CHAPTER 3

ERRATA

This chapter contains specific modifications and corrections to text, figures, and tables in the Leeville Project DEIS. These corrections and modifications were made in response to comments received during the public comment period.

Page 1-2; 2nd column - Insert new **Reclamation Cost Estimate** subsection at the end of **AUTHORIZING ACTIONS.**

Reclamation Cost Estimate

Newmont has determined the cost of completing reclamation activities described under the Proposed Action including the agency preferred alternative to be $2.9 million. The reclamation cost estimate includes costs associated with reclamation activities including but not limited to monitoring; backfilling mine shafts; removal of surface support facilities; removal and reclamation of the dewatering pipeline system; regrading of waste rock disposal facility, haul roads, service roads, mine shaft and facility areas; placement of growth medium, seeding, and planting. Detailed description of the reclamation activities and the schedule for completing reclamation are contained in the revised Reclamation Plan located in *Newmont Proposed Plan of Operations for the Leeville Project, April 2002.*

Newmont has submitted the detailed reclamation cost estimate to BLM and NDEP for agency review. Agency review would be completed and the bond amount as determined by BLM and NDEP would be provided in the Record of Decision. In addition to the reclamation bond amount to be determined by the agencies, a financial instrument is being developed to address long-term groundwater and waste rock disposal site monitoring at the Leeville Project. See the Leeville Project Mitigation Plan. No surface disturbance would occur until the reclamation bond is posted.

Page 2-20; 2nd column, last paragraph of Waste Rock Disposal Facility section, is revised as follows:

A portion of waste rock resulting from development and operation of the Leeville Project underground mine would be Potentially Acid-Generating (PAG) waste rock. Due to the nature of underground mining, segregation of PAG waste rock is not usually possible because mining advance (in either ore or waste rock) in underground mines is less flexible in terms of scheduling removal of various waste rock types. It is necessary to mine whatever rock is present at an individual face of advance.

In cases where acid-base accounting (ABA) indicates the total mixture of waste rock is acid generating, Newmont would encapsulate PAG material within waste rock that has an ANP:AGP ratio of 3:1. The thickness of the encapsulating layers would be a minimum of 10-feet. Control measures for waste rock include: 1) placing PAG rock on a base constructed of compacted low permeability materials designed to minimize leaching to groundwater; 2) segregating and/or mixing PAG rock; 3) encapsulating PAG rock within acid-neutralizing rock (NNP greater than + 40); 4) sloping and wheel compacting lift surfaces; 5) controlling surface water to minimize infiltration; 6) encapsulating and capping PAG rock during reclamation; and 7) reclaiming the waste rock disposal facility.

Encapsulation is achieved by placing waste rock on a base constructed of compacted, low permeability materials, designed to prevent vertical migration of fluids. The base would consist of a 1-foot thick layer of neutral or acid neutralizing waste rock, subsoil, or borrowed subsoil compacted to achieve a hydraulic conductivity of $1X10^{-5}$ cm/sec. The base would be sloped to provide drainage. Precipitation falling within the base perimeter would report to the lowest elevation area on the low permeability base. Solution would then be captured in collection ditches constructed with a hydraulic conductivity of $1X10^{-6}$. Collection pond(s) for sampling and sediment control would be lined facilities suitable for collection of meteoric water that leaches through the waste rock. Pond bottoms would be constructed to achieve a hydraulic conductivity of $1X10^{-7}$ (engineering field tests would be performed to verify structures meet permeability specs). Acidic water is not expected from this facility as 88.6% of the waste rock generated by the Leeville Project is non-PAG. Newmont personnel would periodically inspect collection areas to determine conditions requiring removal and transport of excess water. Solution that has ponded would be sampled and analyzed quarterly for Maximum Contaminant Levels (MCLs). Water exceeding MCLs would not be allowed to hold in the collection pond for more than 20 days. After 20 days water would be trucked to Newmont's Mill 4 tailing facility located north of the Project site. Water that does not exceed MCLs would be allowed to evaporate.

Page 2-25; column 1, 1st paragraph, last sentence is revised as follows:

"Stormwater run-on and run-off diversions would be constructed to contain a 25-year, 24-hour storm event. Sediment control would use Best Management Practices (BMPs) as approved by NDEP."

Page 2-25; column 1, 1st full paragraph, lines 12 through 14, revised as follows:

"Interceptor ditches would be designed and constructed to accommodate a 25-year, 24-hour storm event."

Page 3-11 the Mine Rock Characterization section is revised as follows:

MINE ROCK CHARACTERIZATION

Three deeply buried gold bearing deposits occur in the Leeville Project area: 1) West Leeville; 2) Four Corners; and 3) Turf. Two distinct tectonic units, the upper plate and the lower plate, are present in the area of the deposit. These two units are separated by a thrust fault. All three ore deposits are located within the lower plate, but waste rock to be produced during mine development is located in both plates.

The upper plate is comprised of a single geologic formation known as the Vinini Formation (Ovi), consisting of siliceous mudstones, siltstones, cherts, silty limestones and their metamorphosed equivalents. The lower plate is comprised of three geologic formations: Rodeo Creek Formation (Drc), consisting of siliceous mudstones, siltstones and sandstones; Popovich Formation (Dp), a massive limestone; and Roberts Mountains (SDrm) Formation, consisting of silty limestone.

Three types of mine rock have been identified within the three deposits, based on carbon content and oxidation: 1) unoxidized carbonate rock, 2) carbon sulfide refractory rock, and 3) unoxidized intrusive rock. These classifications reflect metallurgical characteristics of the rock. As the intrusive is volumetrically a small portion of the deposit, characterization was focused on the first two rock types.

Overall, a total of ten classes of waste rock and three classes of ore have been characterized for Leeville, based on deposit, lithology, mineralogy (i.e., carbon and sulfide content), and thrust plate location (**Table 3-3**). The upper plate Turf Unoxidized Carbonate unit (TW1) would not be mined, however, and is therefore not considered further in this EIS. The three ore types and nine waste rock types to be extracted during the Leeville Project are characterized in this EIS.

TABLE 3-3
Mine Rock Classification and Sampling
Leeville Mine Project

Rock Type	Deposit	Domain	Formation	Carbon Classification	No. Samples
WLW1	West Leeville	Upper Plate	Ovi	UC	59
WLW2	West Leeville	Upper Plate	Ovi	CSR	113
WLW3	West Leeville	Lower Plate	SDrm, Dp	UC	119
WLO	West Leeville	Lower Plate	SDrm, Dp	UC	65
FCW1	Four Corners	Lower Plate	Drc, Dp, SDrm	CSR, UC, UI	131
FCO	Four Corners	Lower Plate	Dp, SDrm	CSR	48
TW1	Turf	Upper Plate	Ovi	UC	105
TW2	Turf	Upper/Lower Plate	Ovi/Drc	CSR	205
TW3	Turf	Lower Plate	Dp	UC	62
TW4	Turf	Lower Plate	SDrm HW	UC	36
TW5	Turf	Lower Plate	SDrm FW	UC	In TW4
TW6	Turf	Lower Plate	SDrm4	UC	In TW4
TO	Turf	Lower Plate	Drc, Dp, SDrm	UC	30
Total Samples					**973**

Notes:
Carbon Classification distinguishes carbon content of waste. UC = Unoxidized Carbonate; CSR = Carbon Sulfide Refractory; UI = Unoxidized Intrusive. Rock types classified as WLW = West Leeville Waste; WLO = West Leeville Ore; FCW = Four Corners Waste; FCO = Four Corners Ore; TW = Turf Waste; TO = Turf Ore; Ovi = Vinini Formation; SDrm = Roberts Mountains Formation; Dp = Popovich Formation; Drc = Rodeo Creek Formation; HW = Hanging Wall; FW = Foot Wall. Source: Coxon 1997.

Sampling

A suite of 973 representative samples was collected from drill cuttings for gold assay. Samples were chosen to be laterally and stratigraphically representative of the overall ore bodies, and were split using conventional sub-sampling techniques to prevent particle size bias. The studied samples are representative of the overall deposit. Of these 973 samples, 143 assay samples were in ore and 830 were in waste rock. In addition, of the 973 samples, 37 percent are Turf waste rock, 26 percent West Leeville waste rock, 12 percent Four Corners waste rock, 6 percent West Leeville ore, 4 percent Four Corners ore, and the remaining 15 percent Turf ore.

Geologic logs, assay data, carbon classification, and the mine plan were used to develop composite samples that represent bulk composition for each of the ore and waste rock types proposed to be mined. The number and length of intervals included in the composites varied between materials, as summarized by Coxon (1997). A total of 725 intervals, out of the 830 intervals of waste rock, were included in the nine composites of waste rock proposed to be mined at the Leeville Project. All 143 ore intervals were included in composites for the three ore deposits.

