LMS/DUD/S06350
DOE/EA-1770

Environmental Assessment

Photovoltaic Solar Project at the Durango, Colorado, Disposal Site

Final

June 2011

U.S. DEPARTMENT OF ENERGY | Legacy Management

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U.S. Department of Energy Office of Legacy Management

DOE/EA 1770

FINDING OF NO SIGNIFICANT IMPACT

Photovoltaic Solar Project at the Durango, Colorado, Disposal Site, La Plata County

AGENCY: U.S. Department of Energy (DOE), Office of Legacy Management (LM)

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: LM prepared an Environmental Assessment (EA) (DOE/EA-1770) that evaluated two action alternatives related to the installation, operation, and removal of a photovoltaic (PV) solar energy system on the Durango, Colorado, Disposal Site and the No Action Alternative. Alternative 1 evaluated the use of the 18-acre (ac) vegetated surface of the disposal cell for the installation of a PV system. The second action alternative (Alternative 2, the Preferred Action) considered the use of the surface of the disposal cell but also the use of approximately 3.5 ac of previously disturbed areas adjacent to the disposal cell. Under this alternative, which is the maximum solar development scenario, approximately 21 ac of the disposal site will contain solar panels. Based on preliminary estimates, it could support a potential to generate 4.5 megawatts or more of energy.

LM intends to award a 20-year lease with one 5-year option to a qualified lessee who will install, operate, and maintain a PV system and remove it at the end of the lease term. The lessee will also be responsible for reclaiming all disturbed areas at the end of the lease. The lessee will have full responsibility for all aspects of the system. LM will retain oversight responsibilities and will be able to terminate the lease if unexpected damage occurs to the disposal cell or its components.

LM revised its Long-Term Surveillance Plan (LTSP) to include the placement of a renewable energy facility, such as a PV system, on its Durango disposal site. The U.S. Nuclear Regulatory Commission (NRC) accepted the LTSP in May 2011. Protective stipulations related to the integrity of the disposal cell are stated in the LTSP and will be stated in the lease.

All analysis and discussion of potentially affected resource components related to the installation, operation, and removal of a PV system are provided in the Final EA, which is hereby incorporated by reference.

Based on the information and analysis in the EA, LM has determined that its Preferred Action (Alternative 2) will not constitute a major federal action that would significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA). Therefore, an Environmental Impact Statement is not required, and LM is issuing this FONSI. This FONSI was prepared in accordance with NEPA; the Council on Environmental Quality regulations for implementing NEPA, as amended, at Title 40 *Code of Federal Regulations* Part 1500 (40 CFR 1500) to 40 CFR 1508; and the DOE NEPA regulations at 10 CFR 1021.322.

ENVIRONMENTAL IMPACTS: The EA describes and evaluates impacts on a sliding scale of importance. No impacts were associated with environmental justice, noise, occupational worker health and safety, or intentional destructive acts. An explanation was provided in the text. In addition, none of the following resources were found to be either present or of concern to areas potentially affected by the proposed PV system on the disposal site: floodplains and wetlands, prime and unique farmlands or soils, wild and scenic rivers, state or national parks or forests or other areas of scenic or aesthetic importance,

and threatened or endangered species. For this reason, these resources were eliminated from detailed consideration in the EA.

In response to either local interest or other considerations, a detailed evaluation of impacts was completed on the following resources: climate, air quality, and greenhouse gas; visual resources; wildlife; vegetation; cultural resources; recreation and Lake Nighthorse; and transportation. Based on the more detailed evaluation, only minor impacts associated with some of these resources were found, and they are described as follows.

During the lease term, it is expected that there will be minor, short-term impacts associated with greenhouse gas related to vehicular travel to the site. During the installation and removal of the PV system, workers are expected to commute several miles from the city of Durango. During the system's operation, inspection and maintenance actions will include travel not only from local areas but also from Grand Junction, Colorado. It is anticipated that one or two trips per month will be made when the system is operating. PV solar panels require minimal maintenance, and no chemicals will be used for cleaning.

The La Plata County Planning Department was concerned that the PV system will be visually intrusive. A detailed visual-resource evaluation determined that the top of the disposal cell and adjacent areas near the footprint that will contain PV panels will not be noticeable from known public areas within a 5-mile radius of the disposal cell, with the exception of the view from the adjacent County Road (CR) 212. CR 212 is a lightly used dirt road that provides access to the disposal site and is used to access a communication tower to the north of the disposal site. This road does experience casual use by area residents but does not provide a through passage to other destinations.

It is expected that there will be minor impacts to wildlife, such as potential short-term displacement related to noise and activity in the area during the installation and removal of the PV system components. It is expected that most wildlife will return. The surrounding Bodo State Wildlife Area will not be impacted by the presence of solar panels. A potential positive impact is the possible use of the areas under the panels for cover or protection by various small mammals or birds during the lease term.

It is expected that there will be a change in up to 12.5 ac of vegetation related to the presence of the panels and activities related to accessing the panels. The moisture regime beneath the panels is expected to change due to the presence of the panels, but whether the change will represent a completely positive or negative impact is unknown. An estimated 21.5 ac may be available for a PV system and, of the 12.5 ac affected, it is estimated that 3.5 ac may lose surface vegetation. Stipulations to control erosion related to water runoff from the panels will be in the lease.

There is one cultural resource site near the disposal cell that is eligible for inclusion in the National Register of Historic Places. LM will require the lessee to avoid the site, and specific avoidance stipulations will be included in the lease.

Area recreation and Lake Nighthorse will not be affected by the presence of the PV system or by any activities related to the system. However, the increased number of people in the area related to future recreational activities at Lake Nighthorse might result in increased nuisance activities on the disposal site (e.g., removing or shooting signs, littering).

During the PV system's installation and removal, an estimated 30 trips per day will be required to access and transport supplies to and from the disposal site. As necessary for public and worker safety, temporary traffic controls might be needed at the intersection of the frontage road and CR 210 and at the intersection of CR 210 and CR 212 during the installation and removal of system components. The traffic during installation is expected to be light, but traffic is expected to significantly increase by the time the system is removed. During the system's operation, there will be an estimated one or two trips per month related to inspections and possible maintenance actions.

PUBLIC PARTICIPATION IN THE EA PROCESS: In accordance with applicable policies and practice, LM invited representatives from state, federal, Tribal, and local governments and members of the public to attend a scoping meeting that was held on May 3, 2010. The Notice of Intent to prepare an EA was published in a local newspaper as well as on the DOE NEPA website. Seventeen people attended the public scoping meeting and had various concerns and questions related to the proposed PV system on the disposal site. La Plata County Planning Department subsequently provided written comments. All concerns were addressed in the Draft EA and are included in the Final EA. A 30-day comment period was provided for scoping.

The Southern Ute and Ute Mountain Ute Indian Tribes were invited to attend preliminary meetings that DOE held with various local governments prior to the public scoping meeting. On July 19, 2010, LM met with representatives of the Southern Ute Tribe and representatives of related tribal enterprise groups to provide information on the proposed project. LM also sent consultation letters to the Pueblo of Picuris and to the Ohkay Owingeh (Pueblo of San Juan). Additional cultural resource consultations were conducted with the State Historic Preservation Officer and representatives of the Native American Graves Protection and Repatriation Act.

The Draft EA was published on the DOE and LM NEPA websites for a 30-day review period that ended September 17, 2010. A Notice of Availability of the Draft EA was provided to known interested parties. DOE received one public comment, which was in favor of having a PV system on the disposal site. Several comments were received from the La Plata County Planning Department, NRC, and the Colorado Department of Public Health and Environment. These comments are addressed in this Final EA.

DETERMINATION: LM has concluded that the proposed action of using the surface of the disposal cell and previously disturbed areas surrounding the disposal cell footprint for a PV system will not impact the performance of the disposal cell or constitute a major federal action significantly affecting the human or natural environment as defined by NEPA. The NRC accepted the revised LTSP, which includes provision for renewable energy use on the disposal cell. Design criteria are described in the LTSP that are protective of the disposal cell and human health and the environment.

The Environmental Assessment uncovered only minor and expected impacts (e.g., vehicle emissions related to travel to the site, minor loss of vegetation, minor displacement of wildlife), which will be short-term and related to installation and removal actions. No long-term impacts related to the operation of a PV system were identified. Therefore, preparation of an Environmental Impact Statement is not required, and LM is issuing this FONSI. Copies of the EA and FONSI are available through the following contact:

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Copies of the Final EA and FONSI are also available on the DOE website:
http://nepa.energy.gov/DOE_NEPA_documents.htm.

For further information about the DOE NEPA process, contact:

Carol M. Borgstrom, Director
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Issued at Washington, D.C., on this 9th day of June 2011.

Thomas C. Pauling, Director
Office of Site Operations
U.S. Department of Energy
Office of Legacy Management

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Summary

The Durango Disposal Site is located southwest of the city of Durango in southwestern Colorado. It contains a partially below-grade uranium and vanadium mill tailings pile that has been encapsulated in an engineered cover system that is designed to isolate the mill tailings from the environment. The site is surrounded to the east, north, and west by lands owned by the Colorado Division of Wildlife and to the south by lands owned by the U.S. Bureau of Reclamation. County Road (CR) 210 and CR 212 are used to access the site from U.S. Highway 160/550.

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) began evaluating the potential for reuse opportunities on its properties in 2006. To assist in this effort, the National Renewable Energy Laboratory began studies on solar and wind energy potential on LM properties that were remediated but that could not be released for general public uses (DOE 2008). The Durango disposal site was evaluated in that study. In 2009, LM was contacted by a local entrepreneur who wanted to know if the surface of the Durango disposal site could be used for a photovoltaic (PV) system that would be tied into existing transmission lines that cross the disposal site.

LM subsequently identified two alternatives related to the development of PV systems on the disposal site; these alternatives were evaluated as the action alternatives in the draft Environmental Assessment (EA). Alternative 1 evaluates impacts related to locating a PV system on the 18-acre (ac) surface of the disposal cell. Alternative 2 evaluates impacts related to use of the disposal cell surface, as in Alternative 1, but also includes areas covering 3.5 ac or more in the western portion of the disposal site. Under Alternative 2, which is the maximum solar development scenario, approximately 21 ac of the disposal site would contain solar panels and, based on preliminary estimates, Alternative 2 could generate 4.5 megawatts (MW) or more of energy. A 4.5 MW system could supply the energy needs for approximately 900 local residences. It is recognized that a lessee could potentially install a system with a larger capacity. LM has identified Alternative 2 as their preferred action. LM also considered the No Action Alternative.

LM has two design constraints for solar energy development within the Durango disposal site. One of the constraints is that the frost barrier below the ground surface of the disposal cell is not allowed to be penetrated by structures related to the solar panels, and the other is that components may not be located on previously undisturbed areas within the disposal site. Advances in PV-system technology have created solar-panel-frame designs that use ballasts to support the structures that hold the solar panels, instead of relying on ground-penetrating structural supports.

LM intends to publicly offer a 20-year lease, with a 5-year option for the purpose of solar energy development on the Durango disposal site. The lessee would be required to install, operate, and maintain the PV system and then reclaim all areas at the termination of the lease. LM would retain oversight during all phases, from installation through site reclamation. If any lease stipulations or other lease requirements were not being met, or if unanticipated damage to the cell were observed, LM would be able to revoke the lease. A reclamation bond to cover reclamation costs would be a lease requirement.

This EA, which is prepared as a requirement of the National Environmental Policy Act (NEPA) and the DOE NEPA procedures and guidelines (DOE Order 451.1B, *National Environmental Policy Act Compliance Program*), evaluates the potential impacts of installing, operating, and maintaining a PV system and later reclaiming the areas used for the solar array.

Early discussions with area political entities elicited support for the development of solar energy. The local utility, La Plata Electric Association, has been contacted and might have interest in developing a system to tie into its existing transmission line, which crosses the disposal site. The State of Colorado encourages local utilities to use renewable sources of energy.

A public scoping meeting was held on May 3, 2010, in Durango, and 17 area residents attended. Several concerns were raised during the meeting and also expressed in a follow-up letter from the La Plata County Planning Department. These concerns related to visibility of the system to area residents, potential issues with the need to conduct maintenance actions on the disposal cell, actual disposal cell performance, wildlife, Lake Nighthorse, trails, permits, and emergency management. These concerns were addressed in the draft EA and are included in this final EA. The lessee would be required to obtain all applicable federal, state, and local permits. LM would also require the lessee to provide a list of emergency contacts that could be shared with the applicable county departments.

The draft EA was made available to applicable cooperating agencies and to the public for a 30-day review period (August 20 to September 17, 2010). Only one public comment was received on the draft EA and it was in favor of solar development on the disposal site. Informal and written comments were received from the U.S. Nuclear Regulatory Commission, the Colorado Department of Public Health and Environment, La Plata County Electric Association, and the La Plata County Planning Department, and the text of this EA has been revised to reflect their concerns. These concerns included the potential need for traffic control, overhead airplane travel, limiting the depth of possible trenching on the disposal cell surface to 12 inches, the lease term, and the frequency of inspections.

All impacts identified in this EA were considered minor or negligible and are summarized in Table 4. Operating a PV system would likely cause the loss of between 3.0 and 3.5 ac of vegetation due to changes in the environment beneath the panels. These areas would be reclaimed after the lease is completed. Temporary to potentially permanent displacement of some area wildlife would be expected as a result of noise and activity in the area during the installation and removal of the PV system. It is expected that displaced wildlife would move into the adjacent state wildlife area. Adding a renewable source of energy to the existing transmission lines would support federal and state initiatives to encourage renewable energy. Design criteria related to maintaining cell integrity, protection of a known off-site cultural resource, stipulations that may be applicable to wildlife (e.g., wildlife friendly fences, if fencing is necessary), and the potential need for safety control at two road intersections during installation and removal of a PV system were identified and are included in this EA; they would also be included in a potential lease.

1.0 Introduction

1.1 Background

The Durango Disposal Site is a 120.6-acre (ac) property located southwest of the city of Durango in southwestern Colorado. The disposal site contains uranium and vanadium mill tailings that were removed from a nearby uranium processing site adjacent to the Animas River and near the city of Durango. The site is surrounded to the east, north, and west by lands owned by the Colorado Division of Wildlife (CDOW) and to the south by lands owned by the U.S. Bureau of Reclamation (BOR). County Road (CR) 210 and CR 212 are used to access the site from U.S. Highway 160/550 (Figure 1).

In 1978, the Uranium Mill Tailings Radiation Control Act (UMTRCA) authorized the U.S. Department of Energy (DOE) to perform remedial actions at 22 inactive uranium processing sites. The purpose of UMTRCA was to reduce the potential for adverse health effects on the public from residual radioactive materials in and around uranium mill tailing processing sites. The Durango uranium processing site in La Plata County, Colorado, was one of the 22 sites designated in UMTRCA for remediation. All contaminated materials in the Durango area were moved to a secure location referred to as the Durango disposal site. The DOE Office of Legacy Management (LM) was designated the long-term custodian of all remediated UMTRCA sites.

The Durango disposal site contains an estimated 2.5 million cubic yards of uranium mill tailings and associated contaminated soils and debris that were removed from the former Durango processing site and from vicinity properties. All contaminated materials were compacted in a disposal cell that was constructed partially below grade. A multi-component cover system, approximately 7 feet (ft) thick, was designed to isolate the contaminated materials. The top layer of the cover system consists of a vegetated rock-and-soil matrix that was graded to achieve a 1.5 to 2 percent slope for positive drainage away from the cell.

After completion of the remedial action in 1990, the U.S. Nuclear Regulatory Commission (NRC) licensed the site for use as a disposal site. NRC requires continued compliance and adherence to the license terms as well as to the NRC-accepted Long-Term Surveillance Plan (LTSP) (DOE 1996). The LTSP contains details on cell construction, general protective measures, and general requirements, including an annual site inspection and monitoring requirements. The 1996 LTSP did not consider other land uses within the disposal site, such as a solar project, because at the time of licensing LM did not consider other uses. LM revised the LTSP to include reuse possibilities on the disposal cell and within the disposal site. In May 2011, the NRC accepted the revised LTSP (DOE 2011b).

