soils. By phasing, and slowing development in the checkerboard it could prolong field development and prolong the impacts that occur to the above resources.

- **Drilling certain percentages of wells in sensitive areas each year.**

Because of many of the same reasons as stated above, this phased development scenario was not further analyzed. Because of the complexity of the land ownership and leasing pattern in the MAA, this alternative would not achieve the goals that it is intended to accomplish. In the checkerboard lands, if BLM specified that development on sensitive lands would be limited, the operators could move to non-federal lands where impacts could occur to sensitive resources such as wildlife habitat, big game winter range, cultural resources, soils, and a number of other resources.

Additionally, because of the varying lease conditions, stipulations, and conditions of approval across the MAA, BLM could be limited in its ability to prevent development in sensitive areas. Because the MAA is an existing field, many of the sensitive areas already have development occurring in them. Alternative B was developed to address development in sensitive areas. Alternative B provides the tools necessary to avoid impacts to sensitive areas, to focus on reclamation of these areas, and to reduce disturbance across the project area.

2.6. Comparison of Impacts by Alternative

The table on the following pages (Table 2-6) discusses the potential impacts that could occur to selected resources as a result of implementing the Operators' Proposed Action or any of the project alternatives.

Table 2-6. Comparison of Impacts by Alternative.

Resource	Proposed Action (PA)	Alternative A	Alternative B	Alternative C
Air Quality				
Concentrations of criteria pollutants and Hazardous Air Pollutants (HAPs)	Potential near-field concentrations would be well below applicable National Ambient Air Quality Standards (NAAQS), Wyoming Ambient Air Quality Standards (WAAQS), and PSD Class II Increment for all pollutants; potential Hazardous Air Pollutant (HAP) impacts would be below applicable health-based levels and within acceptable cancer risk ranges for carcinogens	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Sulfur and nitrogen deposition	Potential total deposition would be below the applicable levels of concern (LOCs)	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Acid neutralizing capacity for sensitive lakes	Project total ANC would be below the applicable LOCs	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Visibility in Class I and sensitive Class II areas	Potential significant project visibility impact would be 1 day at Bridger Class I area. Potential significant cumulative impact would be 45 days at Bridger.	There would be no impact from the project. Potential cumulative visibility impact would be 42 days.	Same or less than Alternative C.	Potential significant project visibility impact would be 5 days at Bridger. Potential significant cumulative visibility impact would be 50 days at Bridger.
Ozone	The maximum estimated daily maximum 8-hour ozone concentrations near the Project are below the 8-hour ozone standard.	Concentrations would be lower than the Proposed Action	Same or less than Alternative C.	Concentrations would be higher than the Proposed Action but would not be expected to exceed the NAAQS.

Resource	Proposed Action (PA)	Alternative A	Alternative B	Alternative C
Geology, Minerals, and Paleontology				
Surface Geology	Short-term disturbance of 18,650 acres; 13,279 acres disturbed after interim reclamation; no lasting effects after final reclamation and recontouring	Short-term disturbance of 10,258 acres; 2,848 acres disturbed after interim reclamation; no lasting effects after final reclamation and recontouring	Short-term impacts could be as high as Alternative C. Long-term impacts same as Alternative A.	Short-term disturbance of 45,573 acres; 22,641 acres disturbed after interim reclamation; no lasting effects after final reclamation and recontouring
Geohazards	Low risk of landslide risks along steep slopes and bluffs adjacent to perennial streams and along the sides of residual mesas.	Same as PA	Same as PA	Same as PA
Paleontological Resources	During construction, potential for damage/destruction and also discovery of important fossils.	Same as PA but lower potential for damage/destruction and discovery	Same or less than Alternative C.	Same as PA but higher potential for damage/destruction and discovery
Minerals	Depletion of 60% of the technically recoverable gas resource for the MAA; no potential conflicts with trona mining	Depletion of 28% of the technically recoverable gas resource for the MAA; no potential conflicts with trona mining	Same as Alternative C.	Depletion of 85% of the technically recoverable gas resource for the MAA; possible conflicts with trona mining if MMTA restrictions are relaxed or released