In addition, two master composite samples were prepared to represent run-of-mine ore and waste rock from the West Leeville, Four Corners, and Turf deposits (Coxon 1997). Results of whole rock geochemical analyses of the master composites (summarized in **Table 3-4**) indicate that ore and waste rock are very similar in composition, and that the rocks are composed primarily of silicates followed by carbon (loss on ignition or LOI), aluminum, magnesium, calcium, iron, and trace amounts of titanium, potassium, manganese, phosphorus, and barium.

TABLE 3-4
Whole Rock Analytical Results
Leeville Mine Project

Master Composite	Major Elements (percent by weight)											
	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	MnO	P_2O_5	BaO	LOI
Ore	65.57	0.275	5.693	2.402	3.279	5.296	<0.27	0.705	0.014	0.133	0.044	8.50
Waste	65.96	0.256	5.404	1.853	2.847	5.894	<0.27	0.622	0.015	0.167	0.134	9.00

Notes: SiO_2 = silica; TiO_2 = titanium oxide; Al_2O_3 = aluminum oxide; Fe_2O_3 = iron oxide; MgO = magnesium oxide; CaO = calcium oxide; Na_2O = sodium oxide; K_2O = potassium oxide; MnO = manganese oxide: P_2O_5 = phosphate; BaO = barium oxide; LOI = Loss on ignition (surrogate for carbon). Source: Coxon 1997.

Composite samples were analyzed for metal release potential using meteoric water mobility procedure (MWMP) tests of metal mobility. The composite samples were also analyzed for acid generation potential (AGP), based on an acid base account (ABA) with sulfur speciation. Individual samples were also analyzed for AGP using the Net Carbonate Value (NCV) Leco method, by Newmont's in-house laboratories. Acid generation and metal release potential for ore and waste rock are discussed below.

Ore

Underground development of three Leeville Project ore deposits results in a high ore to waste ratio. Nearly 80 percent of the rock to be mined would be ore. All ore would be produced from the lower plate. Ore in the West Leeville and Four Corners deposits occurs in the Silurian-Devonian Roberts Mountain (SDrm) and the Devonian Popovich (Dp) formations. The Four Corners deposit has a high carbon and sulfide content, exhibits refractory metallurgical behavior, and is identified as carbon sulfide refractory ore (CSR). The West Leeville ore has high carbonate content, but is unoxidized, and is identified as unoxidized carbonate (UC). The Turf deposit occurs in the Rodeo Creek (Drc), Roberts Mountains (SDrm), and Popovich (Dp) formations. Like West Leeville, the Turf deposit is comprised of unoxidized carbonate rock.

The ABA and MWMP analyses were completed for the three composite samples of each ore type as well as for the master ore composite sample (**Table 3-5a**). The number of samples included in each composite is presented in the table, along with the Net Neutralization Potential (NNP), which is equal to Acid Neutralization Potential (ANP), less the Acid Generation Potential (AGP), in units of tons of $CaCO_3$ or equivalent per 1,000 tons of native rock (T/kton). **Table 3-5a** also shows the Neutralization Potential Ratio (NPR), which is equal to ANP/AGP. Major ion and metal concentrations measured in MWMP extracts are also shown, with pertinent Nevada water quality standards as a basis for comparison.

The ANP and AGP of ore to be mined under the Proposed Action was also analyzed for 143 individual ore samples, as summarized in **Table 3-5b**. AGP was determined using the standardized NCV static test method. Carbon (total, carbonate, and organic) and sulfur (total, sulfate, and sulfide) species were determined by Leco furnace before and after roasting to remove sulfate and carbonate, thereby allowing organic carbon and sulfide sulfur to be calculated by difference.

Total sulfur content for ore units ranges from 1.4 to 6.1 percent, with a run-of-mine average of 3.0 percent. Sulfide-sulfur ranges from 1.1 to 5.2 percent, with a run-of-mine average of 2.6 percent. Calculated average ANP, AGP, NCV, NNP, and the NPR (ANP/AGP) are shown in **Table 3-5b** for each ore type and run-of-mine ore. The NPR values in **Table 3-5a** differ slightly from NPR values in **Table 3-5b** because the samples in **Table 3-5a** are composites, whereas NPR results in **Table 3-5b** are from individual sample analyses.

The ABA results show that while Four Corners and, to a lesser degree, Turf ores are potentially acid generating (PAG) (i.e., NPR less than the BLM standard 3.0 and the NDEP standard 1.2), West Leeville ore is net neutralizing and meets the BLM standard of 3.0 NPR or higher.

TABLE 3-5a
Ore Rock – ABA and MWMP Test Results
Leeville Project

						ABA		MWMP Major Ions						
Rock Type	**Plate**	**Fm**	**Lith**	**Lab No.**	**n**	**NNP**	**NPR**	**Cl**	**Fl**	**NO_3**	**CN**	**SO_4**	**TDS**	**pH**
						T/kton $CaCO_3$		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	s.u.
WLO	LP	SDrm, Dp	UC	112946	65	182	6.0	7.04	<0.2	<0.1	.0.01	1500	2550	7.91
FCO	LP	SDrm, Dp	CSR	112947	48	-84.9	0.05	8.29	5.54	0.67	<0.01	3660	5570	2.98
TO	LP	Drc, Dp, SDrm	UC	153006	30	18.8	1.3	14.2	0.8	0.12	<0.01	2730	4500	6.86
Master Ore Composite	UP/LP	all	all	182532	nd	114	3.6	7.6	1.6	0.15	<0.01	3480	5640	5.75
Nevada Water Quality Standards								**250**	**4.0**	**10**	**0.2**	**250**	**500**	**5.0-9.0**

Rock Type	**MWMP Metals**															
	Sb	**As**	**Ba**	**Be**	**Cd**	**Cr**	**Cu**	**Fe**	**Pb**	**Mn**	**Hg**	**Ni**	**Se**	**Ag**	**Tl**	**Zn**
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
WLO	1.11	0.118	0.016	<.001	<.0024	<.005	<.003	<.024	<.005	0.077	0.0003	<.017	0.008	<.003	0.033	0.003
FCO	0.656	30.2	0.024	0.017	<0.012	1.85	9.74	668	<.005	1.51	<.0002	7.81	<0.01	0.053	0.798	9.17
TO	0.109	<0.04	0.017	<0.02	0.019	<.008	<.004	9.39	<.004	3.64	0.0003	4.95	<.048	<.005	0.061	6.31
Master Ore Composite	0.096	<0.04	0.034	<.002	0.035	NA	<.004	189	0.008	3.44	0.0007	4.16	<.048	0.008	0.236	8.85
Nevada Water Quality Standards	**0.146**	**0.05**	**2.0**	**0.004***	**0.005**	**0.1**	**1.3***	**0.3*(s)**	**0.05**	**0.05*(s)**	**0.002**	**.0134**	**0.05**	**--**	**0.013**	**5.0* (s)**

TABLE 3-5b
Summary of NCV Data for Ore Units
Leeville Mine Project

Tons	**% of Tons**	**No. Samples**		**% Total Carbon**	**% Organic Carbon**	**% Carbonate Carbon**	**% Total Sulfur**	**% Sulfate Sulfur**	**% Sulfide Sulfur**	**ANP %$C0_2$**	**AGP %$C0_2$**	**NPR (ANP/AGP)**	**NCV %C02**	**NNP T/kton $CaCO_3$**
		Assay	**Leco**											
West Leeville Lower UC Ore														
8,519,005	60.5	65	65	3.06	0.51	2.55	1.35	0.25	1.09	9.35	1.50	6.22	7.85	17.83
Four Corners Lower CSR Ore														
943,427	6.7	48	48	0.30	0.26	0.04	3.15	0.19	2.99	0.19	4.10	0.05	-3.91	-8.89
Turf UC Ore														
4,618,568	32.8	30	30	2.97	1.58	1.38	6.09	0.90	5.20	5.08	7.12	0.71	-2.04	-4.63
Total Ore														
14,081,000	100	143	143											
Run-of-Mine Weighted Average for Ore														
				2.85	0.85	2.00	3.02	0.46	2.57	7.34	3.52	4.00	3.82	867
PAG Percent of Total Ore Tonnage														
	39.50													

Notes:
State of Nevada Neutralization Potential Ratio (NPR) criteria = 1.2; BLM NPR criteria = 3.0.
Nevada water quality standards are the "Municipal or Domestic Supply" values listed in **Table 3-13**; if no corresponding standard exists, the federal drinking water standard is used and denoted by an asterisk (*). Values with (s) are secondary drinking water standard. Shading indicates results exceed Nevada water quality standards.
mg/L = milligrams per liter; n = number samples included in each composite; nd = No data; NNP = net neutralization potential; NPR = neutralization potential ratio; Dep = Deposit; WLO = West Leeville Ore; FCO = Four Corners Ore; TO = Turf Ore; UP = Upper Plate; LP = Lower Plate; Unk = Unknown; Fm = Formation; Ovi = Vinini Fm; SDrm = Roberts Mountains Fm ; Dp = Popovich Fm; HW = head wall; FW = foot wall; Lith = lithology; CSR = carbon sulfide refractory; UC = unoxidized carbonate; Sb = antimony; As = arsenic; Ba = barium; Be = beryllium; Cd = cadmium; Cr = chromium; Cu = copper; Fe = iron; Pb = lead; Mn = manganese; Hg = mercury; Ni = nickel; Se = selenium; Ag = silver; Tl = thallium; Zn = zinc; Cl = chloride; Fl = fluoride; NO_3 = nitrate; CN = cyanide; SO_4 = sulfate; TDS = total dissolved solids; pH = standard units; NCV = net carbonate value; ANP = acid-neutralizing potential; AGP = acid-generating potential; CO_2 = carbon dioxide; NNP = net-neutralization potential; $CaCO_3$ = calcium carbonate; PAG = potential acid-generating; MWMP = meteoric water mobility procedure. Source: Coxon 1997.

