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Figure 3.2b - Claims Activities, Crescent Valley Study Area

Legend
- Cities/Towns
- Proposed Rail Route
- Railroads
- Highways/Roads
- Metal Exploration Activity
- Mines
- Crescent Valley Study Area
- Township Range
- Mining Districts
- Lander County

Data Sources
Proposed Rail Route: Established by the U.S. Department of Energy, Yucca Mountain Project
Claims Activity: Nevada State BLM, Claims Data R 2000, Sept. 2004
Mining Data: Major Mines of Nevada, Nevada Bureau of Mines and Geological Special Publication P-14
Land Ownership: USDOI BLM/Nevada State Office-Mapping Sciences

Township and Range: Public Lands Survey System (PLSS) USDOI BLM/Nevada State Office-Mapping Sciences

Table of Claims Density:
- Lode Claims
- Mill Site Claims
- placer Claims
- Density
- 1 - 25
- 26 - 50
- 51 - 75
- 76 - 100

Nevada State Office-Mapping Sciences
Figure 3.3b - Crescent Valley Study Area, Mineral Resources-Locatable

Data Sources:
- Digital Elevation Model: U.S. Geological Survey, various dates
- Proposed Rail Route: Established by the U.S. Department of Energy, Yucca Mountain Project
- Mining Data: Major Mines of Nevada, Nevada Bureau of Mines and Geology Special Publication P-14
- Land Ownership: USGS
- Nevada State Office-Mapping Services

Township and Range: Public Land Survey System (PLSS) USGS-BLM-Nevada State Office-Mapping Services
All Other Data: U.S. Census Bureau, 2000
Figure 3.4 - Cortez Area Including Cortez/Pipeline Mines

Data Sources
- Proposed Rail Route: Established by the U.S. Department of Energy, Yucca Mountain Project
- Mining Data: Major Mines of Nevada, Nevada Bureau of Mines and Geology Special Publication P-14
- All Other Data: U.S. Census Bureau, 2000

Legend
- Cities/Towns
- Proposed Rail Route
- Railroads
- Mines
- Metal Exploration Activity
- Mining Districts
- Counties

Map created by: Gannon, Inc.
Figure 3.5 - Mineral Materials-Salable
(includes sand, stone, crushed rock, and gravel) (BLM, personal communication, October 2004)

Data Sources:
- Proposed Rail Route: Established by the U.S. Department of Energy, Yucca Mountain Project
- Mining Data: Major Mines of Nevada, Nevada Bureau of Mines and Geology Special Publication P-14
- Township and Range: Public Lands Survey System USGS, BLM, Nevada State Office Mapping Sciences
- All Other Data: U.S. Census Bureau, 2000
The following legends were obtained from the NEVADA GEOTHERMAL RESOURCES map (m141).
By Lisa Severn and Larry J. Gansle, 2003.

**POWER PLANTS**
(Year of initial operation and January 2003 gross capacity)
1. Beattyway (1986, 16.6 MW)
2. Dine Valley (1988, 42 MW)

**Other Features**
- Hot well (>97°C)
- Warm well (70-97°C)
- Hot spring (>97°C)
- Warm spring (70-97°C)
- Fumarole
- Permitted Wells
- Hot Heat Flow Wells (>100 GJ/km)
- Warm Heat Flow Wells (>100 GJ/km)
- Transmission line (55 kV/115 kV)
- Transmission line, High Voltage DC
- Geographic cluster of thermal springs and wells

**Figure 3.6 - Geothermal Activity, Crescent Valley Study Area**

*Data Sources*
Proposed Rail Route: Established by the U.S. Department of Energy, Yucca Mountain Project.
Figure 3.8 - Oil and Gas Leases, Rail Corridor Study Area

Data Sources:
- Proposed Rail Route: Established by the U.S. Department of Energy, Yucca Mountain Project
- Pending Oil and Gas Leases: Nevada State BLM, Clarksburg District, U.S. Bureau of Land Management, Washington, D.C.
- Land Ownership: NWI120 Bi-County Nevada State Office-Mapping Sciences
- Township and Range: Public Land Survey System (PLSS) 1/2006-BLM, Nevada State Office-Mapping Sciences
- All Other Data: U.S. Census Bureau, 2000

Legend:
- Cities/Towns
- Proposed Rail Route
- Railroads
- Highways/Roads
- Oil and Gas Resources
- Pending Oil and Gas Claims
- DOE Rail Corridor Study Area
- Township Grid
- Mining Districts
- Counties
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Forest Service
- Private

Map credit: 2011 Francois-Dick, Data 7.

