M/035/002

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State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Oil, Gas & Mining

MICHAEL R. STYLER
Executive Director
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Supervisor DRH

Inspection Report
Minerals Regulatory Program
July 21, 2005

Mine Name: Bingham Canyon Mine - North Tailings Impoundment - Barneys Canyon
Permit numbers: M/035/002 – M/035/009 – M/035/015
Operator Name: Kennecott Utah Copper – Kennecott Barneys Canyon Mining
Inspection Date: July 20, 2005
Time: 8:00 AM – 4:00 PM
Inspector(s): Doug Jensen, Paul Baker, Tom Munson, Beth Erickson, Mary Ann Wright, Mark Mesch, Joelle Burns, Daron Haddock
Other Participants: Vicky Peacey, Paula Doughty, Kelly Payne – KUC - Environmental
Alex Reynoso, Denise Powers, Doug Stauffer, Jason Nielson – KUC - North Impoundment
Ray Gottling – Kennecott Barneys Canyon Mining
Ed Park, Glen Lovendahl – KUC Operations – Bingham Canyon Mine
Mine Status: Active
Weather: Hot, Sunny

Elements of Inspection	Evaluated	Comment	Enforcement
1. Permits, Revisions, Transfer, Bonds	☐	☐	☐
2. Public Safety (shafts, adits, trash, signs, highwalls)	☐	☐	☐
3. Protection of Drainages / Erosion Control	☐	☐	☐
4. Deleterious Material	☐	☐	☐
5. Roads (maintenance, surfacing, dust control, safety)	☐	☐	☐
6. Concurrent Reclamation	☐	☐	☐
7. Backfilling/Grading (trenches, pits, roads, highwalls, shafts, drill holes)	☐	☐	☐
8. Water Impoundments	☐	☐	☐
9. Soils	☐	☐	☐
10. Revegetation	☒	☒	☐
11. Air Quality	☐	☐	☐
12. Other	☒	☒	☐

Purpose of Inspection:
This was the Division's annual inspection tour of Kennecott's operations.

Inspection Summary:

M/035/015 – North Impoundment
The tour began at the North Tailings Impoundment offices. Alex Reynoso and Doug Stauffer gave the staff an overview of the expansion work being done at the north impoundment and reclamation efforts at the south tailings impoundment.

The North Impoundment has been in operation since 1999, the operator is currently expanding the footprint of the impoundment to the final designed limits. At the time of our visit, KUC had contractors placing fingers of slag material which will serve as the drain base for the expanded acres. The slag material is being placed in fingers because KUC lacks sufficient quantities of slag to place a continuous blanket of material as they did for the drain base of the initial impoundment construction, but models indicate these fingers of slag will provide sufficient drainage. This new

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drain base was being tied into the drain base which was placed during the construction of the initial impoundment. Drainage from these areas will report to a toe ditch that is located on the outer edge of the impoundment. Effluents from the tailings are pumped back to the concentrator for use in the milling circuit.

The present operating area of the north impoundment is approximately 680 feet wide. The expansion will increase the width of the impoundment 500 feet. The expansion will allow the North Tailings Impoundment to operate until approximately 2030.

M/035/002 – Bingham Canyon Mine

The next area inspected was the south tailings impoundment area, which is located immediately south of the north impoundment. The south impoundment encompasses approximately 6000 acres. This area is presently in the final stages of reclamation. There have not been any tailings placed on this impoundment since 2002.

For reclamation purposes, the impoundment was divided into five areas. Attempts have been made to revegetate four of the five areas of this impoundment. Not all the areas have attained the release criteria, with areas or portions of areas, where the efforts failed for one reason or another.

The area designated No. 2 on the west end of the south impoundment has had reasonably good revegetation success. There is a lot of tall wheatgrass, but salt cedar is growing in some areas.

On the other areas we visited, most vegetation cover was from rye, barley, and weeds, but some areas had some perennial cover. We visited plots where the operator transplanted greasewood, salt grass, and foxtail barley. Many of these plants are doing reasonably well, and the salt grass was starting to spread (it is stoloniferous). None of these species is particularly desirable for wildlife or livestock forage, but they are all native perennials that are adapted to salty soils that may sometimes be inundated.