The MWMP data indicate that ore (especially the PAG Four Corners unit) has the potential to release metals above drinking water standards, including antimony, arsenic, beryllium, chromium, copper, iron, manganese, nickel, thallium, and zinc (**Table 3-5a**). The metals that show no elevated concentrations with respect to standards for ore are: barium, lead, mercury, and silver. For beryllium, chromium, selenium and copper, one ore sample exceeded the respective drinking water quality standards. All ore samples exceeded total dissolved solids (TDS) and sulfate standards. The Four Corners ore is PAG, but the pH of MWMP extracts for the other ores and the master composite are between 5.5 and 8.0 standard pH units.

As the ore is processed, it undergoes physical and chemical change. Tailing material that would result from processing of the Leeville Project ore would be managed at Newmont's tailing disposal facility in the South Operations Area.

Waste Rock

Three types of West Leeville waste rock, five types of Turf waste rock, and one type of Four Corners waste rock are proposed to be mined at the Leeville Project (**Table 3-6a**). The ABA and MWMP analyses were completed for the nine composite samples of waste rock, as well as for the master waste rock composite (**Table 3-6b**). The NNP and NPR data indicate that the West Leeville (WLW2) and Turf (TW2) carbon sulfide refractory rock, as well as the mixed Four Corners waste rock (FCW1), are PAG. The master composite indicates a run-of-mine NPR of 5.1 (i.e., non-PAG), with an NNP of 121.

The AGP of waste rock to be mined under the Proposed Action was also analyzed for 780 individual waste rock samples, as summarized in **Table 3-6b**, using the standardized NCV static test method. For some waste rock intervals, two or more assay intervals were composited prior to NCV analysis, so that 50 fewer NCV analyses (780) were run than the total number of assayed waste rock intervals (830). The difference in number between intervals that were assayed and intervals that were analyzed by Leco is summarized for each waste rock type in **Table 3-6b**.

Total sulfur content for waste rock units ranges from 0.7 to 2.4 percent, with a run-of-mine average of 1.3 percent. Sulfide sulfur ranges from 0.4 to 2.1 percent, with a run-of-mine average of 1 percent. Calculated average ANP, AGP, NCV, NNP, and the NPR ratio (ANP/AGP) are shown in **Table 3-6b** for each waste rock type, and run-of-mine waste rock.

Review of the averaged NCV data for waste rock in **Table 3-6b** shows that, as indicated by the ABA analyses of the composites, the carbon sulfide refractory units in the West Leeville (WLW2), Turf (TW2), and Four Corners waste (FCW1) rock are PAG. NCV data also suggest that the Turf Popovich unoxidized carbonate (TW3) is PAG. Together, these units represent almost 12 percent of the total tonnage to be mined under the Proposed Action. Remaining waste rock units in the West Leeville and Turf deposits are non-PAG.

Most of the waste rock tested (i.e., West Leeville, Four Corners, and Turf) exhibit a tendency to leach some metals such as antimony, arsenic, manganese, nickel, thallium, and zinc. Samples that exceeded pertinent drinking water standards are highlighted in **Table 3-6a**. Sulfate and TDS concentrations typically exceeded water quality standards. Metals that show no elevated concentrations with respect to drinking water standards in any waste rock sample include barium, beryllium, chromium, copper, lead, mercury, silver, and with one exception, selenium. The pH of MWMP extracts is in the range of 7.5 to 8.2 standard pH units.

TABLE 3-6a
Waste Rock - ABA and MWMP Test Results
Leeville Project

Rock type	Deposit	Plate	Fm	Lith	n	Acid Base Account		MWMP Major Ions						
						NNP	NPR	Cl	Fl	NO_3	CN	SO_4	TDS	pH
						T/kton CaCO3		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	s.u.
WLW1	West Leeville	UP	Ovi	UC	59	106	4.1	3.03	0.68	0.11	<0.01	503	829	8.07
WLW2	West Leeville	UP	Ovi	CSR	113	10.2	1.3	4.19	1.18	0.25	<0.01	555	910	8.22
WLW3	West Leeville	LP	SDrm, Dp	UC	119	152	15.7	4.13	0.29	<0.05	<0.01	728	1270	7.84
FCW1	Four Corners	LP	Drc, Dp, SDrm	CSR, UC, UI	131	-27.1	0.4	4.92	1.95	<0.25	<0.01	863	1390	7.68
TW2	Turf	UP/LP	Ovi/Drc	CSR	205	9.5	1.4	6.9	2.0	0.38	<0.01	217	558	8.17
TW3	Turf	LP	Dp	UC	62	104	3.2	21.4	0.7	0.1	<0.01	1980	3230	7.39
TW4	Turf	LP	SDrm HW	UC	36	171	6.5	20.2	1.1	0.18	<0.01	796	1400	7.79
TW5	Turf	LP	SDrm FW	UC	In TW4	137	6.3	17.9	1.1	0.25	<0.01	1470	2380	7.59
TW6	Turf	LP	SDrm4	UC	In TW4	315	26.2	22.1	1.2	0.16	<0.01	633	1040	7.79
Master Waste Rock Composite	all	LP/UP	all	UC/C SR	nd	121	5.1	7.4	0.7	0.1	<0.01	2030	3070	7.56
Nevada Water Quality Standards								**250**	**4.0**	**10**	**0.2**	**250**	**500**	**5.0-9.0**

Rock Type	MWMP Metals															
	Sb	As	Ba	Be	Cd	Cr	Cu	Fe	Pb	Mn	Hg	Ni	Se	Ag	Tl	Zn
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
WLW1	.043	.125	.031	<0.001	<0.002	<0.003	<0.003	<0.017	0.002	0.021	<0.0002	<0.021	0.02	<0.002	<0.001	<0.002
WLW2	.048	.082	.035	<0.001	<0.002	<0.003	0.011	<0.017	<0.001	0.031	<0.0002	<0.021	0.031	<0.002	<0.001	0.006
WLW3	1.45	.067	.024	<0.001	<0.0024	<0.005	0.004	<0.024	0.002	0.025	<0.0002	0.04	0.021	0.003	0.008	0.007
FCW1	1.75	.843	.021	<0.001	<0.0024	<0.005	0.006	0.2	<0.005	1.11	0.0005	1.79	0.018	<0.003	0.01	0.119
TW2	.033	0.75	.215	<0.001	<0.0024	<0.005	0.024	1.21	0.004	0.099	0.0002	0.07	0.05	0.009	<0.01	0.067
TW3	.106	<.04	.014	<0.002	0.017	<0.008	<0.004	0.03	<0.004	1.53	<0.0002	5.52	<0.048	<0.005	0.028	6.07
TW4	.364	0.41	.043	<0.002	<0.002	<0.008	<0.004	<0.019	<0.004	0.086	<0.0002	0.135	<0.048	<0.005	0.01	0.024
TW5	.143	0.17	.019	<0.002	0.004	0.016	<0.004	<0.019	<0.004	0.398	<0.0002	0.681	<0.048	<0.005	0.014	0.688
TW6	.302		.024	<0.002	<0.002	<0.008	<0.004	<0.019	<0.004	0.009	<0.0002	0.021	<0.048	<0.005	0.005	<0.004
Master Waste Composite	.149	<.04	.029	<0.002	<0.002	NA	<0.004	0.054	<0.002	0.91	<00002	0.852	0.064	<0.005	0.032	0.472
Nevada Water Quality Standards	**0.146**	**0.05**	**2.0**	**0.004***	**0.005**	**0.1**	**1.3***	**0.3*(s)**	**0.05**	**0.05* s**	**0.002**	**0.0134**	**0.05**	**--**	**0.013**	**5.0*(s)**

Notes:
State of Nevada Neutralization Potential Ratio (NPR) criteria = 1.2; BLM NPR criteria = 3.0.
Nevada water quality standards are the "Municipal or Domestic Supply" values listed in **Table 3-13**; if no corresponding standard exists, the federal drinking water standard is used and denoted by an asterisk (*). Values with (s) are secondary drinking water standard.
Shading indicates results exceed Nevada water quality standards and/or BLM NPR criteria (3:1).
mg/L = milligrams per liter; n = number samples included in each composite; nd = No data; NNP = net neutralization potential; NPR = neutralization potential ratio; Dep = Deposit; WLW = West Leeville Waste; FCW = Four Corners Waste; TW = Turf Waste; UP = Upper Plate; LP = Lower Plate; Unk = Unknown; Fm = Formation; Ovi = Vinini Fm; SDrm = Roberts Mountains Fm ; Dp = Popovich Fm; Lith = Lithology; CSR = Carbon Sulfide Refractory; UC = Unoxidized Carbonate; Sb = antimony; As = arsenic; Ba = barium; Be = beryllium; Cd = cadmium; Cr = chromium; Cu = copper; Fe = iron; Pb = lead; Mn = manganese; Hg = mercury; Ni = nickel; Se = selenium; Ag = silver; Tl = thallium; Zn = zinc; Cl = chloride; Fl = fluoride; NO_3 = nitrate; CN = cyanide; SO_4 = Sulfate; TDS = Total Dissolved Solids; pH = standard units. Source: Coxon 1997.

