

Common Obstacles to Interim Reclamation Compliance and Production Facility Maintenance at Oil and Gas Well Sites in Wyoming

RECOMMENDATIONS FOR CORRECTIVE ACTION

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Common Obstacles to Interim Reclamation Compliance and Production Facility Maintenance at Oil and Gas Well Sites in Wyoming: Recommendations for Corrective Action

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SUMMARY

This bulletin describes environmental concerns and common areas of non-compliance for oil and gas well sites in Wyoming, including interim reclamation and production facility maintenance. Interim reclamation is required once a well is drilled and completed, and represents not only the recovery of site stability and productivity, but also the first step to achieving final reclamation to pre-disturbance site conditions. Successful interim reclamation depends on careful monitoring for effectiveness, and management of production facilities to minimize the surface disturbance. Background information and methods to identify and solve problems are provided to assist operators with compliance for the life of the well and other facilities prior to final abandonment. This bulletin is guided by the Bureau of Land Management (BLM) Wyoming Reclamation Policy and benefits from practical field experience. Our target audience comprises oil and gas operators on federal land. This information will also assist operators and landowners where private land occurs over federal mineral estate (“split estate”).

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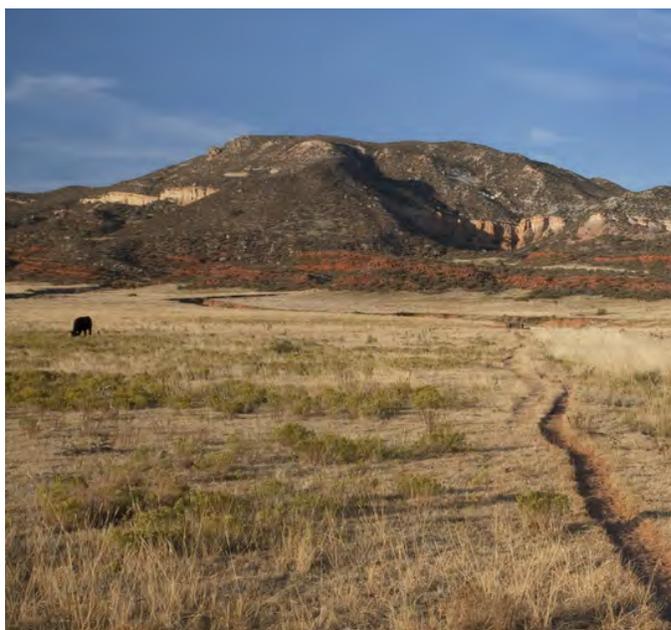
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This bulletin is part of a series by the Wyoming Reclamation and Restoration Center that describes strategies for restoring ecological functions to disturbed Wyoming lands. It represents a joint effort between University of Wyoming (UW) and the BLM Reclamation Policy Team and Field Offices in Wyoming. For this series, reclamation means restoration of components that support desired ecological functions, such as forage for livestock grazing, wildlife forage and cover, water supply, water quality protection, and aesthetic values.

INTERIM RECLAMATION

Throughout the western United States, thousands of surface and mineral land acres administered by the BLM are available for oil and gas leasing. The resulting disturbance includes removal of vegetation, topsoil stockpiling, and alteration of landscape features. Exposed soil is vulnerable to erosion and invasion by exotic and **noxious weeds** (see Glossary). Mitigation of these and other environmental impacts must occur throughout the life of the project.

Onshore Oil and Gas Order No. 1 requires **interim reclamation** of disturbed areas no longer in use during well operation once initial site and road construction are complete (USDI 2007a). Interim reclamation begins with reconstruction to pre-disturbance topography of those portions of the well pad no longer needed to support production operations, and earthwork must be completed within six months after well and oil and gas infrastructure installation concludes (USDI 2007a). Site-specific plans for interim reclamation are described in the **Surface Use Plan of Operations** (Gold Book 2007). Following site **recontouring**, interim reclamation generally requires respreading of topsoil, seeding of native vegetation, and weed control. While site selection is one of the most important considerations for subsequent reclamation, this bulletin is focused on compliance monitoring once sites are established.