Note: This map is preliminary and subject to change.

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4.0 MINERAL IMPACT ASSESSMENT

Lander County is considered relatively prospective for many mineral resources. Even with the current focus on gold and silver mineral development, the area remains prospective for the development of many other different types of mineral resources, including other metals, barite, industrial minerals, stone, and geothermal.

Exploration and development activity is increasing in the Crescent Valley area and in the mining districts in the surrounding mountains – for gold, silver, barite and geothermal resources. The region is also host to a high concentration of historic quarries – areas that may prove to be prospective for decorative and dimension stone resources as better transportation options become available.

The proposed DOE Yucca Mountain rail line if constructed in the county would create both conflicts and opportunities – both negative and potentially positive impacts to mineral resource development. In the Crescent Valley area, the impacts to mineral development are more acute. Mineral development activities are escalating, and impacts will result in this area.

The December 2003 report summarized conflicts and opportunities related to mineral resource development, including:

Potential Adverse Impacts (Conflicts)
- Safety concerns – new and increased traffic and cargo shipments
- Possible interruptions to transportation of supplies to the mines and facilities
- Transportation conflicts and concerns regarding ore haulage from mine areas to facilities
- Possibility of impacting/interfering with mineral development – metals, geothermal and oil and gas resources, industrial minerals and construction materials
- Potential geo-technical concerns near existing mine sites – subsidence related to dewatering and transportation-related engineering considerations, to name a few

Potential Positive Impacts (Opportunities)
- Possible transportation of supplies to mines, power plants and communities
- Possible transportation of gold-silver ores from existing mine sites to other facilities for specialty processing
- Possible transportation of mineral materials, industrial mineral resources and decorative-dimension stone to other markets

This current study focuses on impact identification in the Crescent Valley area, while illustrating suggested solutions and follow up. The impacts and opportunities identified during this Crescent Valley review are little different from those identified above. Increasing mineral development activities are illustrating potential higher frequencies of impacts and opportunities, and these are generally summarized below.
4.1 Impacts Identified
There are conflicts (impacts) currently identified in the Crescent Valley area. Some of the most obvious impacts are related to mineral resource development, mainly related to the Cortez Joint Venture Mine, and lands to the south into the proposed rail corridor as it bisects the area around the Pipeline Mine south into the Cortez Hills. Table 4.1 summarizes a diverse, preliminary range of impacts currently identified.

Table 4.1 Impact Identification

<table>
<thead>
<tr>
<th>Direct Impacts Currently Identified</th>
<th>Area of Impacts</th>
<th>Solution and Suggested Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral resource development – gold and silver</td>
<td>Cortez Joint Venture operations, south to the Pipeline Mine into the proposed rail corridor.</td>
<td>Condemnation drilling, geophysical surveys, other geologic interpretation work to identify important mineralizing trends.</td>
</tr>
<tr>
<td>Mineral resource development – geothermal</td>
<td>Cortez Joint Venture operations, south to the Pipeline Mine into the proposed rail corridor.</td>
<td>Help DOE and rail contractors be aware of geothermal potential in the area of the mine – safety-related issues.</td>
</tr>
<tr>
<td>Mineral resource development – mineral materials</td>
<td>Crescent Valley Area; in the area of the Cortez Gravel Mine</td>
<td>Work with DOE to identify best alignment to not interrupt development of this resource. May be a source for DOE, considering mine’s needs first. Alignment may bisect other resource areas not currently identified.</td>
</tr>
<tr>
<td>Transportation of gold, silver ores</td>
<td>Cortez Joint Venture, Pipeline Mine to Cortez Hills areas.</td>
<td>Address scheduling impacts, engineering requirements for haulage crossings, and safety concerns related to transportation of ore from the Pipeline Mine to the Old Cortez Mill; from the new Cortez Hills-Pediment area to the Pipeline (Cortez Joint Venture) Mine.</td>
</tr>
<tr>
<td>General access issues</td>
<td>Crescent Valley Area – community, mines and exploration projects.</td>
<td>Mining, exploration companies, and community access needs. Address construction schedule, engineered crossings, transportation schedule and safety issues related to access across the corridor.</td>
</tr>
<tr>
<td>Geotechnical considerations</td>
<td>Crescent Valley area, especially near the Cortez Joint Venture Mine</td>
<td>Subsidence related to de-watering efforts related to the Cortez Joint Venture Mine. Share information with DOE and contractors to help identify problem areas, and develop plan to best mitigate.</td>
</tr>
</tbody>
</table>