Resource	Proposed Action (PA)	Alternative A	Alternative B	Alternative C
Soils				
Disturbance to sensitive soils	6,432 acres disturbance during 10-year drilling and construction phase; 2,068 acres after interim reclamation	3,731 acres disturbance during drilling and construction phase; 1,034 acres after interim reclamation	Could be as high as Alternative C but would likely be lower because of emphasis on reclamation.	15,367 acres disturbance during drilling and construction phase; 5,173 acres after interim reclamation
Disturbance to non-sensitive soils	12,213 acres disturbance during drilling and construction phase; 3,926 acres after interim reclamation	6,524 acres disturbance during drilling and construction phase; 1,810 acres after interim reclamation	Could be higher than Alternative C if all development shifts into non-sensitive soils to improve reclamation success. Would likely be lower than alternative C if technologies like directional drilling are used.	30,196 acres disturbance during drilling and construction phase; 10,176 acres after interim reclamation
Water Resources				
Watershed Disturbances	<1% new disturbance of Upper Green, Slate Creek, Blacks Fork, and Muddy Creek watersheds. Slightly greater than No Action	<0.5% new disturbance of Upper Green, Slate Creek, Blacks Fork, and Muddy Creek watersheds	Same or lower than Alternative C.	<1% new disturbance of Upper Green and Muddy Creek watersheds, 1.2% in Slate Creek, and 1.9% in Blacks Fork
Surface Water Quantity	3,722 acre-feet of water required over LOP, 374 acre-feet per year	1,340 acre-feet of water required over LOP, 223 acre-feet per year	Same as Alternative C	10,300 acre-feet of water required over LOP, 414 acre-feet per year
Surface Water Use and Quality	No significant impacts would be expected	Same as PA	Same as PA	Same as PA
Groundwater Use and Quality	Some local depletion to groundwater could occur under all alternatives. Groundwater use is expected to be proportional to the level of development for each alternative.	Same as PA	Same as PA	Same as PA

Resource	Proposed Action (PA)	Alternative A	Alternative B	Alternative C
Vegetation and Wetlands				
Wetland and riparian vegetation types	Impacts would not be significant because of BLM stipulations and CWA regulations, some impacts might occur where roads, pipelines, or well pads intersect those vegetation types	Impacts would not be significant, impacts would be less than PA	Same or less than Alternative C.	Impacts would not be significant because of BLM stipulations and CWA regulations, impacts would be greater than PA
New short-term disturbance of any vegetation type greater than 10% of its availability	No significant impacts to any vegetation class. Desert shrub/sagebrush has greatest disturbance	No significant increases to vegetation disturbance. Less disturbance than PA.	Same or less than Alternative C.	Significant impacts to vegetated sand dunes, alkali scrub, and agriculture/croplands. Possible significant impacts to desert shrub/sagebrush and barrens.
Increase in populations of noxious or invasive plants	No significant increases in noxious weeds expected because of BLM stipulations and current operator management practices	Same as PA	Same as PA	Same as PA
Fisheries and Aquatic Ecosystems				
Impacts to fisheries and aquatic ecosystems resulting in loss of habitat function or life history requirements	No significant impacts would be expected because of protection of wetland and riparian habitats as well as mitigation measures currently in place for water resources	Same as PA	Same as PA	Same as PA
Disruption/loss of vital/high value riparian and aquatic resources	Impacts would not be significant because of BLM stipulations and CWA regulations	Same as PA	Same as PA	Same as PA