In Wyoming, the BLM reclamation policy applies to all BLM-authorized surface disturbing activities in the state, and lists ten requirements for reclamation plans (Wyoming Reclamation Policy 2012). These requirements include waste management, site stabilization, reconstruction of topographic and hydrologic features, topsoil and weed management, revegetation of a desired native plant community, the return of visual quality, and compliance monitoring.

WELL PRODUCTION FACILITIES AND COMPLIANCE

Well production facilities are subject to the Code of Federal Regulations (CFR) for Onshore Oil and Gas Operations. All operators must conduct operations “in a manner which protects the mineral resources, other natural resources, and environmental quality” (43 CFR 3162.5-1a Environmental Obligations). This includes measures to properly dispose of produced water, prevent spills and contamination, avoid unnecessary surface disturbance, and ultimately reclaim all land disturbances.

Compliance to meet environmental obligations is not only required by law (43 CFR 3162.5-1), it can also impact interim reclamation. Ongoing inspection and monitoring should include a review of facilities and site activity to ensure interim reclamation is maximized and the footprint of disturbance is minimized (Fig. 1). Compliance monitoring is required for the life of the well.

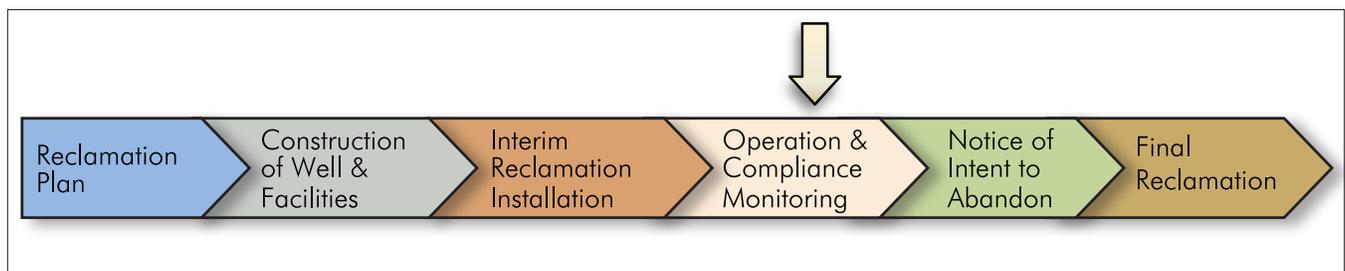


Figure 1. The reclamation timeline begins prior to well installation with the submission of a reclamation plan, and is complete once final reclamation is approved and the bond is released. Here we focus on interim reclamation compliance during the life of the well (i.e., operation and compliance) and related roads and facilities.

To avoid compliance problems, the industry can take advantage of the knowledge of field personnel. Pumpers/operators, field crews, and environmental managers often have opportunities to identify and report problems to their immediate supervisor. A description of problems and proposed mitigation is then communicated to the BLM. Below we provide examples of obstacles to compliance, and offer solutions to meet requirements for ongoing maintenance of interim reclamation. Interim reclamation is required for all production-held surfaces, onsite pipelines, roads, pits and ancillary facilities. The following recommendations apply to each of these facilities unless otherwise noted.

AREAS OF CONCERN

Among required compliance activities, three areas are the source of common problems: (1) stormwater drainage and erosion control, (2) establishment of a native plant community and management of invasive weeds, and (3) environmental compliance of operational well and ancillary facilities.

STORMWATER DRAINAGE AND EROSION CONTROL

To achieve site stability and productivity, interim reclamation must address not only revegetation, but also the ecosystem attributes of **soil stability**, **hydrologic function**, and **biotic integrity** (Pellant et al. 2005; Herrick et al. 2006). A decline in these attributes results in soil erosion and low rates of water infiltration, as well as weed infestation and limited development of the desired native plant community. For example, the loss of soil to wind and water erosion can range from 5 to 13 million tons each year in Wyoming alone (USDA 2013).

Locating wells on relatively level ground minimizes the need for earthwork during reclamation and reduces the risk of later runoff and erosion problems. If wells were constructed on sloping ground, recontouring should eliminate highwalls and other steep slopes to improve overall site stability (Fig. 2). Once recontouring is complete and topsoil is replaced, attention should be directed to reconstruction of site hydrology to minimize erosion.