Input from a broad cross-section of community leaders, ranchers, business owners, mine personnel, and other interested community leaders helped to identify these impacts, while outlining some possible solutions. The personnel at the Cortez Joint Venture Mine indicated that the best possible opportunities for workable solutions is for DOE, the
mineral development companies in the area, and the community to all work together to prioritize schedules and protocols, address safety considerations, access issues, and engineering designs. As well, there is a need for DOE and their contractors to work with Cortez Joint Venture to design a program and schedule to address potential impacts. Condemnation drilling, geophysical surveys and other exploration tactics will need to be completed in partnership to address mineralization trends, geotechnical concerns, and engineering needs addressing transportation issues.

4.2 Opportunities Identified
This recent Crescent Valley study focused mainly on identifying impacts to mineral resource development. There are opportunities as well, and there is an opportunity to advance some of these in partnership with the rail corridor, DOE, and the transportation contractor. These are identified in Table 4.2.

<table>
<thead>
<tr>
<th>Possible Opportunities</th>
<th>Area of Impacts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation of materials</td>
<td>Crescent Valley area, specific mines, the community in general</td>
<td>Supplies to mines, power plants and communities.</td>
</tr>
<tr>
<td>Transportation of materials</td>
<td>Specific mines in Crescent Valley</td>
<td>Shipping gold-silver ores from existing mine sites to other facilities for specialty processing.</td>
</tr>
<tr>
<td>Transportation of materials</td>
<td>Crescent Valley and the region</td>
<td>Transportation of other mineral resources such as mineral materials (sand and gravel), industrial mineral resources and decorative-dimension stone to other markets.</td>
</tr>
</tbody>
</table>
5.0 SUMMARY AND CONCLUSIONS

The Department of Energy (DOE), Yucca Mountain Project, has proposed several rail corridors through Nevada, to facilitate the movement of high-level radioactive waste and spent nuclear fuel from the currently defined seventy-seven civilian and defense sites. The Carlin-Yucca Mountain route has been identified as a secondary preferred rail alignment, to the Yucca Mountain Project. This route travels north-south through Lander County, through mineral-rich areas of a broad spectrum of mineral resources.

This summary report focuses on mineral impact assessments in the Crescent Valley area where it is believed most of the potential conflicts may occur with the proposed rail corridor. It also serves as an update to the December 2003 report. The Crescent Valley area is particularly rich in mineral resources, as is supported by expanding mineral resource development in gold, silver, barite, geothermal, and construction materials. Potential impacts to mineral resource development are greatest in Crescent Valley, especially in the Cortez Joint Venture Mine area where the rail corridor bisects prospective mineralized areas, and passes closest to new discoveries and expanding resources.

Mine personnel, mineral development companies and community leaders welcome the opportunity to develop a relationship with DOE and their contractors to identify solutions for concerns raised around access, safety, and engineering and geotechnical considerations, as well as mineral development interruptions. According to mine personnel (August 2004), none of the conflicts currently identified are insurmountable, and solutions are likely to emerge easily in partnership with DOE and the various contractors who will work on the corridor. Advancing a partnership relationship with DOE and the railroad contractor may lead to the early identification of a broad range of solutions addressing both impacts (conflicts) and opportunities.
REFERENCES

Carpenter, A.S., 1994, Lander County Mineral Resource Inventory.
ETS Pacific, Inc., 1994, Lander County Rail Corridor Assessment – Preliminary Findings (not published data; provided as a courtesy for this report).
National Mining Association, Tables on mineral consumption and foreign reliance. www.nma.org
Appendix A

2001: Reserves and Resources on known mineral properties, Lander County. From The Nevada Mineral Industry 2001, Nevada Bureau of Mines and Geology Special Publication MI-2001. This data is culled to include those in the Crescent Valley Area mainly.
Appendix B

LR 2000 BLM data, September 2004
Compiled by Atanda Clinger, Nevada State BLM Office, Reno.

Summarizing the various mineral resources for which there are leases, plans of operation, and notices of intent (authorized and pending). For mineral resources, including: locatable; leasable – energy (oil and gas, and geothermal); leasable – non-energy; and mineral materials-salable mineral resources.

(There are no leases for leasable – non-energy mineral resources currently identified in Lander County.)