Resource	Proposed Action (PA)	Alternative A	Alternative B	Alternative C
Raptors				
Substantial loss of habitat function or disruption of life history requirements of a species or population segment	BLM stipulations for timing and location of drilling operations during raptor nesting periods would reduce impacts	Similar to PA but with lower potential for impacts to nesting birds	Less than Alternative C.	Similar to PA but with higher potential for impacts to nesting birds
Surface disturbance of more than 5% of area within 0.5 mile buffer around 106 known nests	4.3% disturbance during drilling and completion activities, 1.4% disturbance after interim reclamation	2.3% disturbance during drilling and completion, <1% after interim reclamation	Less than Alternative C.	9.8% disturbance during drilling and completion activities, 3.3% after interim reclamation. Impacts could be significant.
Big Game				
Greater than 5% disturbance in crucial ranges or 10% disturbance in non-crucial ranges	Disturbance in all crucial habitats for pronghorn and elk would be less than 5%; disturbance to all other habitats for all big game species would be less than 10%. Increased habitat fragmentation and encroachment on migration routes could cause significant impacts.	All disturbances would be less than the PA and would fall below the 5% and 10% thresholds	Less than Alternative C. Impacts could be significant.	Short-term impacts to pronghorn crucial range would be 9.2% and would exceed the 5% threshold of significance; short-term impacts to pronghorn spring-summer-fall habitat would be 10.2% and would exceed 10% threshold; 11.9% of mule deer habitat would be disturbed; 10.1% of elk crucial severe winter relief would be expected. Encroachment on migration routes could cause significant impacts.

Resource	Proposed Action (PA)	Alternative A	Alternative B	Alternative C
Well counts that would result in extreme impacts to big game crucial ranges as defined by WGFD	High, but not extreme, impacts to pronghorn crucial ranges in core; extreme impacts to elk crucial range in the core, high impacts to elk crucial range in the flank.	Moderate to high impacts to pronghorn crucial ranges; same as PA for elk	Less than Alternative C.	High impact to pronghorn crucial habitat but greater than PA; extreme impact to elk crucial habitat in both core and flank
ESA Protected Species and BLM Sensitive Species				
Ute ladies'-tresses orchid	Impacts avoided on federal lands through Application for Permit to Drill (APD) and on-site process as well as BLM required buffers around wetlands and riparian areas.	Same as PA	Same as PA	Same as PA
Bald eagle	No significant impacts	Same as PA	Same as PA	Same as PA
Colorado River fishes	Potential depletion to Colorado River Basin of 3,722 acre-feet over the LOP, 374 acre-feet per year	Potential depletion to Colorado River Basin of 1,514 acre-feet over the LOP, 216 acre-feet per year	Same as Alternative C.	Potential depletion to Colorado River Basin of 10,300 acre-feet over the LOP, 414 acre-feet per year
Black-footed ferret	No direct impacts, impacts to potentially suitable prairie dog towns	Same as PA but lower development in prairie dog towns	Same or less than Alternative C.	Same as PA but higher development in prairie dog towns
Yellow-billed cuckoo	No significant impacts	Same as PA	Same as PA	Same as PA
Greater sage-grouse	Impact to 3.7% of available sagebrush habitat, "high" level of impact using WGFD definitions. Impacts could cause significant impacts to some lek site or in some brood rearing habitat	Impact to 1.9% of available sagebrush habitat, "moderate" level of impact using WGFD definitions	Less than Alternative C. Impacts could be significant.	Impact to 9.2% of available sagebrush habitat, "high" level of impact using WGFD definitions. Impacts would be significant.