Figure 2. Ineffective recontouring can result in steep slopes and poor site stability.

Erosion is more likely to occur on sites with limited vegetation and little or no biological crust cover (e.g., mosses, liverworts and lichens). Poor revegetation outcomes contribute to increased susceptibility to wind erosion (Fig. 3). Signs of water erosion, such as rills and gullies, are also common and should be monitored closely (Fig. 4).



Figure 3. Wyoming ecosystems are impacted by water and wind erosion, and sediment loss commonly occurs in areas with steep slopes and low vegetative cover.



Figure 4. Steep slopes and sparse vegetation increase the risk of rill and gully erosion resulting from stormwater runoff.



Figure 5. Failure of straw wattle, leading to rill and gully erosion. Proper installation is necessary to avoid failure. In this case, wattles may not be sufficient to prevent erosion and other measures are needed.

Measures to prevent erosion include deep ripping or imprinting to allow water infiltration, proper installation and use of mulch or wattles, sediment fences, riprap and gabions, and established vegetation. Most erosion control measures (ECMs) are implemented at the time of site reconstruction. However, post-reclamation installation may be needed for compliance, and poor maintenance of ECMs often leads to failed reclamation. For example, mulch can blow off the soil surface if not adequately crimped into the soil, and wattles or sediment fences are likely to fail if installed improperly (Fig. 5).

For purposes of compliance monitoring, field personnel should be able to identify when ECMs on interim reclamation and nearby facilities have failed or require maintenance. In cases where erosion results in large gullies, additional earthwork may be required to repair damage. Proper installation and monitoring of erosion prevention measures will help operators avoid this added expense.

Ground subsidence can also impact interim reclamation, leads to further site instability, and is a common occurrence along pipelines (Fig. 6). To avoid subsidence, compaction should be sufficient to limit the development of large holes or depressions but not so severe as to prevent the growth of vegetation. The timing of compaction is important and can be affected by seasonal temperatures and frozen ground. Changes in land features that result from subsidence should be noted by operators and observed over time to determine if further mitigation measures are necessary.

TOPSOIL STOCKPILE MANAGEMENT

Proper topsoil management is critical for successful interim and **final reclamation**, and represents a special focus for erosion control, monitoring and maintenance. While not recommended everywhere, small topsoil stockpiles may remain onsite once interim reclamation activities are completed, provided that viability of the topsoil can be maintained for the life of the well.

Field personnel can assist with stockpile maintenance through visual inspection to determine if erosion is occurring. All personnel working on the site or at nearby facilities should be notified that the priority use

of stockpiled soil is reclamation, and topsoil should not be diverted for road maintenance or other fill purposes. If topsoil is stockpiled more than one growing season, it should be seeded with the recommended native or sterile non-native seed mix (Wyoming Reclamation Policy 2012). The maximum depth of stockpiles is determined by environmental managers in consultation with the BLM. Operators should note if stockpiles show signs of rill and gully formation or are impacted by invasive weeds.

NATIVE PLANTS AND INVASIVE WEEDS

Interim reclamation should be monitored routinely to determine if establishment of the desired native plant community has been achieved in reclaimed areas. Poor outcomes in revegetation are common in semi-arid and arid climates and contribute to nearly all other compliance concerns, including weed management.

Exotic, **invasive plant species** inhibit the establishment of seeded vegetation and reduce site productivity, including wildlife habitat value and livestock forage (Whitson 1996; WY WPC 2013). Weeds must be monitored and controlled during well operation within the active well pad, on nearby roads, and also on reclaimed areas. No noxious weeds are allowed, and a weed management plan should be in place prior to well installation. If surrounding undisturbed areas (including **reference areas**) are also infested with noxious or invasive weeds, operators should make a note of it and report the problem to BLM personnel.

Visual inspection of the site will be needed on a routine basis to identify weeds and implement control measures. Post-reclamation control measures may include mowing, application of appropriate herbicides, and efforts to increase the number of desired plant species so weeds are unable to establish. Some weed species, such as Russian thistle, decline over time without management. If those species are still present in large numbers (75–100% of estimated cover) after three years, control measures will be required and may include reseeding.