In 2006, LM began evaluating the potential for reuse opportunities on its owned assets. In 2009, a local entrepreneur approached LM about installing photovoltaic (PV) solar energy panels on the Durango disposal cell. At that time, LM was evaluating several disposal sites for renewable energy potential. LM began discussions with NRC to identify potential concerns and requirements for revising the LTSP to accommodate renewable energy reuses on the Durango disposal site. LM also began exploring the terms and requirements appropriate to a long-term property lease.

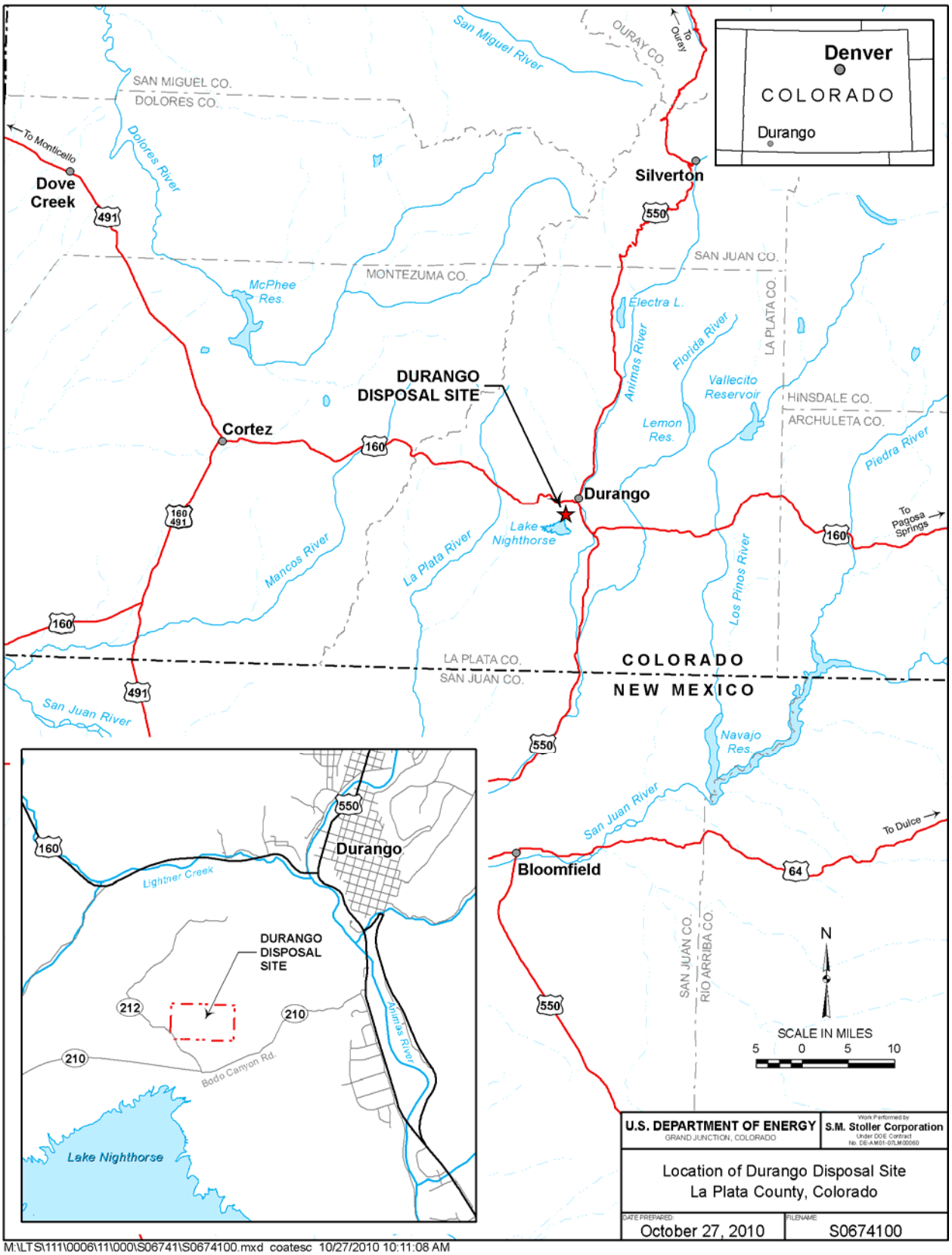

Figure 1. Location of the Durango, Colorado, Disposal Site

This Environmental Assessment (EA) considers two action alternatives and the No Action Alternative. Alternative 1 involves installing an approximate 4-megawatt (MW) PV solar array on the vegetated surface (surface) of the disposal cell. Such a system would connect to existing transmission lines that cross the southwest corner of the disposal site. The surface of the cell takes up 18 ac, and it is assumed that most of the surface could reasonably be used for a PV system. Alternative 2 involves using not only the surface of the disposal cell but also areas in the west portion of the disposal site that were previously disturbed during the remedial action. Depending on a lessee's final acreage and panel capacity, these areas could add 3.5 ac to the PV system and increase the system's capacity to 4.5 MW or more. Either alternative would allow a larger or smaller system to be installed. However, neither alternative considers the use of the disposal cell's side slopes, though the use of the side slopes could be considered in the future. If use of the side slopes were a future consideration, a supplemental analysis to this EA would be completed, a revised LTSP would be submitted to NRC, and NRC would need to accept the LTSP. LM has identified Alternative 2 as its preferred action.

1.2 Location of the Durango Disposal Site

The Durango disposal site is located in southwestern Colorado, approximately 3.5 road-miles from the city of Durango (Figure 1). The disposal site was originally part of a large state wildlife area and is considered remote from human presence and activities. Several transmission lines owned by Tri-State Generation and Transmission Association and La Plata Electric Association (LPEA) cross the site; all lines have excess capacity to accept additional electrical energy. Figure 2 provides a plan view drawing of the disposal site and shows the vegetated surface of the cell and other previously disturbed areas, all of which could potentially be used to support a PV system. The most suitable areas for a PV system, based on accessibility and slope, are in the southwest to west areas of the disposal site. Figure 2 also identifies surrounding land ownership.

1.3 Purpose and Need for Action

The proposed action of leasing portions of the Durango disposal site for the purpose of solar energy development would assist in meeting overall federal goals related to energy independence as well as local utilities' goals to incorporate sources of renewable energy into their energy supply profile. The United States government considers energy independence a top priority and is committed to reducing its need for foreign energy sources. Although the proposed PV system of 4.5 MW is small by national standards, it would assist in meeting larger renewable energy goals. Multiple small systems can be an effective way to meet larger goals. LM's preliminary estimates indicate that there is sufficient suitable area on the disposal site for a 4.5 MW system. A larger PV system within the disposal site might be possible, depending on the lessee's design and available technology.

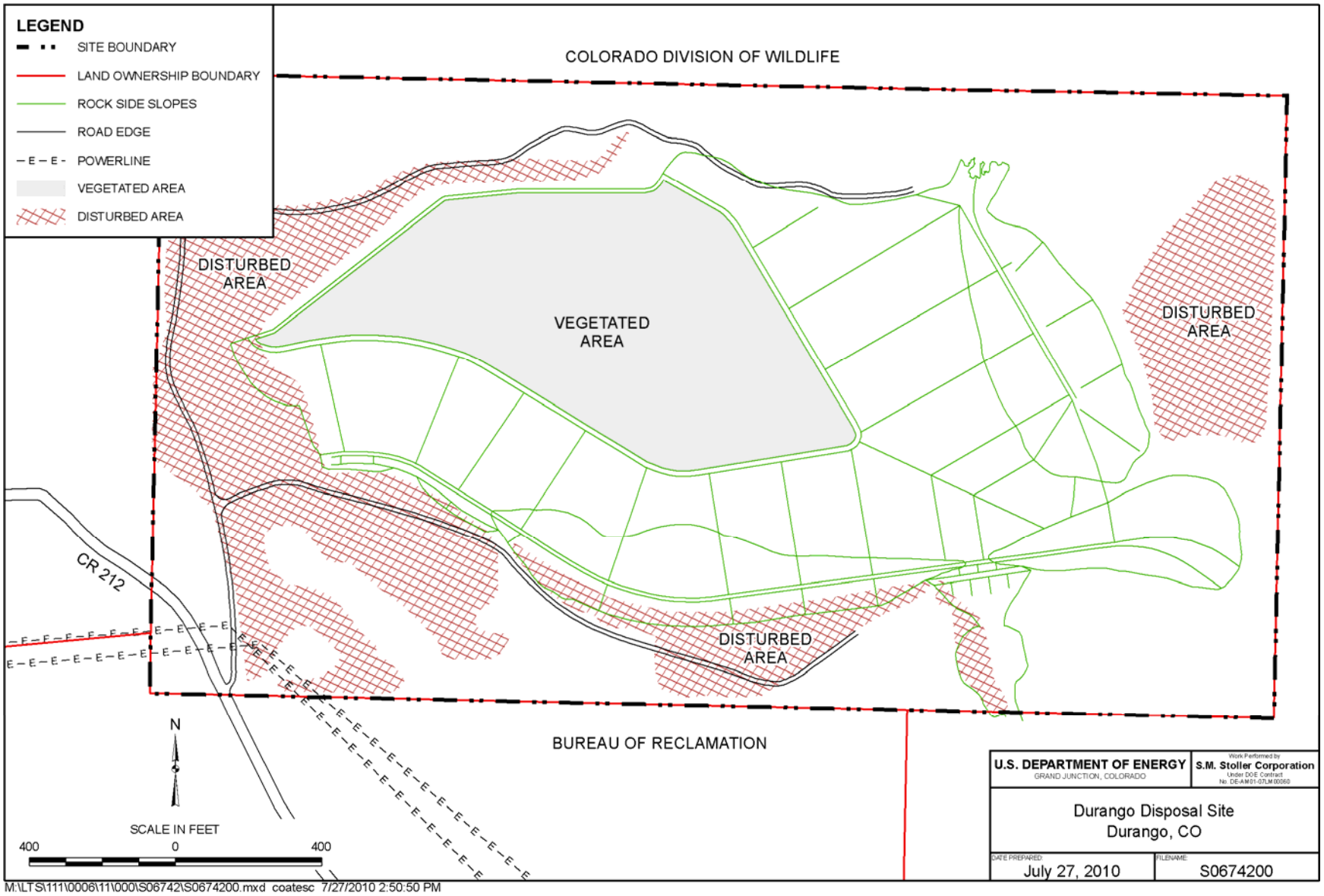

Figure 2. Durango, Colorado, Disposal Site Features and Surrounding Land Ownership

In addition to meeting national priorities, LM is committed to finding appropriate alternative and productive uses for its LM disposal sites. Leasing portions of the Durango disposal site for solar energy development would help LM meet programmatic goals related to reuse and respond to a local request to consider solar development on the Durango disposal site.

1.4 Relationship to Existing Regulatory and Policy Requirements

This EA is prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.), which requires an analysis of impacts related to the physical, biological, and cultural environments for federal projects that would take place on federal land or that would be financed using federal funds. This EA is also prepared in accordance with requirements under LM Order 451.1B, *National Environmental Policy Act Compliance Program*, and Title 10 *Code of Federal Regulations* (CFR) Part 1021, "National Environmental Policy Act Implementing Procedures."

The Durango disposal site is regulated for use as a uranium mill tailings disposal site under a general license issued by the NRC. In order for surface portions of the site to be leased for the development of solar energy (or for any other reuse opportunity), NRC would need to accept a change to the license terms through a revised LTSP. LM revised the LTSP to include potential reuse of the disposal site, including developing solar energy, as well as protective measures to ensure site security. The NRC accepted the revised LTSP (DOE 2011b). NRC's role is to ensure that LM properly manages the disposal cell's protectiveness.

LM contacted the Colorado Department of Public Health and Environment (CDPHE) about the NRC-accepted changes to the LTSP that allow other actions to occur on the disposal site. CDPHE approved the original design of the disposal site and LM continues to involve them when there is a proposed change in site activities.

Two federal executive orders identify various requirements and goals related to reducing the energy footprint associated with federal agency facilities and activities. These are Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, and Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. Although the specific requirements within these orders are related to federal sites that contain buildings, the overarching intent is for federal agencies, through their policies and actions, to improve practices related to sustainability. The production of renewable energy on the Durango disposal site would not reduce the LM energy footprint; however, it would benefit local energy supplies and demonstrate LM's commitment to finding achievable ways to work toward a sustainable future. LM seeks to identify appropriate reuse opportunities on its owned properties, as demonstrated in Goal 4 of the LM Strategic Plan, which is to optimize the use of land and assets (DOE 2011a).

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2.0 Public and Agency Involvement

2.1 General Background

The NEPA process includes a requirement to involve the public in federal actions that are being evaluated in a NEPA document (Council on Environmental Quality [CEQ], Section 1606.6, "Public Involvement"). Under NEPA, the amount of public involvement is considered on a sliding scale as related to the scope and scale of the proposed project, the level of NEPA documentation (EA versus environmental impact statement), and the potential public interest in the action under consideration. Public involvement can consist of an online announcement, letters, meetings, or a combination of these efforts.

LM developed a public communications plan to help guide internal processes during the EA process. To obtain an early understanding of local issues and concerns related to the proposed actions, an informal telephone conference was held with County representatives, which was followed by a formal presentation made by LM to the La Plata County Commissioners. LM wanted to identify early whether there would be opposition to or support for the project. These early contacts elicited support for the idea of renewable energy and an expression of interest in participation. In addition, LM provided a description of the proposed actions to the local congressional representatives. LM also met with representatives of LPEA to inform them of the proposed project and to explore if they had potential interest in any phase of the project.

Other public involvement actions included a public scoping meeting (Section 2.2), agency involvement (Section 2.3), and a 30-day public and agency comment period on the draft EA (Section 2.4).

LM is committed to a transparent process and consideration of local concerns. LM maintains a website that is available to the public, which provides current information and documents for LM sites. In addition, a database of interested citizens was established, and the citizens in it were provided e-mails related to the availability of the EA. Upon approval, the final EA will be posted on the DOE NEPA website (DOE 2010b) and on the LM website (DOE 2010a).

2.2 Public Scoping

Early in the EA process, a scoping meeting is generally held to provide interested members of the public with information on a proposed federal project, to request contact information for future contacts, and to be available to answer questions raised by the public. On May 3, 2010, LM held a public scoping meeting in Durango to provide information on the proposed solar energy alternatives under consideration for the Durango disposal site and to answer questions. Seventeen local residents attended the scoping meeting. Their questions addressed a variety of concerns and interests. Most of the questions—and the corresponding answers given by LM, CDPHE, or Legacy Management Services representatives present—are summarized as follows:

- *Would LM consider other types of solar power systems besides PV, such as concentrating solar?* At present, no other types of solar power systems are under consideration. Concentrating solar energy requires infrastructure that NRC would not allow on the disposal site, and it is associated with more maintenance and more visibility issues.

- *Could LM consider the side slopes of the disposal cell for placement of a system?* LM will evaluate this.
- *What are the terms of the lease?* LM would not expect to generate income related to a lease, and the lease term would be 20 years with one 5-year option.
- *Could local involvement, including that of a local office with local staff, be required?* Any operation would involve a local office.
- *Could the contract extend a preference for local ownership?* LM would consider local presence as an evaluation criterion.
- *Would the solar panels affect cell performance?* LM does not expect that the solar panels would affect cell performance.
- *Would water shedding from the solar panels cause erosion?* LM is concerned about possible erosion. Erosion issues would be addressed through the leasing process with technical specifications and routine and additional inspections.
- *Would there be on-site access to a grid with sufficient capacity?* Yes.
- *Has LM considered the installation cost per MW?* No. Doing so would be the developer's responsibility.
- *Will there be an opportunity for local non-profits to create co-ops and have ownership in the project?* The extensive bonding and insurance requirements may be difficult to meet, and a system must be developed within 2 years of a lease being issued.
- *Must local utilities meet any renewable energy goals?* Major utilities have renewable source requirements that they must meet. LPEA has an internal goal but is not required to meet a state standard.