Area 5 has not dried out sufficiently to allow for vehicle traffic; therefore, nothing has been done to amend or revegetate this area. Once area 5 dries sufficiently reclamation will begin in this area. There were also several areas within the impoundment that will need to have additional work to attain release criteria.

Access roads around the impoundment will need to remain until the entire south impoundment has been reclaimed and has been released.

M/035/009 – Barneys Canyon Mine

After a great lunch, furnished by KUC, we traveled to an area of the Barneys Canyon Mine in order to inspect a washout area that was noted during our inspection last year.

This washout was the result of a heavy precipitation event that occurred right after this area was recontoured and before the vegetation became established. The size of this area affected has not increased in size since the initial event.

Kennecott has planted three species of conifers and a twinberry shrub in the two areas impacted by this washout. These plants were placed last fall, and it appears the conifers have survived well. The twinberry has not done quite as well. Species used were lodgepole pine on the north washout and white fir and blue spruce on the south. The area of the washout is presently stable and once the shrubs and trees become established it should no longer be an area of concern.

Overall the vegetation on the site looks very good and is progressing well.

M/035/002 – Bingham Canyon Mine

The next area we visited was a dump area below the mine access road that was regraded in 2004. This is a small area (~20 acres) in an area where the material not only had to be pushed down, but a portion of the material had to be pushed laterally because of location of the mine access road, which is located directly above this area. The slope was finished with some undulation and considering the work involved to attain the slope, it looked good. Kennecott should be applauded for spending the time necessary to make the slope look more natural. The slope had been ripped after the recontouring effort was completed. No revegetation effort has been made in this area due to the overall pH of the slope being ~3.2. Therefore, seeding of this area at this time would have a greater chance of failing than succeeding.

I suggested that the area be allowed to weather awhile before attempting to seed it. Allowing the final slope to weather for a period should result in the reduction of the sulphides in the material, which would result in a moderation of the pH.

The next area visited was a dump face located on the lower slopes of the northeast corner of the Code 51 dump. This area had also been regarded with some undulation and larger rocks strategically placed on the slope. The final slope had been ripped but not seeded and overall the finished grade looked good.

We then drove to an area below the Midas dump where we were shown areas where two areas of conifer had been planted. This is a flat area of a dump top where leach ponds used to be located during the time when KUC was applying acid to the dumps to recover copper. The area where these trees were planted had been reworked by Rich Borden several years ago and lime chips worked into the surface to help raise the pH. There is some vegetation growing on these sites in addition to the trees. I believe this area is called the Keystone/Code 31 area. The edge of the pit, under the "Giant Leap" expansion will come right to the west side of this area. During our visit, a shovel and several trucks were stripping material just below this area as a part of the pit expansion.

Ed Park showed us where the new pit edge would be in relation to where we were standing. I believe he indicated that the pit edge would move ~500 feet to the east. It was indicated that a portion of this oxidized material would be stockpiled and be used to cap the waste material that will be mined as a result of the pit expansion. This expansion will result in a fairly large amount of oxidized material being available for capping of some of the surrounding high pH dumps. A discussion will need to be arranged with KUC to negotiate this point, as many of the dumps in this area will not be recontoured or reseeded upon closure.

The next area visited was an area on the northeast corner of the Code 51 dump. This was a larger area where material had been pushed to ~3:1 slope which culminated onto a flat area on the top of another dump below.

Conclusions and Recommendations:

The operator should consider making efforts to control salt cedar on area No. 2 of the south tailings impoundment.

The Division has previously recommended that the operator reduce the amount of annual grain being planted on the south tailings impoundment or eliminate grain completely from the seed mix. So far, the best permanent revegetation has been in area No. 2 where grain was not planted. Grain is included in the seed mix primarily for dust control, but the Division once again recommends that the operator reduce the amount of grain being planted.