Compliance for weed control is greatly improved when field personnel properly identify invasive and noxious weed species. Personnel at Weed and Pest Control Districts can provide assistance with the identification and control of weed species. Reference photos are also useful tools for documenting infestation so weeds can be effectively monitored and managed over the life of the well and other facilities (Figs. 7–10). Here, we provide photos of several weed species that are commonly found on reclamation sites and oil and gas well facilities in Wyoming. Early detection and treatment are key to successful weed management. Ultimately, undesirable plant species will be controlled by successful growth of desirable, native vegetation.



Figure 6. Subsidence can be avoided by compacting fill during site recontouring prior to application of topsoil. Once interim reclamation is in place, sites should be monitored for signs of subsidence that require further maintenance.



Figure 7. Two photos of halogeton, a noxious weed that often grows in saline soils in disturbed sites.



Figure 8. Musk thistle (left) and Canada thistle (right), two common, noxious weeds at disturbed sites.



Figure 9. Whitetop or hoary cress (left) and black henbane (right).



Figure 10. Houndstongue (left) and cheatgrass or downy brome (right). Cheatgrass is an exotic, invasive plant species that increases fire frequency and limits forage and habitat value.

COMMON AREAS OF NON-COMPLIANCE FOR WELL FACILITY MAINTENANCE

The active well and related facilities can directly impact interim reclamation, particularly in the case of water quality and wildlife habitat. Pollution prevention is critical to maintain reclaimed areas and limit the need for additional, costly site mitigation, including additional reclamation measures (USDI 1979, 2007b). Field personnel who visit active wells and inspect facilities should keep in mind the following requirements for spill prevention and facilities management.

SPILL PREVENTION:

Spills not only require reporting and potentially costly cleanup, but can also lead to additional expenditures if interim reclamation is impacted. Berms are required for all tanks, and metal berms are more efficient and easier to maintain than earthwork berms (Fig. 11; BLM IM WY 2012-007). Metal berms are also less likely to be breached by livestock or wildlife (Fig. 12). Smaller animals burrow into earth berms, requiring additional maintenance or risking large areas of contamination when spills occur.

FACILITIES MANAGEMENT:

Field personnel must avoid reclaimed areas when driving on site, and graveled roads should be maintained to avoid damage due to increased erosion. Note also that well facilities attract nesting and roosting birds, including raptors that may prey on sensitive species such as greater sage-grouse. Efforts should be made to deter animal presence in the active well area, including fencing production facilities. Many resources are available that describe measures to avoid harm to wildlife, and field personnel should be aware of these measures and their proper monitoring and maintenance (for example, see USFWS 2011). Minimizing surface disturbance and repairing damage to native plant communities contributes to the restoration of degraded sites, and enhances other, pre-existing resource values such as recreation, wildlife habitat, and rangeland health. Compliance monitoring and maintenance ensures these values are retained.



Figure 11. Earthwork berms are easily damaged by wildlife or other activities at a well site, and greatly increase the risk of berm failure in case of a spill, which can contaminate interim reclamation.



Figure 12. Metal berms are easier to maintain and more cost effective in the long term.

Lastly, field personnel should become familiar with the different risks that may occur in wet or dry years. Seasonal variation in precipitation and the length of the growing season will impact vegetation, soil and wind erosion, and wildlife or livestock activity near oil and gas well sites. For example, weeds may require intensive management in wet years, while maintenance of native plants and wind erosion control measures may be more critical in dry years.

MONITORING AND REPORTING

Monitoring during production operations is important to ensure that successful interim reclamation of all well-related facilities is achieved. In addition to required monitoring by environmental managers (e.g., BLM Tech Note #348), field personnel can use visual inspection and routine photos to identify compliance concerns. Once compliance concerns are identified, operators should work with their local BLM office to develop corrective action plans. This will reduce the number of violations and limit the cost of site maintenance and final reclamation. Ultimately, proper planning, monitoring, and maintenance of interim reclamation will reduce the time and money needed for final reclamation of oil and gas facilities. Education and involvement of field crews, pumpers, operators, and environmental personnel will improve compliance with minimal time commitment.