2.3 Agency Involvement

The NEPA process requires the applicable federal agency to contact other federal, state, or local agencies that have a regulatory role or that may have other interests in the project's outcome. LM contacted the following agencies to determine their interest in being an official reviewer of the EA as a cooperating agency: NRC, CDPHE, the Colorado Governor's Office, CDOW, and the La Plata County Commissioners. The Ute Mountain Ute and Southern Ute Tribes were also contacted. In compliance with cultural resource requirements, LM contacted the State Historic Preservation Office.

NRC responded that they wished to review the draft EA and would provide comments but did not want to be a cooperating agency. The La Plata County Commissioners responded that they were interested in being a cooperating agency and in reviewing and providing comments on the EA. After the public scooping meeting that was held on May 3, 2010, the La Plata County Planning Department provided comments related to the following concerns: visual intrusion, wildlife, Lake Nighthorse and trails, cell integrity or cell performance, permits, and emergency management (Hughes 2010a). This EA addresses these issues. The Southern Ute Tribe indicated an interest in meeting with LM, and on July 19, 2010, LM and contractor representatives met with representatives of the Tribe to answer questions and provide a tour of the disposal site. The remaining contacts either did not respond or responded that they would provide comments but would do so unofficially.

2.4 Public and Agency Comments on the Draft EA

The draft EA was posted on the DOE NEPA website on August 20, 2010, and provided to the public and cooperating agencies and entities. The 30-day comment period ended on September 17, 2010. LM received one comment from a public responder; that individual was in support of the proposed solar project. Agency comments are summarized below, and the text of this EA has been revised to reflect these concerns, as indicated below.

NRC commented on the need to state that LM would initially conduct more frequent site inspections, which would include initial once-a-month inspections and an inspection after a severe rainfall event (rainfall greater than 1 inch in 6 hours). NRC also requested that LM require that the lessee fix any problems immediately. These requested changes were made to the text in this EA.

CDPHE requested that the depth of any unavoidable trenching (to contain electrical lines) be limited to 12 inches and that language be added to the EA to minimize required foundations or excavations. These requested changes were made to the text in this EA.

La Plata County Planning Department had six comments:

- *Change the designation of CR 211 between Highway 160/550 and CR 212 to CR 210.* This stretch of County road has been renamed, and the text and figures were changed to reflect this change.
- *Clarify the language related to the use of the term "disposal actions" in Section 1.1, and identify when licensing occurred.* The text was changed to provide this clarification.
- *Clarify situations when side slopes could be considered for future use and what process would be necessary through which the activity could occur.* LM is not pursuing panel placement on the side slopes at this time, and the text was modified to indicate what process would need to be followed if this were a future consideration.
- *Provide more information as to whether the 20-year lease, with one 5-year option, could be renewed and what the process might be to renew it.* At this time, LM considers a total of 25 years to be the maximum lease term. Current technology supports this lease term.
- *Include the potential for the solar panels to affect overhead travel in the discussion of visual resources.* The visual resource sections of the text were revised to provide this information. The County also requested additional information on the anticipated height and potential visibility of the solar panels on the surface of the disposal cell as seen from the future site of the County Multi Events Center. Section 3.1 and a visual resource section were revised to include this information.
- *Address the potential traffic-safety concern and potential need for traffic control during installation.* Traffic congestion at the intersection of the frontage road and CR 210 may be a future concern. The text was revised to include this intersection and to address the potential need for traffic control during the installation or removal of the PV system.

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3.0 Description of Alternatives

3.1 PV Solar Energy Production Requirements

PV systems consist of modules (usually flat plates), frames to hold the panels, and electrical infrastructure.

PV panels are mounted on structural steel or aluminum frames that position the panels at the proper angle to the sun. The panels are connected with electrical conduit and wiring aboveground to carry the generated direct current (*dc*) electricity. The *dc* is converted to alternating current (*ac*) through an inverter, and the *ac* then passes through a transformer to increase the voltage so that it equals the connecting line voltage.

Solar panel frames are typically anchored in subsurface foundations to secure the panels from wind damage. However, due to the non-penetration restrictions on the engineered cell cover at the disposal site, an alternative design, based on ballasting instead of on anchoring into the cell surface, would be used to secure the panels. Concrete blocks may be used for ballast for the frame panels. Figure 3 provides a conceptual view of how this system might look.

If utility trenching for high-voltage lines or a small foundation is required, the depth of excavation would be limited to a maximum of 12 inches (in). The amount of disturbance must be minimized to the extent practical. The length of a utility line would be limited to 300 ft, while the area of foundation would be limited to 50 square ft. The top 6 in of material (soil/rock matrix) must be separated from deeper excavated soils. The soils must be placed back with 90 percent standard proctor compaction.

Solar frame installers prefer flat slopes in the range of 1 to 2 percent for ease of installation. The cover of the cell was constructed with a slope between 1.5 and 2 percent. No additional grading or disturbance of the cover would be allowed (with the exception of a shallow electrical line trench), and the lessee would be required to maintain the existing vegetation as much as practical.

Areas off of the cover and outside of the riprapped (rock-covered) side slopes used for panels (Preferred Action, Alternative 2), would be graded to a flatter slope. Existing slopes range from 2 to 15 percent. Steeper areas are not envisioned for installation of panels. Figure 4 shows areas within the disposal site that may be considered for the placement of solar panels.

Concern has been raised about potential unacceptable erosion that could result if the solar panels concentrate runoff. Lease conditions would include a requirement that the installers would be responsible for any panel design modifications that would be needed to minimize erosion. Ideas that could be considered are gutters, splash plates, or additional rock placed under the panels. Moreover, to ensure that erosion does not occur or progress and cause site damage, LM would increase the frequency of their inspections of the site from annually to monthly, when the site is accessible, or schedule inspections on an as-needed basis. For example, an inspection would be scheduled after a severe rainfall event (rainfall greater than 1 inch in 6 hours). It is anticipated that over time, inspection frequency would decrease relative to the level of incidences or site performance.

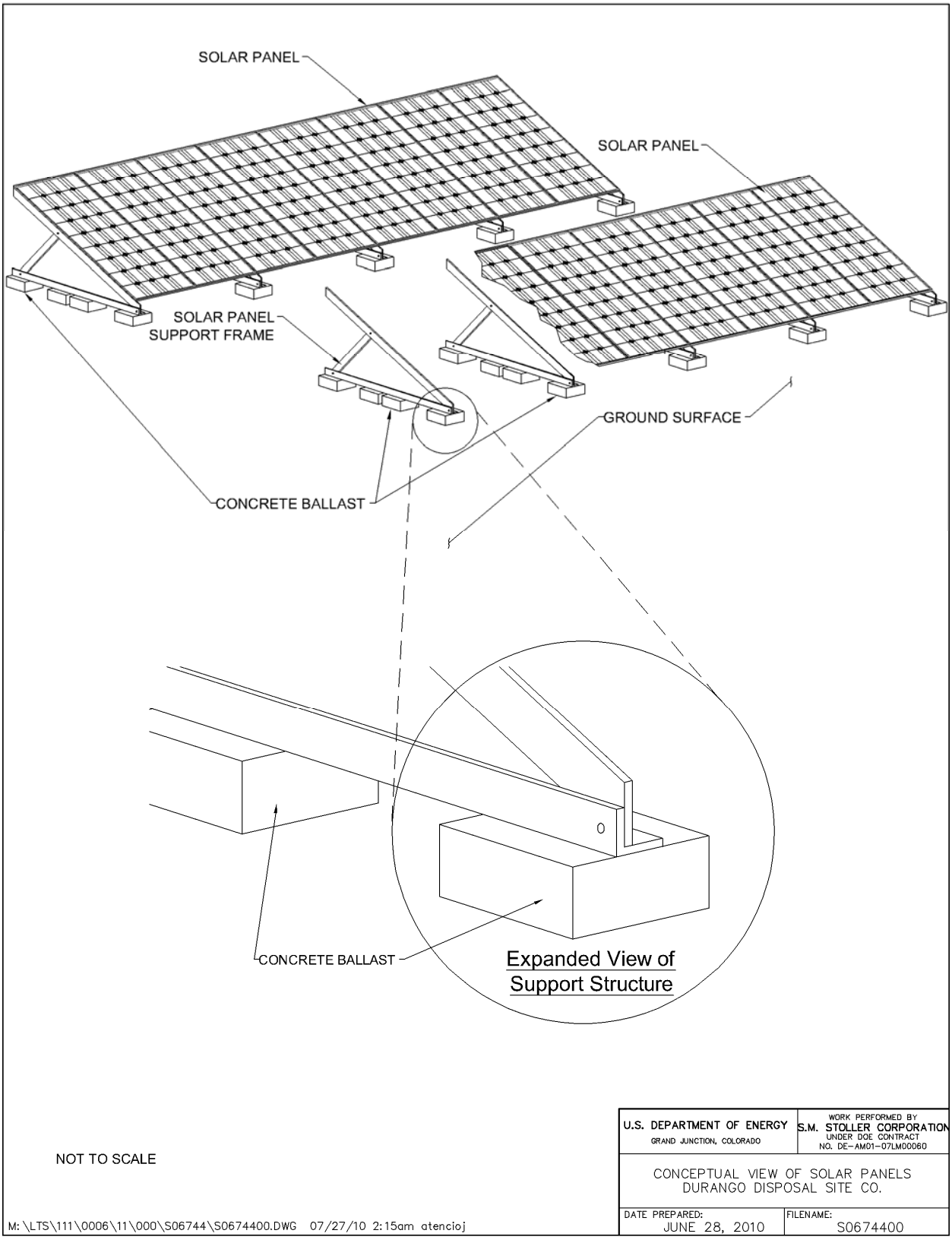

Figure 3. Conceptual View of Solar Panels under Consideration

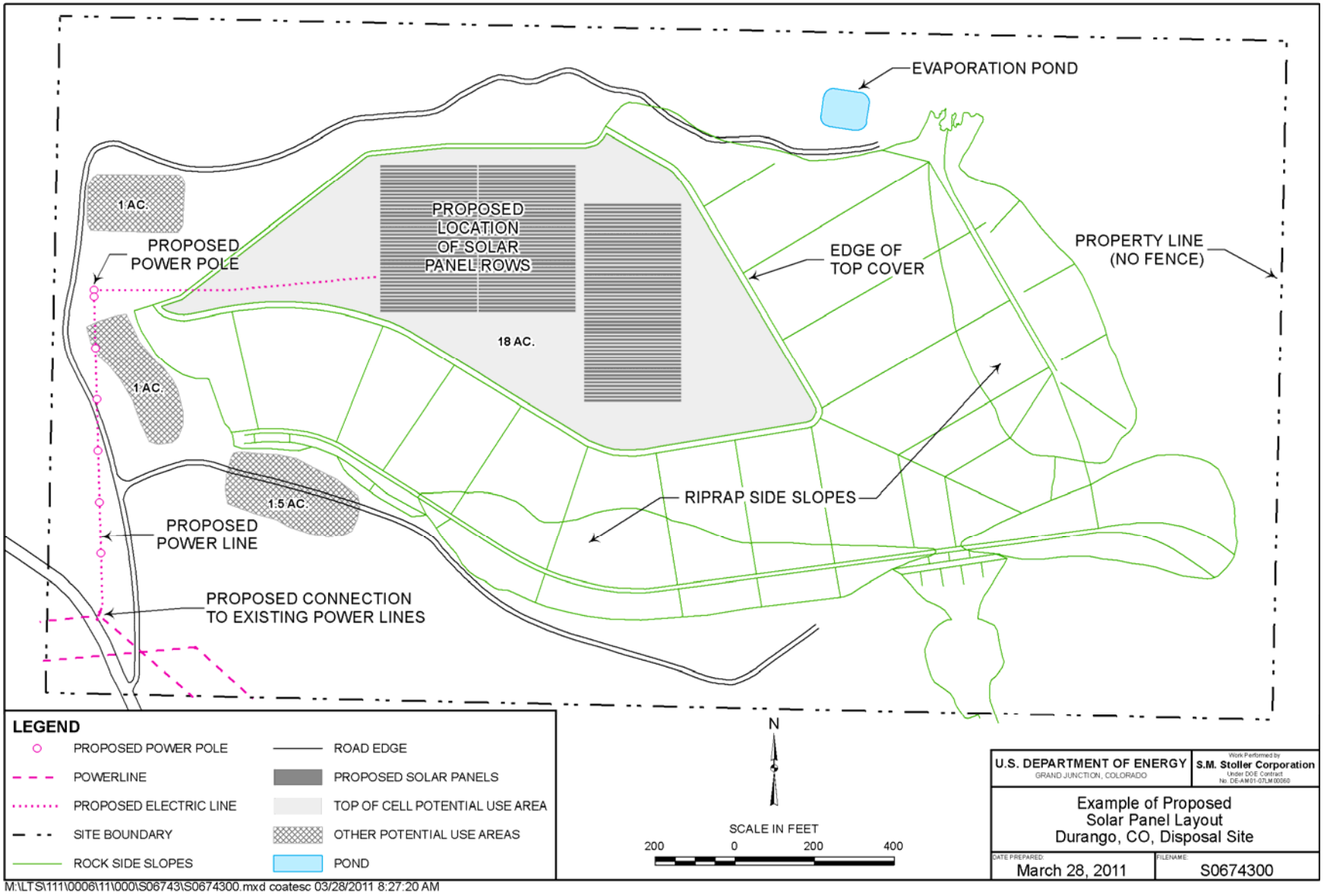

Figure 4. Example of Possible Solar Panel Use Areas

A standard solar array is composed of individual solar modules. A typical module is sized between 170 and 220 watts and has the following dimensions:

- 170-watt module—dimensions: 62 inches × 31 inches; weight: 34 pounds
- 220-watt module—dimensions: 66 inches × 40 inches; weight: 43 pounds

The anticipated height of the modules is approximately 8 ft above the ground surface at the highest point of the panel.

Modules are typically tied into sub-arrays consisting of rows of modules. The energy from the sub-array is fed into an inverter that changes the *dc* to *ac*. The transformer then converts the voltage to the line voltage to which it is connecting.

An array of fixed-tilt panels occupies approximately 33 percent of the ground, leaving room for roads and access between them. A 500 kilowatt (KW) *ac*-rated system covers approximately 2.3 ac, while a 1 MW system covers 4.6 ac. A 4.5 MW system covers approximately 21 ac. The exact energy-to-acreage conversion depends on solar conditions for a particular location. Based on an average home use of 700 KW hours per month, which LPEA has calculated, a 4.5 MW system can supply an estimated 900 residences in the Durango area with power.

The lessee may require some fencing improvements to deter intruders from accessing the site from CR 212. Fencing around the entire site is not practical. Some fencing improvement is envisioned around the southwest corner of the site, which is also the entrance area.

To ensure access, the dirt road on site would be bladed and improved with gravel. If access across a rock-lined storm channel is needed, the crossing could be designed with geotextile fabrics and rock, so that water could still flow through the channel.

Construction of the system would be primarily by a mobile workforce (or possibly a local installation company) that would need an estimated 10 workers, including oversight and supervisory personnel. A temporary construction trailer and generator would provide office space during the installation of the panels. The proposed maximum solar development of 4.5 MW that would occur under the Preferred Action, Alternative 2, would take approximately 4 months to complete. Solar development on the disposal cell surface may be completed in 1 month. If a lessee configures a larger- or smaller-capacity system, it is expected that the incremental changes in expected installation time and necessary workforce would be minor.

All of the areas considered for the two action alternatives have been disturbed, either through the installation of the engineered cover or were disturbed by activities related to the construction of the disposal cell. LM would restrict the location of system components to previously disturbed areas.