Inspector's Signature _____ **Date:** July 21, 2005

DJ:jb
cc: Kennecott Utah Copper, Operator
Attachment: Photos

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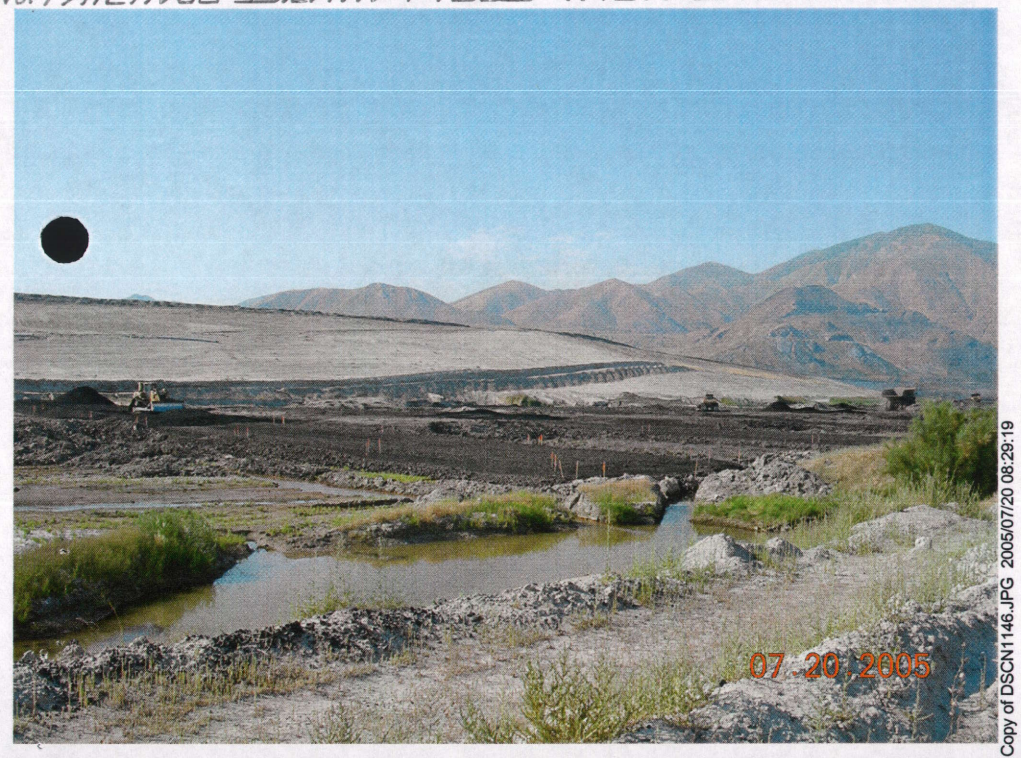
Copy of DSCN1149.JPG 2005/07/20 09:04:38

No. TAILINGS DRAIN FIELD INSTALLATION



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SOUTH TAILINGS REVEGETATION

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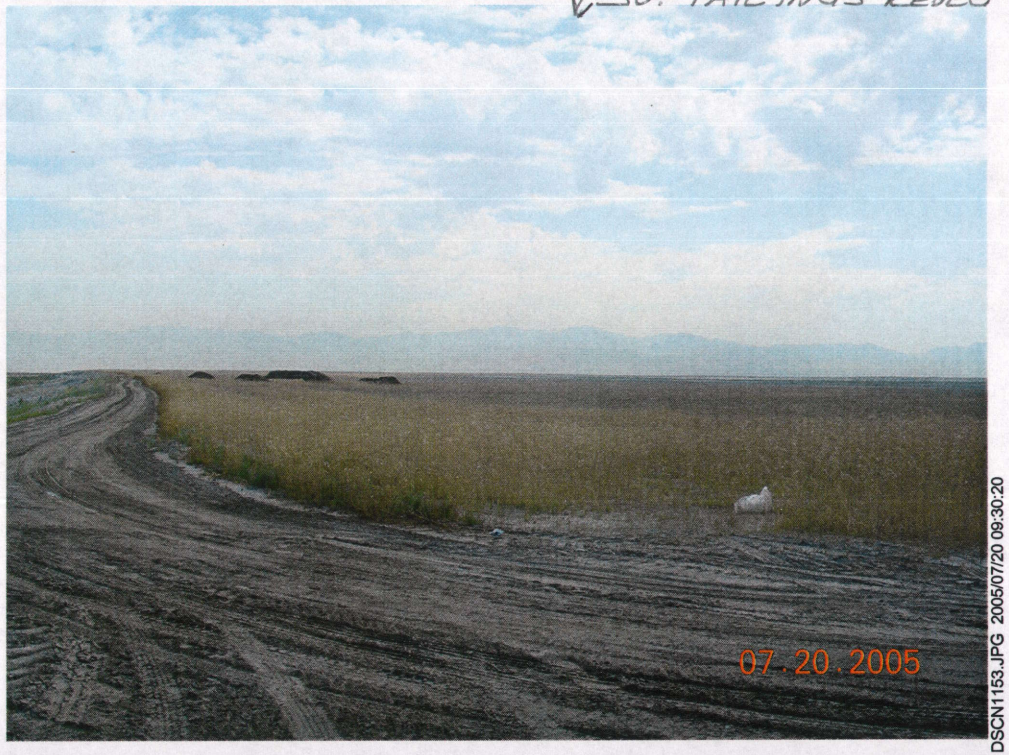
DSCN1157.JPG 2005/07/20 12:02:30