This bulletin was cooperatively prepared to assist readers with the identification and resolution of common problems that affect interim oil and gas reclamation on BLM-managed surface estate in the State of Wyoming. Wyoming oil and gas operators work in a wide range of environmental conditions, and it's impossible to address all concerns that may arise during interim reclamation and subsequent inspection. We encourage operators to work with their local BLM District and Field Offices to meet guidelines specific to their sites.

GLOSSARY

Biotic integrity – capacity of a site to support characteristic plant communities in the context of normal variability. (Pellant et al. 2005)

Final reclamation – removal of facilities and restoration to pre-disturbance site conditions, including original topography or landform, return of hydrologic features and function, application of salvaged topsoil, and reestablishment of the native (or otherwise approved) plant community. Return of visual resources and wildlife habitat is emphasized.

Hydrologic function – capacity of the site to capture, store, and safely release water from rainfall, run-on and snowmelt. (Pellant et al. 2005)

Interim reclamation – partial reclamation of well pads and other structures once well installation is complete with the objective to restore site stability and vegetation and therefore mitigate environmental impacts during the life of the well. (Gold Book 2007)

Invasive plant species – “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.” (Executive Order 13112)

Noxious weeds – “any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.” (Plant Protection Act 2000)

Recontouring – earthwork after any fill to blend the site in with surrounding topography, including reconstruction of natural drainage features.

Reference areas – nearby undisturbed sites where vegetation, topography and elevation are similar to the area disturbed for oil and gas development. Reclaimed sites are compared with reference areas to determine if reclamation is meeting goals for return of pre-disturbance site conditions.

Soil stability – capacity of a site to limit loss of soil resources, including nutrients and organic matter, by wind and water. (Pellant et al. 2005)

Surface Use Plan of Operations – construction, drilling and operation, waste disposal and reclamation plan for oil and gas exploration and development. Required when submitting an Application for Permit to Drill (APD; see Gold Book 2007).

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APPENDIX: BLM INSPECTION FORM FOR INTERIM RECLAMATION AND PRODUCTION FACILITY MAINTENANCE

Production/Interim Reclamation Inspection/Monitoring - Environmental

Case #: Lease #: Operator: Present : Yes <input type="checkbox"/> No <input type="checkbox"/>	Multi-Well Location Yes <input type="checkbox"/> No <input type="checkbox"/> No. Wells:	Well Name: Well #: API #: Well Status: Well Completion Date:
Twn: Rng: Sec: Qtr: N/S Foot: E/W Foot:	County: State: Lat.: Long.:	Facility ID: Facility Name: H2S: Yes <input type="checkbox"/> No <input type="checkbox"/>
Surface Owner: Present: Yes <input type="checkbox"/> No <input type="checkbox"/>		Inspection Activity: ES-- Choose an item.
Office Time:	Travel Time:	Inspection Time:
Trips:	Inspection Open Date: Click here to enter a date.	
Inspection Close Date: Click here to enter a date.		Inspector:

Inspected: Well/Facility Location ; Road ; Pipeline ; Power Line ; Other

Inspection Items	Met	Not Met	N/A	Order/INC
Interim Reclamation				
1. Facilities Clustered and Sited to Maximize Interim Reclamation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
2. Rock Surfacing Removed from Areas to be Interim Reclaimed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
3. Pit Contents Buried <input type="checkbox"/> Removed <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
4. Compacted Areas to be Vegetated have been Ripped	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
5. Recontouring of Areas Not Needed for Production Activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
6. Topsoil Redistributed on Majority of the Disturbed Areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
7. Seeded Method: Drilled <input type="checkbox"/> Broadcast <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
8. Interim Revegetation Close to the Wellhead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
9. Interim Revegetation Close to Road Surface	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
10. Revegetation Success	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
11. Erosion and Stormwater Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
12. Mulch Type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
13. Free of Noxious & Invasive Weeds Weed Type(s):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
14. Well Cellar Properly Covered to Exclude Wildlife & Livestock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
15. Rat and Mouse Holes Closed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Interim Reclamation Meets Standards Yes <input type="checkbox"/> No <input type="checkbox"/> Work Needed				<input type="checkbox"/> <input type="checkbox"/>
Roads				
16. Drainage – Installed and Functioning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
17. Culverts and Waterdips – Installed and Functioning Type/Size:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
18. Surface Material – Installed and Functioning Type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
19. Gates – Installed and Functioning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
20. Cattleguards – Installed and Functioning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
21. Maintenance Needs:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Utility Corridors				
22. Final Reclamation Standards (Recontouring, Vegetation, Excluding Removal of Facilities) Initiated <input type="checkbox"/> Meets Standards Yes <input type="checkbox"/> No <input type="checkbox"/>				<input type="checkbox"/> <input type="checkbox"/>
23. Power Lines Exclude Raptors Surface <input type="checkbox"/> Buried <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Production Facilities:				