Fixed-tilt systems do not require significant maintenance. Any water used to wash panels would have to be trucked onto the site, using long hoses as necessary. A small shed might be constructed on the disposal site (but off the cell) to contain some supplies, tools, and spare parts.

No provisions for upgrades to the installed PV system are under consideration in a lease at this time. However, it is anticipated that technological advances might warrant changing out the panels in 10 to 15 years to improve efficiency. This EA does not evaluate impacts related to potential system upgrades. Any future upgrades would be evaluated in a NEPA review.

PV arrays have an estimated lifetime of 30 to 40 years. Due to degradation of the panels over time and technological advances in panel efficiencies, it is assumed that a potential 25-year lease would provide a suitable investment period. After the completion of the lease, the lessee would be responsible for removing the panels and associated components, and for reclaiming all areas to their original condition. The reclamation of disturbed areas would likely include tilling the top 6 inches of soil to improve soil structure before reseeding.

3.2 Summary of Design Criteria

The following design criteria are protective measures to ensure that the performance of the disposal cell would remain unchanged. In addition, several criteria are included in this section that are protective of a cultural resource, wildlife, and vehicle safety related to potential traffic congestion during installation or removal of the system. These criteria would be stated in a lease.

- The site needs to remain locked at all times. LM and the lessee would daisy-chain locks on the entrance gate.
- The lessee would be allowed to access the site using only designated routes and would be allowed to conduct operations only in areas designated by LM.
- Access roads and paths on the site that LM needs may not be blocked. Clear paths must be maintained for all-terrain-vehicle access.
- Solar infrastructure would not be allowed within 5 ft of the site markers.
- Loads from the panels may not exceed 300 pounds per square foot bearing pressure on the ground.
- Machinery used on the cover must have rubber tires, be considered low-ground-pressure equipment, and not cause visible rutting.
- If electrical lines are installed in a conduit on the disposal cell, the conduit must be weather-resistant and capable of being driven over by vehicles. The lessee is responsible for all improvements required for connections to the local grid or substations. As much of the infrastructure as possible should be placed off of the cover.
- Utility trenching or small foundations are limited to a maximum depth of excavation into the top of the cover of 12 inches. The top 6 inches of material (a soil-and-rock matrix) must be separated from deeper excavated soils. Soils must be compacted to meet design specifications.
- No grading would be allowed on the disposal cell cover.
- The overall integrity of the disposal cell cover must remain intact. No breaching of the side slope areas would be allowed.
- Panels must not concentrate runoff to create a new runoff pattern across the cell cover. Water running off panels must not erode the surface. The lessee must repair any erosion that occurs on the surface.
- LM would increase the frequency of site inspections from once a year to monthly and following severe rainfall events, to ensure that potential erosion or any other negative impacts are identified and remedied before they become significant. The NRC defined a severe rainfall event as rainfall greater than 1 inch in 6 hours. Less frequent inspections may

be accepted by NRC and LM as appropriate. Site inspections would include evaluating the condition of the diversion channels to ensure that they remain functional as engineered.

- The rock armor on the channels and side slope may not be disturbed (this also includes the diversion channels). However, an access road may be built on the northern end (high point of the diversion channel) by using geotextile and road-base materials.
- Any cut slopes required as part of grading on areas off of the disposal cell cover may not be steeper than 4:1. Natural drainage channels may not be disturbed.
- All maintenance areas, including sheds, shall be off of the cover in areas designated by LM. Any hazardous materials required for construction or maintenance must be approved by LM before they are brought on site. Any hazardous material approved for use or storage must have a material safety data sheet on site. Any spills must be properly cleaned up and reported to LM and to any other agencies as required. Fuel for equipment may not be stored on site. Vehicles and machinery can be fueled only off of the disposal cell.
- No water is currently available on the site. No wells may be drilled within the property boundaries.
- All disturbed areas would be revegetated with an approved seed mixture after the installation and removal of the solar panels and associated infrastructure.
- Existing grasses within the solar panel footprint are to remain undisturbed and growing as much as practicable.
- Panels would be placed in rows not exceeding 10 ft in width with a clear path between the panels to allow access by an all-terrain vehicle. Material safety data sheets for herbicides used by LM for spraying weeds would be given to the lessee so that the lessee could determine the herbicides' compatibility with the solar panels.
- LM must have access to the solar facility for spraying noxious weeds, conducting inspections, and maintaining the cell cover.
- After the end of the lease, all equipment, fencing, electrical infrastructure, and other associated improvements must be removed from the site. Except for approved grading changes, all disturbed areas related to the PV system should be restored to preexisting conditions.
- Under either of the proposed action alternatives, LM would require the lessee to avoid cultural site 5LP1986, located near the transmission line. No activity would be allowed within 150 ft of the cultural site. Additionally, the lessee would be responsible for informing all persons associated with the project that they would be subject to prosecution for knowingly disturbing cultural sites or collecting artifacts of any kind.
- During the installation and reclamation of the panels and infrastructure, if potential traffic congestion occurs at the turnoff from the frontage road onto CR 210 or from CR 210 to CR 212, temporary traffic control measures may be required.
- If fencing is required for site security, CDOW has requested that wildlife-exclusion fencing, or fencing that is wildlife-friendly, be installed. Any site fencing related to wildlife concerns should be minimal.
- If an overhead electrical line is required, CDOW would require that a raptor-proof system be installed. Any overhead electrical line may be installed only with advance approval by LM.

- During installation or removal of the PV system, either avoidance of the area or migratory bird species surveys would be required if actions were conducted during migratory bird nesting or breeding seasons in accordance with the Migratory Bird Treaty Act (MBTA). The lease terms would include a requirement to conduct work in compliance with applicable federal and state requirements.

3.3 Alternative 1—Use Surface of Disposal Cell

Under this alternative, only the surface of the disposal cell would be available for operation of a PV system. The surface of the disposal cell covers 18 ac. Because the surface of the disposal cell has an irregular shape, it would not be possible to use the entire surface. Figure 4 illustrates one possible configuration of panels on the disposal cell; however, it doesn't show the maximum extent of the area that could be covered. In addition to the solar panels, a shallow trench to convey electrical lines would be excavated from the solar panels to an inverter located off of the cell but within the disposal site. One of the existing transmission lines that cross the disposal site would be used to convey the electrical energy. It would take approximately 1 month for a 10-person work crew to install or remove the system components. In addition, LM would have one inspector on site for all or part of this time. The surface of the disposal cell would be expected to support a 4.0 MW PV system; however, a lessee may choose to install a larger- or smaller-capacity system that is compatible with the available surface area and specific PV system requirements.

3.4 Alternative 2—Preferred Action: Maximize Use of Disposal Site

This alternative includes the use of the disposal cell surface area described in Alternative 1 and, in addition, the use of previously disturbed areas adjacent to the disposal cell. Areas considered potentially available for locating solar panels are in the southwest and west areas of the disposal site (Figure 4). It is expected that, in addition to a 4.0 MW system on the surface of the disposal cell, a 0.5 MW PV system could be reasonably located on 3.5 ac adjacent to the disposal cell. Although this alternative considers a total system capacity of 4.5 MW, it is reasonable to expect that a final system would have a larger or smaller capacity, depending on the specific system configuration, available system components, and LM requirements. This alternative would require an estimated 4 months to install or remove and may require a slightly larger workforce than the 10-person work crew identified for Alternative 1.

3.5 No Action Alternative

The No Action Alternative is the continuation of the existing situation. The disposal site would continue to be managed as a disposal site as required by the LTSP (DOE 2011b). The current activities of monitoring the cell would continue as required by NRC and described in the LTSP (DOE 1996, 2011b). These activities include general maintenance of site features (e.g., weed control, sign replacement), groundwater monitoring, and an annual site inspection.

3.6 Other Alternatives Considered but Dismissed from Detailed Evaluation

A participant at the May 3, 2010, public scoping meeting raised the possibility of developing a concentrating solar power renewable energy system instead of a PV solar energy system. LM did consider this option but, upon evaluation, decided not to pursue this as an alternative, for the following reasons: concentrating solar power requires infrastructure that would be ground-penetrating; concentrating solar power requires a greater degree of cleaning and other maintenance; and concentrating solar power reflects light to a much greater degree than do PV systems. LM believes that NRC would not grant a license change to include facilities to support a concentrating solar energy system.

Another alternative discussed at the May 3, 2010, public meeting related to configuring panels to go down the side slopes of the disposal cell. The individual who brought up this alternative believed that the panels could be engineered by using ballast at the top and bottom of the slopes to avoid penetration. LM does not believe this is a feasible alternative and is not considering it at this time. This option might be considered in the future after more traditional configurations have been developed, if the lease is granted, and if NRC accepts this alternative use of the disposal site. A supplement to this EA would need to be prepared at that time to evaluate this option.

4.0 Affected Environment

4.1 Introduction

The Durango area is well known for its recreation opportunities and numerous tourist attractions, which include the Durango to Silverton Narrow Gauge train, nearby Mesa Verde National Park, and a variety of outdoor recreation opportunities. Area recreation includes fishing, rafting, and kayaking on the Animas and other nearby rivers; hunting; running, hiking, and mountain-bike trails; alpine and cross-country skiing; and attractive photographic opportunities. The local branch of the state college system, Fort Lewis College, provides many degree concentrations. Several area businesses design and install solar energy systems. In response to the area interest in renewable energy and sustainable living, the City of Durango has established a sustainability coordinator position. All aspects of City energy use are routinely evaluated, and the use of green products is required as appropriate (City of Durango 2010).

The Durango disposal site is located southwest of the city of Durango within La Plata County. Uninhabited land managed by CDOW as a designated State Wildlife Area (SWA) surrounds the disposal site to the north, east, and west and uninhabited land managed by BOR is adjacent to the south disposal site boundary. Several miles west of the disposal site are subdivisions that were largely developed since 2000 and contain single-family homes. Several miles to the east is U.S. Highway 160/550, a main north–south travel route that has commercial business development along the highway corridor (Figure 5).

Additional residential and commercial development in La Plata County could occur on areas of private land. The proposed installation, operation, maintenance, and reclamation of a small PV system would not impact County plans or resources because all actions would occur on LM property. Proposed county-area developments would not affect the installation, operation, maintenance, or reclamation of a solar array system.

Once a system was installed, only minor site visitation would occur. The workforce to install or remove a PV system would consist of an estimated 10 workers. Depending on the final level of development pursued by the lessee, about 4 months would be required to complete the installation or remove panels and reclaim disturbed areas at the end of the lease. Neither the potential workforce needed to install a system or the anticipated time to complete the installation would affect existing employment, schools, or other related socioeconomic factors.

Most of the disposal site was extensively disturbed during the remediation. The site has no natural surface water sources. A small evaporation pond is located in the northeast portion of the site and was developed to contain water draining from the disposal cell. The presence of panels on the surface of the site would not affect groundwater. The LTSP (DOE 1996, 2011b) describes groundwater conditions at the site.

One natural hazard was identified for the disposal site area. The La Plata County website rates the area as having a high wildland fire risk (La Plata County 2009a). Emergency personnel would be identified in the final lease agreement, and appropriate contacts for the leaseholder would be provided to local emergency personnel.

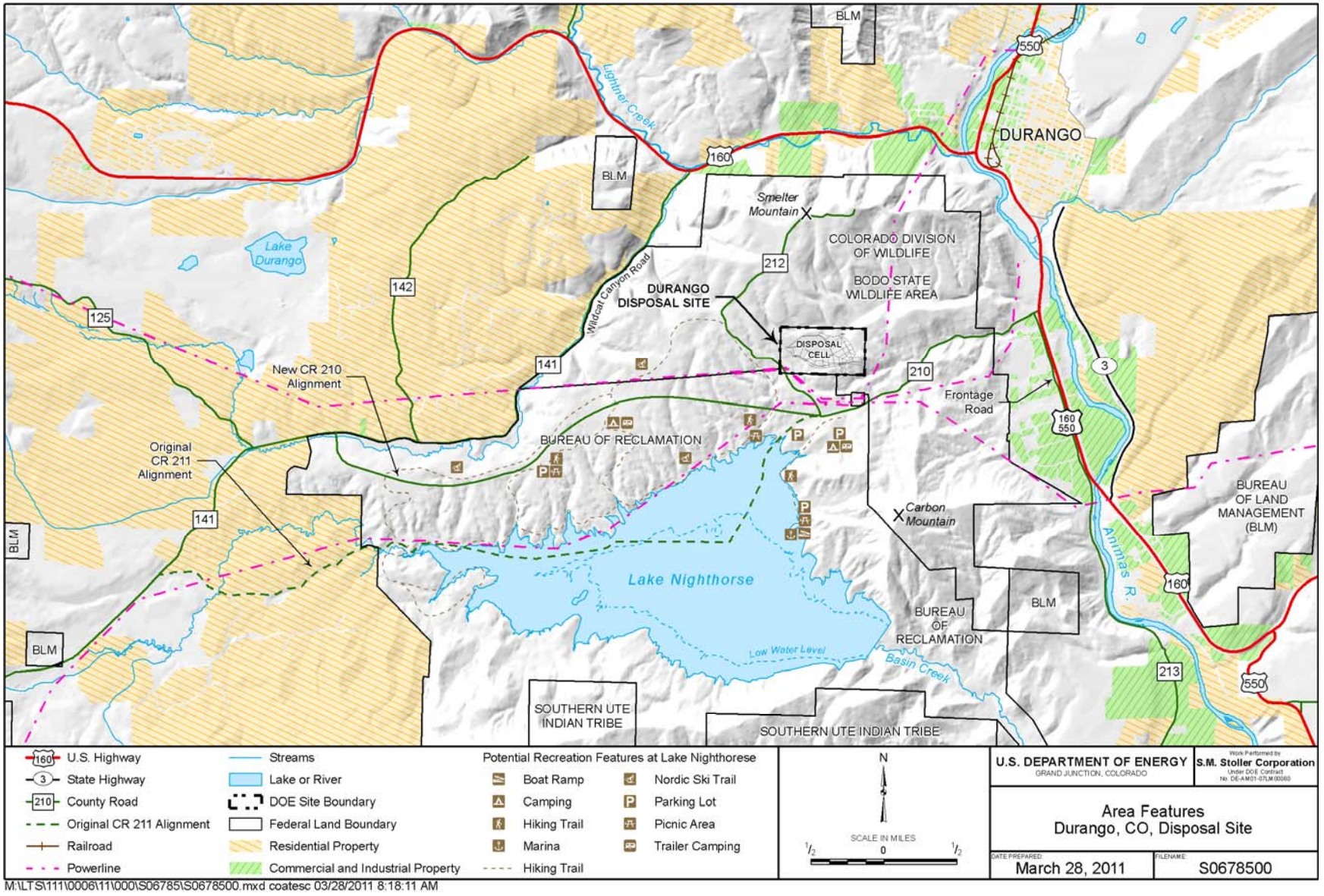

Figure 5. Existing and Proposed Developments near the Durango Disposal Site

4.2 Environmental Justice, Noise, Occupational Worker Health and Safety, and Intentional Destructive Acts

4.2.1 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that each federal agency consider and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." One of the terms and conditions in the lease would be: "the Lessee agrees not to discriminate by segregation or otherwise against any person or persons because of race, color, creed, sex, or national origin in furnishing, or by refusing to furnish to such person or persons the use of any facility, including any and all services, privileges, accommodations, and activities provided therein." In addition, the location of a PV system in an area surrounded by public land and on a disposal site could not affect any minority communities or their environment. Therefore, this element is not considered further in this EA.

4.2.2 Noise

Noise levels are measured in decibels, and maximum decibel levels considered protective of human hearing are identified for various activities and pieces of equipment. As appropriate, hearing protection would be required for workers under Occupational Safety and Health Administration regulations during the installation or removal of the solar array.