TABLE 3-6b
Summary of NCV Data for Waste Rock Units
Leeville Mine Project

Tons	% of Tons	No. Samples		Total Carbon	Organic Carbon	Carbonate Carbon	Total Sulfur	Sulfate Sulfur	Sulfide Sulfur	ANP $\%C0_2$	AGP $\%C0_2$	ANP/AGP	NCV $\%C0_2$	NNP T/kton $CaCO_3$
		Assay	Leco											
West Leeville Upper Plate UC WLW1														
22,100	0.55	59	59	2.67	0.81	1.86	1.36	0.34	1.02	6.83	1.41	4.85	5.42	12.32
West Leeville Upper Plate CSR WLW2														
103,300	2.59	113	113	1.24	0.82	0.42	1.47	0.28	1.20	1.55	-1.64	0.94	-0.09	-0.21
West Leeville Lower Plate UC WLW3														
2,937,300	73.73	119	112	3.20	1.05	2.15	1.20	0.30	0.90	7.90	1.24	6.37	6.64	15.10
Four Corners Lower Plate UC, CSR, UI FCW1														
212,100	5.32	131	88	0.84	0.57	0.27	1.31	0.17	1.14	1.03	1.56	0.66	-0.58	-1.31
Turf Upper Plate UC TW1														
0	0.00	105	105	2.22	0.52	1.70	0.68	0.27	0.41	6.24	0.56	11.06	5.68	12.90
Turf Upper Plate CSR TW2														
15,300	0.38	205	205	1.20	0.85	0.34	1.00	0.31	0.69	1.27	0.94	10.30	0.31	0.71
Turf Lower Plate Dp UC TW3														
125,200	3.14	62	62	3.30	1.75	1.55	2.42	0.34	2.08	5.75	2.85	2.02	2.86	6.49
Turf Lower Plate SDrm UC														
568,700	14.27	36	36	2.44	0.37	2.06	1.36	0.35	1.01	7.59	1.39	5.46	6.19	14.08
Total Waste														
3,984,000	100	830	780											
Run-of-Mine Weighted Average for Ore														
				2.90	0.94	1.97	1.27	0.30	0.97	7.22	1.25	5.76	5.87	13.34
PAG Percent of Total Ore Tonnage														
	11.44													

Notes:
NCV = net carbonate value; ANP = acid neutralizing potential; AGP = acid generating potential; NNP = net neutralizing potential; CO_2 = carbon dioxide; $CaCo_3$ = calcium carbonate; UC = unoxidized carbonate; WLW = West Leeville Waste rock; CSR = carbon sulfide refractory; UI = unoxidized intrusive; FCW = Four Corners Waste rock; TW = Turf Waste rock; Dp = Popovich Formation; SDrm = Roberts Mountains Formation.
Source: Coxon 1997.

Page 3-22; column 1, 1st full paragraph, 1st sentence and last sentence are revised as follows:

"Dewatering from the Gold Quarry Mine began in 1992 and has ranged from 4,000 to 20,000 gpm (9 to 45 cfs), with an expected future rate averaging 20,000 gpm (Figure 3-7)."

"Dewatering at Gold Quarry is expected to continue through 2012."

Page 3-23; Figure 3-5 has been revised to correctly locate the USGS gaging station on Marys Creek. Revised Figure 3-5 is located at the end of this **Errata** chapter.

Page 3-32; 2nd column, 1st paragraph under Marys Creek, 3rd and 4th sentences are revised as follows:

"The USGS has operated a continuous stream gaging station (USGS No. 10322150) on Marys Creek below Carlin Springs since November 1989. Drainage area of Marys Creek above the USGS gaging station (distance of 0.7 mile above confluence with Humboldt River) is 45 square miles (USGS 2000)."

Page 3-39; **Table 3-15** is revised as follows to correct the water quality standards for nitrate and nitrite:

TABLE 3-15
Beneficial Use Water Quality Standards for Humboldt River at Palisade Gage and Battle Mountain Gage Control Points

Parameter[1] (mg/L, unless specified otherwise)	Water Quality Standards for Beneficial Uses[2]	Most Restrictive Beneficial Use
Temp (ºC)	$\Delta T \leq 2^{o}$ C [3]	Aquatic life (warm water fishery)
pH (standard units)	6.5 – 9.0 ΔpH $\forall$ 0.5	Water contact recreation; wildlife propagation
Dissolved Oxygen	$\geq$ 5.0	Aquatic life (warm water fishery)
Chlorides	$\leq$ 250	Municipal or domestic supply
Total Phosphorus (as P)	$\leq$ 0.1	Aquatic life (warm water fishery)
Nitrate Nitrite Ammonia (un-ionized)	$\leq$ 10 $\leq$ 1.0 $\leq$ 0.02	Municipal or domestic supply
TDS	$\leq$ 500	Municipal or domestic supply
TSS	$\leq$ 80	Aquatic life (warm water fishery)
Sulfate	$\leq$ 250	Municipal or domestic supply
Sodium (SAR)	$\leq$ 8	Irrigation
Color (PCU)	No adverse effects	Municipal or domestic supply
Turbidity (NTU)	$\leq$ 50	Aquatic life (warm water fishery)

[1] mg/L = milligrams per liter; ^{o}C = degrees Celsius; P = phosphorous; TDS = total dissolved solids; TSS = total suspended solids; SAR = sodium adsorption ratio; PCU = photoelectric color units; NTU = nephelometric turbidity units. Limits apply from the control point upstream to the next control point.

[2] Δ = change; all values are single-value measurements, except total phosphorus as seasonal average, TDS and SAR as annual averages, and TSS as annual median. $\leq$ = less than or equal to; $\geq$ = greater than or equal to

[3] Maximum allowable increase in temperature at the boundary of an approved mixing zone.

Source: Nevada Administrative Code 445A.204-205

Page 3-41; column 2, 2nd paragraph under Springs and Seeps, last sentence, is revised as follows:

"Four springs have been identified within the Leeville Project boundary, whereas approximately 75 springs/seeps have been inventoried along the portion of the Tuscarora Range shown on **Figure 3-10**."

Page 3-53; **Table 3-17** is revised as follows to add well collar elevations:

TABLE 3-17
Monitoring Well Completion and Water Level Elevation Data
At the Leeville Project Site

Well No. & Formation	Total Depth (ft)	Screen Interval (ft)	Well Collar Elev. (ft)	Initial GW Elev. (ft)	Initial Measure-ment Date	Last Monitored Elev. (ft)	Last Measure-ment Date	Water Level Drawdown to Date (ft)
CG-74 (LP)	2340	2220-2240	6033.84	4961.9	6-20-97	4807.1	9-29-00	154.8
HDP-1D (LP)	1830	1800-1820	5956.51	5213.7	7-19-95	5111.4	3-31-00	102.3
HDP-2S (LP)	1520	1280-1300	6012.32	5057.6	6-23-95	4811.2	9-27-00	246.4
HDP-4 (UP)	500	480-500	6065.43	5804.3	8-8-96	5735.4	9-29-00	68.9
HDP-5 (UP)	1005	980-1000	6028.13	5553.7	8-9-96	5289.0	9-29-00	264.7
HDP-6 (UP)	520	500-520	6026.11	5791.8	8-8-96	5732.1	12-22-00	59.7
HDP-7 (UP)	520	500-520	6044.08	5799.0	8-8-96	5727.1	12-22-00	71.9
HDP-8 (LP)	2100	2030-2050	6070.94	5982.4	1-13-97	NA	NA	NA
HDP-9 (LP)	2940	2890-2930	5827.32	4988.6	1-27-97	5006.7	3-30-00	+18.1
HDP-13S (UP)	2250	1508-1528	6199.00	5789.3	6-23-97	5725.5	9-29-00	63.8
HDP-13D (LP)	2250	2220-2240	6198.60	4960.1	6-24-97	4812.7	9-29-00	147.4
NHD-11 (LP)	1363	1319-1359	5726.64	5458.9	7-7-92	5212.0	6-8-99	246.9
NHD-44 (UP)	1015	995-1015	5829.91	5422.1	8-30-93	5304.6	12-7-00	117.5
NHD-74 (LP)	2000	1979-1999	5922.22	5196.9	10-13-94	4827.5	12-22-00	369.4
NHD-76D (LP)	1869	1849-1869	6093.08	5100.4	10-18-94	4816.2	9-29-00	284.2
NHD-76S (UP)	1869	830-850	6093.08	5789.8	10-13-94	5590.5	9-29-00	199.3
NHD-78 (LP)	1766	1530-1550	6171.40	5079.9	3-8-95	4816.3	9-27-00	263.6
RKP-1S (UP)	1762	720-740	6186.29	5541.5	7-18-95	5647.6	9-27-00	+106.1
RKP-2 (LP)	1550	1528-1548	6189.00	4987.2	12-27-96	4821.1	9-29-00	166.1

Note: See **Figure 3-12** for well locations. UP = upper plate; LP = lower plate; ft = feet; GW = groundwater; Elev. = elevation; NA = not available.