24. Color/Screening: Painted to Blend with the Vegetated Background	<input type="checkbox"/>				
25. Tanks & Other Production Facilities: Labeled, Maintained, and Adequate Secondary Containment Capacity	<input type="checkbox"/>				
26. Exhaust Stacks: Constructed to Prevent Bird/Bat Mortality	<input type="checkbox"/>				
27. Emission Controls	<input type="checkbox"/>				
Housekeeping, Management of Hazardous Materials and Wastes, and Spill Management					
28. Free of Spills or Leaks	<input type="checkbox"/>				
29. Hazardous Material Storage/Secondary Containment/Labels	<input type="checkbox"/>				
30. Drip Pans Exclude Wildlife	<input type="checkbox"/>				
31. General Housekeeping - Free of Trash and Unnecessary Equipment & Materials	<input type="checkbox"/>				
Pits and Ponds					
32. Pits and Ponds: Number _____ Type(s) _____ Authorized <input type="checkbox"/> Unauthorized <input type="checkbox"/>	<input type="checkbox"/>				
33. Adequate Freeboard – 2 feet or more	<input type="checkbox"/>				
34. Lined & Good Condition	<input type="checkbox"/>				
35. Leak Detection	<input type="checkbox"/>				
36. Free of Oil, Trash, Wildlife, and Livestock	<input type="checkbox"/>				
37. Pits or Location Adequately Fenced and/or Netted	<input type="checkbox"/>				
38. Pit(s) Closure Date Click here to enter a date.					
Other					
39. Location properly signed: (43 CFR 3162.6)	<input type="checkbox"/>				
40. No Unauthorized Disturbance	<input type="checkbox"/>				
41. Other: (Describe)	<input type="checkbox"/>				

Comments, Inspection/Monitoring Results, and Additional Actions Necessary:

Original Disturbance Acres/Well:: (including location, roads, and pipelines)		Meets Final Reclamation Standards Acres/Well:		Meets Interim Reclamation Standards Acres/Well:	
Follow-up Requirements: Choose an item.	Correct problem by: Click here to enter a date.	Next Inspection date: Click here to enter a date.	Date AFMSS updated: Click here to enter a date.		
Order/INC No.					

The Privacy Act of 1974 and the regulations in 43 CFR 2.48(d) require that you be furnished the following information.

Authority: 30 U.S.C. 181 et seq.; 43 CFR 3160; Onshore Oil and Gas Order No. 1.

Purpose: The BLM uses this information to document and track operator compliance with the terms of a Federal permit for the development oil and natural gas and to contact the permit holder and other affected parties.

Routine uses: In addition to those disclosures generally permitted under 5 U.S.C. 552a(b) of the Privacy Act, all or a portion of the information collected may be disclosed as a routine use pursuant to 5 U.S.C. 552a(b)(3) as follows: (1) Document and track compliance with permit conditions. (2) Gather contact information for permittees and parties affected by the permit. (3) Track monitoring data. (4) Information from the record and/or the record will be transferred to appropriate Federal, State, or local agencies when relevant to civil, criminal, or regulatory investigations or prosecutions.

Effect of not providing information: Disclosure of the information is voluntary; however, failure to provide the requested information may impede individual participation.

Production/Interim Reclamation ES – Photo Log

PHOTO NUMBER	PHOTO INFORMATION
1.	
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3.	
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5.	
6.	
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8.	