There are no noise sources on site or from immediately adjacent areas. The combination of area vegetation and topography blocks general noise sources, such as motor vehicles on area roads. The short-term activities and equipment related to the installation of the solar array would not likely result in noticeable noise impacts to off-site areas.

PV systems do not generate noise once they are installed. Consequently, the presence of a solar array on the Durango disposal site would not introduce a source of noise to the area. For this reason, this resource is not considered further in this EA.

4.2.3 Occupational Worker Health and Safety

LM would not perform any of the proposed actions. If LM staff were on site, they would be required to comply with existing processes and procedures implemented under 10 CFR 851, "Worker Safety and Health Program." The winning bidder would be required to abide by the various laws governing the occupational health and safety of its own employees (such as 29 CFR 1926, "Safety and Health Regulations for Construction") but would not be subject to 10 CFR 851.

The PV system is expected to be limited to the surface of the disposal cell and limited adjacent areas. To avoid creating overhead electrical lines, a shallow trench, no deeper than 12 inches, may need to be dug into the cell (see Sections 3.1–3.2), or electrical conduit may be used to run electrical lines across the surface of the cell. The conduit, if used, would be required to be weather-resistant and strong enough for vehicles to drive over. The lessee would be required to supply LM with as-built drawings that detail the location of any buried electrical lines installed.

The disposal cell was designed to contain radioactivity and to prevent the emanation of radon from the cell. The top of the tailings are approximately 7 ft below the surface of the cell cover. The National Emission Standards for Hazardous Air Pollutants places a limit of 20 picocuries per meter squared per second (20 pCi/m^2/sec) on the release of radon to the ambient environment (40 CFR 61.222[a]) from non-operational uranium tailings piles, which is considered comparable to closed uranium cells. The radon flux measured across the Durango disposal cell cover after it was completed was 0.2 pCi/m^2/sec, or a factor that is 100 times smaller than the allowable limit. Because the tailings would not be breached, there would be no radiological exposure related to the buried uranium mill tailings. Therefore, this resource is not considered further in this EA.

4.2.4 Intentional Destructive Acts

The installation and operation of a PV system would not involve the transportation, storage, or use of radioactive, explosive, or toxic materials. It is highly unlikely that terrorists would view the installation or operational aspects of the proposed 4.5 MW system as a potential target for potential disruption of the power grid. Even if the system was suddenly pulled off the grid, it would have a negligible impact.

It is expected that the current known acts of vandalism, which include removing signs, shooting signs and markers, and littering, would continue after the installation of a solar array. Once Lake Nighthorse becomes fully developed as a recreational center for the area, there would be greater volumes of traffic and people in the general area, and recreationists would use CR 210 to access the lake. Additional traffic on CR 212 is also expected, and it is likely that there would be more occurrences of vandalism, regardless of the presence of a solar array on the site. If any of the panels were shot at as part of an act of vandalism, no fluids or hazardous materials would leak from an opening. If the lessee decides to fence the perimeter of the site or provide security patrols, the existing or potential vandalism may decrease.

The proposed actions of installing and operating a PV system on the disposal cell surface or on previously disturbed areas within the disposal site would not provide an attractive target or opportunity for terrorists to cause adverse impacts to life, health, or safety. For this reason, this element is not considered further in this EA.

4.3 Resources Not Present or Impacted by Any Alternatives

4.3.1 Floodplains and Wetlands

No 100-year floodplains exist on or adjacent to the Durango disposal site. Floodplains associated with the Animas River occur approximately 1.5 miles east of the site and would not be affected by the proposed work (La Plata County 2009b).

Wetland vegetation associated with a human-made evaporation pond is in the northeast portion of the disposal site. Because the hydrology in this vegetated area is sustained by pumping, it is not a jurisdictional wetland. However, several small potential wetland areas may be present in drainage features at the site, and these areas would be jurisdictional if they were determined to meet all wetland criteria through formal wetland delineations. Delineations are not necessary because all potential wetlands are located in deep drainages in the southwestern and eastern portions of the site and would not be affected by site activities. No construction work would occur in the drainages, and the areas would be protected from sedimentation by best management practices (sediment controls) during all phases of construction, including road grading. The

potential wetlands are located too far away from potential solar panel use areas to be potentially affected by concentrated runoff.

Because no floodplains or wetlands are present or would be affected by site activities, no consultation or permitting with the U.S. Army Corps of Engineers is required. For this reason, these resources are not considered further in this EA.

4.3.2 Prime and Unique Farmlands or Soils

Prime and unique soils are protected under the Farmland Protection Policy Act of 1981 (7 CFR 657). The purpose of the law it is to minimize the extent to which federal activities contribute to the irreversible and unnecessary loss of agricultural land to non-agricultural uses. No prime and unique soils or agricultural lands are present on the Durango disposal site. Therefore, this resource is not considered further in this EA.

4.3.3 Wild and Scenic Rivers, State or National Parks or Forests, or Other Areas of Scenic or Aesthetic Importance

The Wild and Scenic Rivers Act (P.L. 90-542) designates selected rivers of the United States for protection. No designated wild and scenic rivers cross or are near the Durango disposal site or would be impacted by this project. There are no State or national parks, forests, or other areas of scenic or aesthetic importance near the Durango disposal site. Therefore, these resources are not considered further in this EA.

4.3.4 Threatened or Endangered Species

The U.S. Fish and Wildlife Service (USFWS) website (USFWS 2011) was accessed to determine whether any federally listed plant or wildlife species may be present in the Durango disposal site area. Habitat for federally listed (threatened or endangered) wildlife species was not found to be present in the disposal site area. The four federally listed fish known to be present in the Upper Colorado River Basin would not be impacted by water depletion associated with project activities. In addition, habitat for the one federally listed plant species is not known to be present in the disposal site area.

The Colorado Division of Wildlife (CDOW) website (CDOW 2011) was accessed to determine whether any state listed plant or wildlife species may be present in the Durango disposal site area. Habitat for state threatened or endangered species was not found to be present in the disposal site area.

Table 1 provides a summary of the federal and state-listed species and their habitat requirements.

Table 1. Federal and State-Listed Species Potentially Occurring in Colorado

Common Name	Scientific Name	Federal Status	State Status	Comment
Birds				
Burrowing owl	*Athene cunicularia*		T	Inhabits abandoned rodent burrows, especially prairie dog burrows. No burrows exist on the surface of the cell or in the adjacent footprint where potential panels may be placed, or in nearby areas.
Least interior tern	*Sterna antillarum*	E	E	Not found in La Plata County.
Lesser prairie chicken	*Tympanuchus pallidicinctus*		T	Inhabits sandy grasslands originally found in eastern Colorado. This habitat is not present on or near the disposal site.
Mexican spotted owl	*Strix occidentalis lucida*	T	T	Generally found in forested habitat, uneven-aged stands with high canopy closure, high tree density, and steep canyons. The disposal site and nearby areas do not contain this habitat.
Piping plover	*Charadrius melodus*	T	T	Not found in La Plata County.
Plains sharp-tailed grouse	*Tympanuchus phasiainellus jamesii*		E	Habitat is not present on or near the disposal site. A small population is found in Douglas County, Colorado.
Southwestern willow flycatcher	*Empidonax traillii extimus*	E	E	Requires dense riparian habitats, which are not present on the disposal site.
Whooping crane	*Grus americana*	E	E	Not found in La Plata County.
Mammals				
Black-footed ferret	*Mustela nigripes*	E	E	Inhabits a prairie ecosystem also in association with large prairie dog towns. This habitat is not found on or nearby the disposal site.
Canada lynx	*Lynx canadensis*	T	E	Inhabits boreal forests. Habitat is not present on or near the disposal site.
Gray wolf	*Canis lupus*	E	E	No documented populations in Colorado.
Grizzly bear	*Ursus arctos*	T	E	Not known to occur in Colorado.
Kit fox	*Vulpes macrotis*		E	Habitat is not present on or near the disposal site. Known to inhabit the Montrose to Grand Junction area in semi-desert shrub lands.
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	T	T	Not found in La Plata County.
River otter	*Lontra canadensis*		T	Associated with riparian and stream habitats. The disposal site does not contain this habitat.
Wolverine	*Gulo gulo*		E	Habitat is tundra, boreal, and alpine biomes; high elevation. One sighting in North -Central Colorado. Habitat is not present on or near the disposal site.
Insects and Amphibians				
Uncompahgre fritillary butterfly	*Boloria acrocnema*	E		Restricted to isolated alpine habitats in the San Juan Mts. Habitat does not occur on the disposal site.
Boreal toad	*Bufo boreas boreas*		E	Requires spruce-fir forests and alpine meadows. Habitat is not present on or near the potentially affected disposal site area.
Fish				
Arkansas darter	*Etheostoma cragini*		T	Not found in La Plata county. Found in tributaries to the Arkansas River.
Bonytail chub	*Gila elegans*	E	E	No work would be conducted in tributaries to the Upper Colorado River Basin nor is there anticipated water depletion.
Brassy minnow	*Hybognathus hankinsoni*		T	Not found in La Plata county. Found in northeast Colorado.
Colorado pikeminnow	*Ptychocheilus lucius*	E	T	No work would be conducted in tributaries to the Upper Colorado River Basin nor is there anticipated water depletion.

Table 1 (continued). Federal and State-Listed Species Potentially Occurring in Colorado

Common Name	Scientific Name	Federal Status	State Status	Comment
Common shiner	*Luxilus cornutus*		T	Not found in La Plata county. Found in tributaries to the South Platte River.
Humpback chub	*Gila cypha*	E	T	No work would be conducted in tributaries to the Upper Colorado River Basin nor is there anticipated water depletion.
Greenback cutthroat trout	*Oncorhynchus clarki stomias*	T	T	Not found in western Colorado. Associated with the South Platte and Arkansas Rivers.
Northern redbelly dace	*Phoxinus eos*		E	Inhabits flowing pools of creeks or streams; no streams are on the disposal site.
Plains minnow	*Hybognathus placitus*		E	Not found in La Plata county. Found in eastern Colorado.
Pawnee montane skipper	*Hesperia leonardus montana*	T		Not found in La Plata County.
Razorback sucker	*Xyrauchen texanus*	E	E	No work would be conducted in tributaries to the Upper Colorado River Basin nor is there anticipated water depletion.
Rio grande sucker	*Catostomus plebeius*		E	Not found in La Plata county. Found in portions of the Rio Grande Basin and San Luis Valley.
Southern redbelly dace	*Phoxinus erythrogaster*		E	Inhabits flowing pools of creeks or streams; no streams are on the disposal site.
Suckermouth minnow	*Phenacobius mirabilis*		E	Not known to be in La Plata County. Inhabits cold water streams, and no streams are on the disposal site.
Plants				
Knowlton's cactus	*Pediocactus knowltonii*	E	E	Habitat may occur in La Plata County, but does not occur at the site. Occurs only in extreme southern La Plata County, at the border of New Mexico. Habitat: on alluvial deposits forming rolling gravelly hills in piñon-juniper and sagebrush, 6,400 ft.
Clay-loving wild buckwheat	*Eriogonum pelinophilum*	E	E	Does not occur in La Plata County
Colorado butterfly plant	*Gaura neomexicana* var. *coloradensis*	T	T	Does not occur in La Plata County
Colorado hookless cactus	*Sclerocactus glaucus*	T	T	Does not occur in La Plata County
Dudley Bluffs bladderpod	*Lesquerella congesta*	T	T	Does not occur in La Plata County
Dudley Bluffs twinpod	*Physaria obcordata*	T	T	Does not occur in La Plata County
Mancos milk-vetch	*Astragalus humillimus*	E	E	Does not occur in La Plata County
Mesa Verde cactus	*Sclerocactus mesae-verdae*	T	T	Does not occur in La Plata County
North Park phacelia	*Phacelia formosula*	E	E	Does not occur in La Plata County
Osterhout milk-vetch	*Astragalus osterhoutii*	E	E	Does not occur in La Plata County
Penland alpine fen mustard	*Eutrema penlandii*	T	T	Does not occur in La Plata County
Penland beardtongue	*Penstemon penlandii*	E	E	Does not occur in La Plata County
Ute ladies'-tresses	*Spiranthes diluvialis*	Y	T	Does not occur in La Plata County

E = Endangered
T = Threatened

The Knowlton cactus (*Pediocactus knowltonii*), a federal and state listed endangered species, is currently listed as potentially present in La Plata County. The most recent 5-year review (USFWS 2010) confirms that the species is restricted to New Mexico, and that if potential habitat for this species occurs within Colorado, it is restricted to extreme southern La Plata County on the New Mexico border, and so does not occur in the project area. No other federal or state listed threatened or endangered plant species occur in La Plata County.

Under Section 7 of the Endangered Species Act (16 U.S.C. 1531 et seq*)*, no consultation is required with USFWS if a federal agency determines that a proposed action will not affect a listed species or critical habitat. No federally listed wildlife or plant species are present or potentially present on the surface of the disposal cell or in the adjacent previously disturbed or otherwise potentially affected areas.

4.4 Other Resources Evaluated

4.4.1 Climate, Air Quality, and Greenhouse Gas

The following information characterizes the climate at Durango, which is situated at 6,512 ft above sea level. In general, the climate in the Durango area is characterized by warm summers, cold springs and autumns, and moderately cold winters. Winter temperatures average a high of 41.9 °F and a low of 13 °F. Average snowfall is approximately 70 inches. Summer temperatures average a high of 83 °F and a low of 47 °F. Wind blows from the north at between 5 and 10 miles per hour. It is assumed that the climate at the disposal site, located at 7,100 ft above sea level, is similar but colder during all times of the year and typically has a greater snow depth. The Durango area generally experiences an average of 300 sunny days a year.

La Plata County is part of the Four-Corners Air Quality Task Force, which includes the states of Colorado and New Mexico. Nine sites monitor air quality in the state of Colorado and three of these sites are in La Plata County. The results of monitoring air quality at the sites in Colorado indicate that air quality at all sites is in compliance with the U.S. Environmental Protection Agency (EPA) Clean Air Act Standards, including ozone. However, La Plata County does have concern with levels of mercury that have been reported in area lakes, soil, and air (La Plata County 2011).

The remoteness of the area and lack of adjacent developments contribute to excellent air quality.

4.4.2 Visual Resources

Visual resources are the visible physical features of a landscape that impart scenic value. Currently, the physical features at the Durango disposal site contrast sharply with the surrounding natural landscape as a result of past disposal cell construction. The disposal site consists of simple, smooth forms created by the flat, grass-covered cell top and light-colored, riprapped side slopes. Immediately surrounding the disposal cell are smooth, gently sloping, reclaimed grassland areas. In contrast, the surrounding natural areas consist of more complex, textured forms created by dense stands of dark-green trees and rugged hillsides.

The scenery in the general vicinity of the disposal cell consists of a mixture of landscape types, including (1) a smooth, reflective lake and barren construction areas associated with the new

Lake Nighthorse in the nearby valley bottom; (2) clear-cut pipeline and power line rights-of-way; (3) smooth, linear dirt roads; and (4) rugged, dark mountains in the background. Scattered throughout the landscape are numerous steel-colored, vertical communication towers and electrical transmission poles. Although it is a rural landscape, it has been highly transected by human-made geometric forms.

The disposal site can be viewed primarily from CR 212, an improved dirt road that provides access to the disposal site as well as to numerous communication towers on the top of nearby Smelter Mountain. Communication companies that maintain the towers, transmission-line employees, BOR personnel associated with Lake Nighthorse, hunters, mountain-bikers, and other recreationists use this road. LM staff often see local inhabitants parked on CR 212 near the disposal site, or hiking or sitting in nearby wooded areas. Figure 6 shows a typical view of the disposal site by a northbound traveler on CR 212. When a person is traveling northbound, he or she can barely see the top of the disposal cell. The disposal cell's riprapped side slopes are intermittently visible for a total time of approximately 1.5 minutes by northbound travelers and 1.6 minutes by southbound travelers.

Figure 6. View of the Durango Disposal Site Looking North from CR 212 (Transmission lines and a pole are visible in the foreground.)