Source: Newmont 2000, 2001.

Page 3-54; **Table 3-18** is revised as follows to add copper, lead, molybdenum, nickel, and silver:

TABLE 3-18
Groundwater Quality in Vicinity of Leeville Project

Parameter[1]	Well HDDW-1A		Well HDDW-2		Well HDDW-3		Standards for Municipal or Domestic Supply[2]
No. of samples	4		4		4		---
Hydrostratigraphic Unit	Lower Plate (Popovich / Roberts Mtn Formations)		Lower Plate (Rodeo Ck / Popovich / Roberts Mtn Formations)		Upper Plate (Vinini Formation)		---
Statistics	Range	Mean / SD[3]	Range	Mean / SD[3]	Range	Mean / SD[3]	---
TDS	233 – 305	266 / 37.1	233 – 321	275 / 44.1	229 - 241	233 / 5.3	500 – [1000]
SC (µmhos/cm)	367 – 372	369 / 2.6	494	494 / NM	NA	NA / NA	---
PH (std units)	7.20 - 8.17	7.9 / 0.47	8.08 – 8.16	8.15 / 0.07	7.83 - 8.07	7.95 / 0.13	5.0 – 9.0
Temperature (º F)	86 – 87	86.5 / NM	67 – 70	68.5 / NM	59 – 63	61 / NM	---
Alkalinity (as HCO_3)	137 – 146	140 / 4.1	179 – 185	182 / 3.1	109 – 138	118 / 13.9	---
Calcium (Ca)	39.7 – 42.2	40.4 / 1.2	48.6 – 51.9	49.9 / 1.5	33.0 - 39.0	37.3 / 2.9	---
Sodium (Na)	6.5 – 10	7.5 / 1.7	9.0 - 13.1	10.8 / 1.8	9.0 - 10.4	9.6 / 0.71	---
Magnesium (Mg)	19.1 – 19.5	19.2 / 0.2	18.7 – 20.2	19.5 / 0.7	14.0 - 15.6	14.7 / 0.79	125 – [150] (s)
Potassium (K)	2.9 - 3.0	2.95 / 0.06	3.0 - 4.0	3.43 / 0.42	3.0 - 3.4	3.1 / 0.2	---
Chloride (Cl)	6.9 - 7.7	7.2 / 0.35	8.8 - 12.5	10.5 / 1.52	6.1 - 7.7	6.8 / 0.67	250 – [400]
Fluoride (F)	0.32 – 0.33	0.32 / 0.005	0.79 - 0.84	0.81 / 0.026	0.42 - 0.53	0.45 / 0.05	2.0(s) - 4.0
Sulfate (SO_4)	44.6 - 45.5	45 / 0.38	65.0 – 72.2	68.2 / 3.01	62.6 - 70.0	65.8 / 3.2	250 – [500]
Nitrate as NO_3-N	<0.02 - <0.10	0.04 / 0.02	<0.10	0.05 / 0	<0.10	0.05 / 0	10
Antimony (Sb)	0.007	0.007 / NM	0.015 - 0.030	0.023 / 0.006	<0.005	0.0025 / 0	0.146
Arsenic (As)	0.057 – 0.068	0.061 / 0.005	0.508 - 0.726	0.628 / 0.104	0.097 - .572	0.348 / 0.22	0.05
Boron (B)	<0.10	0.05 / 0	<0.10	0.05 / 0	<0.10	0.05 / 0	---
Cadmium (Cd)	<0.005	0.0025 / 0	<0.005 - 0.009	0.004 / 0.003	<0.005	0.0025 / 0	0.005
Chromium (Cr)	<0.05	0.025 / 0	<0.05	0.025 / 0	<0.05	0.025 / 0	0.10
Copper (cu)	<0.01	0.005 / 0	<.01	0.005 / 0	<0.01- 0.01	0.0063 / .003	1.3
Iron (Fe)	0.14 - 0.32	0.21 / 0.08	0.37 - 0.39	0.38 / 0.008	0.17 – 4.69	2.25 / 2.14	0.3 – [0.6] (s)
Lead (Pb)	<.005 - <.007	0.0036 / .002	<.005	0.0025 / 0	<.005 - .01	0.0044 / .004	0.05
Manganese (Mg)	<0.01 - 0.01	0.006 / 0.003	0.06 - 0.08	0.068 / 0.01	0.18 – 0.32	0.395 / 0.08	0.05 – [0.10] (s)
Mercury (Hg)	<0.001	0.0005 / 0	<0.001	0.0005 / 0	<0.001	0.0005 / 0	0.002
Molybdenum (Mo)	<.01 - <.10	0.016 / .002	<.01 - .05	0.0188 / .021	<.01 - <.05	0.01 / .01	--
Nickel (Ni)	<.01 – <.05	0.01 / .01	<.01 - .02	0.0125 / .009	<.01 - <.05	0.014 / .01	0.0134
Selenium (Se)	<0.001 - .005	0.0016 / 0.002	<0.001 - 0.004	0.0018 / 0.002	<.001 - .004	0.0018 / 0.0017	0.05
Silver (Ag)	<.005	0.0025 / NM	<.005 - <.01	0.0038 / .001	<.005 - <.01	0.003 / .001	--
Zinc (Zn)	<0.01 - 0.01	0.0075 / 0.003	<0.01 - 0.06	0.0188 / 0.028	0.03 - 0.09	0.05 / 0.028	5.0 (s)

Note: Samples were collected and analyzed during the period April 1996 – August 1997. See **Figure 3-12** for well locations.

1 All units in milligrams per liter (mg/L) unless otherwise specified. Metals are dissolved concentrations. SC = specific conductance in micromhos per centimeter; TDS = total dissolved solids; NA = not analyzed.

2 Numbers in brackets [ ] are mandatory secondary standards for public water systems. Values with an (s) are federal secondary drinking water standards. See **Table 3-13** for a listing of water quality standards.

3 SD = standard deviation; NM = not measured. For statistical purposes, values reported by the laboratory at less than the detection limit were converted to half the specified limit value.

Source: Newmont 1996, 1997b.

Page 4-2; column 2, 5th paragraph under Mining Activities, 1st sentence is revised as follows:

"The largest mine dewatering program in the North Operations Area occurs at the Goldstrike Property where current dewatering rate is approximately 25,000 gpm."

GEOLOGY AND MINERALS

Direct and Indirect Impacts

Page 4-7; 2nd column, beginning with the first full paragraph is revised as follows:

The run-of-mine master ore composite net neutralizing potential (NNP) of 114 T/ktons $CaCO_3$ and neutralization potential ratio (NPR) of 3.6 suggest that the ore would be net neutralizing (**Table 3-5a**). The NCV data indicate that run-of-mine ore would have a NNP of 8.7 T/ktons $CaCO_3$ with a NPR of 4.0 (**Table 3-5b**). Potentially acid generating (PAG) rock has a NPR of less than the BLM standard of 3.0 and the NDEP standard of 1.2 (BLM 1996b).

Ore in the stockpile would be net neutralizing, although it has the potential to be locally acidic. The ore stockpile is temporary and, therefore, would not be capped and reclaimed. Processing alters the geochemistry of ore, so that run-of-mine calculations based on pre-processing ABA or MWMP tests are not meaningful predictors of long-term acid generation or metal release potential for the ore units in the tailing impoundment.

Waste rock production under the Proposed Action is estimated at 3.9 million tons (Newmont 2002a). Tonnage of waste rock to be extracted has been estimated for the life of the project according to rock type (Coxon 1997). These data indicate that approximately 75 percent of the waste rock would be West Leeville lower plate unoxidized carbonate, which is non-PAG based on calculations shown in **Tables 3-6a and 3-6b**. The remaining 25 percent consists of a mix of West Leeville, Four Corners, and Turf deposits, the majority of which is also non-PAG. Based on the NCV data, 12 percent of the waste rock is PAG.