Photo 1

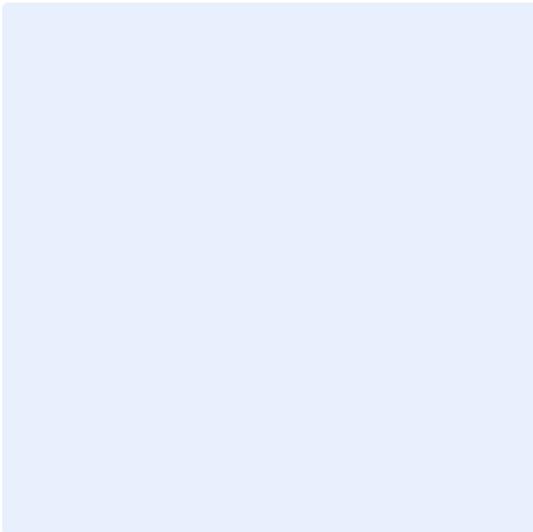


Photo 2

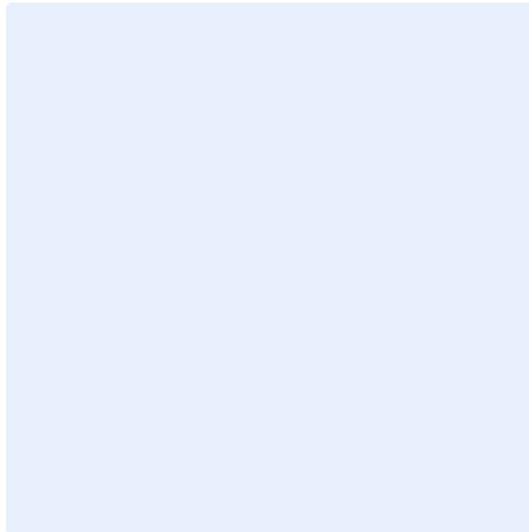


Photo 3

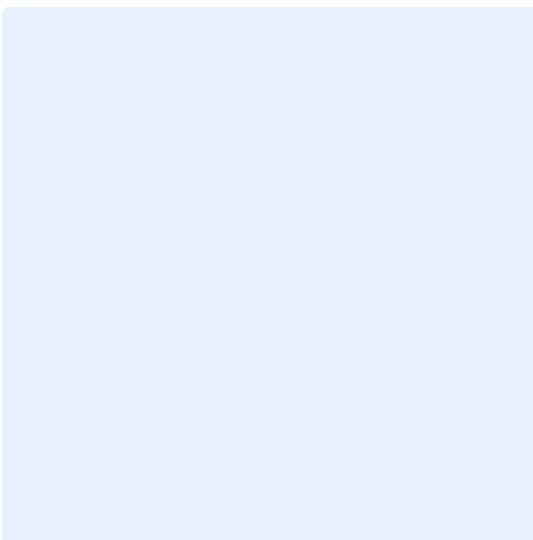


Photo 4

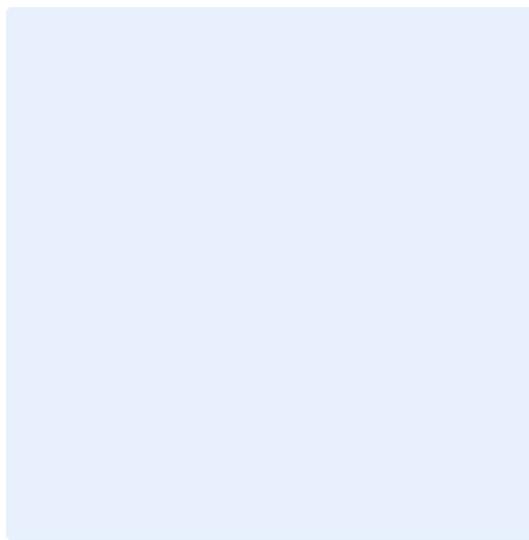


Photo 5