Resource	Proposed Action (PA)	Alternative A	Alternative B	Alternative C
Cultural and Historical Resources				
Vandalism and illegal collection	Impacts would be proportional to the amount of disturbance for each alternative.	Lower potential for impacts than PA	Same as or less than Alternative C.	Higher potential for impacts than PA
Non-mitigated impacts to eligible sites	Impacts would be proportional to the amount of disturbance for each alternative.	Lower potential for impacts than PA	Same or less than Alternative C.	Higher potential for impacts than PA
Socioeconomics and Environmental Justice				
Increased demand for housing that exceeds supply and results from project activities	Majority of workforce (60%) would come from outside the area. Current housing in area is inadequate to meet increased demands and population growth.	Current housing is adequate.	Same as Alternative C	Similar to PA with greater potential for housing shortages.
Increases in demand for local government facilities or services that exceed existing capacity and are not offset by adequate revenues	School capacity is adequate. Sewer and transportation is inadequate. Additional law enforcement personnel and costs would be necessary. Ad valorem, severance tax, and mineral royalties tax would generate approximately \$1.17 billion in revenue for county, state, and federal governments that would help to offset costs of increased infrastructure.	School capacity is adequate. Ongoing upgrades to the sewer system would be sufficient for the No Action. Ad valorem, severance tax, and mineral royalties tax would generate approximately \$541 million in revenue for county, state, and federal governments that would help to offset costs of increased infrastructure.	Same as Alternative C	School capacity is adequate. Sewer and transportation is inadequate. Additional law enforcement personnel and costs would be necessary. Ad valorem, severance tax, and mineral royalties tax would generate approximately \$1.68 billion in revenue for county, state, and federal governments that would help to offset costs of increased infrastructure.
Employment and income	Would generate up to 7,894 worker years in new employment including 22,993 jobs during drilling and construction and 4,872 jobs during production.	Would generate up to 3,211 worker years in new employment including 9,353 jobs during drilling and construction and 2,252 jobs during production.	Same as Alternative C	Would generate up to 21,911 worker years in new employment including 63,814 jobs during drilling and construction and 7,007 jobs during production.

Resource	Proposed Action (PA)	Alternative A	Alternative B	Alternative C
Population	Peak population increase would be approximately 264 individuals	Peak population increase would be approximately 165 individuals	Same as Alternative C	Peak population increase would be approximately 283 individuals
Land Use				
Land Status/Prior Rights	No changes expected	Same as PA	Same as PA	Same as PA
Loss of AUMs	The reduction in animal unit months (AUMs) from the Proposed Action would not be a significant loss	Same as PA but fewer AUMs lost	Same as Alternative A/No Action.	Same as PA but more AUMs lost
Impacts to livestock	Possible decreased forage quality near roads, increased potential for collisions with livestock, potential for spread of some invasive weeds	Same as PA but less impact	Same as Alternative A/No Action.	Same as PA but more impact
Recreation	Some impacts to recreation experiences for primitive camping, hunting, fishing, and open recreation. Level of impact would be roughly proportional to the amount of development for each alternative.	Fewer impacts than PA	Less than Alternative C. Likely impacts would be closer to impacts of No Action or PA.	Greater impacts than PA
Transportation				
Number of trips in peak development year	85,298 trips	49,258 trips	Same or less than Alternative C.	103,817 trips
Percent of projected 2015 Average Annual Daily Traffic volumes	180 – 1.4% US 30 – 7.2% US 189 – 2% WY 372 – 1.5% WY 240 – 1.7%	Not expected to change from current conditions or those conditions projected in 1995 EIS (BLM 1995a)	Same or less than Alternative C.	180 – 1.5% US 30 – 8.2% US 189 – 2.1% WY 372 – 1.7% WY 240 – 1.7%

Resource	Proposed Action (PA)	Alternative A	Alternative B:	Alternative C:
Visual Resources				
Disturbance within various visual resource classes	Class II – 2,217 acres Class III – 4,787 acres Class IV – 11,646 acres	Class II – 702 acres Class III – 2,144 acres Class IV – 7,413 acres	Same or less than Alternative C. Long-term impact same as Alternative A/No Action	Class II – 4,180 acres Class III – 44,276 acres Class IV – 27,116 acres
Hazardous Materials/Health and Safety				
Potential for increased risk to the public	Increased risks would not be significant	Same as PA	Same as PA	Same as PA