4.4.3 Wildlife

Much of the disposal site has been disturbed due to the construction of the disposal cell and therefore does not contain valuable wildlife habitat immediately adjacent to the disposal cell. The low degree of slope of the vegetated disposal cell cover does provide attractive grazing for large mammals, such as deer, and fecal evidence of casual use by them has been observed during site inspections. Common song birds hunting insects in the grass cover over the disposal cell have been observed during site inspections. The area to the west of the disposal cell is partially vegetated with scattered shrubs, which also provides limited attractive wildlife habitat. However, areas to the north and along the east and south perimeter portions of the disposal site become heavily vegetated with mixed shrubs and trees as the area transitions into the Bodo State Wildlife Area (SWA) or the undeveloped forested lands managed by the BOR.

The CDOW-owned and -managed SWA surrounds most of the Durango disposal site. This large area encompasses 2,293 ac. Deer, elk, rabbit, dusky (blue) grouse, band-tail pigeon, and dove can be hunted within the SWA. No hunting is allowed within the disposal site. Large herds of elk and deer winter north of the disposal site in the SWA but do not migrate through the disposal site. Bald eagles are known in the area, and three nests are typically seasonally occupied just east of Lake Nighthorse on Mount Carbon, several miles southeast of the disposal site. When Lake Nighthorse is completely full, Osprey are expected to frequent the area. Ferruginous hawks are known to hunt in the SWA and would be expected to utilize undeveloped portions of the disposal site as well as the BOR property to the south.

CDOW provided information on wildlife and bird species that are known to, or have the potential to, occur within the SWA (Table 2). None of the species are federal- or state-listed as threatened or endangered. With the exception of the bald eagle, ferruginous hawk, and midget faded rattlesnake, which the State has deemed candidate species, all of the species are listed as "Species of Greatest Conservation Need" in the Colorado Wildlife Conservation Strategy (Schuler 2010). Although these species do not have restrictions associated with their classification, the State of Colorado is trying to protect them or their habitat and considers them vulnerable to change.

It is likely that many of the avian species listed in Table 2 are transient visitors over the site or may nest or forage in remote portions of the disposal site or in the adjacent SWA.

Table 2. Wildlife and Bird Species Potentially Present in the Disposal Site Area

American peregrine falcon (*Falco peregrinus anatum*)	Gunnison prairie dog (*Cynomys gunnisoni*)
Bald eagle (*Haliaeetus leucocephalus*)	Juniper titmouse (*Baeolophus ridgwayi*)
Band-tailed pigeon (*Patagioenas fasciata*)	Lewis's woodpecker (*Melanerpes lewis*)
Black-throated warbler (*Dendroica nigrescens*)	Loggerhead shrike (*Lanius ludovicianus*)
Brewer's sparrow (*Spizella breweri*)	Meadow jumping mouse (*Zapus hudsonius*)
Ferruginous hawk (*Buteo regalis*)	Midget faded rattlesnake (*Crotalus viridis concolor*)
Flammulated owl (*Otus flammeolus*)	Northern goshawk (*Accipiter gentilis*)
Fringed myotis (*Myotis thysanodes*)	Olive-sided flycatcher (*Contopus cooperi*)
Golden eagle (*Aquila chrysaetos*)	Pinyon jay (*Gymnorhinus cyanocephalus*)
Gray vireo (*Vireo vicinior*)	Swanson's hawk (*Buteo swainsoni*)

4.4.4 Vegetation

Vegetation on the cell cover and on disturbed portions of the site consists primarily of seeded reclamation grasses—smooth brome (*Bromus inermis*) and blue grama (*Bouteloua gracilis*). Other species, including western wheatgrass (*Pascopyrum smithii*) and hairy golden aster (*Heterotheca villosa*), occur in smaller amounts. Deep-rooted plant species on the cell cover (including shrubs and alfalfa) are routinely treated with herbicides to prevent growth.

Native shrub lands and forests dominate the perimeter of the disposal site. Shrub lands contain predominantly big sagebrush (*Artemisia tridentata*) and rubber rabbitbrush (*Ericameria nauseosa*), and forests contain predominantly Gambel oak (*Quercus gambelii*), piñon pine (*Pinus edulis*), and Utah juniper (*Juniperus osteosperma*). A diverse understory of native grasses, flowers, and cacti exists under the shrub lands and forests. Noxious weed species include spotted knapweed (*Centaurea maculosa*), yellow toadflax (*Linaria vulgaris*), musk thistle (*Carduus nutans*), and Canada thistle (*Cirsium arvense*). They are routinely treated with herbicides in the native and disturbed areas of the site.

4.4.5 Cultural Resources

Humans have lived and hunted in the area of the Durango disposal site since prehistoric times. Several present-day Indian tribes have historic ties to the land, including the Ute Mountain Ute, Southern Ute, Ohkay Owingeh (Pueblo of San Juan), and Pueblo of Picuris. These tribes have been contacted about the proposed actions.

The area potentially affected by the proposed actions was inventoried for cultural resources in 1981 (Nickens and Chandler 1981), 1986 (Horn et al. 1986), and 1999 (Honeycutt and Fetterman 1999). Most of the inventory work was conducted before LM began construction of the uranium mill tailings disposal cell in 1987. A total of 13 cultural sites were identified within the project area. All but two of them were completely excavated or tested before 1988 (Fuller 1985a, 1985b, 1988). One of the two untested sites is a probable prehistoric habitation site, and the other is a lithic scatter. Both are considered eligible for inclusion in the National Register of Historic Places.

LM completed a Class I inventory—an archive and literature search—in May 2010 (Hammack 2010) to determine if new cultural sites had been identified in or near the project area since the earlier inventories. No additional sites had been identified, and no new field inventories were recommended.

4.4.6 Recreation and Lake Nighthorse

Recreation is not permitted on the disposal site. The Bodo SWA surrounds three sides of the site. Its dedicated purpose is to maintain the historical wildlife values and habitat that are present in the area. Hunting for large and small game and birds is seasonally allowed within the SWA (Section 4.4.3). In addition to hunting in the SWA, other opportunities include picnicking, hiking, horseback riding, and wildlife viewing. There are no developed facilities within the SWA.

Approximately 1 road-mile south of the disposal site, the newly completed Lake Nighthorse, which is still being filled, is expected to become a center for a variety of recreational opportunities that will service the area. In addition to its primary purpose as a water supply reservoir, the lake will provide a resource for water sports. The lake was originally known as the Ridges Basin Reservoir and is located on Basin Creek, a tributary of the Animas River in Colorado. In 2004, Ridges Basin Reservoir was re-designated as Lake Nighthorse through an act of Congress.

When the entire lake is filled, it will hold a maximum of 120,000 acre-feet of water and will cover 1,500 ac. Adjacent BOR lands comprise an additional 4,000 ac and are located adjacent to the disposal site and to the Bodo SWA (Chiarito 2010; Christensen 2010).

Future recreational developments related to Lake Nighthorse are expected to be located north of the lake and south of CR 210. Areas to the south and west of the lake likely will not have any trail or campground development or use due to the steepness of the terrain and seasonal closures related to big-game migrations. The area to the east of the lake is also expected to remain largely undeveloped due to closures related to eagle nesting on nearby Mount Carbon. There are plans to locate a boat ramp and small parking areas on the northeast portion of the lake (Figure 5) (Chiarito 2010).

The complete filling of Lake Nighthorse is not expected before 2012. A boat ramp and marina must be completed before the lake can finish being filled. BOR would like to have a completed and approved master plan for recreational facilities when the lake is full. As of April 2011, funding opportunities and partnerships to prepare a master plan were being sought (Chiarito 2010). The State of Colorado manages state parks. Until state funding is available, Lake Nighthorse will remain a water supply reservoir that will not allow public trespass and is fenced for that purpose.

La Plata County, BOR, and the City of Durango emphasize the importance of creating a hiking/biking trail system that would link existing trail segments along the Animas River and proposed trails along Lake Nighthorse. Due to the contiguous border of the Durango disposal site and the BOR lands with the nearby proposed trails related to Lake Nighthorse, there is interest in creating a potential trail link through a portion of the disposal site. The City of Durango has recently completed a recreation master plan for the development of trails within the city, and the County continues to operate under a trails plan completed in 2000 that does indicate a need for a bike/pedestrian trail near the disposal site (Chiarito 2010; Christensen 2010; Hughes 2010b).

4.4.7 Transportation

The Durango disposal site is accessed by turning west from U.S. Highway 160/550 onto CR 210 (Figure 5). U.S. Highway 160/550 is the main north–south highway that connects points north of Durango to New Mexico. It is four lanes wide in the Durango area. In the area of the CR 210 turnoff, there is a frontage road with signals, which is shown on Figure 5.

CR 210 extends from U.S. Highway 160/550 to Wildcat Canyon Road (CR 141) to the west and currently services residential homes off CR 141. It is a paved two-lane road that begins at the intersection with U.S. Highway 160/550 and extends to CR 141, where it continues as CR 141. Existing traffic use is light. However, in the future, traffic volume is expected to increase significantly related to the expected change of use of Lake Nighthorse from a water supply

reservoir to a state park or related to residents from subdivisions to the west commuting to Durango. CR 210 is expected to eventually carry an average daily traffic volume of 1,500 vehicles.

Approximately 1 mile west of the interchange with U.S. Highway 160/550 and CR 210, CR 212 intersects with CR 210 and provides direct access to the disposal site. The disposal site is approximately 0.4 mile north of the intersection with CR 210. CR 212 is used to access the top of Smelter Mountain and a microwave tower north of the disposal site. It does not provide access to other county roads but does experience casual use. CR 212 is a two-lane dirt-surface road. Current use of both county roads is light.

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5.0 Environmental Impacts

5.1 Introduction and Impact Assumptions

Impacts in the following sections are considered for all alternatives. An impacts assessment generally includes long-term, short-term, and direct and indirect impacts. These are provided as applicable. As described in Section 3.1, installation of the panels would take between 1 and 4 months, depending on whether development was limited to the surface of the disposal cell (Alternative 1) or also included the adjacent areas near the footprint of the cell (Preferred Action: Alternative 2). The operation phase, which would include maintenance actions as needed, would occur over the lease term. After the lease is completed, all components related to the solar array be removed from the site, and the surface be reclaimed to the existing surface situation. To reduce compaction of surface areas, after components have been removed, the affected surfaces be tilled to improve soil texture, and disturbed areas be seeded with species native to the area. Table 4, in Section 5.11, compares the alternatives' potential impacts.

5.2 Disposal Cell Performance

Uranium mill tailings disposal cells were engineered and designed "To be effective for up to one thousand years, to the extent reasonably achievable, and in any case, for at least 200 years" (40 CFR 192). To meet this requirement, a variety of cover materials were used to limit radon escape, keep moisture out of the tailings, physically protect the cell from natural or human-caused erosion, and prevent deep-rooted vegetation from penetrating the cell into the tailings. The vegetated soil-and-rock matrix that forms the outer cover would provide a stable and durable base for a PV system.

Many factors may affect the longevity of any disposal cell—among them, the durability of the rock on the side slopes, surrounding activities, changes in moisture regimes, soil development, and ecological succession. For these reasons, as part of their license terms with LM, NRC requires annual inspections of the disposal site to monitor the integrity of the engineering design. More frequent inspections would be conducted during all phases of the PV system. LM expects only minor maintenance activities over the potential 25-year lease term. If cell performance became compromised, as a worst-case scenario, LM would always retain the right to have the solar panels removed.

5.2.1 Alternative 1—Use Surface of Disposal Cell

During the installation of the PV system, there would be travel on the cell surface to drop off supplies and workers. Temporary compaction of surface layers from equipment is not expected to influence the gravel/soil surface layer. With a few exceptions related to excavating shallow trenches to convey electrical lines, no surface disturbance would be allowed.

During operation, solar panels would likely change the existing vegetation (Section 5.6). It is expected that, due to the presence of the panels and required space between the arrays, vegetation and subsurface moisture would become less homogeneous. The Durango disposal cell was designed to meet EPA criteria without the presence of vegetation. There is no known research related to impacts associated with the presence of solar panels on disposal cells. Due to the cover design, LM does not expect solar panels to have a measurable effect on the cell performance.

After completion of the lease, the PV system and all associated infrastructure would be removed, and the disturbed surfaces would be reclaimed by tilling 6 inches of surface-compacted soils and seeding with native plant species.

5.2.2 Alternative 2—Preferred Action: Maximize Use of Disposal Site

None of the actions related to using previously disturbed areas adjacent to the disposal cell would impact cell performance. Impacts related to the placement of solar panels on the surface of the cell would be the same as described in Section 5.2.1.

5.2.3 No Action

The disposal cell would continue to function as it does currently.

5.3 Air Quality and Greenhouse Gas

5.3.1 Alternative 1—Use Surface of Disposal Cell

During the installation of the PV system, no grading would be allowed on the surface of the cell. However, it would be necessary to excavate shallow trenches that would convey electrical lines from the solar panels to an inverter off the cell, and this activity may cause minor amounts of fugitive dust. The dirt access road on the site would be upgraded by grading and adding a graveled surface. If necessary, small quantities of water would be used as a fugitive-dust control measure. Vehicles on CR 212 would not be expected to generate fugitive dust due to the short distance (0.4 mile) traveled on the unpaved road and the need to reduce speed at the turnoff from CR 210 onto CR 212. Minor amounts of greenhouse gas associated with vehicle emissions related to workers and suppliers traveling to the disposal site and miscellaneous trips in the city of Durango would occur for approximately 1 month.

Because no trees are expected to be removed as a result of this alternative, no change to carbon absorption or storage sources is expected.

During operation and maintenance actions, no changes to air quality would be expected. The addition of a renewable source of energy to the electrical grid would (slightly) reduce greenhouse gas emissions. Travel to the site for inspection or maintenance purposes would likely average once or twice a month and involve one or two vehicles. However, LM personnel would travel from Grand Junction, Colorado, when site inspections were necessary. Impacts to greenhouse gases related to vehicle emissions would be negligible.

During the restoration of the site, the actions associated with disassembling and removing the PV system and reclaiming the disposal cell surface would likely cause more fugitive dust than would the activities associated with installation. Once PV system components were removed, all areas would be tilled prior to reseeding. Fugitive dust would be controlled in accordance with applicable laws and regulations. Minor increases in greenhouse gas may be associated with vehicle use, but this impact would be negligible.

5.3.2 Alternative 2—Preferred Action: Maximize Use of the Disposal Site

During the installation of the panels, potential impacts would be similar to those addressed in Section 5.3.1. In addition, new disturbance to previously disturbed areas that have a light vegetation cover (such as grading to reduce the degree of slope on off-cell areas) may cause minor amounts of fugitive dust, which would be controlled as necessary. Greenhouse gas associated with vehicle travel emissions over a period of 4 months would be negligible.

During the potential 25-year operation and maintenance period, greenhouse gas would be reduced as described in Section 5.3.1. LM's vehicle trips from Grand Junction to the disposal site for inspection purposes would have negligible impacts on greenhouse gas.

During the restoration and reclamation of affected areas on the disposal site, impacts to air quality would be similar to those discussed in Section 5.3.1. The greater time period required to remove a larger PV system from the off-cell areas would extend the period of potential impact, but the impact would still be minor. All off-cell areas would be tilled prior to reseeding, and fugitive-dust control would be in accordance with applicable laws and regulations.

Any increase in greenhouse gas related to vehicle emissions would be negligible.

5.3.3 No Action

The existing air quality at the disposal site would continue with no changes.

5.4 Visual Resources

5.4.1 Alternative 1—Use Surface of Disposal Cell

To assess impacts to visual resources, LM used geographic-information-system software to map all areas within 10 miles of the disposal site from which the proposed project could be viewed. The software is based on elevation and topography and does not take into account the potential obstruction of views from cultural modifications (such as buildings and roads) and vegetation. Once this map was generated, LM overlaid the area's primary travel routes, subdivisions, and other cultural features onto it and then selected 17 key observation points (KOPs), from which potential views of the PV panels could be field-verified (Figure 7). Table 3 lists the KOP locations, lists the approximate distance from each KOP to the disposal site, and states whether the disposal site was visible from the KOP.