Calculation of a weighted run-of-mine average based on the tonnage of each waste rock type, as it was characterized in NCV analyses summarized in **Table 3-6b**, indicates an overall NNP of 13 T/kton as $CaCO_3$ (NCV = 5.8% CO_2) and a NPR of 5.76. The values measured for composited samples, which are summarized in **Table 3-6b**, indicate more neutralizing conditions, with an NNP of 141 T/kton as $CaCO_3$ and an NPR of 13. Waste rock meets pertinent regulatory criteria on a run-of-mine basis based on calculation using either composite ABA or individual NCV data. The observed NPR for the NCV data set agrees closely with the results reported for the run-of-mine master composite sample. Operational sampling during development and exploration would be used to monitor waste rock to verify baseline geochemistry as well as to identify PAG rock.

Table 4-4 also summarizes average metal mobility values, calculated for the MWMP results using waste rock tonnage. These results indicate that seepage from run-of-mine waste rock would exceed drinking water quality standards for antimony (Sb), arsenic (As), manganese (Mn), nickel (Ni), selenium (Se), sulfate and total dissolved solids (TDS).

TABLE 4-4
Run-of-Mine Waste Rock MWMP Characteristics
Leeville Mine Project

	Nevada Water Standards (mg/L)	Weighted Average MWMP for ROM Waste Rock (mg/L)
Metals		
Antimony (Sb)	0.146	1.195
Arsenic (As)	0.05	0.15
Barium (Ba)	2.0	0.02
Beryllium (Be)	0.004*	0.001
Cadmium (Cd)	0.005	0.003
Chromium (Cr)	0.1	0.006
Copper (Cu)	1.3*	0.004
Iron (Fe)	0.3* (s)	0.04
Lead (Pb)	0.05	0.0025
Manganese (Mn)	0.05* (s)	0.17
Mercury (Hg)	0.002	0.0002
Nickel (Ni)	0.0134	0.3626
Selenium (Se)	0.05	0.08
Silver (Ag)	——	0.008
Thallium (Tl)	0.013	0.009
Zinc (Zn)	5.0* (s)	0.27
Non-Metals		
Chloride (Cl)	250	6.8
Fluoride (Fl)	4.0*	0.5
Nitrate (NO_3)	10	0.09
Cyanide (CN)	0.2	0.01
Sulfate (SO_4)	250	832
Total Dissolved Solids (TDS)	500	1417
pH	5.0-9.0 standard units	--

Notes:
Nevada water quality standards are the "Municipal or Domestic Supply" values listed on **Table 3-13**; if no corresponding state standard exists, the federal drinking water standard is used and denoted by an asterisk (*). Values with (s) are secondary drinking water standard.
MWMP = meteoric water mobility procedure; ROM = run-of-mine; mg/L = milligrams per liter

Source: Coxon 1997

Newmont has developed guidelines for storage and disposal of PAG and rock material, including waste rock and ore, that have potential to release metals (Newmont 1995). The objective of the guidelines is to minimize potential for acid drainage by controlling the acid generation process. Control measures for waste rock and stockpiled ore include: 1) placing PAG rock on a base constructed of compacted low permeability materials designed to minimize leaching to groundwater; 2) segregating and/or mixing PAG rock; 3) encapsulating PAG rock within acid-neutralizing rock (NNP greater than 40 T/kton $CaCO_3$); 4) sloping and wheel compacting lift surfaces; 5) controlling surface water to minimize infiltration; 6) encapsulating and capping PAG rock during reclamation; and 7) reclaiming the waste rock disposal facility.

Waste rock would be selectively handled to isolate and encapsulate PAG rock under the Proposed Action. Data indicate the total mass of waste rock to be generated over the Project life would be non-PAG. However, of this total mass, concentrated volumes of PAG rock would be produced at specific points in the mining sequence. An estimated 212,100 tons of Four Corners waste rock that is PAG would be generated between 2003 and 2010, and another 103,300 tons of West Leeville waste rock that is PAG would be generated in 2002 and 2003.

PAG waste rock would be identified based on net acid generation potential using visual classification with verification by NCV analysis, as defined in the Refractory Ore and Waste Rock Management Plan (Newmont 1995). PAG waste rock would be encapsulated with rock having a high net neutralization potential (NNP > 40 T/kton $CaCO_3$) in order to neutralize acid generated by the waste rock. The waste rock facility would be constructed on a low permeability base to inhibit leaching of metals into groundwater. At closure, the waste rock facility would be capped with 24-inches of topsoil or other suitable growth medium and revegetated to minimize potential infiltration. Additional information about the design of the Waste Rock Disposal Facility is contained on pages 3-1 and 3-2 of this Errata chapter under the revision to page 2-20.

Use of these management strategies would reduce potential for oxidation in all run-of-mine waste rock, but particularly for encapsulated PAG. These strategies would thereby reduce potential acid and metal release below values conservatively predicted by static tests, which are based on the assumption of complete oxidation of all sulfide minerals.

The proposed Plan of Operations states that most mined out stopes would be backfilled with cemented rock fill (Newmont 2002a). Access levels, excavations for underground facilities, and shafts would not be backfilled. Backfill would consist of neutral or acid-neutralizing material from existing open pit operations in the area or Project waste rock.

Methods of post-mining waste rock facility reclamation have been proposed by Newmont (2002a), but will be finalized in the Closure Plan after numerical modeling of waste rock disposal facility. These methods include regrading and revegetating the waste rock facility and diverting run-on surface water. These actions would stabilize the facilities and simultaneously limit infiltration and erosion. Quarterly inspection of refractory ore stockpiles and the waste rock disposal facility would be conducted for signs of acid rock drainage (ARD) production and to ensure integrity of the cover and surface water management systems.

Any disruption to mine facilities and workings from seismic activity would be from liquefaction or ground rupture. Liquefaction occurs when seismic shaking causes earth material to lose its inherent strength and behave like a liquid. In general, liquefaction can occur where earth material is fully saturated, loose, unconsolidated, and/or sandy. Surface or underground rupture may occur along an active fault trace during an earthquake. Underground workings are typically designed to withstand pressures exerted by the overlying mass of rock. These design criteria are typically much greater than ground shaking or acceleration stresses exerted by earthquakes.

Page 4-8; Table 4-3 of the Draft EIS has been deleted.

Page 4-24; **Table 4-5** is revised as follows to add copper, lead, molybdenum, nickel, and silver:

TABLE 4-5
Representative Groundwater Quality for Dewatering at Leeville Project

Parameter[1]	Well HDDW-1A[3]	Well HDDW-2[3]	Combined Wells[4]	Aquatic Life Standards[5]	Nevada Standards for Municipal or Domestic Supply[6]
Number of Samples	4	4	8	---	---
Pumping Rate (gpm)[2]	18,000	2,000	20,000	---	---
Est. % of Total Water	90%	10%	100%	---	---
Hydrostratigraphic Unit	Lower Plate	Lower Plate	---	---	---
TDS[2]	305	321	307	---	500 - [1000]
pH (std units)	8.09 – 8.17	8.08 – 8.16	---	6.5 – 9.0	5.0 – 9.0
Temperature (°F)	86 – 87	67 – 70	---	ss[5]	---
Alkalinity (as HCO_3)	170	185	172	---	---
Calcium (Ca)	42.2	51.9	43.2	---	---
Sodium (Na)	10	13.1	10.3	---	---
Magnesium (Mg)	19.5	20.2	19.6	---	---
Potassium (K)	3.0	4.0	3.1	---	---
Chloride (Cl)	7.7	12.5	8.2	---	250 - [400]
Fluoride (Fl)	0.33	0.84	0.38	---	---
Sulfate (SO_4)	45.5	72.2	48.2	---	250 - [500]
Nitrate (NO_3)	<0.10	<0.10	<0.10	90 / 90	10
Antimony (Sb)	0.007	0.030	0.009	---	0.146
Arsenic (As)	0.068	0.726	0.134	0.342 / 0.18	0.05
Boron (B)	<0.10	<0.10	<0.10	---	---
Cadmium (Cd)	<0.005	0.009	0.003*	0.0053 / 0.0013	0.005
Chromium (Cr)	<0.05	<0.05	<0.05	0.015 / 0.01	0.10
Copper (Cu)	<0.01	<0.01	<0.01	0.0221 / 0.0142	1.3
Iron (Fe)	0.32	0.39	0.33	1.0 / 1.0	0.3 - [0.6] (s)
Lead (Pb)	<0.007	<0.005	<0.007	0.0684 / 0.0013	0.05
Manganese (Mn)	0.01	0.08	0.02	---	0.05 - [0.1] (s)
Mercury (Hg)	<0.001	<0.001	<0.001	0.002 / 0.000012	0.002
Molybdenum (Mo)	<0.10	0.05	0.05*	0.019 / 0.019	--
Nickel (Ni)	<0.05	0.02	0.02*	1.699 / 0.189	0.0134
Selenium (Se)	0.005	0.004	0.005	0.02 / 0.005	0.05
Silver (Ag)	<0.005	<0.01	<0.01	0.0069 / 0.0069	--
Zinc (Zn)	0.01	0.06	0.02	0.14 / 0.127	5.0 (s)