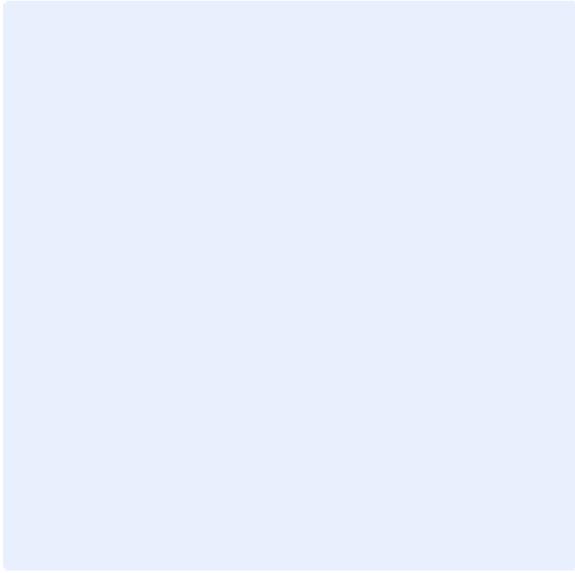


Photo 6

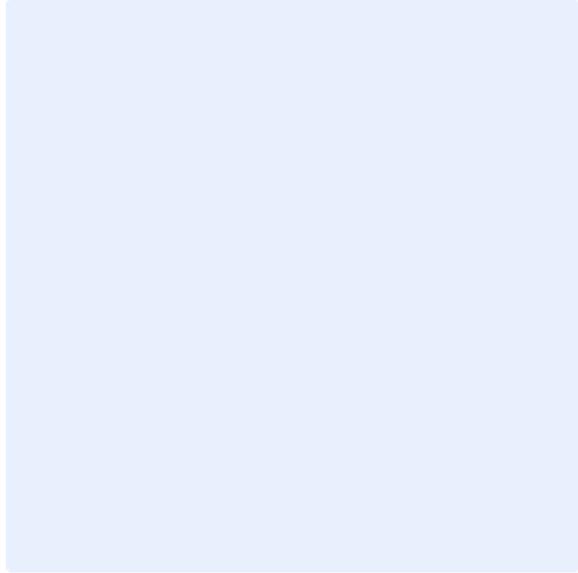


Photo 7

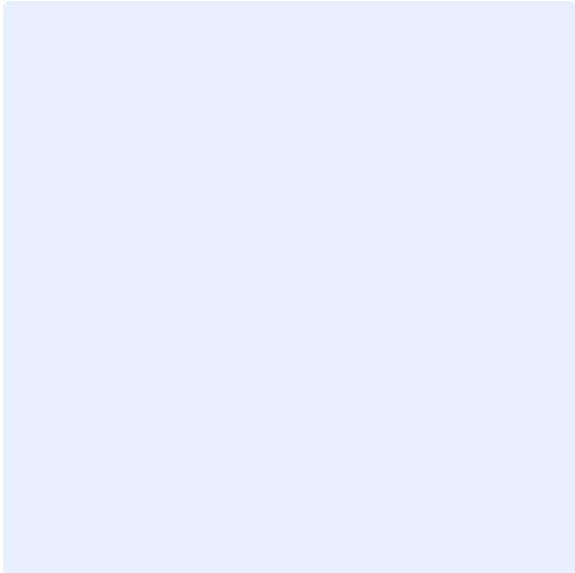
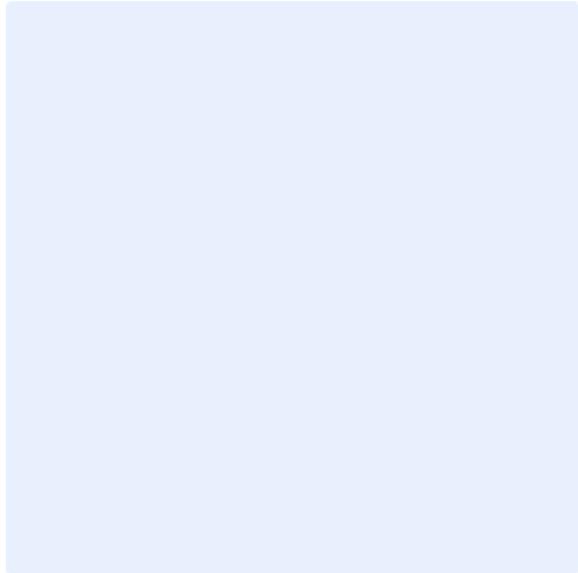


Photo 8





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