The field verification of KOP locations indicated that the top of the disposal cell, on which the 8-ft-tall PV panels would be constructed, would not be noticeable from known public areas, with the exception of CR 212 adjacent to the disposal site. For example, Figure 8 shows a view toward the disposal cell from KOP 17, the site of La Plata County's future fairgrounds. The disposal cell's riprapped side slope is barely visible in the center background, and the top of the disposal cell is not visible. Given the probable placement of the PV panels away from the disposal cell's edge (Figure 4), it is not likely that the 8-ft-tall PV panels would be visible from this location either.

Table 3. Descriptions of Key Observation Points and Results of Field Verification of Potential Views

KOP Description[a]	Straight-Line Distance from Disposal Site	Is the Disposal Site Target Visible from the KOP?
KOP 1: Wildcat Canyon Road (CR 141)	6.5 miles	No. View is too diverse and target too small to see, even with binoculars.
KOP 2: Wildcat Canyon Road (CR 141)	6.0 miles	No. View is too diverse and target too small to see, even with binoculars.
KOP 3: Subdivision south of Wildcat Canyon, from subdivision road	4.7 miles	No. Trees and homes block potential view.
KOP 4: Subdivision south of Wildcat Canyon, near driveway of home	4.8 miles	No. Trees block potential view.
KOP 5: Subdivision south of Wildcat Canyon, from back deck of home	4.6 miles	No. Trees block potential view.
KOP 6: Subdivision south of Wildcat Canyon, from subdivision road	4.2 miles	No. Trees block potential view.
KOP 7: On former alignment of CR 211 (now CR 210), southwest of disposal site	1.5 miles	No. View is too diverse and target too small to see, even with binoculars.
KOP 8: CR 212, directly adjacent to disposal site	0.1-0.2 mile	Yes. Target is to viewer's right when northbound on CR 212, and to viewer's left (and briefly at center) when southbound on CR 212.
KOP 9: CR 212, northwest of disposal site	0.6 mile	No. Trees block potential view.
KOP 10: CR 212, near top of Smelter Mountain	0.7 mile	Yes. Target is in background but not a focal point, as it is "overwhelmed" by diverse landforms, rugged skyline, and complex lines formed by multiple ridgelines.
KOP 11: Ewing Mesa, on road	2.0 miles	No. Not visible, even with binoculars.
KOP 12: Ewing Mesa, on road	2.2 miles	No. Not visible, even with binoculars.
KOP 13: CR 220, rural farmland southeast of Durango	3.8 miles	No. Top of disposal cell is not visible from KOP 13; however, the disposal cell's riprapped side slope is visible briefly (for about 1 second) when westbound on CR 220. The cell constitutes 0.01 percent of the viewer's entire viewshed and is unlikely to be noticed.
KOP 14: Rural road off CR 220, rural farmland southeast of Durango	4.2 miles	No. Trees block all potential views of target.
KOP 15: Dreamy Draw Road, rural farmland southeast of Durango	4.3 miles	No. Same as KOP 13, except viewer is northbound on Dreamy Draw Road.
KOP 16: Dreamy Draw Road, rural farmland southeast of Durango	4.4 miles	No. Trees block all potential views of target.
KOP 17: Gravel pit on top of mesa southeast of Durango, potential future site of La Plata County Multi-Event Center (fairgrounds)	3.0 miles	No. Top of disposal cell is not visible from KOP 17; however, a thin sliver of the disposal cell's riprapped side slope is visible. The cell constitutes 0.1 percent of the viewer's entire viewshed and is unlikely to be noticed.

[a] LM attempted to establish a KOP at Lake Nighthorse, but potential viewing areas were under water and not accessible.

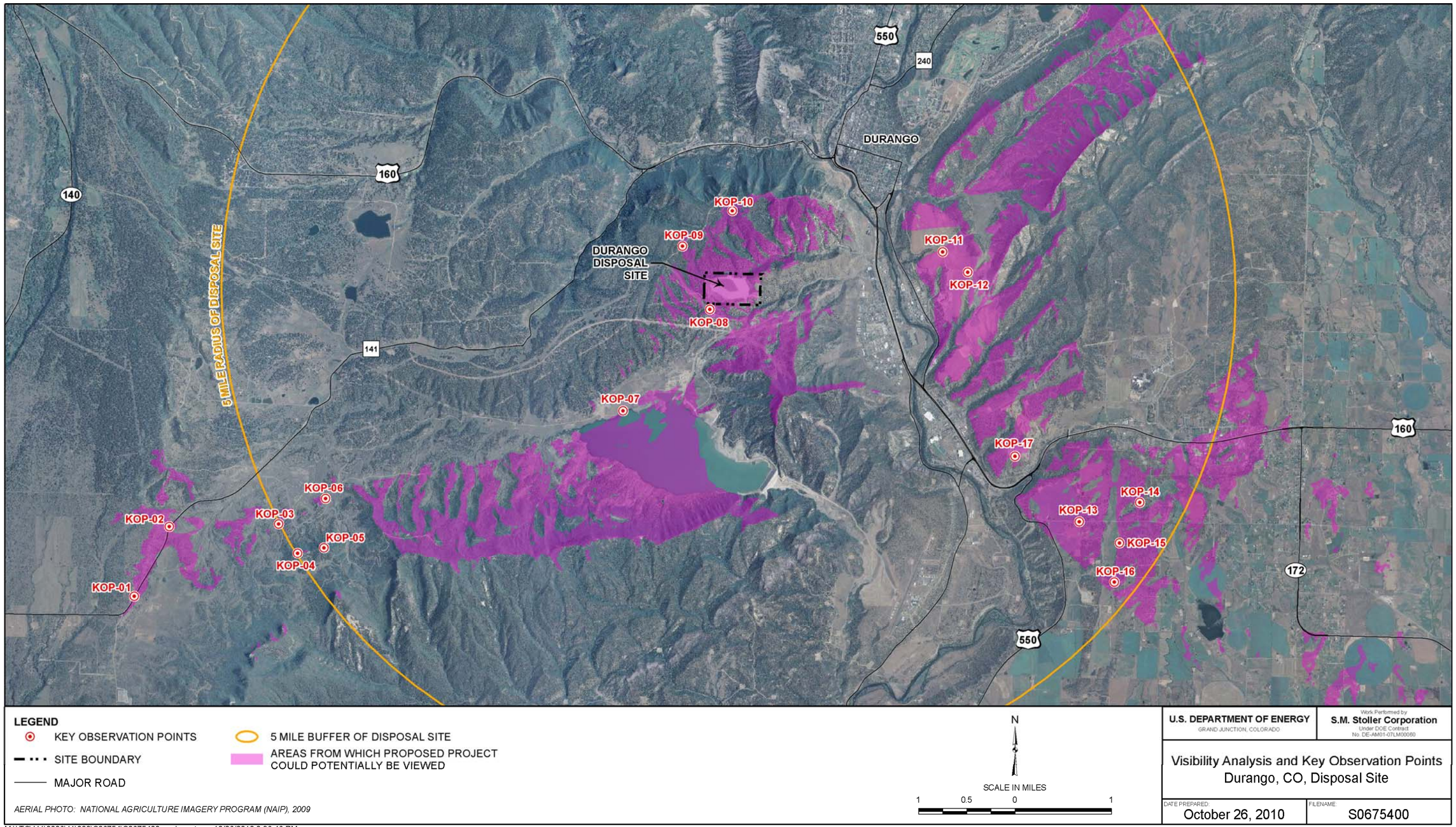

Figure 7. Location of Key Observation Points from Which Potential Views of PV Panels Were Field-Verified

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Figure 8. View to the Northwest from the Site of the La Plata County Future Fairgrounds (The rock side slopes of the disposal dell are visible as the tan area in the center background.)

LM visual resource specialists attempted to establish a KOP at Lake Nighthorse, but potential viewing areas were under water and not accessible. Given the variety of landscapes and nearby anthropogenic landscape alterations in the area of Lake Nighthorse, it is not likely that recreationists would notice PV panels in the distant background.

Figure 9 shows a simulation of a view that a southbound traveler on CR 212 might have of the PV panel array. The photo simulation represents a worst-case scenario, as the actual configuration would likely have rows of panels with spaces between them (for access) rather than one or two solid areas of panels. Additionally, the angle of view shown in Figure 9 would be visible only for a number of seconds as travelers on CR 212 drive by the site. The longest continuous view-time (about 1 minute) would be from viewpoints on CR 212 that would be level with or below the elevation of the disposal cell top, making the view less direct.

The geometrical shape and dark surface of the PV panel array would contrast sharply with the surrounding natural landscape and disposal cell feature itself. Overall, however, the riprapped side slopes of the disposal cell would likely be the more noticeable of the two human-made features, as the side slopes (1) encompass more area, (2) have a lighter, more contrasting color than the solar array, and (3) can be seen from a greater number of viewpoints than the proposed solar array on top of the disposal cell.

Figure 9. View East from CR 212 of the Disposal Cell Top with Simulated PV Panels

Concern has been raised about potential impacts to air travelers from glare reflecting off the PV panels. The proposed location of the PV panel array is approximately 5 air-miles northwest of the landing strip at the Durango-La Plata County Airport, and approximately 2 air-miles northwest of the restricted airspace surrounding the airport. Additionally, the proposed PV panel array is approximately 8 air-miles south-southwest of the Val-Air Glider Port, a privately owned airstrip used by the Durango Soaring Club. Potential glare from the panels would not directly affect aircraft during landing at or take-off from either airport. Flight paths at the Durango-La Plata County Airport would be in a northeast or southwest direction and not toward panel glare (AirNav, LLC 2010), and flight paths at the Val-Air Glider Port would not be near enough to the panel array to be affected by glare. Commercial aircraft flights above the Durango area would not be affected by reflected glare, as commercial pilots fly above 18,000 feet with instruments and would not be affected by glare emanating below them (glare from direct sunlight would be more of an issue). Conversely, reflected glare from PV panels could be seen by local aircraft pilots flying nearer to the ground. This impact would be temporary and could be mitigated, if necessary, by the pilot turning or dipping the aircraft away from the glare.

There would not be any change in impacts to this resource during the potential 25-year operation (including maintenance) and the restoration of the PV system. However, new residential development continues to occur throughout the county, and it is improbable, but possible, that a new subdivision may have a view of the disposal site. The disposal site is surrounded by land with state and federal protections that would preclude development close to the site. Any new development would likely be sufficiently far from the site that any view of the solar panels would be minimal within the total landscape view.

5.4.2 Alternative 2—Preferred Action: Maximize Use of Disposal Site

Visual resource impacts related to the installation, operation, and restoration of the surface of the disposal cell and adjacent use areas would be similar to those described in Section 5.4.1 with one exception: views of the solar panels in adjacent use areas would be more at eye level; hence, the solar panels would be more noticeable. The total viewing times for travelers on CR 212 would be approximately 1.5 minutes by northbound travelers and 1.6 minutes by southbound travelers.

5.4.3 No Action Alternative

No impacts to visual resources would occur under the No Action Alternative, as no physical changes would take place at the disposal cell site.

5.5 Wildlife

5.5.1 Alternative 1—Use of Surface of Disposal Cell

The general disturbance in the area from vehicles and workers during the solar panels' installation would likely result in temporary displacement of various common wildlife species to nearby areas. Birds are known to hunt the surface of the cell and may or may not return to the area. Disturbance to wildlife is a spatial consideration and not related to the specific area of disturbance. Noise and human presence may be sufficient to result in avoidance behavior within both the disposal site and adjacent areas of the SWA.

Big game that forage in the general area would likely move deeper into the adjacent SWA as a temporary or longer term avoidance behavior. Once all noise and activity cease, they would likely return to foraging areas in perimeter portions of the disposal site. Evidence of big game presence on the surface of the disposal cell has been noted during site inspections; it is unknown if they would return to graze the remaining vegetated portions on the disposal cell cover surface.

Although it is unlikely that nesting or breeding birds would occur on the disposal cell surface, they likely nest in nearby forested areas, including the SWA. Conducting activities during migratory bird nesting and breeding periods would need to be in accordance with the requirements of the MBTA. The MBTA requires avoidance of disturbing activities during designated breeding and nesting periods, which generally includes the March-through-July time period, if nesting or breeding birds are present. The wetland area surrounding the evaporation pond in the northeast corner of the disposal site may seasonally host nesting migratory birds, and the ferruginous hawk is a known visitor to the area. Although various hawks can be observed as transient visitors over the disposal site, the immediate disposal site area does not contain suitable habitat for nesting. Some hawks, however, are very sensitive to noise and may abandon nests as far away as 0.5 miles from the source of the noise.

If an overhead electrical line is required, CDOW would require a raptor-proof system to be installed.

During the operation (including maintenance) of the solar array, it is likely that former resident or transient wildlife would return to use the general disposal site area. Some small species may find nesting under the panels attractive as a shield from weather elements or for use as cover. It

is unlikely that any short-term maintenance actions (lasting a few hours to a day) would disturb birds or other wildlife in the area. If site security became an issue that required fencing, CDOW has requested that wildlife-exclusion fencing, or fencing that is wildlife-friendly, be installed

During the disposal site restoration activities, wildlife would leave the site similar to what occurred during the installation of the system, and considerations related to the MBTA would also apply.

5.5.2 Alternative 2—Preferred Action: Maximize Use of the Disposal Site

During the PV system's installation, impacts to resident or transient wildlife would be considered similar to those described in Section 5.5.1. The longer duration of the activities may cause less wildlife to return to the area once the arrays are in place, due to seasonal changes and the potential establishment of territory in a new or nearby area.

During the potential 25-year operation (including maintenance) of the solar arrays, area wildlife would adjust to the presence of the panels, and many species would likely return to the general disposal site area. The change in site conditions may benefit some species, as described in Section 5.5.1.

During restoration of the disposal site, wildlife would likely leave portions of the site due to noise and activity in the general area. Wildlife displacement is expected to be short-term for most species, similar to that described in Section 5.5.1. MBTA would also apply. However, the larger area disturbed and longer period of disturbance may cause fewer species to return to the disposal site.

5.5.3 No Action Alternative

Under this alternative, wildlife presence would continue as currently observed.

5.6 Vegetation

5.6.1 Alternative 1—Use Surface of Disposal Cell

During installation activities on the disposal cell, it is expected that some surface grass cover would be lost due to vehicles carrying supplies and workers, and due to the general activity on the disposal cell. In addition, there would be a loss of surface grass related to excavating shallow trenches that would convey the electrical line from the solar panels to an inverter. Although the amount of disturbed area would depend on the size and configuration of the PV system designed by the lessee, it is estimated that surface disturbance may affect 2 ac of the 18 ac disposal cell surface. After the PV system is installed, disturbed areas would be reseeded with an appropriate grass species. The lessee would not be allowed to grade the disposal cell surface, and it is expected that the grass cover under the solar panels would not be disturbed during installation activities.

The proposed work would not affect native shrub lands and forests present in other areas on the site.

During the operation of the PV system, changes in vegetation may occur over approximately 9 ac of soils. Changes may include increased vegetative cover in some areas, decreased cover in other areas, and changes in plant species composition. Shading and soil moisture retention may increase under the solar panels although total precipitation reaching the ground may decrease. These effects would be greater under the edge of the panels nearest the ground. In between the panels, runoff may increase, and some plants may be crushed by occasional maintenance-vehicle traffic. All of these changes could cause shifts in plant community composition because ambient species more adapted to the changed conditions may gradually outcompete the existing dominant plants. However, it is unlikely that large, unvegetated areas would develop, and net vegetative cover would likely increase or remain the same. Under a worst-case scenario, loss of vegetation over approximately 3 of the 9 affected acres may be expected. Gravels in the soil surface, the relatively flat slope, and the surrounding well-established vegetation would protect against potential erosion; if erosion should occur, the lessee would be required to install additional protections.