1 All units in milligrams per liter (mg/L) unless otherwise specified. Metals are dissolved concentrations.
2 TDS = total dissolved solids; gpm = gallons per minute.
3 Samples were collected during the period of April 1996 – August 1997; values on table are the highest concentrations measured (see **Table 3-18** for range, mean, and standard deviation values).
4 Results of groundwater mixing are based on 90% from well HDDW-1A and 10% from well HDDW-2 as recommended by Paul Pettit of Newmont (personal communication); the values with an asterisk (*) indicate that the less than detection value was set at half the value for calculating a resultant concentration.
5 See **Table 3-13** for listing of aquatic life standards; first value is the 1-hour average standard (propagation) and the second value is the 96-hour average standard (put and take). ss = site-specific determination for water temperature.
6 See **Table 3-13** for listing of water quality standards; numbers in brackets [ ] are mandatory secondary standards for public water systems; (s) indicates federal secondary drinking water standard.

Source: Newmont 1997b.

Table 4-7 is a new table to be included in the document in response to public comments:

TABLE 4-7
SUMMARY OF CUMULATIVE MINE DEWATERING RATES IN THE CARLIN TREND

Year	Dewatering Rate (gpm) at Mine Site			Cumulative Pumping Rate (gpm)
	Goldstrike Property (Betze/Post & Meikle Mines)	Gold Quarry Mine	Leeville Mine	
1990	10,000	0	0	10,000
1991	25,000	0	0	25,000
1992	43,000	3,000	0	46,000
1993	67,000	6,000	0	73,000
1994	69,000	16,000	0	85,000
1995	58,000	15,000	0	73,000
1996	10,000	12,000	0	22,000
1997	35,000	16,000	0	51,000
1998	66,000	19,000	0	85,000
1999	45,000	11,000	0	56,000
2000	32,000	11,000	0	43,000
2001	26,000	7,000	0	33,000
2002	23,000	17,000	25,000	65,000
2003	21,000	25,000	25,000	73,000
2004	21,000	20,000	25,000	66,000
2005	20,000	20,000	18,000	58,000
2006	20,000	20,000	18,000	58,000
2007	19,000	20,000	13,000	52,000
2008	19,000	20,000	12,000	51,000
2009	18,000	20,000	11,000	49,000
2010	18,000	20,000	10,000	48,000
2011	---	20,000	9,000	29,000
2012	---	20,000	9,000	29,000
2013	---	---	9,000	9,000
2014	---	---	9,000	9,000
2015	---	---	9,000	9,000
2016	---	---	9,000	9,000
2017	---	---	9,000	9,000
2018	---	---	9,000	9,000
2019	---	---	9,000	9,000

Note: gpm = gallons per minute; see **Figure 3-7** in the Draft EIS for graphical presentation of pumping rates. At the end of the primary dewatering period shown above for each mine, some groundwater pumping will continue at rates of several hundred gpm for several years for purposes of mine closure and reclamation.

TABLE 1
Statistical Summary by Waste Rock Type
Leeville Mine Project

Tons	% by Weight	No. Samples Leco		Total Carbon	Organic Carbon	Carbonate Carbon	Total Sulfur	Sulfate Sulfur	Sulfide Sulfur	ANP $\%CO_2$	AGP $\%CO_2$	ANP/AGP	NCV $\%CO_2$	NNP t/kton $CaCO_3$
West Leeville Upper Plate UC (WLW1)														
22,100	0.55%	59	Min	0.48	0.00	0.39	0.40	0.00	0.05	1.43	0.07	0.81	-0.48	-1.09
			Max	6.13	3.10	5.29	3.26	0.64	2.90	19.40	3.99	118.01	19.21	43.65
			Median	2.54	0.44	1.71	1.24	0.34	0.92	6.27	1.27	4.20	3.73	8.47
			Mean	2.67	0.81	1.86	1.36	0.34	1.02	6.83	1.41	4.85	5.42	12.32
West Leeville Upper Plate CSR (WLW2)														
103,300	2.59%	113	Min	0.27	0.07	-0.21	0.04	0.07	-0.10	-0.77	-4.10	0.19	-3.43	-7.80
			Max	3.19	2.18	1.62	3.37	0.56	2.98	5.94	0.14	43.20	4.52	10.28
			Median	1.21	0.72	0.29	1.45	0.26	1.14	1.06	-1.57	0.68	-0.21	-0.48
			Mean	1.24	0.82	0.42	1.47	0.28	1.20	1.55	-1.64	0.94	-0.09	-0.21
West Leeville Lower UC (WLW3)														
2,937,300	73.73%	112	Min	0.19	0.03	-0.12	0.50	0.05	0.30	0.04	0.41	0.02	-2.83	-6.43
			Max	11.04	6.38	8.20	2.75	1.38	2.55	30.09	3.51	56.39	29.55	67.16
			Median	2.95	0.57	1.85	1.16	0.24	0.82	6.78	1.12	6.04	5.66	12.86
			Mean	3.20	1.05	2.15	1.20	0.30	0.90	7.90	1.24	6.37	6.64	15.10
Four Corners Lower Plate Mixed UC, CSR, UI (FCW1)														
212,100	5.32%	88	Min	0.03	0.00	-0.06	0.12	-0.01	0.05	0.00	0.07	0.00	-8.20	-18.63
			Max	7.06	4.82	4.41	6.82	0.68	6.25	16.18	8.56	236.27	16.12	36.63
			Median	0.45	0.16	0.07	1.14	0.16	0.98	0.26	1.34	0.21	-0.77	-1.75
			Mean	0.84	0.57	0.27	1.31	0.17	1.14	1.03	1.56	0.66	-0.58	-1.31
Turf Shaft Site Upper Plate UC (TW1)														
0	0.00%	105	Min	0.08	0.07	-0.05	0.01	0.04	-0.03	0.18	0.03	1.15	-0.14	-0.32
			Max	7.50	4.56	4.20	2.56	1.70	2.17	15.41	2.97	342.89	15.07	34.25
			Median	2.08	0.36	1.63	0.52	0.20	0.32	5.98	0.44	12.92	5.48	12.45
			Mean	2.22	0.52	1.70	0.68	0.27	0.41	6.24	0.56	11.06	5.68	12.90
Turf Shaft Site Upper Plate CSR (TW2)														
15,300	0.38%	205	Min	0.01	-0.01	-0.21	0.01	0.01	-0.08	0.04	0.01	0.04	-2.02	-4.60
			Max	3.37	3.15	1.40	3.19	2.11	2.86	5.14	3.92	219.66	3.33	7.56
			Median	1.28	0.80	0.31	1.01	0.17	0.69	1.14	0.90	1.54	0.14	0.31
			Mean	1.20	0.85	0.34	1.00	0.31	0.69	1.27	0.94	10.30	0.31	0.71
Turf Lower Plate Dp UC (TW3)														
125,200	3.14%	62	Min	0.03	0.01	-0.12	0.36	0.04	0.14	0.01	0.19	0.00	-7.96	-18.09
			Max	12.41	5.52	7.56	6.15	1.10	6.05	27.75	8.29	116.19	26.59	60.44
			Median	2.49	1.21	0.18	1.93	0.23	1.61	0.64	2.21	0.28	-0.98	-2.23
			Mean	3.30	1.75	1.55	2.42	0.34	2.08	5.75	2.85	2.02	2.86	6.49
Turf Lower Plate SDrm UC (TW4, 5, and 6)														
568,700	14.27%	36	Min	0.08	0.01	-0.05	0.01	0.01	-0.09	0.00	0.01	0.00	-6.95	-15.79
			Max	8.48	1.92	8.41	5.20	1.10	5.07	30.86	6.95	1896.61	30.82	70.05
			Median	2.05	0.16	1.37	1.15	0.22	0.76	5.03	1.04	7.01	4.76	10.82
			Mean	2.44	0.37	2.06	1.36	0.35	1.01	7.59	1.39	5.46	6.19	14.08
Turf Lower Plate Ovi CSR														
0	0	8	Min	0.74	0.02	0.42	0.57	0.36	0.05	1.54	0.07	1.60	1.16	2.63
			Max	2.97	1.43	2.28	2.65	0.57	2.08	8.37	2.85	45.00	7.44	16.90
			Median	1.01	0.50	0.84	0.65	0.52	0.15	3.08	0.21	13.26	2.29	5.20
			Mean	1.49	0.57	0.93	0.94	0.50	0.45	3.39	0.61	5.57	2.79	6.33
Turf Lower Plate UI														
0	0	6	Min	0.86	0.00	0.79	0.50	0.17	0.33	2.90	0.45	0.60	-1.94	-4.40
			Max	1.61	0.07	1.61	3.90	0.93	3.53	5.91	4.84	13.07	5.46	12.40
			Median	1.20	0.02	1.16	2.02	0.42	1.32	4.26	1.80	3.72	2.40	5.45
			Mean	1.25	0.02	1.23	1.94	0.53	1.41	4.50	1.93	2.33	1.93	4.39
Turf Lower Plate Drc CSR														
0	0	8	Min	0.28	0.12	0.06	1.08	0.04	0.82	0.22	1.12	0.16	-2.70	-6.13
			Max	2.40	2.01	0.44	2.51	0.30	2.37	1.61	3.25	1.35	0.42	0.96
			Median	1.95	1.78	0.18	1.31	0.14	1.14	0.66	1.56	0.35	-1.16	-2.63
			Mean	1.88	1.65	0.23	1.51	0.17	1.34	0.83	1.83	0.45	-1.00	-2.28
TOTAL														
3,984,000	100%	802	Median	2.62	0.51	1.59	1.19	0.23	0.85	5.82	1.09	5.52	4.79	10.89
			Mean	2.90	0.97	1.94	1.27	0.30	0.97	7.22	1.25	5.66	5.87	13.34
TOTAL IN ORE														
		143												
TOTAL IN ORE AND WASTE														
		945												
TOTAL IN WASTE MWMP COMPOSITES														
		675												
PAG														
	11.44%													