SOUTH TAILINGS REVEGETATION

DSCN1150.JPG 2005/07/20 09:17:14

BARNEYS CANYON REVEG ↑

↙ SO. TAILINGS REVEG



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DSCN1159.JPG 2005/07/20 12:13:25

BARNEYS CANYON REVEG

DSCN1162.JPG 2005/07/20 12:14:48

BARNEYS CANYON WASHOUT REPAIR

DSCN1158.JPG 2005/07/20 12:13:05

DSCN1160.JPG 2005/07/20 12:13:42

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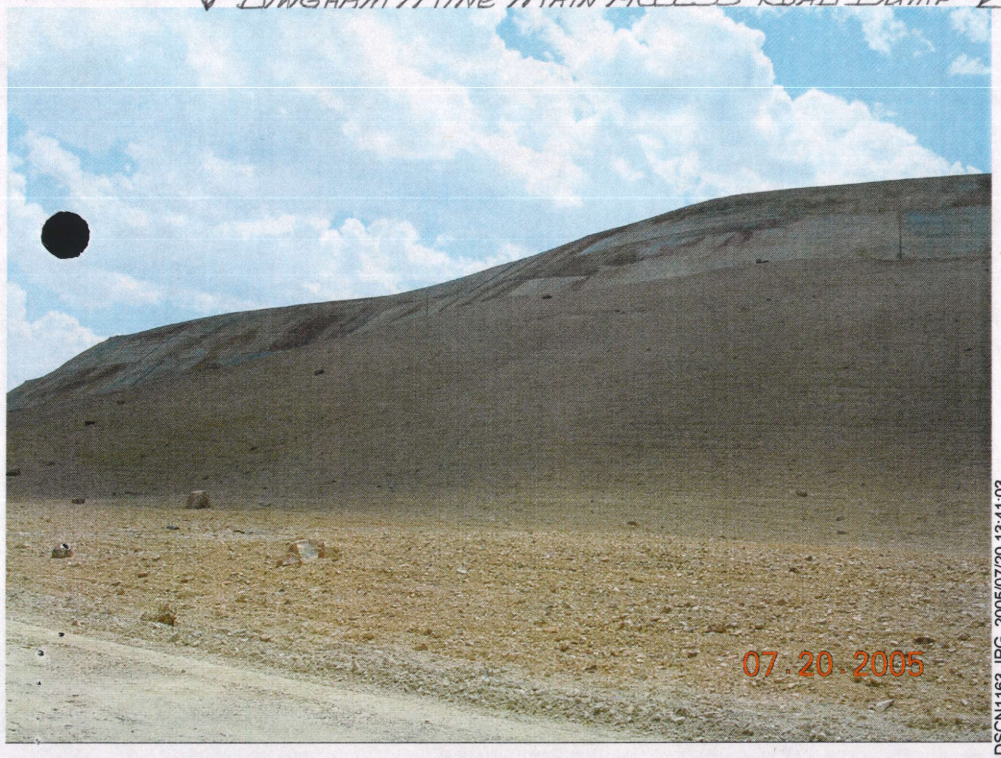
BARNEYS CANYON REVEG ↑
↓ BINGHAM MINE MAIN ACCESS ROAD DUMP RESLOPING



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