An indirect impact may occur as a result of installation activities and miscellaneous site visits during the facility's operation. The unintentional importation of weeds that could hitchhike on vehicle tires and shoes may increase weed management by LM. LM has a weed management protocol that is followed to prevent the establishment of noxious weeds.

During reclamation, after the removal of all PV system components, disturbed areas would be tilled to improve soil texture and then revegetated with an appropriate seed mix that would consist of species native to the region.

5.6.2 Alternative 2—Preferred Action: Maximize Use of Disposal Cell

During installation activities, impacts related to use of the disposal cell surface would be the same as described in Section 5.6.1. In addition, for areas adjacent to the disposal cell that are disturbed, the existing sparse vegetation would likely be lost since these areas may need grading to achieve required slopes. It could be expected that up to 5.5 ac (3.5 ac in adjacent areas and 2 ac on the surface of the disposal cell) would be disturbed during installation actions. Surface disturbed areas adjacent to the panels would be seeded to prevent erosion if necessary.

During the operation of the solar arrays, impacts to all areas would be similar to those described in Section 5.6.1. Vegetation would be expected to establish under the solar panels in graded areas over time. Up to 0.5 ac of soils under the panels in graded areas (off of the disposal cell) may not reestablish.

Impacts related to reclamation activities would be similar to those presented in Section 5.6.1.

5.6.3 No Action Alternative

There would be no change to the existing situation under this alternative.

5.7 Cultural Resources

5.7.1 Alternative 1—Use Surface of the Disposal Cell

The project area encompasses two cultural sites eligible for inclusion in the National Register of Historic Places. One of the cultural sites would not be affected, as it is located at a significant distance from proposed activities. The other cultural site could be affected, as it is located near the transmission line that crosses the site. However, LM would require the lessee to entirely avoid this site, which could be easily accomplished and would be stated in the lease. The Colorado State Historic Preservation Office concurred in this approach in July 2010.

During the operation of the PV system, there would be no impacts to the cultural resources in the area.

When the system is being dismantled and reclaimed, the lessee would be required to avoid the known cultural resource site, as described above.

5.7.2 Alternative 2—Preferred Action: Maximize Use of Disposal Site

All impacts related to the installation, operation, and site reclamation would be the same as those described in Section 5.7.1.

5.7.3 No Action Alternative

Under the No Action Alternative, neither of the two eligible cultural sites would be affected, as no land-disturbing activity would take place.

5.8 Recreation and Lake Nighthorse

5.8.1 Alternative 1—Use Surface of Disposal Cell

Installation activities that would occur on the disposal site would not impact the Lake Nighthorse water supply reservoir, unless there is a delay in awarding a lease. The State of Colorado does not have funding to develop the reservoir as a state park in the coming year, which implies completion of a management plan.

During the potential 25-year operation phase, recreational facilities related to Lake Nighthorse are expected to be fully operational. The presence of a PV system on the disposal site would not impact recreational use in the area. Recreational users would not likely experience a degradation of views related to the presence of the solar array, given the variety of landscapes and nearby anthropogenic landscape alterations in the area of Lake Nighthorse (see Section 5.4). However, as discussed in Section 5.9, it is expected that travel on CR 210 to access Lake Nighthorse and associated recreational facilities would result in increased casual vehicle travel on CR 212. As a result of this increased use, there may be an increase in acts of vandalism related to littering or shooting disposal-site perimeter signs or even shooting the PV system components.

Actions taken during the reclamation of the disposal site would not impact recreational users of Lake Nighthorse or its associated facilities.

5.8.2 Alternative 2—Preferred Action: Maximize Use of Disposal Site

During the installation, operation, and reclamation of the site, all impacts would be the same as described in Section 5.8.1.

5.8.3 No Action Alternative

With the completion of Lake Nighthorse and associated recreation facilities, it is assumed that, due to the greater presence of people in the area, vandals would be more likely to breach site security and damage site features.

5.9 Transportation

5.9.1 Alternative 1—Use Surface of Disposal Cell

Installation of a PV system would likely begin in 2011 or 2012. At that time, the recreational facilities at the lake would not be developed. The small amount of vehicle traffic associated with installing solar panels and the expected short duration (1 month) of the installation process would not impact vehicle use of CR 210. Worker and supply trips may result in an additional 30 vehicles per day on CR 210 and CR 212. If necessary for public safety, temporary traffic control (such as signage) at the frontage road turnoff onto CR 210 and at the intersection of CR 210 and CR 212 would be considered.

During the operation of the PV system, it is expected that established recreational use of Lake Nighthorse, in combination with residential traffic, would result in daily traffic volumes of up to 1,500 vehicles on CR 210 (Chiarito 2010). During operation of the PV system, one to two trips a month might be made to inspect the site or perform maintenance actions; these trips would not impact users of CR 210.

The amount of vehicle traffic associated with removing the PV system and reclamation of disturbed areas would be similar to that described above for the installation phase. If necessary for public health and safety during these activities, temporary traffic control measures may be needed at the intersection of CR 210 and the frontage road and at the intersection of CR 210 with CR 212 (Chiarito 2010).

5.9.2 Alternative 2—Preferred Action: Maximize Use of Disposal Site

Traffic impacts related to the installation of the solar array system would not likely affect existing uses of CR 210 and CR 212. Worker and supply trips may result in an additional 30 vehicles per day on CR 210 and CR 212 over a 4-month period. However, if necessary for public safety, temporary traffic control at the intersection of the frontage road and CR 210 and the intersection of CR 210 and CR 212 would be considered.

Similarly to Alternative 1, discussed in Section 5.9.1, no impacts to area roads would be associated with the operation phase.

During the reclamation phase, impacts would be similar to those described in Section 5.9.1.

5.9.3 No Action

As described in Section 4.4.6, it is expected that the future recreational developments at Lake Nighthorse and use of CR 210 by residents from subdivisions to the west would significantly increase vehicle traffic on CR 210. Currently, the use of CR 210 is extremely light, but traffic is expected to increase to 1,500 vehicles per day. The increase in traffic would not impact the disposal site, but the increase in people in the area may result is more casual use of CR 212.

5.10 Cumulative Impacts

CEQ regulations for implementing NEPA define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). CEQ Guidance states: "It is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful."

Land controlled by CDOW and BOR surrounds the disposal site. CDOW has no specific plans related to future wildlife improvements near the Durango disposal site. Their preference is to maintain and improve the area for wildlife habitat.

BOR was contacted for information related to their future plans; Section 4.4.6 describes the BOR plans. Adding solar panels to the disposal site would not affect the eventual recreational development at Lake Nighthorse; in fact, BOR has an interest in potentially tying into the system to provide power for their proposed campgrounds. However, the development of recreational opportunities related to Lake Nighthorse would increase vehicle traffic on CR 210 and human presence in the area. These increases could make vandalism on the disposal site more likely, regardless of the presence of a PV system.

Many people in residential developments, planned or existing, west of the disposal site would use the newly aligned CR 210 to travel from subdivisions west of Wildcat Canyon past CR 212 en route to U.S. Highway 160/550. The increased travel in the general area and potential for side travel on CR 212 could result in increased vandalism to disposal site features.

Potential site security issues related to increased travel on CR 210 and CR 212 may require LM, in conjunction with a lessee, to evaluate whether site security is sufficient.

A potential positive cumulative impact related to the general requirement to develop renewable sources of energy. Development of PV power on the Durango disposal site would, in combination with other renewable energy projects, benefit local utilities.

The installation, operation, maintenance, and reclamation of the proposed PV system is expected to have negligible impacts on the use or enjoyment of the environment. Furthermore, a PV system, in concert with other potential changes related to recreational developments associated with Lake Nighthorse or general growth in the area, would not decrease opportunities to develop other projects or harm environmental quality.

5.11 Comparison of Impacts

Very few impacts were identified during the analysis of the alternatives, and those impacts were considered minor. Table 4 summarizes all expected impacts.

Table 4. Summary of Potential Environmental Impacts

Resource	Alternative 1: Use Surface of Disposal Cell	Alternative 2 (Preferred Action): Maximize Use of Disposal Site	No Action
Support Renewable Energy Initiatives:	Benefit to LM and to the nation in support of renewable energy initiatives.	Benefit to LM and to the nation in support of renewable energy initiatives.	No change.
Goal 4 of the LM Strategic Plan: Optimize the use of land and assets**.**	Provides some support of the LM reuse goal	Supports the LM reuse goal to extent possible at this time.	Does not support the LM reuse goal.
Cell Performance All phases	No impacts.	No impacts.	No change.
Greenhouse Gas Installation	Minor increase in greenhouse gas related to vehicle emissions from travel related to the PV system on the disposal site.	Minor increase in greenhouse gas related to vehicle emissions from travel related to the PV system on disposal site.	No change.
Operation and Maintenance	Minor beneficial effect on greenhouse gas emissions related to providing a renewable energy source. Negligible greenhouse gas associated with travel from Grand Junction to Durango for inspections.	Minor beneficial effect on greenhouse gas emissions related to providing a renewable energy source. Negligible greenhouse gas associated with travel from Grand Junction to Durango for inspections.	No change.
Reclamation	Minor increase in greenhouse gas related to vehicle emissions from travel related to the PV system on the disposal site.	Minor increase in greenhouse gas related to vehicle emissions from travel related to the PV system on the disposal site.	No change.
Visual Resources All phases	Primary view would be from CR 212 and would last about 1 minute. Best views would be below eye level.	Views would be more at eye level and more noticeable. The total viewing times from CR 212 would be approximately 1.5 minutes for northbound travelers and 1.6 minutes for southbound travelers.	No change.
Wildlife Installation	Temporary to permanent displacement of resident and transient wildlife related to area noise and human presence.	Temporary to permanent displacement of resident and transient wildlife related to area noise and human presence.	No change.
Operation	Potential benefit to wildlife that may use the solar panels for cover.	Potential benefit to wildlife that may use the solar panels for cover.	No change.
Reclamation	Temporary to permanent displacement of resident and transient wildlife related to area noise and human presence.	Temporary to permanent displacement of resident and transient wildlife related to area noise and human presence.	No change.

Table 4 (continued). Summary of Potential Environmental Impacts

Resource	Alternative 1: Use Surface of Disposal Cell	Alternative 2 (Preferred Action): Maximize Use of Disposal Site	No Action
Vegetation Installation	Potential surface disturbance of 2 ac.	Potential surface disturbance of 2 ac on the disposal cell and 3.5 ac in adjacent areas.	No change.
	Potential introduction of weeds that would require management.	Potential introduction of weeds that would require management.	No change.
Operation	Up to 9 ac of vegetation may be positively or negatively impacted by the presence of solar panels. Of these 9 ac, up to 3 ac may lose surface vegetation.	Up to 12.5 ac of vegetation may be positively or negatively impacted by the presence of solar panels: 9 ac on the disposal cell cover and 3.5 ac in nearby areas. Of these 12.5 ac, up to 3.5 ac may lose surface vegetation.	No change.
	Potential introduction of weeds that would require management.	Potential introduction of weeds that would require management.	No change.
Reclamation	Benefit related to removing the PV system and establishing preexisting conditions.	Benefit related to removing the PV system and establishing preexisting conditions.	No change.
Cultural Resources All phases	No impact.	No impact.	No change.
Recreation and Lake Nighthorse All phases	No impact.	No impact.	No change.
Transportation Installation	Potential for traffic congestion at the turnoff from the frontage road to CR 210 and at the turnoff from CR 210 to CR 212. Temporary traffic control measures may be required.	Potential for traffic congestion at the turnoff from the frontage road to CR 210 and at the turnoff from CR 210 to CR 212. Temporary traffic control measures may be required.	No change.
Operation	No impact.	No impact.	Traffic volumes on CR 210 are expected to increase.
Reclamation	Potential for congestion at the turnoff from the frontage road to CR 210 and at the turnoff from CR 210 to CR 212. Temporary traffic control measures may be required.	Potential for congestion at the turnoff to from the frontage road to CR 210 and at the turnoff from CR 210 to CR 212. Temporary traffic control measures may be required.	Traffic volumes on CR 210 are expected to increase.

6.0 Persons or Agencies Consulted

During the preparation of the draft EA, LM invited NRC, CDPHE, the Colorado Governor's Office, CDOW, the La Plata County Commissioners, the Ute Mountain Ute Tribe, and the Southern Ute Tribe to be cooperating agencies, based on the agencies' respective areas of expertise, jurisdictional responsibilities, or potential interest in the project. In addition, during the preparation of this EA, various subject matter experts were contacted, and the staff of the S.M. Stoller Corporation, a contractor to LM, also participated in providing sections or reviews. The following individuals were contacted as a part of the consultation process or were contacted to provide subject matter expertise.

Agency or Company	Title
La Plata County Board of Commissioners (Durango, Colorado)	La Plata County Commissioners La Plata County Manager La Plata County Attorney
La Plata County Planning Department (Durango, Colorado)	Planners
U.S. Nuclear Regulatory Commission (Washington, DC)	Branch Chief Special Projects Branch
Colorado Division of Wildlife (Durango, Colorado)	Wildlife Biologists
Colorado Department of Public Health and Environment (Denver, Colorado)	Professional Engineer Uranium Mill Tailings Remedial Action Program Manager
Governor's Energy Office (Denver, Colorado)	Director
Ute Mountain Ute Tribe (Towaoc, Colorado)	Chairman Native American Graves Protection and Repatriation Act Representative
Southern Ute Indian Tribe (Ignacio, Colorado)	Chairman Native American Graves Protection and Repatriation Act Representative
Southern Ute Indian Tribe Environmental Programs Division (Ignacio, Colorado)	Representative
Southern Ute Alternative Energy LLC (Ignacio, Colorado)	Representatives
Southern Ute Growth Fund - Safety & Environmental Compliance Management Group (Ignacio, Colorado)	Representative

Agency or Company	Title
Pueblo of Picuris (Penasco, New Mexico)	Native American Graves Protection and Repatriation Act Representative
Ohkay Owingeh (Pueblo of San Juan) (San Juan, New Mexico)	Native American Graves Protection and Repatriation Act Representative
State Historic Preservation Office, Colorado History Museum (Denver, Colorado)	State Historic Preservation Officer
Tri-State Generation and Transmission Association (Westminster, Colorado)	Utility Engineer
La Plata Electric Association (Durango, Colorado)	Energy Management Advisor Director of Corporate Service and Planning
U.S. Bureau of Reclamation (Durango, Colorado)	Land and Recreation Management Team Leader
DHM Design (Durango, Colorado)	Principal
Battelle Memorial Institute (Buena Vista, Colorado)	National Environmental Policy Act Expert

7.0 Abbreviations

ac	acre(s)
ac	alternating current
BOR	U.S. Bureau of Reclamation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CR	County Road
dc	direct current
DOE	U.S. Department of Energy
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FONSI	Finding of No Significant Impact
ft	foot (or feet)
in	inch(es)
KOP	key observation point
KW	kilowatt(s)
LM	Office of Legacy Management
LPEA	La Plata Electric Association
LTSP	Long-Term Surveillance Plan
MBTA	Migratory Bird Treaty Act
MW	megawatt(s)
NEPA	National Environmental Policy Act
NRC	U.S. Nuclear Regulatory Commission
$pCi/m^2/sec$	picocurie(s) per meter squared per second
PV	photovoltaic
SWA	State Wildlife Area
UMTRCA	Uranium Mill Tailings Radiation Control Act
USFWS	U.S. Fish and Wildlife Service

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8.0 References

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10 CFR 851. U.S. Department of Energy, "Worker Safety and Health Program," *Code of Federal Regulations*, January 1, 2010.

10 CFR 1021. U.S. Department of Energy, "National Environmental Policy Act Implementing Procedures," *Code of Federal Regulations*, January 1, 2010.

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