Notes: ANP = acid-neutralizing potential; AGP = acid-generating potential; NCV = net carbonate value; NNP = net-neutralization potential; CO_2 = carbon dioxide; $CaCO_3$ = calcium carbonate; UC = unoxidized carbonate; CSR = carbon sulfide refractory; UI = unoxidized intrusive; WLW = West Leeville waste; FCW = Four Corners waste; TW = Turf waste; Dp = Popovich Formation; Ovi = Vinini Formation; SDrm = Roberts Mountains Formation..

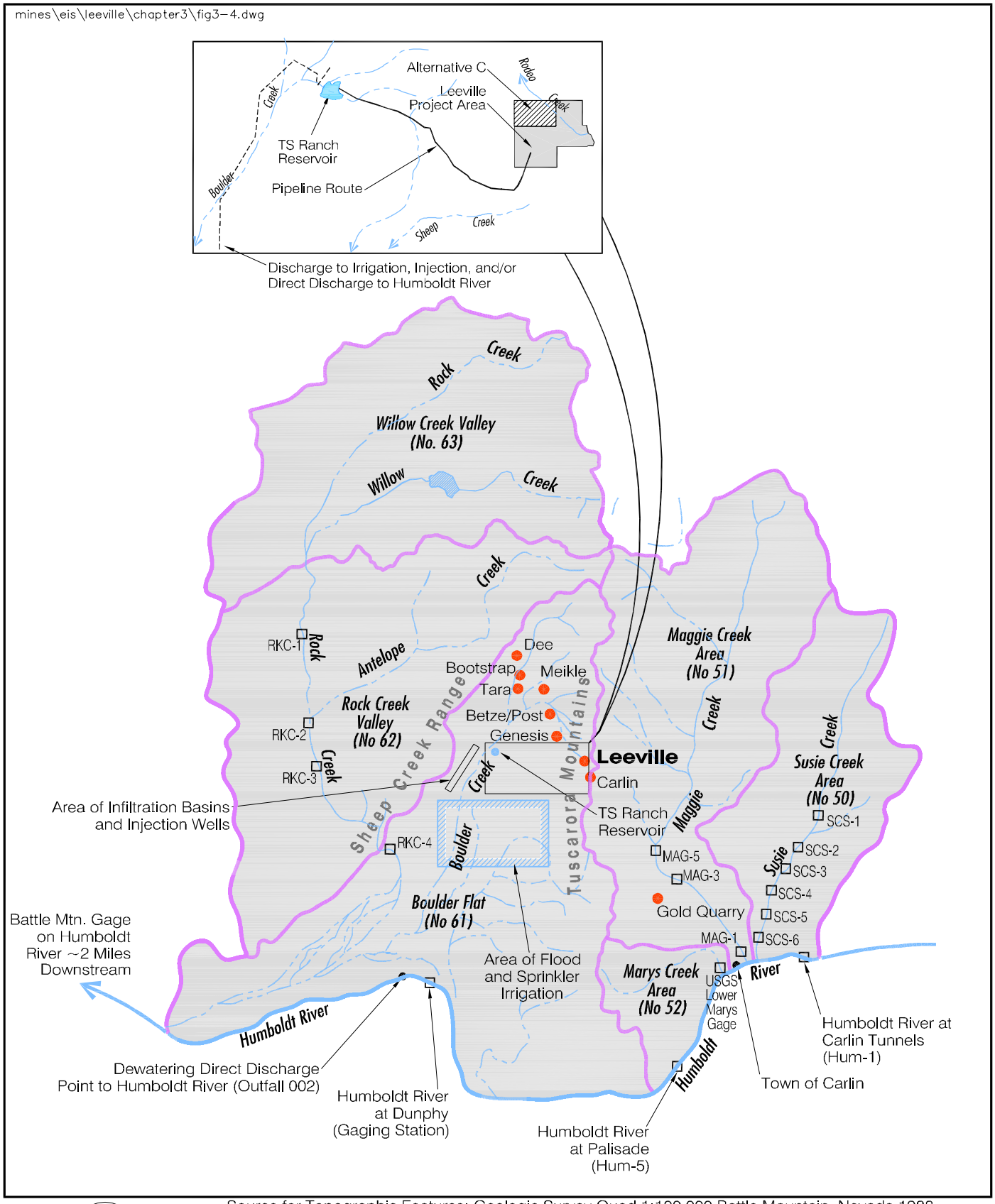
Source: Coxon 1997

TABLE 2
Statistical Summary by Ore Type
Leeville Mine Project

% by Weight	No. Samples			Total Carbon	Organic Carbon	Carbonate Carbon	Total Sulfur	Roast Sulfur	Sulfide Sulfur	ANP $\%CO_2$	AGP $\% CO_2$	ANP/AGP	NCV $\%CO_2$	NNP t/kton $CaCO_3$
	Assay	Leco												
West Leeville Lower UC SDrm Ore														
60.5%	65	65	Min	1.08	0.19	0.43	0.47	0.07	0.40	1.58	0.55	0.98	-0.03	-0.07
			Max	4.93	1.07	4.51	2.41	0.37	2.11	16.54	2.90	17.28	15.48	35.18
			Median	2.74	0.46	2.22	1.30	0.25	1.09	8.14	1.50	5.51	6.57	14.94
			Mean	3.06	0.51	2.55	1.35	0.25	1.09	9.35	1.50	6.22	7.85	17.83
Four Corners Lower CSR Ore														
6.7%	48	48	Min	0.04	0.03	-0.04	1.12	0.05	1.04	0.00	0.00	0.00	-18.55	-42.15
			Max	1.90	1.90	0.43	14.20	0.54	13.66	1.59	18.71	0.46	-1.39	-3.17
			Median	0.15	0.11	0.02	2.87	0.14	2.49	0.10	3.09	0.03	-3.06	-6.95
			Mean	0.30	0.26	0.04	3.15	0.19	2.99	0.19	4.10	0.05	-3.91	-8.89
Turf Ore														
32.8%	30	30	Min	0.08	0.01	-0.07	1.42	0.12	0.82	-0.26	1.12	0.23	-8.70	-19.77
			Max	7.13	5.06	2.25	6.90	0.77	6.51	8.26	8.92	0.93	6.55	14.88
			Median	0.82	0.20	0.29	2.28	0.39	1.86	1.06	2.55	0.42	-1.46	-3.31
			Mean	2.97	1.58	1.38	6.09	0.90	5.20	5.08	7.12	0.71	-2.04	-4.63
TOTAL SAMPLES														
	143	143	Mean	2.85	0.85	2.00	3.02	0.46	2.57	7.34	3.52	4.00	3.82	8.67

Notes: ANP = acid-neutralizing potential; AGP = acid-generating potential; NCV = net carbonate value; NNP = net-neutralization potential; CO_2 = carbon dioxide; $CaCO_3$ = calcium carbonate; UC = unoxidized carbonate; CSR = carbon sulfide refractory; SDrm = Roberts Mountains Formation.

Source: Coxon 1997



Source for Topographic Features: Geologic Survey Quad 1:100,000 Battle Mountain, Nevada 1988

N

0 Miles 10

Hydrographic Basin Boundary and Number

Mine / Proposed Mine

Surface Water Monitoring Station

Regional Surface Water Drainages
Leeville Project
FIGURE 3-5